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May 3, 2023

VIA FIRST CLASS AND ELECTRONIC MAIL

Commissioner Elizabeth Mahony
c/o Emily Webb, Chief of Staff
Massachusetts Department of Energy Resources
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Subject: Petition for Massachusetts Department of Energy Resources Rulemaking to Establish Regulations to Implement the Global Warming Solutions Act and An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy

Dear Commissioner Mahony:

Conservation Law Foundation ("CLF")[1] hereby petitions the Massachusetts Department of Energy Resources ("DOER") to initiate one or more rulemaking proceedings to promulgate new and amended regulations under the Commonwealth's Global Warming Solutions Act ("GWSA"), An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy ("Roadmap Law"), and An Act Driving Clean Energy and Offshore Wind ("2022 Energy Law") pursuant to M.G.L. c. 30A, § 4 and 310 CMR 2.00. As a result of the Commonwealth's new net-zero emission standard, its statutory requirement to update the Clean Energy and Climate Plan ("CECP"), and the recent directive from the Massachusetts Legislature to consider environmental justice in climate programs, CLF asserts that previously enacted regulations require review and revision at this time. This petition is one of several concurrent petitions that CLF has filed as part of a multi-agency GWSA implementation package in which CLF seeks action by DOER, Executive Office of Energy and Environmental Affairs ("EEA"), Energy

[1] CLF, on behalf of its members, seeks a multi-agency GWSA implementation plan that puts Massachusetts on the path to be a national leader in both addressing the climate crisis and environmental injustice. Founded in 1966, CLF is a nonprofit, member-supported, regional environmental organization working to conserve natural resources, protect public health, and promote thriving communities for all in the New England region. CLF protects New England's environment for the benefit of all people. We use the law, science, and markets to create solutions that preserve our natural resources, build healthy communities, and sustain a vibrant economy. CLF serves to protect and promote the interests of its 5,300 members, including more than 2,900 members residing throughout the Commonwealth.

Facilities Siting Board ("EFSB"), Massachusetts Department of Transportation ("MassDOT"), Massachusetts Department of Public Utilities ("DPU"), and Massachusetts Department of Environmental Protection ("MassDEP"). The multi-agency GWSA implementation package is summarized in Appendix A.

GWSA compliance and achieving our net-zero climate targets requires a comprehensive set of regulatory amendments. While Massachusetts has begun implementing the GWSA and the Roadmap Law, implementation is lacking and falls short of mandatory climate goals. In particular, the Roadmap Law requires the Secretary to promulgate greenhouse gas ("GHG") emission limits every five years starting in 2025 and to reach carbon neutrality by 2050.[2] It also requires that the level of emissions in 2050 should not be higher than 85 percent below the 1990 level.[3] Executive Order 569 further holds that agencies should reduce emissions per GWSA limits. With Massachusetts' new Clean Energy and Climate Plan for 2025/2030 ("2025/2030 CECP"), the state aims to reduce 33 percent of emissions from the 1990 level by 2025 and 50 percent from 1990 levels by 2030.[4] With this Petition, CLF requests that DOER undertake these regulatory changes to ensure the Commonwealth achieves its climate mandates and effectively decarbonizes the economy in a just and equitable manner.

Regulatory amendments must address historic disinvestment in Black, Brown, Indigenous, low-income, and immigrant communities, while also setting the stage for emissions reductions in the transportation, electricity, gas, buildings, and solid waste sectors as required by the GWSA and Roadmap Law.[5] Climate justice can only be achieved if DOER and other executive agencies promulgate regulations that bring about concrete improvements in the health and lives of communities in the Commonwealth, especially those that both continue to be disproportionately impacted by pollution and experience the worst impacts of climate change and COVID-19. The policies must be holistic and developed and implemented with community participation. Unless climate justice is a central component of the Commonwealth's path to net-zero emissions, the inequities of the Commonwealth's past energy and environmental policies will be replicated.

CLF's significant history of climate and environmental justice advocacy has included litigation to enforce the GWSA, legislative support to advance climate and environmental justice bills, as well as general advocacy to increase zero-emission transportation policies, expand energy efficiency services, reduce reliance on fossil fuels, and support greater reliance on clean energy. For example, in the 2016 case *Kain v. Department of Environmental Protection*, CLF contended that the Commonwealth was obligated to create and implement regulations to meet its carbon emission reduction mandates.[6] The Massachusetts Supreme Judicial Court agreed with CLF's assertion and held that the plain language of the statute and Section 3(d) required the

[2] St. 2021, c. 8, § 9.
[3] *Id*. § 8(b).
[4] *Massachusetts Clean Energy and Climate Plan for 2025 and 2030*, Executive Office of Energy and Environmental Affairs (June 30, 2022), https://www.mass.gov/doc/clean-energy-and-climate-plan-for-2025-and-2030/download (hereinafter 2025/2030 CECP).
[5] St. 2021, c. 8, § 10; *see also* St. 2021, c. 8, § 56.
[6] *Kain v. Dep't of Envtl. Prot.*, 474 Mass. 278, 288-90 (2016).

department to promulgate regulations.[7] CLF has further worked to uphold the goals and purpose of the GWSA through its participation as an amicus curiae in the 2018 case, *New England Power Generators Association v. Department of Environmental Protection*.[8] Following the above-referenced litigation, MassDEP proceeded to successfully meet its confirmed duties by promulgating GWSA regulations directed at compliance with the GWSA's 2020 targets. In the intervening years climate science, law, and policy options have advanced. We are now faced with new information about the climate crisis, more aggressive emissions targets, and the need to formulate and implement a new set of policies aimed at achieving the Commonwealth's new, more stringent emissions mandate for 2030.

CLF has engaged with DOER on climate policy over the years in the development of energy efficiency policies and incentives that align with the GWSA. The clean energy transition in Massachusetts is obligated to prioritize energy equity and ensure disadvantaged communities have equal access to clean energy and affordable energy-efficiency solutions, which DOER has fostered through clean energy incentive programs, including MassSave. CLF now seeks to work with DOER to implement a regulatory package that will continue advancing climate action and climate justice within the Commonwealth.

CLF's advocacy and commitment to Massachusetts' communities, environmental protection, and justice have yielded significant expertise among CLF staff members in energy and climate matters, as well as matters relating to the transportation, electricity, solid waste, gas, and building sectors. Pursuant to Section 4 of the Massachusetts Administrative Procedure Act,[9] CLF formally requests through this petition that DOER now enact regulations to implement the GWSA, Massachusetts 2050 Decarbonization Roadmap ("2050 Roadmap Report"), and the Commonwealth's emissions limits to mitigate climate change and protect vulnerable environmental justice populations.

[7] *Id*. at 292.
[8] *New England Power Generators Ass'n, Inc. v. Dep't of Envtl. Prot.*, 480 Mass. 398, 399 (2018).
[9] M.G.L. c. 30A, § 4.

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I. BACKGROUND

Legislative and Planning Actions

Recognizing the long-term threat posed by climate change, Massachusetts passed the GWSA in 2008 and was one of the first states to implement a regulatory program to mitigate climate change.[10] The GWSA requires at least an 80 percent reduction in GHG emissions by 2050 from 1990 GHG emission levels.[11] It further requires coordinated state agency actions to achieve these GHG emission limits,[12] and mandates DOER to promulgate GHG reporting regulations.[13] The GWSA also sets forth target goals for the reduction of GHG emissions from all sectors of the Commonwealth's economy.

A history of executive, legislative, and judicial actions followed the GWSA to address the grave threats that the climate crisis presents for the people, natural resources, and environment of the Commonwealth. In May 2016, the Supreme Judicial Court established in *Kain* that MassDEP must set actual enforceable limits for greenhouse gas emissions and not "promulgate regulations that merely establish aspirational goals or unenforceable targets."[14] The *Kain* decision underscored that the EEA and its agencies are primarily responsible for administering the required emission reductions.[15] In September 2016, Governor Baker signed Executive Order 569, which set forth a comprehensive approach to meeting the Commonwealth's GHG emission goals, as well as protecting residents, businesses, and municipalities from the impacts of climate change. In 2018, the Supreme Judicial Court recognized that the GWSA "is designed to make Massachusetts a national, and even international, leader in the efforts to reduce the greenhouse gas emissions that cause climate change."[16] In upholding MassDEP's authority to promulgate sector specific regulations under M.G.L. c. 21N, § 3(d), the Supreme Judicial Court stated that the GWSA "establishes significant, 'ambitious,' legally binding, short-and long-term restrictions on those emissions."[17]

In January 2020, Governor Baker announced a commitment for Massachusetts to achieve net-zero GHG emissions by 2050 during his State of the Commonwealth Address.[18] A year later, the Legislature passed S.2995, the Roadmap Law, amending the GWSA to incorporate a 2050 net-zero emissions mandate. After an initial veto, refiling, and passage again by the Legislature, a negotiated and amended version of the Act was enacted on March 26, 2021, requiring an updated 2025/2030 CECP for 2025 and 2030.[19] On June 30, 2022, EEA released its Clean Energy and Climate Plan for 2025 and 2030. On August 11, 2022, Governor Charlie Baker

[10] St. 2008, c. 298.
[11] M.G.L. c. 21N, § 3B.
[12] M.G.L. c. 21N, §§ 2-3.
[13] M.G.L. c. 21N §§ 2, 10.
[14] *Kain*, 474 Mass. at 287-290.
[15] *See* M.G.L. c. 21N, § 7; M.G.L. c. 21A, § 2 clause (30).
[16] *New England Power Generators Ass'n, Inc.*, 480 Mass. at 399.
[17] *Id.* (citations omitted).
[18] Press Release: *Governor Baker Delivers 2020 State of the Commonwealth Address*, MASS GOV (January 21, 2020), https://www.mass.gov/news/governor-baker-delivers-2020-state-of-the-commonwealth-address.
[19] St. 2021, c. 8.

signed another climate law, An Act Driving Clean Energy and Offshore Wind, which included new measures for clean energy, energy efficiency, and transportation emissions.

EEA has determined that Massachusetts must achieve at least an eighty-five percent gross emissions reduction while meeting the Roadmap Law's net-zero GHG emissions requirement by 2050. Former EEA Secretary Theoharides issued a Letter of Determination on April 22, 2020, defining the net-zero requirement:

> *A level of statewide greenhouse gas emissions that is equal in quantity to the amount of carbon dioxide or its equivalent that is removed from the atmosphere and stored annually by, or attributable to, the Commonwealth; provided, however, that in no event shall the level of emissions be greater than a level that is 85 percent below the 1990 level*.[20]

EEA followed this Determination with the 2050 Roadmap Report on December 30, 2020, a technical report that set forth eight pathways to achieve net-zero emissions by 2050. The 2050 Roadmap Report was the culmination of input from a technical advisory committee and implementation advisory committee, in which CLF participates. A plan styled as an "Interim Clean Energy and Climate Plan" for 2030 and a request for comments accompanied the 2050 Roadmap Report.[21] CLF filed detailed comments on the Interim 2030 CECP.

On June 30, 2022, former EEA Secretary Beth Card released a final Clean Energy and Climate Plan ("CECP") for 2025 and 2030, which aims to achieve a 33 percent reduction in GHG emissions from the 1990 level by 2025 and the Roadmap Law's statutorily required 50 percent reduction in GHG emissions from the 1990 level by 2030.[22] While the 2025/2030 CECP sets overall objectives for the Commonwealth to tackle the climate crisis, the Plan lacks concrete action goals in multiple areas. Regulatory action is timely as DOER needs to establish concrete opportunities to achieve those goals and promulgate adequate regulations to meet its climate mandates.

On December 21, 2022, EEA released the 2050 CECP, a comprehensive plan to achieve net-zero GHG emissions by 2050.[23] The 2050 CECP reflects the state's strategies to reach emission goals and is on the right track on phasing out fossil fuels, but still requires additional work to ensure that no environmental justice populations are left behind.

In January 2023, Governor Healey signed Executive Order 604, establishing the Office of Climate Innovation and Resilience and appointing a Climate Chief, a new-cabinet level position responsible for prioritizing climate change policies across all agencies. In the appointment of

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[20] Secretary Kathleen Theoharides, *Determination of Statewide Emissions Limit for 2050*, Executive Office of Energy and Environmental Affairs (April 22, 2020), Commonwealth of Massachusetts, https://www.mass.gov/doc/final-signed-letter-of-determination-for-2050-emissions-limit/download.

[21] *Interim Clean Energy and Climate Plan for 2030*, Executive Office of Energy and Environmental Affairs, at 47 (2020) (hereinafter Interim CECP).

[22] *See generally* 2025/2030 CECP, *supra* note 4.

[23] *Clean Energy and Climate Plan for 2050*, Executive Office of Energy and Environmental Affairs (Dec. 2022) (hereinafter 2050 CECP), https://www.mass.gov/doc/2050-clean-energy-and-climate-plan/download.

Climate Chief Hoffer to monitor cross-agency climate work, Governor Healey established Massachusetts as the first state in the nation to establish such a position at the cabinet level.

DOER Implementation

The GWSA directs the Commonwealth's executive agencies to promulgate regulations that achieve compliance. "In implementing its plan for statewide greenhouse gas emissions limits, the commonwealth and its agencies shall promulgate regulations that reduce energy use, increase efficiency and encourage renewable sources of energy in the sectors of energy generation, buildings and transportation."[24] To implement the 2025/2030 CECP and to achieve the emissions limits set forth by the Baker administration, DOER must take advantage of the present opportunity and amend its regulations to ensure achievement of the Commonwealth's climate goals.

DOER's past regulations have been insufficient to meet the mandates of the GWSA and the Roadmap Law. DOER has promulgated three regulations pursuant to the Roadmap Law in the last five years; one regulation amended appliance energy-efficiency standards, testing, and certification[25] and two others amended the Stretch Energy Code, split between Residential low-rise construction and all other construction.[26] DOER changed the Stretch Energy Code by adding new energy efficiency requirements.[27] DOER also updated the Stretch Code to strengthen the air leakage limit, mandate partial electrification of space heating forcertain buildings, and bolster insulation performance requirements.[28] While theupdate of the Stretch Energy Code is important, DOER's efforts historically have been minimal in meeting the climate objectives of the GWSA and Roadmap Law.

In the 2025/2030 CECP, the EEA estimates that Massachusetts will achieve a 32 percent emissions reduction in 2025 on the way toward a 50 percent reduction emissions requirement by 2030. While existing policies including the 3-Year Energy Efficiency Plan and power plant emissions limits have helped reduce emissions and decarbonize Massachusetts' economy, MassDOT must seize other opportunities to maximize emissions reductions through regulatory actions. The regulatory proposals in this petition will help ensure a transition to a clean energy economy while also considering equity and environmental justice.

II. THE THREAT OF THE CLIMATE CRISIS REQUIRES URGENT ACTION

Climate scientists agree that at least net-zero GHG emissions must be achieved by mid-century to have a chance at mitigating the worst effects of climate change. The Massachusetts Supreme Judicial Court has acknowledged the emerging consensus shared by the scientific community that climate change is attributable to increased emissions, as well as perceptions in

[24] M.G.L. c. 21N, § 6.
[25] 225 CMR 9.00.
[26] *Summary of Proposed New 225 CMR 22.00 and 23.00*: 2023 Stretch Energy Code Update and Municipal Opt-in Specialized Code, MASS. DEP'T OF ENERGY RES. (June 2022), https://www.mass.gov/doc/a-summary-of-the-proposed-specialized-stretch-energy-code-regulation-published-june-24-2022/download?_ga=2.177002853.1198978553.1664903533-1612519953.1662996795.
[27] *Id.* at 4.
[28] *Id.* at 6.

the Commonwealth that national and international efforts to reduce those emissions are inadequate.[29] As recognized by Governor Healey in her former role as Massachusetts Attorney General, climate change poses an existential threat to living beings.[30] The Intergovernmental Panel on Climate Change ("IPCC") has warned that the time between now and 2030 is the most important for climate action.[31]

Dire Warnings from Climate Scientists

The IPCC has found that the global surface air temperature has risen approximately 1.0 degree Celsius (1.8 degrees Fahrenheit) above pre-industrial temperatures.[32] The world and the region are also experiencing higher annual temperatures, increased and more severe storms, extreme weather, and rising sea levels as a result of the global rise of GHG emissions.[33] A vast majority of these rising emissions are from the burning, extraction, and transportation of fossil fuels over the past decades.[34]

The IPCC emphasizes the effects of climate change are increasingly getting more severe, and drastic decarbonization is needed to meet climate goals. For example, in 2014 the IPCC concluded that "continued emission of greenhouse gases will cause further warming" and long-lasting impacts and limiting climate change would require "substantial and sustained reductions in greenhouse gas emissions."[35] In 2018, the IPCC provided a graver assessment, concluding that with the current pace of emissions, warming will reach 1.5 degrees Celsius (2.7 degrees Fahrenheit) by mid-century.[36] At 1.5 degrees Celsius there are still significant impacts on human health, food and water supply, sea level rise and mass species extinction.[37] Similar warnings came from the United States Global Change Research Program in 2018[38] and the World Economic Forum's Global Risks Report in 2019.[39] In 2020, the global community collectively experienced the highest temperatures on record, alarming heat and wildfires in the Arctic, and a record 29 tropical storms in the Atlantic.[40]

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[29] *Kain*, 474 Mass. at 281.
[30] *Massachusetts v. Exxon Mobil Corp*., No. 19-3333, at 49 Massachusetts Superior Court (Oct. 24, 2019), https://www.mass.gov/files/documents/2019/10/24/Complaint%20-%20Comm.%20v.%20Exxon%20Mobil%20Corporation%20-%2010-24-19.pdf.
[31] Press Release: *The evidence is clear: the time for action is now. We can halve emissions by 2030*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (April 4, 2022), https://www.ipcc.ch/2022/04/04/ipcc-ar6-wgiii-pressrelease/.
[32] *Global Land-Ocean Temperature Inde*x, NASA, https://climate.nasa.gov/vital-signs/global-temperature/.
[33] *The Effects of Climate Change*, NASA, https://climate.nasa.gov/effects/.
[34] *Climate Change 2014 Synthesis Report Summary for Policymakers*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, (2014), at 5, https://www.ipcc.ch/site/assets/uploads/2018/02/AR5_SYR_FINAL_SPM.pdf.
[35] *Id*. at 8.
[36] *Global Warming of 1.5 ºC, Chapter 1,* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (2018), 82, https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter1_Low_Res.pdf.
[37] *Id*. at 9.
[38] *Fourth National Climate Assessment, Vol. II: Impacts, Risks, and Adaptation in the United States*, US GLOBAL CHANGE RESEARCH PROGRAM (2018), https://nca2018.globalchange.gov/.
[39] *The Global Risks Report 2019*, WORLD ECONOMIC FORUM (2019), https://www.weforum.org/reports/the-global-risks-report-2019.
[40] Damian Carrington, *Climate Crisis: 2020 was joint hottest year ever recorded*, THE GUARDIAN (January 8, 2021), https://www.theguardian.com/environment/2021/jan/08/climate-crisis-experts-2020-joint-hottest-year-ever-recorded.

In 2021, the IPCC issued another dire report, finding that climate change is "unequivocally" caused by human influence,[41] and that recent changes in the climate system are "unprecedented" over hundreds to thousands of years.[42] The report also stated that human-caused climate change is "already affecting many weather and climate extremes in every region across the globe."[43] For instance, heavy precipitation events have increased since 1950 in most land areas and ecological and agricultural droughts have increased as well, mainly due to human-caused climate change.[44] The 2021 IPCC report warned that there is a narrow window to limit climate change to 1.5 degrees Celsius and policies must be enacted immediately to avoid setting off irreversible tipping points.

In fact, the 2021 IPCC report revealed that global surface temperature will continue to rise "until at least mid-century under all emission scenarios considered."[45] Mitigating climate change and its most catastrophic effects requires "limiting cumulative CO_2 emissions, reaching at least net zero CO_2 emissions."[46] The 2021 IPCC report also emphasized the importance of timely action, as every ton of carbon dioxide contributes to climate change and "[w]ith every increment of global warming, changes in extremes continue to become larger."[47] While some effects of climate change would take millennia to reverse, scenarios that severely limit GHG emissions "would have rapid and sustained effects to limit human-caused climate change," such as flooding.[48] Limiting emissions in the near term is imperative to minimize future warming and avoid the most devastating and irreversible impacts of climate change.[49]

Since the dire 2021 report, two reports have been released that support cross-cutting regulatory action in Massachusetts. In the 2022 Summary for Policymakers Report on Mitigation, the IPCC recognized that "[c]limate governance is most effective when it integrates across multiple policy domains, helps realise synergies and minimize trade-offs."[50] The IPCC further stated that policies shifting behavioral changes can "open up a broader range of mitigation efforts," including promoting walkable urban areas, electrification, and renewable

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[41] *Climate Change 2021: The Physical Science Basis, Summary for Policymakers*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (2021), at 4, https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf (hereinafter 2021 IPCC Report).
[42] *Id*. at 6.
[43] *Id*. at 10.
[44] *Id*. at 8, 10.
[45] *Id*. at 14.
[46] *Id*. at 27.
[47] 2021 IPCC Report, *supra* note 41, at 15 ("For example, every additional 0.5°C of global warming causes clearly discernible increases in the intensity and frequency of hot extremes, including heatwaves (very likely), and heavy precipitation (high confidence), as well as agricultural and ecological droughts in some regions (high confidence)."
[48] *Climate Change 2022: Impacts, Adaptation and Vulnerability, Summary for Policymakers*, Intergovernmental Panel on Climate Change, at 31 (2022), IPCC AR6 WG II, https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf (hereinafter 2022 IPCC Adaptation Report).
[49] *Id*. at 27-28.
[50] *Climate Change 2022: Mitigation of Climate Change, Summary for Policymakers*, Intergovernmental Panel on Climate Change, at 59 (2022), IPCC AR6 WG III, https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf.

energy.[51] Overall, this report called for "a substantial reduction in overall fossil fuel usage," as well as the "widespread electrification of the energy system."[52] The 2022 Summary for Policymakers Report on impacts, adaptation, and vulnerability stated that "[s]oft limits to some human adaptation have been reached," emphasizing the need for clear action.[53] The 2022 IPCC Adaptation Report concluded that "[i]nclusive governance contributes to more effective and enduring adaptation outcomes and enables climate resilient development."[54]

Severe Climate Impacts Already Hitting Massachusetts

Massachusetts is already experiencing harmful impacts from climate change and remains particularly vulnerable if GHG emissions continue to rise. Temperatures in Massachusetts already have increased more than the national average, and heavy precipitation in the region is greater than anywhere else in the country.[55] Severe storms have pounded the state in recent years causing flooding, displacement, and millions of dollars of property damage.[56] Residents living in urban areas such as Boston, particularly the young, ill, and elderly, will also face additional challenges if they live in buildings without air conditioning and "will face greater risks of serious heat-related health illnesses" as heat waves are projected to become more frequent and intense.[57] Boston is also at risk of coastal flooding, storm surges, and sea level rise, jeopardizing Boston Logan Airport, the train system, and those living throughout the city. Other coastal areas in Massachusetts are also particularly vulnerable to sea level rise and extreme sea level events that previously occurred once per century and are projected to occur at least annually in many areas by 2100. Low-lying areas will experience increases in the frequency and intensity of flooding, and sandy coasts will undergo more severe coastal erosion. These impacts are most severely felt by environmental justice populations, frontline, and marginalized communities. For example, in addition to Boston, Revere (an environmental justice population), Marshfield, Quincy (an environmental justice population), Hull, and Salisbury are particularly exposed to sea level rise and flooding.[58]

Failing to reduce GHG emissions will force higher costs on the people of Massachusetts and impose greater threats to their health, safety, and property.[59] This will exacerbate issues felt by environmental justice populations already overburdened by pollution.

As the United Nations Secretary-General stated:

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[51] *Id*.
[52] *Id*. at 36.
[53] 2022 IPCC Adaptation Report, *supra* note 48, at 28.
[54] *Id*. at 33.
[55] *Rising Temperatures*, RESILIENT MA CLIMATE CHANGE CLEARINGHOUSE FOR THE COMMONWEALTH, https://resilientma.org/changes/rising-temperatures.
[56] *Billion-Dollar Weather and Climate Disasters*: *Events*, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, https://www.ncdc.noaa.gov/billions/events.
[57] *Id*.
[58] *U.S. Coastal Property at Risk from Rising Seas*, Union of Concerned Scientists, https://ucsusa.maps.arcgis.com/apps/MapSeries/index.html?appid=cf07ebe0a4c9439ab2e7e346656cb239.
[59] *Id*.

> *Today's IPCC Working Group 1 Report is a code red for humanity. The alarm bells are deafening, and the evidence is irrefutable: greenhouse gas emissions from fossil fuel burning and deforestation are choking our planet and putting billions of people at immediate risk. Global heating is affecting every region on Earth, with many of the changes becoming irreversible.*
>
> *The internationally agreed threshold of 1.5 degrees Celsius is perilously close.*
>
> *[…]*
>
> *We must act decisively now to keep 1.5 alive*.[60]

The regulations proposed herein provide concrete steps that the Commonwealth should take to immediately implement the GWSA and 2050 Roadmap Law, and align with the spirit and urgency of the most recent 2022 IPCC report to maintain climate change at 1.5 degrees Celsius.

III. AGENCIES MUST PRIORITIZE AND CENTER EQUITY AND JUSTICE IN GWSA IMPLEMENTATION

The "climate crisis, species loss, pollution, and predatory capitalism have placed increased pressures on our natural and built environment, often leaving the most marginalized communities, especially people of color, low-income residents, and limited English proficient residents, to bear the worst of the burden of environmental pollution."[61] Race determines which neighborhoods are safe and healthy places to live, learn, work, commute, and play,[62] and the COVID-19 pandemic has exacerbated these long-standing inequities in health outcomes between

[60] Press Release, *Secretary-General's statement on the IPCC Working Group 1 Report on the Physical Science Basis of the Sixth Assessment*, UNITED NATIONS (Aug. 9, 2021), https://www.un.org/sg/en/content/secretary-generals-statement-the-ipcc-working-group-1-report-the-physical-science-basis-of-the-sixth-assessment.
[61] *Recommendations for 80x50 Study Scenario Planning*, Climate Justice Working Group (February 24, 2020), https://www.mass.gov/doc/gwsa-iac-climate-justice-working-group-memo/download.
[62] Daniel R. Faber and Erie J. Krieg, *Unequal Exposure to Ecological Hazards 2005: Environmental Injustices in the Commonwealth of Massachusetts*, Report by Philanthropy and Environmental Justice Research Project Northeastern University (October 2005), at 1, https://web.northeastern.edu/ejresearchnetwork/wp-content/uploads/2014/10/Final-Unequal-Exposure-Report-2005-10-12-05.pdf.

white people and people of color.[63] Specifically, environmental justice populations[64] are at risk of suffering from health conditions from criteria pollutants such as particulate matter, ground-level ozone, lead, carbon monoxide, nitrogen oxides, volatile organic compounds, black carbon, and researchers found that more people have died from fossil fuel pollution than earlier suggested.[65] The Commonwealth will not succeed in achieving net zero emissions without ensuring emission reductions in all communities and concurrent improvements in air quality, public health, and economic opportunity in historically disinvested communities.

DOER, EEA, MassDEP, EFSB, MassDOT, and DPU have a responsibility and opportunity to concurrently meet their obligations under the GWSA, Green Communities Act ("GCA"), Green Jobs Act, Executive Order on Environmental Justice Number 552, the EEA's 2021 Environmental Justice Policy, and to begin to redress environmental injustice and work toward climate justice. Environmental justice means that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthy environment regardless of race, income, national origin, or English language proficiency.[66] Climate justice focuses on the root causes of climate change – human-caused GHG emissions – and making systemic changes that are required to address unequal burdens to our communities and realign

[63] *Weekly COVID-19 Public Health Report*, Massachusetts Department of Public Health COVID-19 Dashboard, at 46 (Dec. 24, 2022) (The most recent data set released by the Department of Public Health regarding COVID-19 as of December 2020 shows that 19 of the 20 municipalities with the highest total average daily cases in the Commonwealth contain EJ populations), https://www.mass.gov/doc/weekly-covid-19-public-health-report-december-24-2020/download; *See also Weekly Dashboard Data*, City/Town" and "Race and Ethnicity" Tabs, https://www.mass.gov/doc/weekly-public-health-report-raw-data-december-24-2020/download *compared to 2010 Environmental Justice Populations*, https://www.mass.gov/doc/ej2010communitystatisticspdf/download. Many of these communities also have poor air quality and are home to essential workers who do not have the luxury of being able to work remotely. *See COVID-19 and Health Neighborhoods Study Communities*, Conservation Law Foundation (2020), https://www.clf.org/covid-19-and-healthy-neighborhoods-study-communities/; *see also Data Show COVID-19 is Hitting Essential Workers and Communities of Color Hardest*, ACLA Massachusetts (2020), https://www.aclum.org/en/publications/data-show-covid-19-hitting-essential-workers-and-people-color-hardest; *and see* Lisa Friedman, *New Research Links Air Pollution to Higher Coronavirus Death Rates*, NEW YORK TIMES (April 7, 2020), https://www.nytimes.com/2020/04/07/climate/air-pollution-coronavirus-covid.html.

[64] M.G.L. c. 30, § 56 ("Environmental justice population", a neighborhood that meets 1 or more of the following criteria: (i) the annual median household income is not more than 65 per cent of the statewide annual median household income; (ii) minorities comprise 40 per cent or more of the population; (iii) 25 per cent or more of households lack English language proficiency; or (iv) minorities comprise 25 per cent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 per cent of the statewide annual median household income; provided, however, that for a neighborhood that does not meet said criteria, but a geographic portion of that neighborhood meets at least 1 criterion, the secretary may designate that geographic portion as an environmental justice population upon the petition of at least 10 residents of the geographic portion of that neighborhood meeting any such criteria; provided further, that the secretary may determine that a neighborhood, including any geographic portion thereof, shall not be designated an environmental justice population upon finding that: (A) the annual median household income of that neighborhood is greater than 125 per cent of the statewide median household income; (B) a majority of persons age 25 and older in that neighborhood have a college education; (C) the neighborhood does not bear an unfair burden of environmental pollution; and (D) the neighborhood has more than limited access to natural resources, including open spaces and water resources, playgrounds and other constructed outdoor recreational facilities and venues.").

[65] *Conservation Law Foundation Comments on Interim 2030 Clean Energy and Climate Plan*, at 12, 14-15 (March 22, 2021) (hereinafter CLF Comments on Interim 2030 CECP).

[66] EXEC. ORDER No. 552 (2014).

our economy with our natural systems.[67] At its core, climate change is a social and ethical issue as the effects of climate change will be most severely felt by low-income and underserved communities. As a form of environmental justice, climate justice advocates hold that all humans (some would say species/living beings, too) have the right to access and obtain the resources needed to have an equal chance of survival and freedom from discrimination.

The GWSA requires the EEA secretary to determine "whether activities undertaken to comply with state regulations and efforts disproportionately impact low-income communities," and to "consider overall societal benefits, including reductions in other air pollutants, diversification of energy sources and other benefits to the economy, environment and public health."[68]

Massachusetts passed the GCA in 2008 "to help municipalities become more sustainable, control rising energy costs, and incubate clean energy technologies and practices."[69] The GCA also laid out several provisions to ensure that low-income communities have access to the benefits of energy efficiency resources. Section 141 states that "[i]n all decisions or actions regarding rate designs, the department [of energy resources] shall consider the impacts of such actions" and "[w]here the scale of on-site generation would have an impact on affordability for low-income customers, a fully compensating adjustment shall be made to the low-income rate discount."[70] Additionally, the GCA requires the Secretary of EEA to prepare "a 5-year plan for meeting the renewable and alternative energy and energy efficiency goals of the commonwealth" that addresses the "equitable distribution of program benefits to all customers and particularly low income customers to address the affordability and adverse impacts on low-income households of energy costs and demand mitigation strategies, and mitigation of such adverse impacts, such as by compensating adjustments to the low-income rate discount."[71]

In November 2014, former Governor Deval Patrick issued Executive Order ("EO") 552 "to encourage sustained and continued efforts now and into the future to ensure that environmental justice (EJ) remains a priority for the Executive branch." Each Secretariat, including the EEA and DOER, must develop a strategy to incorporate environmental justice considerations into its programs, including through permitting processes, economic development opportunities, and public participation and outreach.[72] EO 552 directs the EEA Secretary to update the Environmental Justice Policy originally issued in 2002.[73] The 2017 Environmental Justice Policy requires that, "EEA agencies shall consider the current and future impacts that climate change will have on EJ populations" and "shall take appropriate measures towards ensuring that EJ populations are equally protected from hazards and health risks imposed by

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[67] *Climate Justice Working Group Memorandum*, Massachusetts GWSA Implementation Advisory Committee (Feb. 24, 2020), https://www.mass.gov/doc/gwsa-iac-climate-justice-working-group-memo/download.
[68] M.G.L. c. 21N, § 5.
[69] *Massachusetts Clean Energy and Climate Plan for 2020*, Secretary of Energy and Environmental Affairs Matthew A. Beaton, at 111 (2015), https://www.mass.gov/files/documents/2017/12/06/Clean%20Energy%20and%20Climate%20Plan%20for%202020.pdf.
[70] St. 2008, c. 169, § 141.
[71] St. 2008, c. 169, § 116(b)(3).
[72] EXEC. ORDER No. 552 § 5.
[73] *Id.* § 3.

future climate changes and properly informed of appropriate measures taken to increase their adaptive capacity."[74]

Through initiating rulemaking proceedings as recommended by this petition, executive agencies can simultaneously advance work to achieve the 2030 and 2050 climate targets while complying with a variety of other statutory mandates and benefiting environmental justice populations that have been marginalized and face additional burdens from climate change.

IV. DOER HAS THE AUTHORITY TO AMEND ITS REGULATIONS TO ACHIEVE THE GWSA

The right to petition agencies to engage in rulemaking is enshrined in Section 4 of the Massachusetts Administrative Procedure Act ("MassAPA"), which provides that "[a]ny interested person may petition an agency requesting the adoption, amendment or repeal of any regulation, and may accompany his petition with such data, views and arguments as he thinks pertinent."[75] It further states: "Each agency shall prescribe by regulation the procedure for the submission, consideration and disposition of such petitions."[76] Agencies in Massachusetts also have a right to engage in the rulemaking process. See *Borden, Inc. v. Commissioner of Public Health*, 338 Mass. 707 (1983) (*citing Cambridge Elec. Light Co. v. Department of Pub. Utils*., 363 Mass. 474, 486-487 (1973)) ("The nature of the rule-making process is such that one may reasonably contemplate that the regulatory body will, either on the basis of some external or internal impetus, determine that a potential problem exists and further investigation is warranted to determine whether (1) such a problem does, in fact, exist and (2) some regulation is necessary to resolve the problem."); *see also Arthurs v. Board of Registration in Medicine*, 383 Mass. 299, 312-313, (1981) ("an agency may adopt policies through adjudication as well as through rule-making."). CLF proposes the following regulatory amendments to enable the Commonwealth to achieve the 2030 and 2050 climate goals and work toward climate justice.

[74] *Environmental Justice Policy of the Executive Office Of Energy And Environmental Affairs*, at 13, Executive Office of Energy and Environmental Affairs (June 24, 2021), https://www.mass.gov/files/documents/2017/11/29/2017-environmental-justice-policy_0.pdf.
[75] M.G.L. c. 30A, § 4.
[76] *Id.*

V. DOER HAS AN OPPORTUNITY TO IMPLEMENT A CROSS-SECTOR RULEMAKING PROCESS TO IMPLEMENT THE GWSA AND WORK TOWARD NET ZERO EMISSIONS BY 2050

Based upon the expertise gained through its experience advocating for climate policies, CLF is confident that the best strategy to achieve the Commonwealth's decarbonization and emissions goals is a multi-sectored approach,[77] wherein the largest gains will come from reforming the building and transportation sectors. The regulations below should be enacted and implemented by sector to achieve the best possible and practicable results.

A. Achieving a Decarbonized Transportation Sector Requires Implementing the Commission on the Future of Transportation Report

Current Status

The transportation sector is the largest contributor of GHG emissions in Massachusetts. In 2017, transportation accounted for 42 percent of GHG emissions in the state.[78] "60 percent of those emissions from the transportation sector come from light-duty passenger cars, trucks and sport utility vehicles."[79] "14 percent of transportation emission arise from medium- and heavy-duty vehicles, rail, and aviation."[80] The Commonwealth's strategy to reduce light-duty transportation emissions is to switch from "fossil-fueled vehicles to zero emissions vehicles" in addition to "maintaining and supporting existing public transit systems, reducing single occupancy vehicle use where possible, making complementary land use decisions, and supporting active transportation infrastructure such as bike lanes and sidewalks."[81] The primary types of zero emission vehicles include electric vehicles ("EVs") and hydrogen fuel cell electric vehicles.[82] For medium- and heavy-duty vehicles, battery-electricity technology is seen as a "viable strategy," as well as implementing battery electric vehicles and fuel cell electric vehicles.[83]

Reducing car trips is a key climate measure, but Massachusetts' public transportation systems are in crisis. On a continuing basis, environmental justice populations have disproportionately "borne the environmental and health burdens associated with our current energy economy."[84] Before the pandemic, service cuts, safety failures, delayed infrastructure upgrades, and chronic delays denied riders the service they needed, while reliance on fossil fuel

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[77] *Massachusetts 2050 Decarbonization Roadmap*, at 12 Massachusetts Executive Office of Energy and Environmental Affairs (Dec. 2020), https://www.mass.gov/doc/ma-2050-decarbonization-roadmap/download (hereinafter 2050 Roadmap Report).
[78] *Summary of Massachusetts GHG Emissions – October 2020*, Greenhouse Gas Baseline, Inventory, and Projection, Appendix C: Massachusetts Annual Greenhouse Gas Emissions Inventory: 1990-2017 with Partial 2018 & 2019 Data, MASSDEP (October 2020), https://www.mass.gov/doc/appendix-c-massachusetts-annual-greenhouse-gas-emissions-inventory-1990-2017-with-partial-2018/download.
[79] 2050 Roadmap Report, *supra* note 77, at 21.
[80] *Id*. at 38.
[81] *Id*. at 33.
[82] *Id*. at 35.
[83] *Id*. at 39.
[84] 2050 Roadmap Report, *supra* note 77, at 17.

vehicles degraded public health and the health of our climate. During the pandemic, riders making essential trips faced crowded conditions on transit routes serving environmental justice populations. Race determines which neighborhoods are safe and healthy places to live, learn, work, commute, and play,[85] and the COVID-19 pandemic has and is continuing to exacerbate these long-standing inequities in health outcomes between white people and people of color.[86] Yet, our transportation system is overwhelmed, underfunded, and utterly unprepared for changing climate conditions.

According to the 2025/2030 CECP, "[t]he 2025 GHG emissions sublimit for the transportation sector is set at 24.9 $MMTCO_2e$, or an 18% reduction from 1990 level."[87] In 2020, transportation accounted for 37% of emissions in the State.[88] "To achieve the 2025 sublimit, the Commonwealth set a goal of 200,000 total EVs on the road and 15,000 public charging stations in 2025. To achieve the 2030 sublimit, the Commonwealth set a goal of 900,000 total EVs on the road."[89] However, the CECP failed to set annual air pollution reduction targets. CLF recommends that the Commonwealth implement a transportation strategy that identifies and reduces air pollution hotspots attributed to transportation and launches air quality monitoring programs, especially along routes serving environmental justice populations.

As of December 31, 2020, 21,010 EVs were registered with the Registry of Motor Vehicles according to the U.S. Department of Energy.[90] In 3 years, only 9,010 more EVs were registered within the state of Massachusetts, resulting in the total amount of EVs on the road at 31,000 in 2022,[91], with more than 16,000 EV owners obtaining a state rebate as of October 2022.[92] Over 750,000 EVs are needed to reach GHG emission targets by 2030, demonstrating the need for regulatory amendments.[93]

[85] Faber et al., *supra* note 62.
[86] *Weekly COVID-19 Public Health Report*, *supra* note 63; *see also Building Toward Racial Justice and Equity in Health: A Call to Action*, at 10-13 Massachusetts Attorney General Maura Healey (2020), https://www.mass.gov/doc/building-toward-racial-justice-and-equity-in-health-a-call-to-action/download; *see also* Barbara Moran, "Communities of color get more gas leaks, slower repairs, says study," WBUR News (last accessed February 24, 2023); Marcos Luna and Dominic Nicholas, "An environmental justice analysis of distribution-level natural gas leaks in Massachusetts, USA," *Energy Policy* 162 (March 2022): 112778.
[87] 2025/2030 CECP, *supra* note 4, at 31.
[88] *Id.*
[89] *Id*. at 31-32.
[90] *Maps and Data – Electric Vehicle Registrations by State*, U.S. DEPARTMENT OF ENERGY, https://afdc.energy.gov/data/10962 (last accessed on June 15, 2022).
[91] Sabrina Shankman, Taylor Dolven, *Massachusetts needs at least 750,000 electric vehicles on the road by 2030. We are nowhere close*, BOSTON GLOBE (April 9, 2022).
[92] Massachusetts Offers Rebates for Electric Vehicles, https://mor-ev.org/program-statistics (last accessed on December 5. 2022).
[93] *Id*.

Legal Authority

Massachusetts law requires agencies to set emission regulations consistent with and equally stringent as those passed in California pursuant to the Clean Air Act.[94] For example, MassDEP recently promulgated the final regulations approving the Advanced Clean Trucks, Heavy-Duty Omnibus, Greenhouse Gas Phase 2 Standards for Model Year 2025 regulations for medium-and heavy-duty vehicles, and the Low Emission Vehicle Program, tightening emissions standards for cars, sport utility vehicles, minivans, and light-duty trucks under Advanced Clean Cars II.[95] To decarbonize, this strategy includes three general transitions: replace conventional vehicles with EVs, replace conventional vehicles with fuel cell electric vehicles, and substitute decarbonized fuels for petroleum-based fuels in internal combustion engine vehicles.[96] As of 2017, only 1.4 percent of light-duty vehicles sold in Massachusetts were EVs and 12,000 EVs were registered with the Registry of Motor Vehicles.[97]

Pursuant to Executive Orders 579 and 580, the Commission on the Future of Transportation issued its report identifying transportation initiatives to achieve by 2040 that will both reduce GHG emissions and expand access to transportation options. Per the Commission on the Future of Transportation, "[w]ithout further action, transportation sector GHG emissions are projected to increase."[98] The Commission on the Future of Transportation recommended that "bus service, in particular, needs to be reinvented."[99] The Commission on the Future of Transportation also concluded that all buses purchased with state resources should be zero emissions by 2030.[100]

Executive Order 594: Leading By Example, sets out targets for the decarbonization of the state fleet, but such targets are too modest to make sufficient contributions to achieving the emissions reductions goals of the GWSA and Roadmap Law.[101] For instance, the Order encourages the state fleet only consist of 20 percent zero emission vehicles by 2030 and reduce emissions "associated with the burning of onsite fossil fuels at buildings and in vehicles" only 20 percent by 2025 and 35 percent in 2030.[102] Bolder action is needed to dramatically reduce GHG emissions within the transportation sector.

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[94] *Transportation Sector Report: A Technical Report of the Massachusetts 2050 Decarbonization Roadmap Study*, Cadmus Group and Evolved Energy Research, at 8 (Dec. 2020), https://www.mass.gov/doc/transportation-sector-technical-report/download.
[95] *Id*.; 310 CMR 7.40, 310 CMR 7.71, 310 CMR 7.75.
[96] *Id*. at 10.
[97] *Choices for Stewardship: Recommendations to Meet the Transportation Future: Executive Summary*, Commission on the Future of Transportation, at 4 (December 2018), https://www.mass.gov/files/documents/2018/12/14/FOTC-ExecutiveSummary.pdf (Hereinafter Recommendations to Meet the Transportation Future: Executive Summary).
[98] *Id*. at 3.
[99] *Choices for Stewardship: Recommendations to Meet the Transportation Future*, Volume 1: Submitted Pursuant to Executive Orders 579 and 580, Commission on the Future of Transportation in the Commonwealth, at 36, https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download.
[100] *Id.* at 54.
[101] EXEC. ORDER No. 594 (2021).
[102] *Id*.

Needed Action

Massachusetts must pursue a suite of policies to address disproportionate burdens of pollution, reduce greenhouse gas emissions, and improve our transportation systems, particularly for those that were hardest hit by COVID-19. Studies reveal that "ridership on the Massachusetts Bay Transportation Authority ("MBTA") … has been declining for the past several years."[103] Yet transit routes that serve environmental justice populations have shown the lowest reduction in ridership because people must ride buses and trains to get to and from work and make other essential trips.[104] MassDOT should implement low-income fares to incentivize commuters to take public transit, thereby reducing single occupancy trips which produce more GHG emissions per mile than public transportation.[105] For example, a study conducted by the Federal Transit Administration showed that "heavy rail transit, such as subways and metros ... produce 76% less in greenhouse gas emissions per passenger mile than an average single-occupancy vehicle. Light rail systems produce 62% less and bus transit produces 33% less."[106] Public transit continues to be a useful means to reduce congestion and can help revitalize communities by giving them access to jobs, schools, grocery stores, and healthcare facilities.[107] Access to transit is also a lifeline for many who have no other means of transportation. Incentivizing workers to use public transit and keeping rail fares at a lower cost will also help reduce the burden on environmental justice communities.[108]

While An Act Driving Clean Energy and Offshore Wind will assist in reducing emissions from the transportation sector, MassDOT must still maximize opportunities to effectively promulgate regulations. The law requires that all new MBTA bus purchases to be electric by 2030 and the entire bus fleet to be all-electric by 2040.[109] The law also requires other agencies such as the Department of Public Utilities to promulgate vehicle electrification and GHG emission regulations for transportation network companies and for DOER to provide Massachusetts Offers Rebates for Electric Vehicles program data, including data on participation of low-and moderate-income households, for the previous calendar year by June 30th of each year to MassDOT.[110] MassDOT is also required by the law to install EV charging stations at all service plazas on the Massachusetts Turnpike, and at least five MBTA commuter rail stations, five subway stations, and one ferry terminal.[111]

Overall, to reach the 2030/2050 climate goals, decarbonizing and reducing emissions from the transportation sector is essential. Highway projects which trigger an environmental

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[103] *Recommendations to Meet the Transportation Future: Executive Summary*, *supra* note 97, at 3.
[104] *Report from the General Manager to the Fiscal and Management Control Board*, Massachusetts Bay Transportation Authority, at slides 4-8 (October 5, 2020), https://cdn.mbta.com/sites/default/files/2020-10/2020-10-05-fmcb-E-report-from-general-manager-accessible.pdf.
[105] 2030 SECP Joint Transportation Comment Letter, at 2-3 (March 22, 2021).
[106] 2050 Roadmap Report, *supra* note 77, at 3.
[107] *Id*.
[108] *Id*.; *see also Choices for Stewardship: Recommendations to Meet the Transportation Future: Volume I*, at 36 (2018), https://www.mass.gov/doc/choices-for-stewardship-recommendations-to-meet-the-transportation-future-volume-1/download.
[109] St. 2022, c. 179, § 78.
[110] *Id*. § 45
[111] *Id*. § 88(b).

impact review should, where possible, consider the addition of high-occupancy vehicle lanes and bicycle lanes. Programs that encourage commuters to take public transportation should also be implemented.

Below is a summary of the regulatory amendments that CLF recommends DOER integrate into proposed regulations for public comment. Full redline amendment language is included in Appendix B.

Transportation Sector Regulatory Proposals

Work with municipalities to establish charging stations

- Amend 225 CMR 16.04 to require partnerships with municipalities to launch programs to develop curbside and utility pole charging infrastructure.

Eliminate barriers to electric vehicle use

- Amend the Massachusetts residential and commercial stretch energy codes to update electric vehicle parking space requirements, including low- and moderate- income housing.

B. Achieving a Decarbonized Electricity Sector Requires Accurate Reporting of GHG Impacts of Hydroelectric Power and Eliminating Combustion Energy Sources from Clean Energy Programs

The Massachusetts electricity sector has achieved GHG reductions, in part, due to the Regional Greenhouse Gas Initiative as the first cap-and-invest regional initiative.[112] However, there is still ample opportunity to do more and declare the end of dirty electricity in Massachusetts. "To achieve a statewide 50% GHG emissions reduction economy-wide below the 1990 baseline in 2030, GHG emissions from the electricity sector must decrease by more than 53% by 2025 and 70% by 2030."[113] Emissions in the electricity sector are expected to come from "in-state fossil fuel generation, municipal solid waste combustion, and imported fossil fuel generation."[114]

ISO-NE must commit to shift its planning paradigm and market design to meet the Commonwealth's decarbonization goals. Its technology-neutral approach to short term electric system reliability impedes our region's progress toward our collective decarbonization goals. Further, the New England states may not reach a timely consensus on the pace of decarbonization sufficient to meet the Commonwealth's goals. If the regional structure is not on track to meet our decarbonization requirements, the Commonwealth must prepare to modify its commitments. CLF sets out below the benchmarks that ISO-NE must meet as it transitions its market design. If it becomes apparent that ISO-NE is not able to align itself with the Commonwealth's climate goals, the Commonwealth must be prepared to establish a new strategy

[112] *See* The Regional Greenhouse Gas Initiative: an initiative of Eastern States of the US, https://www.rggi.org/.
[113] 2025/2030 CECP, *supra* note 4, at 63.
[114] *Id*.

for decarbonizing the Massachusetts electric grid.

A decarbonized electricity sector also requires the elimination of subsidies for energy produced by burning biomass and municipal solid waste. Optimally, DOER should endeavor to eliminate energy produced from biomass, municipal solid waste, and high heat incineration facilities from eligibility under the RPS and APS. For purposes of these recommendations, "high heat waste processing facility" refers to any facility that disposes of, processes, or treats solid waste, solid waste that is separated for reuse, recyclable materials, construction and demolition debris, hazardous waste, or medical waste through any process that exposes waste to temperatures above four hundred degrees Fahrenheit (400°F).

With respect to biomass, in the absence of statutory change, DOER can lessen the harmful impacts of continued combustion by requiring biomass facilities to meet the highest standards for safety and efficiency, utilizing the most advanced technology available. Biomass facilities, even when they are "low emission" as required by statute, still release some level of harmful pollutants.[115] Such facilities pose risks to the health of nearby communities, and overburdened EJ populations are particularly vulnerable to any further decrease in air quality. Accordingly, DOER should subject new and existing biomass facilities to the most stringent standards permitted by statute.

Below are regulatory amendments that CLF recommends DOER integrate into proposed regulations for public comment.

Electricity Sector Regulatory Proposals

End attribute market subsidies for biomass and municipal solid waste

- Amend 225 CMR 14.02, 225 CMR 14.05, 225 CMR 15.02, 225 CMR 15.05, 225 CMR 15.06, 225 CMR 15.07, and 225 CMR 15.08 to restore and strengthen the Commonwealth's nation-leading standards for biomass electricity generation to be eligible for RPS incentives; tighten standards for waste combustion to qualify for RPS incentives

[115] See MassDEP Conditional Approval, at 15 (June 30, 2011), http://www.pfpi.net/wp-content/uploads/2019/05/Palmer-Renewable-Energy_Non-Major-Conditional-Plan-Approval_06_30_11-FINAL.pdf (Air Permit for PRE Proposed Biomass-Fired Power Plant at 1000 Page Boulevard in Springfield, MA allowing proposed biomass facility in East Springfield, MA to emit 34.55 tons of particulate matter and 13.2 tons of hazardous air pollutants annually). For detailed discussion of the unsuitability of woody biomass for clean electricity technology incentives, *see* CLF, et al., *Joint Environmental Comments on Proposed Changes to the Biomass Regulations in the Renewable Energy Portfolio Standard* (July 26, 2019), https://www.pfpi.net/wp-content/uploads/2019/10/Joint-Environment-and-Clean-Energy-Stakeholder-Comments-re-Proposed-225-CMR-14.00-15.00-Jul.-26-2019.pdf.

C. Achieving a Decarbonized Building Sector Requires Pursuing Deep Energy Efficiency Retrofits, Electrifying Our Heating Systems, and Transitioning Off of Heating Fossil Fuels

The Commonwealth aims to electrify heating systems by 2050, which would avoid cardiovascular deaths, create jobs, and improve public health.[116] According to the 2025/2030 CECP, buildings now account for 30 percent of statewide GHG emissions as of 2020.[117] Most of our 2050 building stock is already standing today. Heating and water heating account for sixty percent of emissions in the building sector.[118] Transforming our building sector to become 2050-compliant is required to decarbonize the economy and limit the impacts of climate change. The State aims to achieve a 28 percent reduction in 2025 and 47 percent reduction in 2030 for heating buildings by deploying efficiency improvements and electric heat pumps installations.[119]

To reach those goals, the Commonwealth plans to implement policies aimed at helping consumers install electric heat pumps (ground-source heat pumps, variable refrigerant flow heat pumps, heat pump water heaters, and induction stove tops).[120] The Commonwealth also aims to invest in efficiency measures and to blend zero-carbon gas into the pipeline.[121] The 2030 CECP also proposes the development of a long-term, declining cap on heating fuel (i.e., gas, oil, propane) emissions consistent with meeting or exceeding GWSA required emissions reductions. Furthermore, the Commonwealth's policies acknowledge the importance of outreach to educate consumers about energy efficiency measures and various incentive programs.[122] The Commonwealth must ensure that EJ populations participate in the transition to energy efficiency programs at comparable rates to other communities within the Commonwealth.

On November 30, 2022, the Commission and Task Force on Clean Heat released a report which recommended numerous legislative and policy changes to achieve equitable and affordable buildings sector decarbonization.[123] Based on recommendations from the CECP processes and bolstered by the Clean Heat Report, CLF understands that MassDEP is currently working on regulatory processes for a Clean Heat Standard and for a scientifically accurate emissions accounting framework for methane and other combustion fuels. CLF supports these undertakings and plans to participate in the regulatory process. CLF is not currently proposing redline regulatory language for these undertakings.

In addition to the regulatory provisions MassDEP is currently working on, compliance with the GWSA demands immediate actions to reduce emissions from the gas system that must

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[116] 2050 Roadmap Report, *supra* note 77, at 43.
[117] 2025/2030 CECP, *supra* note 4, at xiii.
[118] 2050 Roadmap Report, *supra* note 77, at 21.
[119] 2025/2030 CECP, *supra* note 4, at 47.
[120] *Id*.
[121] 2050 Roadmap Report, *supra* note 77, at 43-49.
[122] 2025/2030 CECP, *supra* note 4, at 48-49.
[123] *Learn about the Commission on Clean Heat*, MASS.GOV, https://www.mass.gov/info-details/learn-about-the-commission-on-clean-heat#:~:text=The%20Commission%20has%20explored%20options,issued%20on%20November%2030%2C%202022 (last accessed on Dec. 21, 2022); *see also Final Report, Massachusetts Commission on Clean Heat* (Nov. 30, 2022), SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS, https://www.mass.gov/doc/massachusetts-commission-on-clean-heat-final-report-november-30-2022/download.

extend well beyond leak repair. Within the gas sector, CLF proposes that MassDEP establish annual methane limits. CLF urges MassDEP to eliminate barriers to the adoption of electric heating systems and mandate the decreased use of fossil fuel appliances.

Without dramatic reductions in natural gas and petroleum heating oil consumption, Massachusetts will not achieve its targeted reduction in GHG emissions.[124] It is important to note at the outset that the gas and fuel industries are already attempting to deflect from and fight the inevitability of sunsetting fossil fuel distribution for building sector combustion by claiming, in the face of all logic and evidence, that it will be possible to decarbonize the fossil gas and oil supply.

Biogas and biofuel blending is not a sustainable solution for several reasons. First, no credible analysis has suggested that decarbonizing the fossil fuel gas supply is possible given: (1) the relative paucity of "renewable" biogas feedstocks compared with high building sector consumption; (2) the life cycle emissions profile of such feedstocks; and (3) the significant infrastructure changes that would be necessary to incorporate more than a small amount of hydrogen into the gas supply.[125] Second, biofuel transportation disproportionately harms EJ populations, where blending facilities are commonly sited. Third, reliance on biofuel delays the necessary electrification identified by the 2030 CECP, as key electrification opportunities would be missed if suppliers shifted customers toward blended heating fuels. Use of biofuels poses significant risks to consumers, making it both an unsustainable and uneconomical path for the Commonwealth to achieve its 2050 goals. Customers who replace their heating equipment with another combustion heating system during 2021-2030 may be forced to replace this equipment before the end of its useful life as the Commonwealth strives to meet its 2040 and 2050 goals. Gas customers with legacy equipment will face rising costs as the customer base shrinks, and there is currently no option for fuel blending with propane. Fourth, with respect to biofuel blending, there are many uncertainties regarding its impact on toxic emissions such as GHG, particulate matter, and nitrogen oxides, and how these are affected by the blend's strength. As with biogas, feedstock source is significant because lifecycle emissions of the feedstocks must be accounted for. Finally, as evidenced by the 2030 CECP and 2050 Roadmap Reports, the Commonwealth has yet to engage in a meaningful analysis that accounts for these environmental and health impacts and feasibility concerns. Lastly, any emissions cap must be structured to avoid incentivizing fossil fuel blending.

As an alternative to an emissions cap, DOER can encourage electrification in the building sector by prohibiting the installation of new thermal diesel infrastructure and by imposing a surcharge on heating fuels. These efforts would directly encourage customers to transition to electric HVAC equipment, in contrast to an upstream emissions cap. The revenue collected from

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[124] CLF Comments on Interim 2030 CECP, *supra note* 65, at 32 ("[T]he current level of natural gas use for building heating and the continued use of petroleum heating oil is inconsistent both with achieving Net Zero in 2050 and a 45% reduction from the 1990 baseline in 2030.").

[125] Randy Crawford, *Natural Gas and its Contribution to a Low Carbon Future: Carbon Business Plan for Washington, D.C.*, AltaGas (March 2020), https://edocket.dcpsc.org/apis/api/filing/download?attachId=101994&guidFileName=e69b6cb2-963c-4122-aca3-3b45e838b2b7.pdf.

either an emissions cap or surcharge should be devoted to assisting residents of EJ populations transition away from fossil fuel heating systems.

Additionally, D.P.U. 20-80 must facilitate a just transition off of gas by ensuring that the current fossil fuel workforce is trained to work with renewable energy technologies. DOER can support this transition through workforce development efforts aimed at enhancing diversity and re-training workers. DOER can also help inform the gas transition effort of D.P.U. 20-80 by undertaking a study that assesses the merits of biogas blending.

Finally, while the suggested regulations focus on operational energy (the energy consumed by running a building such as heating cooling, lighting, and power), embodied energy is equally important in DOER regulatory considerations, especially for the transition to high performance buildings. Embodied carbon refers to the GHG emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials. Once embodied emissions have been released, there are no future efforts to reduce these emissions (as can be done with operational energy). One of the metrics used to measure embodied carbon is global warming potential (GWP), which is quantified in kilograms of CO2 equivalent (kg CO2e).[126]

Embodied emissions make up 20-50% of a building's whole life emissions.[127] The construction sector accounts for 11% of total carbon emissions annually worldwide. Concrete production alone accounts for 8% of global emissions. According to research conducted by the City of Vancouver, if the concrete industry were its own country, it would be the third-largest emitter in the world. These emissions are expected to grow, as the global building stock is projected to double by 2060.[128]

Estimates show that there will be over 220 billion new square meters of indoor space, an amount equivalent to building New York City, including all five boroughs, every month for the next 40 years.[129] In their Embodied Carbon Review (2018), Binova found that the focus of regulation needs to be on the process of designing and delivering buildings. This would include: (1) targeting early stages of projects; (2) setting carbon caps for common building types; (3) applying a fixed method for setting cap values; (4) providing incentives carbon reduction below

[126] *Embodied Carbon 101-1*, CARBON LEADERSHIP FORUM (December 17, 2020), https://carbonleadershipforum.org/embodied-carbon-101/.
[127] *Zero Net Carbon Building Zoning: Embodied Carbon Public Meeting Presentation*, BOSTON PLANNING & DEVELOPMENT AGENCY (April 27, 2021), https://www.bostonplans.org/getattachment/88b7e6bc-f331-4c32-bd43-8a1f334a9d0d.
[128] Global Status Report for Building and Construction, GABC (2021), https://globalabc.org/resources/publications/2021-global-status-report-buildings-and-construction.
[129] General Manager of Planning, Urban Design and Sustainability and General Manager of Engineering Services, Climate Emergency Action Plan, Vancouver City Council (Oct. 22, 2020), https://council.vancouver.ca/20201103/documents/p1.pdf.

the caps; (5) setting rules and requirements based on official standards; and (6) setting open compliance requirements and verify outcomes.[130]

Cities in Massachusetts have already shown interest in implementing such policies through municipal ordinances. Ordinances addressing embodied carbon have been suggested or adopted in Newton, Somerville, Cambridge, and Boston. At the state level, Executive Order 594 has directed that, under the building code, "all new construction and substantial renovations, where possible and cost-effective, shall […] Evaluate and implement strategies to reduce carbon contained in building materials."[131]

Below are regulatory amendments that CLF recommends DOER integrate into proposed regulations for public comment.

Building Sector Regulatory Proposals

Eliminate barriers to adoption of electric heating systems

- Amend 225 CMR 4.02 to design and implement a program within the Residential Conservation Services to educate consumers about heat pump adoption benefits and require program vendors to install systems of appropriate type and size. 225 CMR 4.02 should also be amended to explore equity within the Residential Conservation Services program for EJ populations and discourage displacement of low- and moderate-income renters.

Mandate decreased use of fossil fueled appliances and heating systems

- Amend the Massachusetts residential and commercial stretch codes and the Massachusetts municipal opt-in residential and commercial specialized codes (2023) to both phase out fossil fuel heating systems and prohibit new installations of fossil fueled-appliances.

Require new construction projects to submit environmental product declarations for concrete, steel, cement, bricks, and insulation which includes analysis and disclosure of embedded carbon

- Implement 780 CMR 13 C408.1 (Carbon Limits for Building Materials Procurements) to mandate all building permit applicants supply information about key construction materials and products in compliance with ISO 21930 and ISO 14025 with minimum

[130] BINOVA, LTD., THE EMBODIED CARBON REVIEW: EMBODIED CARBON REDUCTION IN 100+ REGULATIONS AND RATING YSTEMS GLOBALLY (2018), https://buildingtransparency-live-87c7ea3ad4714-809eeaa.divio-media.com/filer_public/a6/60/a6600a77-4255-4549-bbb7-09c7a7069c54/wc_am-embodiedcarbonreview2018pdf.pdf.

[131] Exec. Order 594: Leading by Example: Decarbonizing and Minimizing Environmental Impacts of State Government (2021), https://www.mass.gov/executive-orders/no-594-leading-by-example-decarbonizing-and-minimizing-environmental-impacts-of-state-government.

scope A1-A3 manufacturing; and the EPD must be valid at point of specification and cover product(s) supplied.

- Implement 780 CMR 13 C408.2 (Low-Embodied Carbon Concrete) to prohibit municipalities and permitting processes from setting prescriptive concrete standards and instead mandate that concrete standards be performance-based.

- Implement 780 CMR 13 C408.3 (Establish a Materials Reuse Facility) to require DOER in collaboration with MassDEP to create a center to facilitate the recovery, reuse, and recycling of building materials, as well as business assistance, basic and applied research and development, and policy analysis, to further the development of domestic processing and markets for salvaged and recycled building materials and commodities.

- Implement 780 CMR 13 C408.4 (Carbon Reduction or Salvaging Requirement for Demolitions) to require demolition permits only be granted when the contractor can show that the demolition and new construction project reduces life-cycle carbon by at least 30% compared to maintaining the existing structure over 60-year period; commits to minimum 90% reuse and recycling rate by weight and demonstrate this achievement on project completion by submitting a waste disposal report; or show that the building contains asbestos or other health harming contaminants, is posing other health risks, or is structurally damaged or derelict.

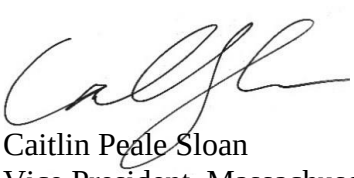
- Implement 780 CMR 13 C408.5 (Renovation vs. Knock-Down and Rebuild Comparison) to require all projects, where a demolition and rebuild option is proposed, consider a renovation option.

VI. CONCLUSION

As outlined above, CLF contends that a multi-sectoral approach will best allow the Commonwealth to achieve its 2030 and 2050 climate targets, while meeting additional statutory mandates and working toward climate justice. CLF is ready and able to work with DOER and other agencies to amend current regulations and promulgate new ones, as needed, to meet the 2030 emissions target and more pressing timeline facing Massachusetts. CLF urges DOER to take action to make these changes to help protect Massachusetts residents, communities, and natural resources from the potentially devastating effects of climate change.

Thank you for your continued work and dedication. CLF looks forward to continuing to work together to achieve just, equitable, and effective solutions for the Commonwealth.

Respectfully submitted,



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APPENDIX A: COMPREHENSIVE MULTI-SECTOR REGULATORY PACKAGE

Department of Environmental Protection

Regulation	Description
310 CMR 4.01: Purpose, Authority, and General Provisions	Ensures all permits of any kind approved by DEP comply with no net emissions increase requirement
310 CMR 7.00: Statutory Authority; Legend; Preamble; Definitions	Defines net GHG emissions and zero emissions vehicles; adds the GWSA as statutory authority under DEP's air pollution control chapter
310 CMR 7.02 U Plan Approval and Emission Limitations	Ensures all air permits approved by DEP comply with no increase in net GHG emissions requirement
310 CMR 7.11: U Transportation Media	Accelerates zero emission vehicle deployment for MBTA trains and state or municipality-owned fleets
310 CMR 7.32: Natural Gas-Fired Furnace NOx Emissions Standards	Phases out NOx emitting natural gas-fired furnace and boiler sales and installations between 2024 and 2030
310 CMR 7.35: Water Heater NOx Emissions Standards	Phases out NOx emitting water heater sales and installations between 2024 and 2030
310 CMR 7.37: MB High Occupancy Vehicle Lanes	Increases deployment of bus-only and HOV lanes
310 CMR 7.40: U Low Emission Vehicle Program	Accelerates zero emission vehicle deployment for state or municipality-owned fleets
310 CMR 7.73: Reducing Methane Emissions from Natural Gas Distribution Mains and Services	Accelerates methane emissions reductions from and phase out of gas distribution system
310 CMR 7.75: Clean Energy Standard	Eliminates biomass from Clean Energy Standard; Requires hydroelectric power GHG emissions reporting
310 CMR 7.77: Net Zero Communities Program	Empowers municipalities to accelerate climate action and enforce consistency with climate plans
310 CMR 7.78: Reducing Peak Electric Sector Emissions	Requires electric utilities to reduce the difference between peak and average electric system demand
310 CMR 9.01: Purpose	Ensures all coastal zone management permits approved by DEP comply with no net emissions increase requirement
310 CMR 9.02: Definitions	Ensures all coastal zone management permits approved by DEP comply with no net emissions increase requirement
310 CMR 9.31: Summary of License and Permit Requirements	Ensures all coastal zone management permits approved by DEP comply with no net emissions increase requirement
310 CMR 10.01: Introduction and Purpose	Ensures all wetlands permits approved by DEP comply with no net emissions increase requirement
310 CMR 10.04: Definitions	Ensures all wetlands permits approved by DEP comply with no net emissions increase requirement

310 CMR 16.01: General Requirements	Ensures all solid waste permits approved by DEP comply with no net emissions increase requirement
310 CMR 16.02: Definitions	Ensures all solid waste permits approved by DEP comply with no net emissions increase requirement; Phases out high heat waste processing facilities
310 CMR 16.03: Exemptions from Site Assignment	Ensures all solid waste permits approved by DEP comply with no net emissions increase requirement; Reduces methane emissions feedstocks from landfills
310 CMR 16.04: General Permit for Recycling, Composting or Aerobic and Anaerobic Digestion Operations	Ensures all solid waste permits approved by DEP comply with no net emissions increase requirement
310 CMR 16.05: Permit for Recycling, Composting and Conversion (RCC) Operations	Phases out high heat waste processing facilities
310 CMR 16.08: Site Assignment Application Submission Requirements	Requires application for site suitability to confirm that facility will not increase GHGs or harm EJ populations
310 CMR 16.13: Department Report on Suitability (Report)	Requires that applications that increase net greenhouse gas emissions or harm an environmental justice population receive negative determinations of suitability
310 CMR 19.001: Authority	Adds the GWSA as statutory authority under DEP's solid waste permitting chapter
310 CMR 19.002: Purpose	Adds the reduction of GHG emissions as a purpose under DEP's solid waste permitting chapter
310 CMR 19.006: Definitions	Ensures all solid waste permits approved by DEP comply with no net emissions increase requirement; Requires amendment to definition of recyclable material to create recyclable guidelines document every two years
310 CMR 19.018: Third-party Inspections	Improves enforcement of waste ban requirements
310 CMR 19.032: Permit Procedure for a New Facility or Expansion Permit Application	Ensures all solid waste permits approved by DEP comply with no net emissions increase requirement
310 CMR 36.01: Authority	Adds the GWSA as statutory authority under DEP's water management permitting chapter
310 CMR 36.02: Purpose	Adds the reduction of GHG as a purpose under DEP's water management permitting chapter
310 CMR 36.03: Definitions	Defines net GHG emissions within DEP's water management permitting chapter.
310 CMR 36.07: Registration Conditions	Ensures all DEP-registered withdrawals comply with no net GHG emissions increase requirement

310 CMR 36.27: Issuance of Permits	Ensures all water management permits approved by DEP comply with no net GHG emissions increase requirement
310 CMR 60.03: U Conformity to the State Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. Or the Federal Transit Act	Updates environmental justice and greenhouse gas emissions reduction requirements for transportation implementation plan; adds increased EV charging requirements and reduced internal combustion engine sales numbers as supplemental measures
310 CMR 60.05: Global Warming Solutions Act Requirements for Transportation	Accelerates transportation sector greenhouse gas reduction requirements

Department of Energy Resources

Regulation	Description
225 CMR 4.02: RCS Program	Focuses the RCS program on equity, affordability, and deployment of heat pumps
225 CMR 14.02: Definitions	Restores and strengthens MA's nation-leading standards for biomass electricity generation to be eligible for RPS incentives
225 CMR 14.05: Eligibility Criteria for RPS Class I, Solar Carve-out Renewable Generation Units, and Solar Carve-out II Renewable Generation Units	Restores and strengthens MA's nation-leading standards for biomass electricity generation to be eligible for RPS incentives
225 CMR 15.02: Definitions	Restores and strengthens MA's nation-leading standards for biomass electricity generation to be eligible for RPS incentives; tightens standards for waste combustion to qualify for RPS incentives
225 CMR 15.05: Eligibility Criteria for RPS Class II Generation Units	Restores and strengthens MA's nation-leading standards for biomass electricity generation to be eligible for RPS incentives; tightens standards for waste combustion to qualify for RPS incentives
225 CMR 15.06: Statement of Qualification Process for RPS Class II Renewable Generation Unit	Tightens standards for waste combustion to qualify for RPS incentives
225 CMR 15.07: Renewable Energy Portfolio Standard -- Class II	Tightens standards for waste combustion to qualify for RPS incentives
225 CMR 15.08: Compliance Procedures for Retail Electricity Suppliers	Tightens standards for waste combustion to qualify for RPS incentives
225 CMR 22.1.00: [Re] Scope and Administration	Updates municipal opt-in stretch building code to fully implement Roadmap Law, empower

	municipalities to eliminate fossil fuel use in new buildings, and increase EV readiness
225 CMR 22.2.00: [Re] Definitions	Updates municipal opt-in stretch building code to fully implement Roadmap Law, empower municipalities to eliminate fossil fuel use in new buildings, and increase EV readiness
225 CMR 22.4.00: [Re] Residential Energy Efficiency	Updates municipal opt-in stretch building code to fully implement Roadmap Law, empower municipalities to eliminate fossil fuel use in new buildings, and increase EV readiness
Appendix RC: MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED STRETCH CODE 2023	Updates municipal opt-in stretch building code to fully implement Roadmap Law, empower municipalities to eliminate fossil fuel use in new buildings, and increase EV readiness
225 CMR 23.2.00: [Ce] Definitions	Updates municipal opt-in stretch building code to fully implement Roadmap Law, empower municipalities to eliminate fossil fuel use in new buildings, and increase EV readiness
225 CMR 23.4.00: [Ce] Commercial Energy Efficiency	Updates municipal opt-in stretch building code to fully implement Roadmap Law, empower municipalities to eliminate fossil fuel use in new buildings, and increase EV readiness
APPENDIX CC - MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED ENERGY CODE 2023	Updates municipal opt-in stretch building code to fully implement Roadmap Law, empower municipalities to eliminate fossil fuel use in new buildings, and increase EV readiness
780 CMR 2.02 Definitions	Addresses embodied carbon in construction materials
780 CMR 13 C408.1: Carbon Limits for Building Materials Procurements	Addresses embodied carbon in construction materials
780 CMR 13 C408.2 Low-Embodied Carbon Concrete	Addresses embodied carbon in construction materials
780 CMR 13 C408.3 Establish a Materials Reuse Facility	Addresses embodied carbon in construction materials
780 CMR 13 C408.4 Carbon Reduction or Salvaging Requirement for Demolitions	Addresses embodied carbon in construction materials
780 CMR 13 C408.5 Renovation vs. Knock-Down and Rebuild Comparison	Addresses embodied carbon in construction materials

Department of Public Utilities

Regulation	Description
220 CMR 5.02: Format of Tariffs, Schedules and Contracts	Ensures all tariffs explain in plain language how rates reflect resilient infrastructure based on climate science
220 CMR 10.000: Hazard Mitigation and Climate Plans	Mandating the filing of Hazard Mitigation and Climate Plans; prescribing what should be included
220 CMR 11:02: General Definitions	Facilitates ZEV deployment
220 CMR 11.04: Distribution Company Requirements	All contracts and rate increases must reduce GHGs; Facilitates ZEVs; Prohibit utilities from using customer money for political activities or advertising of false climate solutions
220 CMR 11.09: Forward Capacity Market	Triggers for leaving ISO
220 CMR 11.10: Charge Electric Vehicles Utility Pole Program (Charge EVs UPP)	Accelerating municipal EV charging on utility poles
220 CMR 11.11: Electric Vehicle Charging Station Installation	Prohibiting approval of EV charging station installation by EDCs w/o a Dept finding that it will withstand climate change stressors
220 CMR 14.01: Purpose and Scope	Updates LDC purpose to include networked geothermal
220 CMR 14.02: General Definitions	Updates LDC definitions to include networked geothermal
220 CMR 14.03: Local Distribution Company Requirements	All contracts and rate increases must reduce GHGs; Updates LDC requirements to include networked geothermal; Prohibits utilities from using customer money for political activities or advertising of false climate solutions
220 CMR 14.05: Information Disclosure Requirements	Updates LDC info disclosure requirements to include networked geothermal; requires GHG disclosures; requires analysis before using alternative gases
220 CMR 17.05: General Criteria for Long-term Contracts and Renewable Energy Generation Sources	Ensures long-term contracts have RE generation sources that are resilient to current and future climate hazards
220 CMR 19.03: Performance Standards for Emergency Preparation and Restoration of Service	Ensures LDCs consider their Hazard Mitigation and Climate Adaptation Plan and general hazard mitigation and climate resilience planning in the development of emergency preparation
220 CMR 19.04: Emergency Response Plans	Requires LDCs to identify applicable components of their Hazard Mitigation and Climate Adaptation Plans that considers climate science in making hazard predictions and response plans

220 CMR 19.05: Department Investigation into Company Performance; Remedies	Allows Department denial of LDC recovery for failure to follow a Hazard Mitigation and Climate Adaptation Plan during outages
220 CMR 79.01: Annual Return for Gas Companies	Requires reporting of just transition workforce data for LDCs
220 CMR 79.04: Annual Return for Electric Companies	Requires reporting of just transition workforce data for EDCs
220 CMR 112.11: Plans and Procedures	Ensures that LNG plant operators update plans and procedures every 5 years for safety planning, using climate science
220 CMR 115.04: Annual Reporting Requirements	Requires accurate tracking of methane emissions from gas leaks
220 CMR 274.02: Definitions	Requires TNC fleet decarbonization
220 CMR 274.08: Transportation Network Vehicle Requirements	Requires TNC fleet decarbonization
220 CMR 274.12: Reporting Requirements	TNC fleet reporting statistics

Energy Facilities Siting Board

Regulation	Description
980 CMR 1.01: Scope and Construction of Rules	Environmental justice and GHG emissions updates to definitions
980 CMR 1.04: Institution of an Adjudicatory Proceeding	Environmental justice, GHG emissions, and climate resilience pre-filing requirement
980 CMR 1.08: Rendering of Decisions in Adjudicatory Proceedings	Environmental justice, GHG emissions, and climate resilience conditions for granting petitions
980 CMR 1.09: Supplemental Procedures	Environmental justice site visit procedures
980 CMR 5.02: Environmental Assessment	Environmental justice requirements for environmental assessments
980 CMR 13.01: Facility Construction and Maintenance	Environmental justice, GHG emissions
980 CMR 14.00: Site Restoration and Decommission	Requiring a decommissioning site and restoration plan

Executive Office of Energy and Environmental Affairs

Regulation	Description
301 CMR 11.01: General Provisions	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.02: Definitions	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.03: Review Thresholds	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.04: Fail-Safe Review	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.05: ENF Preparation and Filing	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.06: ENF Review and Decision	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.07: EIR Preparation and Filing	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.08: EIR Review and Decision	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 11.11: Waivers	Ensures all MEPA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 20.01: Authority and Purpose	Ensures all CZMA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 20.02: Definitions	Ensures all CZMA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 20.03: Implementation of the Coastal Zone Management Program	Ensures all CZMA approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 23.01: Purpose	Ensures all MHP approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 23.02: Definitions	Ensures all MHP approvals by EEA comply with no net GHG emissions increase requirement
301 CMR 23.04: Review Procedures	Ensures all MHP approvals by EEA comply with no net GHG emissions increase requirement
310 CMR 40.01: Authority and Purpose	Ensures all Toxics Use Reduction approvals by EEA comply with no net GHG emissions increase requirement
310 CMR 40.02: Definitions	Ensures all Toxics Use Reduction approvals by EEA comply with no net GHG emissions increase requirement
310 CMR 40.03: Toxic Use Fees	Ensures all Toxics Use Reduction approvals by EEA comply with no net GHG emissions increase requirement
310 CMR 40.05: Fee Waiver	Ensures all Toxics Use Reduction approvals by EEA comply with no net GHG emissions increase requirement

Department of Transportation

Regulation	Description
700 CMR 4.01: Purpose	Accelerates deployment of electric rail
700 CMR 4.02: Definitions	Accelerates deployment of electric rail
700 CMR 4.04: Administration	Accelerates deployment of electric rail
700 CMR 4.07: Application Process	Accelerates deployment of electric rail
700 CMR 4.08: Evaluation Criteria	Accelerates deployment of electric rail
700 CMR 7.01: Scope and Effect	Adds equity and GHG reductions to Purpose of DOT
700 CMR 7.02: Definitions	Defines electric vehicle
700 CMR 7.09: Traffic, Operation, and Safety	Accelerates deployment of HOV lanes
700 CMR 11.05: Vehicle Operations	Codifies Tobin Bridge bus-only lane
700 CMR 14.08: Miscellaneous for Contractors	Requires GHG-related disclosures in bidding documents
700 CMR 15.00 Planning and Transit Operations	Accelerates electrification of MBTA-owned vehicles

APPENDIX B: REDLINED REGULATIONS

225 CMR 4.02: RCS Program

…

All RCS Program Administrators shall implement the RCS program.

The RCS Program shall:

(a) consider accessibility and affordability of energy conservation measures for Residential Customers, particularly low and moderate-income Residential Customers in the development of the State Plan and Coalition Action Plan;

(b) discourage displacement of low and moderate-income renters;

(c) incentivize customers to purchase and install heat pumps (with accompanying necessary electrical upgrades) with upfront capital to Residential Customers; and

(d) provide funding through targeted enhanced incentives to low and moderate-income households and environmental justice population households to transition away from fossil fuel heating systems.

…

(2) DOER shall:

…

(h) Launch an educational curriculum designed to teach consumers about heat pump adoption benefits, with a focus on addressing uncertainties about performance and comfort, and the most cost-effective time(s) to transition to a heat pump. Such educational curriculum shall be designed to be inclusive of both low and moderate-income households.

(i) Establish a list of approved program vendors to install heat pump systems of appropriate type and size based on building specifications.

225 CMR 14.02: Definitions

…

Biomass Fuel Certificate. A certificate issued in accordance with rules established by the Department in the Guideline on Eligible Biomass Fuel for Renewable Generation Units that:

(a) quantifies the supply of Eligible Biomass Woody Fuel or Manufactured Biomass Fuel;

(b) specifies the source of the Eligible Biomass Woody Fuel or Manufactured Biomass Fuel; and

(c) specifies the eligibility of the Eligible Biomass Woody Fuel or Manufactured Biomass Fuel as Forest Derived Residues, Forest Derived Thinnings, Forest Salvage, or Non-forest Derived Residues. For Forest Derived Residues and Forest Derived Thinnings, the Biomass Fuel Certificate shall reference the relevant Eligible Forest Biomass Tonnage Report, and include any additional information deemed necessary by the Department.

Biomass Input Heat Content. The thermal energy content, measured in MWh, of biomass fuel as it is input into a Generation Unit over a period of time. For the purpose of wood chips, the value will be determined using a methodology to be provided by the Department in the Overall Efficiency and Greenhouse Gas Analysis Guideline. The methodology will include a weighted average of all the metered weight of utilized biomass fuel types (as differentiated by typical moisture content), and an assigned heat content from referenced literature to each biomass type. For processed biomass fuels, the thermal energy content shall be documented to the satisfaction of the Department by an independent testing laboratory.

~~Blended Fuel. A liquid or gaseous fuel that is blended from both Eligible RPS Class I Renewable Fuel(s) and ineligible fuel(s), a portion of whose electrical energy output may qualify as RPS Class I Renewable Generation under criteria set forth in 225 CMR 14.05(3).~~

…

~~Clean Wood. As defined in 310 CMR 19.006: Clean Wood.~~

…

~~Eligible Biomass Fuel. Fuel sources consisting of the following:~~

~~(a) Eligible Biomass Woody Fuel;~~

~~(b) Manufactured Biomass Fuel;~~

~~(c) Eligible Biogas Fuel~~

~~(d) by-products or waste from animals or agricultural crops;~~

~~(e) food or vegetative material;~~

~~(f) algae;~~

~~(g) organic refuse derived fuel; and~~

~~(h) Eligible Liquid Biofuel.~~

Eligible Biomass Fuel. Fuel sources consisting of Eligible Biomass Woody Fuel, Manufactured Biomass Fuel; and anaerobic digester gas and other biogases that are derived from such resources; but shall not include Construction and Demolition Waste as defined in 310 CMR 19.006.

~~Eligible Biomass Woody Fuel. Woody fuels that are derived from the following sources, consistent with the requirements of 225 CMR 14.05(8):~~

~~(a)~~ Forest Derived Residues~~.~~

~~1. Tops, crooks and other portions of trees produced as a byproduct, and trees collaterally damaged, during the normal course of harvesting material, such as timber, pulpwood or cordwood in the implementation of a silvicultural prescription as administered by a licensed or certified forester as prescribed in the Department's Guideline on Eligible Biomass Fuel for Renewable Generation Units.~~

~~2. Trees and portions of trees harvested for the purpose of the restoration and management of habitat for rare and endangered species as listed by the Massachusetts Division of Fisheries and Wildlife. Qualifying harvest areas must be approved by the Massachusetts Division of Fisheries and Wildlife Natural Heritage Program.~~

~~3. Other woody vegetation that interferes with regeneration or the natural growth of the forest, limited to locally invasive native species and non-native invasive woody vegetation.~~

~~(b)~~ Forest Derived Thinnings~~.~~

~~1. Unacceptable growing stock which is defined as trees considered structurally weak or have low vigor and do not have the potential to eventually yield an eight-foot sawlog or survive for at least the next ten years.~~

~~2. Trees removed during thinning operations, the purpose of which is to reduce stand density and enhance diameter growth and volume of the residual stand.~~

~~(c)~~ Forest Salvage~~.~~

~~1. Damaged, dying or dead trees removed due to injurious agents, such as wind or ice storms or the spread of invasive epidemic forest pathogens, insects and diseases or other epidemic biological risks to the forest, but not removed due to competition. Such eligible trees may be~~

~~removed without limitation for biomass fuel, only if the injurious agent is a threat to forest health or risk to private or public resources, and if the United States Department of Agriculture Animal and Plant Health Inspection Service, the United States Department of Agriculture Forest Service, or appropriate federal or state governmental agency has issued a declaration, rule, or order declaring a major threat to forest health or risk to private or public resources, or if they are harvested through a DCR-approved cutting plan.~~

~~2. Trees removed to reduce fire hazard within fire-adapted forest ecosystems, as certified by a letter to the Department from the state agency responsible for forestry in consultation with the appropriate environmental state agencies.~~

~~(d) Non-forest Derived Residues.~~

~~1. Forest Products Industry. Residues derived from wood products manufacturing consisting of Clean Wood.~~

~~2. Land Use Change -- Agricultural. Trees cut or otherwise removed in the process of converting forest land to agricultural usage, either for new or restored farm land.~~

~~3. Wood Waste. Post-consumer wood products from Clean Wood; pruned branches, stumps, and whole trees removed during the normal course of maintenance of public or private roads, highways, driveways, utility lines, rights of way, and parks.~~

~~4. Agricultural Wood Waste. Pruned branches, stumps, and whole trees resulting from maintenance activities directly related to the production of an agricultural product that is not Clean Wood.~~

Eligible Biomass Woody Fuel. Woody fuels that are derived from the following sources, consistent with the requirements of 225 CMR 14.05(8):

(a) Forest Derived Residues.

1. Tops, crooks and other portions of trees produced as a byproduct during the normal course of harvesting material, such as timber, pulpwood or cordwood.

2. Other woody vegetation that interferes with regeneration or the natural growth of the forest, limited to locally invasive native species and non-native invasive woody vegetation.

(b) Non-forest Derived Residues.

1. Primary Forest Products Industry. Lumber mill residues or lumber processing residues consisting of the slabs, shavings, trimmings, sawdust, bark, end pieces of wood, and log cores that result from the various processing operations occurring in sawmills, pulp mills, and veneer and plywood plants.

2. Secondary Forest Products Industry. Wood waste produced as a byproduct of the

production of finished wood products, including but not limited to clean residues from woodworking shops, furniture factories, and truss and pallet manufacturing.

3. Wood Waste. Pruned branches, stumps, and whole trees removed during the normal course of maintenance of public or private roads, highways, driveways, utility lines, rights of way, and parks.

…

~~Eligible Liquid Biofuel. A liquid fuel that is derived from organic waste feedstock and meets the standards for advanced biofuels under the Environmental Protection Agency's Renewable Fuel Standard (RFS2) program. Organic waste feedstocks shall include, but not be limited to, waste vegetable oils, waste animal fats, or grease trap waste. Eligible Liquid Biofuel shall not include petroleum-based waste or Hazardous Waste as defined in 310 CMR 40.0006: *Terminology, Definitions, and Acronyms*, unless otherwise determined by the Department in consultation with MassDEP.~~

Eligible RPS Class I Renewable Fuel. An Eligible Biomass Fuel~~, hydrogen derived from such fuels or hydrogen derived from water using the electrical output of a Renewable Generation Unit, but not hydrogen derived using RPS Class I Renewable Generation if the RPS Class I Renewable Generation Attributes of such Generation are sold, retired, claimed, used or represented as part of electrical energy output or sales, or used to satisfy regulatory obligations in any jurisdictions, and not hydrogen derived directly or indirectly from ineligible fuels~~.

…

Executive Office. The Executive Office of Energy and Environmental Affairs established by M.G.L. c. 6A, § 2.

…

Lifecycle Greenhouse Gas Emissions. The aggregate quantity of greenhouse gas emissions, including direct emissions and significant indirect emissions such as significant emissions from land use changes, and temporal changes in forest carbon sequestration and emissions resulting from biomass harvests, regrowth, and avoided decomposition as determined by the Department in consultation with the MassDEP and the Executive Office, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.

…

NERC Tag. A document that identifies an electrical energy interchange transaction and its associated participants, assigned in accordance with rules set forth by the North American Electric Reliability Corporation, a non-profit corporation granted by the Federal Energy

Regulatory Commission (FERC) the legal authority to enforce mandatory reliability standards for the U.S. bulk power system, subject to FERC oversight.

…

Percent Under-compliance. The difference, if positive, between 50% and the reported lifecycle greenhouse gas emissions over 20 years as reported in a Biomass Unit Annual Compliance Report by an RPS Class I Renewable Generation Unit that utilizes Eligible Biomass Woody Fuel, as provided in 225 CMR 14.05(8)(d).

…

RPS Class I Renewable Generation. The electrical energy output excluding any electrical energy utilized for parasitic load of a RPS Class I Renewable Generation Unit, or that portion of the electrical energy output excluding any electrical energy utilized for parasitic load of an RPS Class I Renewable Generation Unit that qualifies under:

(a) the Special Provisions for Incremental Generating Capacity, pursuant to 225 CMR 14.05(2) issued on or after January 1, 2009;

(b) a Vintage Waiver, pursuant to 225 CMR 14.05(2) issued before January 1, 2009;

~~(c) a Co-firing and Blended Fuel Waiver, pursuant to 225 CMR 14.05(3);~~

(~~d~~c) the Special Provisions for a Generation Unit Located in a Control Area Adjacent to the ISO-NE Control Area, pursuant to 225 CMR 14.05(5); or

(~~e~~d) any other applicable provision of 225 CMR 14.00.

…

~~Sustainable Forestry Management. Practicing a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat, and aesthetics and the stewardship and use of forests and forest lands in a way, and a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality, and potential to fulfill, now and in the future, relevant ecological, economic, and social functions at local, national, and global levels, and that does not cause damage to other ecosystems. Criteria for sustainable forestry include:~~

~~(a) conservation of biological diversity;~~

~~(b) maintenance of productive capacity of forest ecosystems;~~

~~(c) maintenance of forest ecosystem health and vitality;~~

~~(d) conservation and maintenance of soil and water resources;~~

~~(e) maintenance of forest contributions to global carbon cycles;~~

~~(f) maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies; and~~

~~(g) a legal, institutional, and economic framework for forest conservation and sustainable management.~~

~~Useful Thermal Energy. Energy in the form of direct heat, steam, hot water, or other thermal form that is used in production and beneficial measures for heating, cooling, humidity control, process use, or other valid thermal end use energy requirements, for which fuel or electricity would otherwise be consumed. Thermal energy used to produce a dried or refined biomass fuel shall not be considered Useful Thermal Energy if the biomass fuel produced is used to fuel the Generation Unit that dried or refined the biomass fuel.~~

Useful Thermal Energy. Energy:

(a) in the form of direct heat, steam, hot water, or other thermal form that is used in production and beneficial measures for heating, cooling, humidity control, process use, or other valid thermal end use energy requirements; and

(b) for which fuel or electricity would otherwise be consumed.

Thermal energy used for the purpose of drying or refining biomass fuel shall not be considered Useful Thermal Energy.

225 CMR 14.05: Eligibility Criteria for RPS Class I, Solar Carve-out Renewable Generation Units, and Solar Carve-out II Renewable Generation Units

(1) Eligibility Criteria. A Generation Unit may qualify as an RPS Class I Renewable Generation Unit, a Solar Carve-out Renewable Generation Unit, or Solar Carve-out II Renewable Generation Unit subject to the limitations in 225 CMR 14.05.

(a) Fuels, Energy Resources and Technologies. The Generation Unit shall use one or more of the fuels, energy resources and/or technologies listed in 225 CMR 14.05(1)(a)1. through 9.

…

7. Low-emission, Advanced Biomass Power Conversion Technologies Using an Eligible Biomass Fuel. A Generation Unit may qualify as an RPS Class I Renewable Generation Unit, provided it uses an Eligible Biomass Fuel, subject to the limitations in 225 CMR 14.05(1)(a)7.

a. Pursuant to Sections 33 through 36 and Section 88 of Chapter 179 of the Acts of 2022, starting January 1, 2022, Eligible Biomass Woody Fuel, Co-mingled Biomass Woody Fuel, and Manufactured Biomass Fuel Generation Units shall no longer be eligible to submit a Statement of Qualification Application under 225 CMR 14.06.

~~b. A Generation Unit utilizing an Eligible Biomass Fuel, that is required to obtain an air permit in its jurisdiction, must possess a Valid Air Permit.~~

~~c~~b. The Department shall set forth in Guidelines low-emission eligibility criteria which will become effective on their date of issuance. Any emission eligibility criteria in subsequently revised regulations or Guidelines shall become effective 12 months from their date of issuance. ~~A Generation Unit utilizing an Eligible Biomass Fuel that is not a solid fuel, such as Eligible Liquid Biofuel, or does not use a steam boiler, shall follow the low-emission eligibility criteria process described in the Departments' Guideline on Eligible Biomass Fuel for Renewable Generation Units.~~ In the case of a Generation Unit for whose size, type, or fuel the Department's Guidelines do not provide applicable emission limits, the Department will determine appropriate limits in consultation with the MassDEP.

c. A Generation Unit with a Commercial Operation Date after December 31, 1997, that is required to obtain an air permit in its jurisdiction, must possess a Valid Air Permit and must demonstrate to the satisfaction of the Department that the emission rates of the Unit do not exceed limits set forth in the Guidelines that are applicable for the date on which the Department receives the Unit's Statement of Qualification Application.

d. A Generation Unit with a Vintage Waiver that is required to obtain an air permit in its jurisdiction must possess a Valid Air Permit and must demonstrate to the satisfaction of the Department that the emission rates of the Unit do not exceed

limits set forth in the Guidelines that are applicable for the date on which the Department receives the Unit's Statement of Qualification Application.

e. A Generation Unit that is not required to obtain an air permit in its jurisdiction must demonstrate to the satisfaction of the Department that its emissions are consistent with criteria set forth in the Guidelines that are applicable for the date on which the Department receives the Unit's Statement of Qualification Application.

f. In the case of a Generation Unit for whose size, type, or fuel the Guidelines do not provide applicable emission limits, the Department will determine appropriate limits in consultation with the MassDEP.

g. A Generation Unit, that uses an Eligible Biomass Woody Fuel or a Manufactured Biomass Fuel, must provide to the Department as part of their Statement of Qualification Application the following items.

i. A fuel supply plan indicating the anticipated fuel types, sources, and amounts. Not later than January 1st, the Unit shall provide on an annual basis a report of the anticipated fuel supply for that Compliance Year.

ii. A design and operational plan~~Generation Unit utilizing an Eligible Biomass Woody Fuel or Manufactured Biomass Fuel with a Commercial Operation Date after December 31, 2021 or a Generation Unit utilizing an Eligible Biomass Woody Fuel or Manufactured Biomass Fuel~~ that demonstrates that the Unit will achieve an Overall Efficiency, as calculated in~~has 5% or more of its fuel sourced from Forest Derived Residues, Forest Derived Thinnings,~~ 225 CMR 14.05(8)(c)2. through 3.~~,and Forest Salvage must achieve an overall efficiency~~ of at least 70% on a quarterly basis~~. A Generation Unit with a Commercial Operation Date on or before December 31, 2021 and utilizing an Eligible Biomass Woody Fuel or Manufactured Biomass Fuel that has over 95% of its fuel sourced from Non-forest Derived Residues on a quarterly basis shall have no applicable overall efficiency requirement. The procedure for calculating whether the Generation Unit meets the 60% overall efficiency requirement can be found in the Department's Guideline on Overall Efficiency and Greenhouse Gas Analysis~~.

iii. An analysis of net Lifecycle Greenhouse Gas Emissions ~~d. A Generation Unit utilizing an Eligible Biogas Fuel,~~ that demonstrates, to the satisfaction of the Department, that such Eligible Biomass Woody Fuel~~, Eligible Liquid Biofuel~~ or Manufactured Biomass Fuel shall reduce lifecycle greenhouse gas emissions, over a ~~20~~10-year life cycle, yield~~lifecycle, by~~ at least a 50% reduction of greenhouse gas emissions per unit of useful energy compared to the Lifecycle Greenhouse Gas Emissions from the aggregate use of the operation of a new combined cycle natural gas electric generating facility using the most efficient commercially available technology as of the date of the Statement of Qualification Application for the portion of electricity delivered by the

Generation Unit and, if applicable, the operation of the fossil fuel fired thermal energy unit being displaced, or in the case of new Useful Thermal Energy, a gas-fired thermal energy unit using the most efficient commercially available technology as of the date of Statement of Qualification Application for the portion of the Useful Thermal Energy delivered by the Generation Unit. The Department shall provide in the Overall Efficiency and Greenhouse Gas Analysis Guideline ~~procedure for calculating whether a Generation Unit meets the 50% reduction can be found in the~~a standard analytical methodology to meet this requirement, including a full accounting of greenhouse gas emissions associated with any fuel processing ~~Department's Guideline on Overall Efficiency and Greenhouse Gas Analysis~~.

A Generation Unit that does not achieve a lifecycle greenhouse gas emissions reduction of at least 50% over a ~~2010~~10-year lifecycle in a particular calendar quarter of the Compliance Year, pursuant to 225 CMR 14.05(1)(a)7.~~d~~h, shall not be eligible to report RPS Class I Renewable Generation Attributes to the NEPOOL GIS for that Calendar Quarter.

~~e~~h. In the case of a Generation Unit that uses Eligible Biogas Fuel, the Eligible Biogas Fuel ~~may be either~~ must be conveyed directly to the Generation Unit without the use of facilities used as common carriers of natural gas~~, or transported to a Generation Unit within the ISO-NE Control Area or an adjacent Control Area *via* a common carrier of natural gas, in which instance the gas would be subject to the following provisions:~~

~~i. the gas is produced entirely within the ISO-NE Control Area or an adjacent Control Area;~~

~~ii. documentation is provided, satisfactory to the Department, regarding the gas transportation and related contracts; and~~

~~iii. demonstration is provided, satisfactory to the Department, that the gas can be physically delivered to the Generation Unit~~.

~~f~~i. ~~A Generation Unit using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel with a Commercial Operation Date after December 31, 2021 that is either:~~

~~i. sited in an environmental justice population; or~~

~~ii. sited within five miles of an environmental justice population, shall not qualify as an RPS Class I Renewable Generation Unit; provided, however, that the Secretary of the Executive Office of Energy and Environmental Affairs shall determine environmental justice populations in accordance with law.~~

…

(e) Capacity Obligation. The Generation Unit's generating capacity is subject to the obligations in CMR 14.05(1)(e).

1. The amount of the generation capacity of the Generation Unit whose electrical energy output is claimed as RPS Class I Renewable Generation shall not be committed to any Control Area other than the ISO-NE Control Area unless such Generation Unit has entered into a Capacity Obligation in another Control Area before the start of the first available compliance year for the ISO-NE Forward Capacity Market, in which case this subsection shall apply upon the expiration of that Capacity Obligation. However, if the Generation Unit executed a contract for the sale of RPS Class I Renewable Generation Attributes or RPS Class I Renewable Generation, or both, before January 1, 2009, for a term of at least two years, the contract price of which relied on the receipt of capacity payments from a Control Area adjacent to the ISO-NE Control Area, and the Generation Unit can demonstrate such reliance to the satisfaction of the Department, this requirement shall not take effect for that Generation Unit until the expiration of that contract

2. The Generation Unit Owner or Operator of a Generation Unit that is not an Intermittent Generation Unit shall commit to the ISO-NE Control Area the amount of the capacity of that Unit claimed as RPS Class I Renewable Generation by submitting by the applicable deadline a show of intent for the ISO-NE Forward Capacity Auction that is the earliest available for the Unit after the Owner or Operator has submitted a Statement of Qualification Application unless the Owner or Operator can provide to the Department documentation of its prior commitment to the ISO-NE Control Area of such capacity. The Owner or Operator of any Unit that cannot demonstrate such prior commitment must also clear the Forward Capacity Auction for which it has qualified, even if it must participate as a price taker. The requirements of 225 CMR 14.05(1)(e)2. do not apply to Generation Units for which the Department has received an administratively complete Statement of Qualification Application prior to July 2, 2008.

3. An RPS Class I Renewable Generation Unit that was deemed unqualified by the ISO-NE for participation in the ISO-NE Forward Capacity Market for technical reasons may commit capacity to another Control Area and may receive GIS Certificates for the energy sold into the ISO-NE Control Area, subject to a determination by the Department.

4. An RPS Class I Renewable Generation Unit or a Solar Carve-out Renewable Generation Unit that has registered with the relevant distribution company as a net metering facility pursuant to 220 CMR 18.00: *Net Metering*, shall be exempt from the capacity obligation under 225 CMR 14.05(1)(e) while the facility is net metering.

…

~~(3) Co-firing and Blended Fuel Waiver. All or a portion of the electrical energy output of a Generation Unit that uses ineligible fuel in conjunction with an Eligible RPS Class I Renewable Fuel, whether by co-firing such fuels or by using a Blended Fuel, may qualify as RPS Class I~~

~~Renewable Generation, provided the Generation Unit meets the eligibility requirements of 225 CMR 14.05, subject to the limitations in 225 CMR 14.05(3).~~

~~(a) The portion of the total electrical energy output that qualifies as RPS Class I Renewable Generation in a given time period shall be equal to the ratio of the net heat content of the Eligible RPS Class I Renewable Fuel consumed to the net heat content of all fuel consumed in that time period.~~
~~If using a Blended Fuel of which the eligible portion is an Eligible Biomass Fuel or if co-firing an ineligible fuel with an Eligible Biomass Fuel, the entire Generation Unit must meet the requirements set forth in 225 CMR 14.05(1)(a)7.~~

~~(b) If using an Eligible Biomass Fuel, the Generation Unit must demonstrate to the satisfaction of the Department that the emission rates for the entire Generation Unit are consistent with rates prescribed by the MassDEP for comparably fueled Generation Units in the Commonwealth. The Department may require the Generation Unit Owner or Operator to retain at its own expense a third-party consultant deemed satisfactory to the Department, to provide the Department and the MassDEP with assistance in this determination.~~

~~(c) The Generation Unit must provide with its Statement of Qualification Application a fuel supply plan that specifies each and every fuel that it intends to use, in what relative proportions either in co-firing or in a Blended Fuel, and with what individual input heat values. Such plan shall include the procedures by which the Unit will document to the satisfaction of the Department its compliance with the plan.~~

~~(d) The provisions of 225 CMR 14.05(3) shall not apply to the incidental use of ineligible fuels for the purpose of cold starting a Generation Unit that otherwise exclusively uses an Eligible RPS Class I Renewable Fuel.~~

(~~4~~3) Special Provisions for a Solar Carve-out Generation Unit. All references to kW or MW in 225 CMR 14.05(4) shall be measured on a nameplate capacity basis in direct current (DC).

…

(~~5~~4) Special Provisions for a Generation Unit Located in a Control Area Adjacent to the ISO-NE Control Area. The portion of the total electrical energy output of an RPS Class I Renewable Generation Unit located in a Control Area adjacent to the ISO-NE Control Area that qualifies as RPS Class I Renewable Generation shall meet the requirements in Rule 2.7(c) and all other relevant sections of the NEPOOL GIS Operating Rules, and the requirements in 225 CMR 14.05(5).

(a) The Generation Unit Owner or Operator shall provide documentation, satisfactory to the Department, of a contract or other legally enforceable obligation(s) (Legal Obligation) that is executed between the Generation Unit Owner or Operator and an electrical energy purchaser located in the ISO-NE Control Area for delivery of the Unit's electrical energy to the ISO-NE Control Area. Such documentation shall include provisions for obtaining associated

transmission rights for delivery of the Unit's electrical energy from the Unit to the ISO-NE Control Area. The Generation Unit Owner or Operator shall pay for evaluation and verification of the provisions of such documentation by an independent party that is engaged or approved by the Department.

(b) The Generation Unit Owner or Operator shall provide documentation, satisfactory to the Department, that:

1. the electrical energy delivered pursuant to the Legal Obligation was settled in the ISO-NE Settlement Market System;

2. the Generation Unit produced, during each hour of the applicable month, the amount of MWhs claimed, as verified by the NEPOOL GIS administrator; if the originating Control Area employs a Generation Information System that is comparable to the NEPOOL GIS, information from that system may be used to support such documentation;

3. the electrical energy delivered under the Legal Obligation received a NERC Tag confirming transmission from the adjacent Control Area to the ISO-NE Control Area; and

4.~~(a)~~ The ~~Generation Unit Owner or Operator shall provide documentation, satisfactory to the Department that the~~ RPS Class I Renewable Generation Attributes have not otherwise been, nor will be, sold, retired, claimed, used or represented as part of electrical energy output or sales, or used to satisfy obligations in jurisdictions other than Massachusetts.

(c~~b~~) The Generation Unit Owner or Operator must provide an attestation in a form to be provided by the Department that it will not itself or through any affiliate or other contracted party, knowingly engage in the process of importing RPS Class I Renewable Generation into the ISO-NE Control Area for the creation of RPS Class I Renewable GIS Certificates, and then exporting that energy or a similar quantity of other energy out of the ISO-NE Control Area during the same hour.

(d~~c~~) The quantity of electrical energy output from an RPS Class I Renewable Generation Unit outside the ISO-NE Control Area that can qualify as RPS Class I Renewable Generation at the NEPOOL GIS during each hour is limited to the lesser of the RPS Class I Renewable Generation actually produced by the Generation Unit or the RPS Class I Renewable Generation actually scheduled and delivered into the ISO-NE Control Area.

…

(8) Special Provisions for Generation Units Using Eligible Biomass Woody Fuels or Manufactured Biomass Fuels.

(a~~8~~) ~~Special Provisions for Generation Units Using~~ Eligible Biomass Woody Fuels or

Manufactured Biomass Fuel Certification, Verification, and Enforcement.~~Fuels.~~ An Owner, Operator, or Authorized Agent of a Generation Unit that uses an Eligible Biomass Woody Fuel or a Manufactured Biomass Fuel must meet the following provisions.

1. Over each Compliance Year, the tonnage of all Eligible Biomass Woody Fuel input to the Generation Unit shall be documented, in a Biomass Unit Annual Compliance Report provided in 225 CMR 14.05(8)(d), by ownership by the Owner or Operator of the Generation Unit of Biomass Fuel Certificates equal to the tonnage input. For Manufactured Biomass Fuel, the Biomass Fuel Certificates shall be for the required tonnage of Eligible Biomass Woody Fuel necessary for the production of the delivered volume of Manufactured Biomass Fuel.

2. Biomass Fuel Certificates shall be originated, procured, and transacted in accordance with the Biomass Eligibility and Certificate Guideline and shall be limited to the follow Certificates:

a. Biomass Fuel Certificates that accompany the shipment of Eligible Biomass Woody Fuel from its original source and which is delivered directly to a RPS Class I Renewable Generation Unit, and which has not been modified or mixed with other fuels or materials.

b. Biomass Fuel Certificates obtained by and transacted between the Owners, Operators, or Authorized Agents of Generation Units that have received Statements of Qualification from the Department under 225 CMR 14.00, 225 CMR 15.00: *Renewable Energy Portfolio Standard - Class II*, or 225 CMR 16.00: *Alternative Energy Portfolio Standard (APS).*

3~~(a) Sustainable Forest Management~~. For Forest Derived Residues ~~and Forest Derived Thinnings~~ the Biomass Fuel Certificate shall only be issued consistent with the Eligible Forest Biomass Tonnage Report which shall include one of the following:~~sourced from forests meeting Sustainable Forestry Management practices, as independently verified through the attestation of a licensed forester, certified forester, or independent certification.~~

a~~(b) Overall Efficiency~~. Citation of the DCR Cutting Plan under the Long Term Management option and prepared by a Massachusetts Licensed Forester, and shall include detail of the total allowable tonnage of~~A Generation Unit utilizing Eligible Biomass Woody Fuel or Manufactured Biomass Fuel that does not comply with the overall efficiency requirements in 225 CMR 14.05(1)(a)7.c. shall be subject the following:~~forest derived Eligible Biomass Woody Fuel;

b. Citation to a cutting plan authorized under the host state forest agency which includes a determination, approved by the Department, that the material removed meets the definition of an Eligible Biomass Woody Fuel; or

c. Signature of a professional forester who is certified by the Society of American

Foresters, licensed and/or certified by the host state of the harvest site, or certified by the Department where the Department has received documentation that the professional forester has proficiency and experience in forestry.

4. The Eligible Forest Biomass Tonnage Report shall include certification by the professional forester of compliance with all eligibility requirements for Eligible Biomass Woody Fuels under 225 CMR 14.00. This may include evidence that the fuel has been received from land certified by the Forest Stewardship Council (FSC), Sustainable Forest Initiative (SFI), USDA Forest Service; Forest Stewardship Program, or the host state's Current Use Program.

5. For~~1. A Generation Unit utilizing an Eligible Biomass Woody Fuel or Manufactured Biomass Fuel with a Commercial Operation Date after December 31, 2021 or a Generation Unit utilizing Eligible Biomass Woody Fuel or Manufactured Biomass Fuel that has 5% or more of its fuel sourced from~~ Forest Derived Residues ~~Forest Derived Thinnings~~, the Eligible~~and~~ Forest Biomass Tonnage Report shall also include a certification from the professional forester that no more than the allowable per cent~~Salvage and does not achieve an overall efficiency of at least 60% in a particular calendar quarter~~ of the total weight of all forest products harvested from a given forest harvest site is prescribed to be removed for utilization as an Eligible Biomass Woody Fuel~~Compliance Year, pursuant to 225 CMR 14.05(1)(a)7~~. The professional forester~~c.,~~ shall also certify that the prescribed harvest meets the forest sustainability thresholds provided in the Biomass Eligibility and Certificate Guideline. The Eligible Forest Biomass Tonnage Report shall also include:~~not be eligible to report RPS Class I Renewable Generation Attributes to the NEPOOL GIS for that calendar quarter.~~ the total tons of~~2. A Generation Unit utilizing~~ Eligible Biomass Woody Fuel prescribed for harvesting under the category~~or Manufactured Biomass Fuel with a Commercial Operation Date on or before December 31, 2021 and that has over 95% of its fuel sourced from Non-Forest Derived Residues in a particular calendar quarter of the Compliance Year, shall only be eligible to receive RPS Class I Renewable Generation Attributes at NEPOOL GIS in a proportion equal to the percentage~~ of ~~fuel sourced from Non-~~Forest Derived Residues.~~ for that calendar quarter.~~

6~~(c) Reporting Requirements for Generation Units Using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel~~. For Non-forest Derived Residue fuels, the Biomass Fuel Certificate shall be completed by the fuel supplier and certified by the~~An~~ Owner, Operator, or Authorized Agent duly verifying the fuel supplier, tonnage, source, and that said material feedstock meets the criteria of an Eligible~~of a Generation Unit using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel shall provide to the Department on a quarterly basis the~~ Biomass Woody Fuel ~~Report~~ as prescribed in the ~~Department's Guideline on Eligible~~ Biomass Eligibility and Certificate Guideline~~Fuel for Renewable Generation Units.~~

(b~~d~~) Verification Provision.~~of Eligible Biomass Woody Fuel~~ The Department or independent third-parties contracted for by the Department, shall conduct document inspections, audits, or site visits under~~. In order to verify the use of Eligible Biomass Woody Fuel, an RPS Class~~

~~I Renewable Generation Unit utilizing~~ 225 CMR 14.11, as often as the Department determines is necessary to verify compliance with all relevant provisions of~~Eligible Biomass Woody Fuel shall report the following to the Department on a quarterly basis in a~~ 225 CMR 14.00 pertaining to use of an Eligible Biomass Woody ~~manner outlined in the Department's Guideline on Eligible Biomass~~ Fuel~~. for Renewable Generation Units:~~

~~1. Supplier of the fuel;~~

~~2. Amount of fuel delivered; and~~

~~3. Date of delivery.~~

1~~(e) Biomass Fuel Certificate~~. Advisory Panel. The Department~~tonnage of all Eligible Biomass Woody Fuel or Manufactured Biomass Fuel reported in the Quarterly Biomass Fuel Report~~ shall appoint a panel~~be documented by ownership~~ of nine members representing the Executive Office, the Department, DCR, MassDEP, an environmental advocacy group, a licensed Massachusetts forester, a conservation biologist,~~Biomass Fuel Certificates. The tonnage input for Eligible Biomass Fuel noted on the Biomass Fuel Certificate shall equal or be greater than~~ the Owner of a biomass~~tonnage of Eligible Biomass Fuel consumed at the~~ Generation Unit~~. For Manufactured Biomass Fuel~~, and a member~~the Biomass Fuel Certificates shall be for the required tonnage~~ of ~~Eligible Biomass Woody Fuel necessary for~~ the public~~production of the delivered volume of Manufactured Biomass Fuel~~. The Panel~~Biomass Fuel Certificates~~ shall monitor the ongoing verification processes and shall meet not less than two times per year and provide the Department from each meeting, its findings~~be originated, procured,~~ and recommendations, including its level of confidence in the verification and enforcement provisions, regarding:~~transacted in accordance with the Guideline on Eligible Biomass Fuel for Renewable Generation Units.~~

a. the tracking and enforcement of Eligible Biomass Woody Fuel; and

b. the tracking of Biomass Fuel Certificates and their impact on the biomass fuel market and greenhouse gas accounting. The Panel shall also review the costs of verification and make recommendations to the Department on any measures that may be required to offset this cost.

2.~~(f)~~ Forest Impact Assessment. Every five years, beginning in 2020, the Department, in coordination with DCR, will conduct an assessment of the impacts on Massachusetts and regional forests resulting from biomass fuel removals. The five-year assessment shall also consider information on the Eligible Biomass Woody Fuel utilized by qualified Generation Units and the extent to which such fuels come from the categories of Non-forest Derived Residues, and Forest Derived Residues, ~~Forest Derived Thinnings, and Forest Salvage~~. The Department shall use this information to evaluate the appropriateness and accuracy of greenhouse gas accounting from Generation Units utilizing Eligible Woody Biomass Fuel as provided in the Lifecycle Greenhouse Gas Analysis required under 225 CMR 14.05(1)(a)7.h.iii., and as implemented in the Overall

Efficiency and Greenhouse Gas Analysis Guideline. Findings from the assessment shall be reported to the Executive Office and made available to the public no later than June 1st of each assessment year. If the Department concludes its findings would likely result in significant impacts on long term forest sustainability or accurate greenhouse gas accounting, the Department shall consult with the MassDEP, and DCR on any changes that may be required by the Department, MassDEP, or DCR to maintain long term forest sustainability and climate change mitigation.

(c) A Generation Unit that uses Eligible Biomass Woody Fuel or Manufactured Biomass Fuel must report to the Department the following information on a quarterly basis, and will be provided RPS Class I Renewable Generation Attributes as a function of its Overall Efficiency as calculated in 225 CMR 14.05(8)(c)2. and 3.

1. Each quarter, the designated independent Third-party Meter Reader of a Generation Unit approved by the Department, must report the following information to the Department; Biomass Input Heat Content, Useful Thermal Energy, Merchantable Bio-products, Renewable Generation, Renewable Generation utilized behind-the-meter, and the Overall Efficiency as calculated in 225 CMR 14.05(8)(c)2. and 3. For all reported data and prior to the calculation of Overall Efficiency, all energy units must be expressed in MWh. For Useful Thermal Energy and Biomass Input Heat Content the conversion of energy units shall consider that each 3412 thousand BTUs is equivalent to one MWh. For Merchantable Bio-products the product shall be prescribed an energy content based on its enthalpy of reaction, as determined by a standard independent laboratory analysis, and those units of energy appropriately converted to MWhs.

2. The Overall Efficiency of the Generation Unit each quarter shall be calculated as: the sum of:

a. Renewable Generation not utilized behind-the-meter;

b. Renewable Energy utilized behind-the-meter divided by one minus the average distribution and transmission line losses of the electrical grid for which for this purpose shall be 8%;

c. Useful Thermal Energy; and

d. Merchantable Bio-Products; divided by Biomass Input Heat Content

3. A Generation Unit shall be provided on the NEPOOL GIS each quarter an amount of Renewable Energy Attributes calculated as follows:

a. A Generation Unit achieving 70% or higher Overall Efficiency in a quarter will receive one RPS Class I Renewable Energy Attribute for each MWh of RPS Class I Renewable Energy Generation.

b. A Unit achieving less than 70% Overall Efficiency shall not be eligible to receive

RPS Class I Energy Attributes.

(d) Annual Compliance of Generation Units using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel. An Owner, Operator, or Authorized Agent of a Generation Unit using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel shall provide to the Department by January 31st of each year a Biomass Unit Annual Compliance Report and be subject to the following:

1. Within the Biomass Unit Annual Compliance Report, in a format set forth in the Overall Efficiency and Greenhouse Gas Analysis Guideline, the Owner, Operator, or Authorized Agent shall identify the Owner's ownership of Biomass Fuel Certificates denoting the fuel consumption for the Compliance Year by the Generation Unit by tons of fuel, categorized as Forest Derived Residues and Non-forest Derived Residues. The Owner, Operator, or Authorized Agent shall retain copies of all Biomass Fuel Certificates for five years. The Report must explain any variances with the proposed Fuel Supply Plan filed with the Department for that Compliance Year.

2. The Biomass Unit Annual Compliance Report must include a greenhouse gas analysis for the Compliance Year. The analysis shall be prepared in accordance with the Overall Efficiency and Greenhouse Gas Analysis Guideline and the fuel use as represented by the Biomass Fuel Certificates owned for the Compliance Year. This Report must also document the Unit's performance with respect to the lifecycle greenhouse emissions requirements in 225 CMR 14.05(1)(a)7.g.iii., including the actual percent lifecycle greenhouse gas emissions reduction over 20 years, as determined in the Guideline. The Report shall document any under-compliance and the Percent Under-compliance with the lifecycle greenhouse gas emission reduction requirement.

3. For Generation Units that report a Percent Under-compliance in 225 CMR 14.05(8)(d)2., the Unit's Statement of Qualification will be revoked, as provided under 225 CMR 14.06(9).

225 CMR 15.02: Definitions

…

Biomass Fuel Certificate. A certificate issued in accordance with rules established by the Department in the Guideline on Eligible Biomass Fuel for Renewable Generation Units that:

(a) quantifies the supply of Eligible Biomass Woody Fuel or Manufactured Biomass Fuel;

(b) specifies the source of the Eligible Biomass Woody Fuel or Manufactured Biomass Fuel; and

(c) specifies the eligibility of the Eligible Biomass Woody Fuel or Manufactured Biomass Fuel as Forest Derived Residues, Forest Derived Thinnings, Forest Salvage, or Non-forest Derived Residues.

For Forest Derived Residues and Forest Derived Thinnings, the Certificate shall reference the relevant Eligible Forest Biomass Tonnage Report, and include any additional information deemed necessary by the Department.

Biomass Input Heat Content. The thermal energy content, measured in MWh, of biomass fuel as it is input into a Generation Unit over a period of time. For the purpose of wood chips, the value will be determined using a methodology to be provided by the Department in the Overall Efficiency and Greenhouse Gas Analysis Guideline. The methodology will include a weighted average of all the metered weight of utilized biomass fuel types (as differentiated by typical moisture content), and an assigned heat content from referenced literature to each biomass type. For processed biomass fuels, the thermal energy content shall be documented to the satisfaction of the Department by an independent testing laboratory.

~~Blended Fuel. A liquid or gaseous fuel that is blended from both Eligible RPS Class II Renewable Fuel(s) and ineligible fuel(s), a portion of whose electrical energy output may qualify as RPS Class II Renewable Generation under criteria set forth in 225 CMR 15.05(2).~~

…

~~Clean Wood. As defined in 310 CMR 19.006: Clean Wood.~~

…

~~Eligible Biomass Fuel. Fuel sources consisting of the following:~~

~~(a) Eligible Biomass Woody Fuel;~~

~~(b) Manufactured Biomass Fuel;~~

~~(c) Eligible Biogas Fuel~~

~~(d) by-products or waste from animals or agricultural crops;~~

~~(e) food or vegetative material;~~

~~(f) algae;~~

~~(g) organic refuse derived fuel; and~~

~~(h) Eligible Liquid Biofuel.~~

Eligible Biomass Fuel. Fuel sources consisting of Eligible Biomass Woody Fuel, Manufactured Biomass Fuel; and anaerobic digester gas and other biogases that are derived from such resources; but shall not include Construction and Demolition Waste as defined in 310 CMR 19.006.

~~Eligible Biomass Woody Fuel. Woody fuels that are derived from the following sources, consistent with the requirements of 225 CMR 14.05(8):~~

~~(a) Forest Derived Residues.~~

~~1. Tops, crooks and other portions of trees produced as a byproduct, and trees collaterally damaged, during the normal course of harvesting material, such as timber, pulpwood or cordwood in the implementation of a silvicultural prescription as administered by a licensed or certified forester as prescribed in the Department's Guideline on Eligible Biomass Fuel for Renewable Generation Units.~~

~~2. Trees and portions of trees harvested for the purpose of the restoration and management of habitat for rare and endangered species as listed by the Massachusetts Division of Fisheries and Wildlife. Qualifying harvest areas must be approved by the Massachusetts Division of Fisheries and Wildlife Natural Heritage Program.~~

~~3. Other woody vegetation that interferes with regeneration or the natural growth of the forest, limited to locally invasive native species and non-native invasive woody vegetation.~~

~~(b) Forest Derived Thinnings.~~

~~1. Unacceptable growing stock which is defined as trees considered structurally weak or have low vigor and do not have the potential to eventually yield an eight-foot sawlog or survive for at least the next ten years.~~

~~2. Trees removed during thinning operations, the purpose of which is to reduce stand density and enhance diameter growth and volume of the residual stand.~~

~~(c) Forest Salvage.~~

~~1. Damaged, dying or dead trees removed due to injurious agents, such as wind or ice storms or the spread of invasive epidemic forest pathogens, insects and diseases or other epidemic biological risks to the forest, but not removed due to competition. Such eligible trees may be removed without limitation for biomass fuel, only if the injurious agent is a threat to forest~~

~~health or risk to private or public resources, and if the United States Department of Agriculture Animal and Plant Health Inspection Service, the United States Department of Agriculture Forest Service, or appropriate federal or state governmental agency has issued a declaration, rule, or order declaring a major threat to forest health or risk to private or public resources, or if they are harvested through a DCR-approved cutting plan.~~

~~2. Trees removed to reduce fire hazard within fire-adapted forest ecosystems, as certified by a letter to the Department from the state agency responsible for forestry in consultation with the appropriate environmental state agencies.~~

~~(d) Non-forest Derived Residues.~~

~~1. Forest Products Industry. Residues derived from wood products manufacturing consisting of Clean Wood.~~

~~2. Land Use Change -- Agricultural. Trees cut or otherwise removed in the process of converting forest land to agricultural usage, either for new or restored farm land.~~

~~3. Wood Waste. Post-consumer wood products from Clean Wood; pruned branches, stumps, and whole trees removed during the normal course of maintenance of public or private roads, highways, driveways, utility lines, rights of way, and parks.~~

~~4. Agricultural Wood Waste. Pruned branches, stumps, and whole trees resulting from maintenance activities directly related to the production of an agricultural product that is not Clean Wood.~~

Eligible Biomass Woody Fuel. Woody fuels that are derived from the following sources, consistent with the requirements of 225 CMR 14.05(8):

(a) Forest Derived Residues.

1. Tops, crooks and other portions of trees produced as a byproduct during the normal course of harvesting material, such as timber, pulpwood or cordwood.

2. Other woody vegetation that interferes with regeneration or the natural growth of the forest, limited to locally invasive native species and non-native invasive woody vegetation.

(b) Non-forest Derived Residues.

1. Primary Forest Products Industry. Lumber mill residues or lumber processing residues consisting of the slabs, shavings, trimmings, sawdust, bark, end pieces of wood, and log cores that result from the various processing operations occurring in sawmills, pulp mills, and veneer and plywood plants.

2. Secondary Forest Products Industry. Wood waste produced as a byproduct of the production of finished wood products, including but not limited to clean residues from

woodworking shops, furniture factories, and truss and pallet manufacturing.

3. Wood Waste. Pruned branches, stumps, and whole trees removed during the normal course of maintenance of public or private roads, highways, driveways, utility lines, rights of way, and parks.

~~Eligible Liquid Biofuel. A liquid fuel that is derived from organic waste feedstock and meets the standards for advanced biofuels under the Environmental Protection Agency's Renewable Fuel Standard (RFS2) program. Organic waste feedstocks shall include, but not be limited to, waste vegetable oils, waste animal fats, or grease trap waste. Eligible Liquid Biofuel shall not include petroleum-based waste or Hazardous Waste as defined in 310 CMR 40.0006: *Terminology, Definitions, and Acronyms*, unless otherwise determined by the Department in consultation with MassDEP.~~

Eligible RPS Class II Renewable Fuel. An Eligible Biomass Fuel~~, municipal solid waste, hydrogen derived from such fuels or hydrogen derived from water using the electrical output of a Renewable Generation Unit, but not hydrogen derived using RPS Class I or Class II Renewable Generation if the RPS Class I or Class II Renewable Generation Attributes of such Generation are sold, retired, claimed, used or represented as part of electrical energy output or sales, or used to satisfy regulatory obligations in any jurisdictions, and not hydrogen derived directly or indirectly from ineligible fuels~~.

Executive Office. The Executive Office of Energy and Environmental Affairs established by M.G.L. c. 6A, § 2.

…

Lifecycle Greenhouse Gas Emissions. The aggregate quantity of greenhouse gas emissions, including direct emissions and significant indirect emissions such as significant emissions from land use changes, and temporal changes in forest carbon sequestration and emissions resulting from biomass harvests, regrowth, and avoided decomposition as determined by the Department in consultation with the MassDEP and the Executive Office, related to the full fuel lifecycle, including all stages of fuel and feedstock production and distribution, from feedstock generation or extraction through the distribution and delivery of the finished fuel to the ultimate consumer, where the mass values for all greenhouse gases are adjusted to account for their relative global warming potential.

…

NERC Tag. A document that identifies an electrical energy interchange transaction and its associated participants, assigned in accordance with rules set forth by the North American Electric Reliability Corporation, a non-profit corporation granted by the Federal Energy Regulatory Commission (FERC) the legal authority to enforce mandatory reliability standards for the U.S. bulk power system, subject to FERC oversight.

…

Overall Efficiency. For a Generation Unit using an Eligible Biomass Woody Fuel, the calculation shall be the sum of

(a) Renewable Generation not utilized behind-the-meter; plus

(b) Renewable Energy utilized behind-the-meter divided by 0.92, or 92%, which is one minus the average distribution and transmission line losses of the electrical grid, which, for the purpose of this calculation, is 8%; plus

(c) Useful Thermal Energy;

and this summation shall be divided by the Biomass Input Heat Content.

…

Percent Under-compliance. The difference, if positive, between 50% and the reported lifecycle greenhouse gas emissions over 20 years as reported in a Biomass Unit Annual Compliance Report by an RPS Class I Renewable Generation Unit that utilizes Eligible Biomass Woody Fuel, as provided in 225 CMR 15.05(5)(d).

…

RPS Class II ~~Renewable~~ Generation. The electrical energy output of an RPS Class II ~~Renewable~~ Generation Unit, or that portion of the electrical energy output of an RPS Class II Generation Unit that qualifies under:

~~(a) a Co-firing and Blended Fuel Waiver, pursuant to 225 CMR 15.05(2);~~

(~~b~~a) the Special Provisions for a Generation Unit Located in a Control Area Adjacent to the ISO-NE Control Area, pursuant to 225 CMR 15.05(3); or

(~~c~~b) any other applicable provision of 225 CMR 15.00.

RPS Class II ~~Renewable~~ Generation Attribute. The Generation Attribute of the electrical energy output of a specific RPS Class II Generation Unit that derives from the Generation Unit's production of RPS Class II Renewable Generation~~, excluding Attributes derived from the production of Waste Energy~~.

RPS Class II ~~Renewable~~ Generation Unit. A Generation Unit or Aggregation that has received an RPS Class II Statement of Qualification from the Department.

~~RPS Class II Waste Energy Generation Attribute. The Generation Attribute of the electrical energy output of a specific Waste Energy Generation Unit that derives from the Generation Unit's production of Waste Energy.~~

…

~~Sustainable Forestry Management. Practicing a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat, and aesthetics and the stewardship and use of forests and forest lands in a way, and a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality, and potential to fulfill, now and in the future, relevant ecological, economic, and social functions at local, national, and global levels, and that does not cause damage to other ecosystems. Criteria for sustainable forestry include:~~

~~(a) conservation of biological diversity;~~

~~(b) maintenance of productive capacity of forest ecosystems;~~

~~(c) maintenance of forest ecosystem health and vitality;~~

~~(d) conservation and maintenance of soil and water resources;~~

~~(e) maintenance of forest contributions to global carbon cycles;~~

~~(f) maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies; and~~

~~(g) a legal, institutional, and economic framework for forest conservation and sustainable management.~~

~~Useful Thermal Energy. Energy in the form of direct heat, steam, hot water, or other thermal form that is used in production and beneficial measures for heating, cooling, humidity control, process use, or other valid thermal end use energy requirements, for which fuel or electricity would otherwise be consumed. Thermal energy used to produce a dried or refined biomass fuel shall not be considered Useful Thermal Energy if the biomass fuel produced is used to fuel the Generation Unit that dried or refined the biomass fuel.~~

Useful Thermal Energy. Energy:

(a) in the form of direct heat, steam, hot water, or other thermal form that is used in production and beneficial measures for heating, cooling, humidity control, process use, or other valid thermal end use energy requirements; and

(b) for which fuel or electricity would otherwise be consumed.

Thermal energy used for the purpose of drying or refining biomass fuel shall not be considered Useful Thermal Energy.

…

~~Waste Energy. Electrical energy generated from the combustion of municipal solid waste.~~

~~Waste Energy Generation Unit. A Generation Unit that utilizes conventional municipal solid waste plant technology in commercial use to generate Waste Energy.~~

225 CMR 15.05: Eligibility Criteria for RPS Class II Generation Units

(1) Eligibility Criteria. A Generation Unit may qualify as an RPS Class II Generation Unit subject to the limitations in 225 CMR 15.05.

(a) Fuels, Energy Resources and Technologies. The Generation Unit shall use one or more of the fuels, energy resources and/or technologies listed in 225 CMR 15.05(1)(a)1. through 10.

…

8. Low-emission, biomass power conversion technologies using an Eligible Biomass Fuel. A Generation Unit may qualify as an RPS Class II Generation Unit, provided it uses an Eligible Biomass Fuel, subject to the limitations in 225 CMR 15.05(1)(a)8.

a. Pursuant to St. 2022, c. 179, §§ 33 through 36 and § 88, starting January 1, 2022, Eligible Biomass Woody Fuel Generation Units shall no longer be eligible to submit a Statement of Qualification Application under 225 CMR 154.06~~: *Qualification Process for RPS Class I, Solar Carve-out Renewable Generation Units, and Solar Carve-out II Renewable Generation Units*~~.

~~b. A Generation Unit utilizing an Eligible Biomass Fuel that is required to obtain an air permit in its jurisdiction must possess a Valid Air Permit.~~

b~~c~~. The Department shall set forth in Guidelines low-emission eligibility criteria which will become effective on their date of issuance. Any emission eligibility criteria in subsequently revised regulations or Guidelines shall become effective 12 months from their date of issuance. ~~A Generation Unit utilizing an Eligible Biomass Fuel that is not a solid fuel, such as Eligible Liquid Biofuel, or does not use a steam boiler, shall follow the low-emission eligibility criteria process described in the Departments' Guideline on Eligible Biomass Fuel for Renewable Generation Units.~~ In the case of a Generation Unit for whose size, type, or fuel the Department's Guidelines do not provide applicable emission limits, the Department will determine appropriate limits in consultation with the MassDEP.

c. A Generation Unit must demonstrate to the satisfaction of the Department that its emissions are consistent with criteria set forth in the Guidelines that are applicable for the date on which the Department receives the Units Statement of Qualification Application.

d. In the case of a Generation Unit for whose size, type, or fuel the Guidelines do not provide applicable emission limits, the Department will determine appropriate limits in consultation with the MassDEP.

e~~d~~. A Generation Unit utilizing an Eligible Biomass Woody Fuel ~~or Manufactured Biomass Fuel that has 5% or more of its fuel sourced from Forest Derived Residues, Co-mingled Forest Derived Thinnings and Forest Salvage must achieve an overall~~

~~efficiency of at least 60% on a quarterly basis. A Generation Unit utilizing an Eligible Biomass Woody Fuel,~~ or ~~a~~ Manufactured Biomass Fuel, must provide to the Department as part of their Statement of Qualification Application ~~that has over 95% or more of its fuel sourced from Non-forest Derived Residues on a quarterly basis shall have no applicable overall efficiency requirement. The procedure for calculating whether the Generation Unit meets the 60% overall efficiency requirement can be found in~~ the following items:~~Department's Guideline on Overall Efficiency and Greenhouse Gas Analysis.~~

i. A fuel supply plan indicating the anticipated fuel types, sources, and amounts. The Unit shall provide a report of the anticipated fuel supply for that Compliance Year no later than January 1st of each year on an annual basis

ii. A design and operational plan that demonstrates that the Unit will achieve an Overall Efficiency, as calculated in 225 CMR 15.05(5)(c)2. through 4., of at least 70% on a quarterly basis.

iii. An analysis of net Lifecycle Greenhouse Gas Emissions~~e. A Generation Unit utilizing an Eligible Biogas Fuel,~~ that demonstrates, to the satisfaction of the Department, that such ~~Eligible Biomass Woody Fuel, Eligible Liquid Biofuel or Manufactured Biomass Fuel shall reduce lifecycle greenhouse gas~~ emissions, over a ~~2010~~ 10-year life cycle, yield~~lifecycle, by~~ at least a 50% reduction of greenhouse gas emissions compared to the Lifecycle Greenhouse Gas Emissions from the aggregate operation of a new combined cycle natural gas electric generating facility using the most efficient commercially available technology as of the date of the Statement of Qualification Application for the portion of electricity delivered by the Generation Unit and, if applicable, the operation of the fossil fuel fired thermal energy unit being displaced, or in the case of new Useful Thermal Energy, a gas-fired thermal energy unit using the most efficient commercially available technology as of the date of Statement of Qualification Application for the portion of the Useful Thermal Energy delivered by the Generation Unit. The Department shall provide in the Overall Efficiency and Greenhouse Gas Analysis Guideline ~~procedure for calculating whether a Generation Unit meets the 50% reduction can be found in the~~a standard analytical methodology to meet this requirement, including a full accounting of greenhouse gas emissions associated with any fuel processing ~~Department's Guideline on Overall Efficiency and Greenhouse Gas Analysis~~.

A Generation Unit that does not achieve a lifecycle greenhouse gas emissions reduction of at least 50% over a ~~2010~~10-year lifecycle in a particular calendar quarter of the Compliance Year, pursuant to 225 CMR 15.05(1)(a)8.~~d~~e, shall not be eligible to report RPS Class I Renewable Generation Attributes to the NEPOOL GIS for that Calendar Quarter.

~~e~~f. In the case of a Generation Unit that uses Eligible Biogas Fuel, the Eligible Biogas Fuel ~~may be either~~ must be conveyed directly to the Generation Unit without

the use of facilities used as common carriers of natural gas~~, or transported to a Generation Unit within the ISO-NE Control Area or an adjacent Control Area *via* a common carrier of natural gas, in which instance the gas would be subject to the following provisions:~~

~~i. the gas is produced entirely within the ISO-NE Control Area or an adjacent Control Area;~~

~~ii. documentation is provided, satisfactory to the Department, regarding the gas transportation and related contracts; and~~

~~iii. demonstration is provided, satisfactory to the Department, that the gas can be physically delivered to the Generation Unit~~.

…

(e) Capacity Obligation. The Generation Unit's generating capacity is subject to the following obligations:

1. The amount of the generation capacity of the Generation Unit whose electrical energy output is claimed as RPS Class II Renewable Generation shall not be committed to any Control Area other than the ISO-NE Control Area unless such Generation Unit has entered into a Capacity Obligation in another Control Area before the start of the first available compliance year for the ISO-NE Forward Capacity Market, in which case this subsection shall apply upon the expiration of that Capacity Obligation. However, if the Generation Unit executed a contract for the sale of RPS Class II Renewable Generation Attributes or RPS Class II Renewable Generation, or both, before January 1, 2009, for a term of at least two years, the contract price of which relied on the receipt of capacity payments from a control area adjacent to the ISO-NE Control Area, and the Generation Unit can demonstrate such reliance to the satisfaction of the Department, this requirement shall not take effect for that Generation Unit until the expiration of that contract.

2. The Owner or Operator of a Generation Unit that is not an Intermittent Generation Unit shall commit to the ISO-NE Control Area the amount of the capacity of that Unit claimed as RPS Class II Renewable Generation by submitting by the applicable deadline a show of intent for the ISO-NE Forward Capacity Auction that is the earliest available for the Unit after the Owner or Operator has submitted a Statement of Qualification Application.

3. An RPS Class II Renewable Generation Unit that was deemed unqualified by the ISO-NE for participation in the ISO-NE Forward Capacity Market for technical reasons may commit capacity to another control area and may receive GIS Certificates for the energy sold into ISO-NE Control Area, subject to a determination by the Department.

~~(2) Co-firing and Blended Fuel Waiver. All or a portion of the electrical energy output of a Generation Unit that uses ineligible fuel in conjunction with an Eligible RPS Class II Renewable~~

~~Fuel, whether by co-firing such fuels or by using a Blended Fuel, may qualify as RPS Class II Renewable Generation, provided the Generation Unit meets the eligibility requirements of 225 CMR 15.05, subject to the limitations in 225 CMR 15.05(2).~~

~~(a) The portion of the total electrical energy output that qualifies as RPS Class II Renewable Generation in a given time period shall be equal to the ratio of the net heat content of the Eligible RPS Class II Renewable Fuel consumed to the net heat content of all fuel consumed in that time period.~~

~~(b) If using a Blended Fuel of which the eligible portion is an Eligible Biomass Fuel or if co-firing an ineligible fuel with an Eligible Biomass Fuel, the entire Generation Unit must meet the requirements of an advanced biomass Power Conversion Technology as set forth in 225 CMR 15.05(1)(a)8.~~

~~(c) If using an Eligible Biomass Fuel, the Generation Unit must demonstrate to the satisfaction of the Department that the emission rates for the entire Generation Unit are consistent with rates prescribed by the MassDEP for comparably fueled Generation Units in the Commonwealth. The Department may require the Generation Unit Owner or Operator to retain at its own expense a third-party consultant deemed satisfactory to the Department, to provide the Department and the MassDEP with assistance in this determination.~~

~~(d) The Generation Unit must provide with its Statement of Qualification Application a fuel supply plan that specifies each and every fuel that it intends to use, in what relative proportions either in co-firing or in a Blended Fuel, and with what individual input heat values. Such plan shall include the procedures by which the Unit will document to the satisfaction of the Department its compliance with the plan.~~

~~(e) The provisions of 225 CMR 15.05(2) shall not apply to the incidental use of ineligible fuels for the purpose of cold starting a Generation Unit that otherwise exclusively uses an Eligible RPS Class II Renewable Fuel.~~

(3) Special Provisions for a Generation Unit Located in a Control Area Adjacent to the ISO-NE Control Area. The portion of the total electrical energy output of an RPS Class II Generation Unit located in a Control Area adjacent to the ISO-NE Control Area that qualifies as RPS Class II Renewable Generation shall meet the requirements in Rule 2.7(c) and all other relevant sections of the NEPOOL GIS Operating Rules or any successor rule, and the following requirements:

(a) The Generation Unit Owner or Operator shall provide documentation, satisfactory to the Department, of a contract or other legally enforceable obligation(s) ("Legal Obligation") that is executed between the Generation Unit Owner or Operator and an electrical energy purchaser located in the ISO-NE Control Area for delivery of the Unit's electrical energy to the ISO-NE Control Area. Such documentation shall include provisions for obtaining associated transmission rights for delivery of the Unit's electrical energy from the Unit to the ISO-NE Control Area. The Generation Unit Owner or Operator shall pay for evaluation and verification of the provisions of such documentation by an independent party that is engaged

or approved by the Department.

(b) The Generation Unit Owner or Operator shall provide documentation, satisfactory to the Department, that:

1. the electrical energy delivered pursuant to the Legal Obligation was settled in the ISO-NE Settlement Market System;

2. the Generation Unit produced, during each hour of the applicable month, the amount of MWhs claimed, as verified by the NEPOOL GIS administrator, if the originating Control Area employs a Generation Information System that is comparable to the NEPOOL GIS, information from that system may be used to support such documentation;

3. the electrical energy delivered under the Legal Obligation received a NERC Tag confirming transmission from the adjacent Control Area to the ISO-NE Control Area; and

4.~~(a)~~ The Generation Unit Owner or Operator shall provide documentation, satisfactory to the Department, that the RPS Class II ~~Renewable~~ Generation Attributes ~~or RPS Class II Waste Energy Generation Attributes~~ have not otherwise been, nor will be, sold, retired, claimed, used or represented as part of electrical energy output or sales, or used to satisfy obligations in jurisdictions other than Massachusetts.

(~~b~~c) The Generation Unit Owner or Operator must provide an attestation in a form to be provided by the Department that it will not itself or through any affiliate or other contracted party, engage in the process of importing RPS Class II Renewable Generation into the ISO-NE Control Area for the creation of RPS Class II Renewable GIS Certificates, and then exporting that energy or a similar quantity of other energy out of the ISO-NE Control Area during the same hour.

(~~c~~d) The quantity of electrical energy output from an RPS Class II Generation Unit outside the ISO-NE Control Area that can qualify as RPS Class II Renewable Generation at the NEPOOL GIS during each hour is limited to the lesser of the RPS Class II Renewable Generation actually produced by the Unit or the RPS Class II Renewable Generation actually scheduled and delivered into the ISO-NE Control Area.

…

~~(5) Special Provisions for Generation Units Using Eligible Biomass Woody Fuels, or Manufactured Biomass Fuels. An Owner, Operator, or Authorized Agent of a Generation Unit that uses an Eligible Biomass Woody Fuel or a Manufactured Biomass Fuel must meet the following provisions:~~

~~(a) Sustainable Forest Management. Forest Derived Residues and Thinnings shall only be sourced from forests meeting Sustainable Forestry Management practices, as independently~~

verified through the attestation of a licensed forester, certified forester or independent certification.

(b) Overall Efficiency. A Generation Unit utilizing Eligible Biomass Woody Fuel or Manufactured Biomass Fuel that does not comply with the overall efficiency requirements in 225 CMR 15.05(1)(a)8.c. shall be subject the following:

1. A Generation Unit utilizing Eligible Biomass Woody Fuel or Manufactured Biomass Fuel that has 5% or more of its fuel sourced from Forest Derived Residues, Forest Derived Thinnings and Forest Salvage and does not achieve an overall efficiency of at least 60% in a particular calendar quarter of the Compliance Year, pursuant to 225 CMR 15.05(1)(a)8.c., shall not be eligible to report RPS Class II Renewable Generation Attributes to the NEPOOL GIS for that calendar quarter.

2. A Generation Unit utilizing Eligible Biomass Woody Fuel or Manufactured Biomass Fuel that has more than 95% of its fuel sourced from Non-forest Derived Residues in a particular calendar quarter of the Compliance Year, shall only be eligible to receive RPS Class II Renewable Generation Attributes at NEPOOL GIS in a proportion equal to the percentage of fuel sourced from Non-forest Derived Residues for that calendar quarter.

(c) Reporting Requirements for Generation Units Using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel. An Owner, Operator, or Authorized Agent of a Generation Unit using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel shall provide to the Department on a quarterly basis the Biomass Fuel Report as prescribed in the Department's Guideline on Eligible Biomass Fuel for Renewable Generation Units.

(d) Verification of Eligible Biomass Woody Fuel. In order to verify the use of Eligible Biomass Woody Fuel, an RPS Class I Renewable Generation Unit utilizing Eligible Biomass Woody Fuel shall report the following to the Department on a quarterly basis in a manner outlined in the Department's Guideline on Eligible Biomass Fuel for Renewable Generation Units:

1. Supplier of the fuel;

2. Amount of fuel delivered; and

3. Date of delivery.

(e) Biomass Fuel Certificate. The tonnage of all Eligible Biomass Woody Fuel or Manufactured Biomass Fuel reported in the Quarterly Biomass Fuel Report shall be documented by ownership of the Biomass Fuel Certificates. The tonnage input for Eligible Biomass Fuel noted on the Biomass Fuel Certificate shall equal or be greater than the tonnage of Eligible Biomass Fuel consumed at the Generation Unit. For Manufactured Biomass Fuel, the Biomass Fuel Certificates shall be for the required tonnage of Eligible Biomass Woody Fuel necessary for the production of the delivered volume of Manufactured Biomass Fuel. The Biomass Fuel Certificates shall be originated, procured, and transacted in accordance with the Guideline on Eligible Biomass Fuel for Renewable Generation Units.

(5) Special Provisions for Generation Units Using Eligible Biomass Woody Fuels or Manufactured Biomass Fuels.

(a) Eligible Biomass Woody Fuel or Manufactured Biomass Fuel Certification. Verification, and Enforcement. An Owner, Operator, or Authorized Agent of a Generation Unit that uses an Eligible Biomass Woody Fuel or a Manufactured Biomass Fuel must meet the following provisions:

1. Over each Compliance Year, the tonnage of all Eligible Biomass Woody Fuel input to the Generation Unit shall be documented by the Owner or Operator in a Biomass Unit Annual Compliance Report provided in 225 CMR 15.05(5)(d). The documentation shall demonstrate that the Owner or Operator of the Generation Unit has obtained a quantity of Biomass Fuel Certificates representing an equal or greater quantity than the tonnage of Eligible Biomass Woody Fuel in the Report. For Manufactured Biomass Fuel, the Biomass Fuel Certificates shall be for the required tonnage of Eligible Biomass Woody Fuel necessary for the production ofthe volume of Manufactured Biomass Fuel delivered to the unit

2. Biomass Fuel Certificates shall be originated, procured, and transacted in accordance with the Department's Biomass Eligibility and Certificate Guideline. Certificates shall be valid only in one of the following instances:

a. Biomass Fuel Certificates that accompany the shipment of Eligible Biomass Woody Fuel from its original source and:

i. is delivered directly to an RPS Class II Renewable Generation Unit; and

ii. has not been modified or mixed with other fuels or materials.

b. Biomass Fuel Certificates obtained by and transacted between the Owners, Operators, or Authorized Agents of Generation Units that have received Statements of Qualification from the Department under 225 CMR 14.00: *Renewable Energy Portfolio Standard-Class I, 15.00, or 16.00: Alternative Energy Portfolio Standard (APS).*

3. For Forest Derived Residues the Biomass Fuel Certificate shall be issued consistent with the Eligible Forest Biomass Tonnage Report and signed by a Professional Forester.

4. The Eligible Forest Biomass Tonnage Report shall include certification by the Professional Forester of compliance with all eligibility requirements for Eligible Biomass Woody Fuels under 225 CMR 15.00. This may include evidence that the fuel has been received from land certified by the Forest Stewardship Council (FSC), Sustainable Forest Initiative (SFI), USDA Forest Service; Forest Stewardship Program, or the host state's Current Use Program

5. For Forest Derived Residues, the Eligible Forest Biomass Tonnage Report shall also include each of the following:

a. A certification from a Professional Forester that the amount to be removed for Eligible Biomass Woody Fuel is no more than the allowable percent of the total weight of all forest products harvested from a given forest harvest site;

b. A certification from a Professional Forester that the prescribed harvest meets the forest sustainability thresholds provided in the Department's Biomass Eligibility and Certificate Guideline; and

c. The total tons of Eligible Biomass Woody Fuel prescribed for harvesting under the category of Forest Derived Residues.

6. For Non-forest Derived Residue fuels, the Biomass Fuel Certificate shall be completed by the fuel supplier and certified by the Owner, Operator, or Authorized Agent duly verifying the fuel supplier, tonnage, source, and that the Non-forest Derived Residue fuels meet the criteria of an Eligible Biomass Woody Fuel as provided in the Department's Biomass Eligibility and Certificate Guideline

(b) Verification Provision. The Department or independent third-parties contracted for by the Department, shall conduct document inspections, audits, or site visits under 225 CMR 15.11, as often as the Department determines is necessary to verify compliance with all relevant provisions of 225 CMR 15.00 pertaining to use of an Eligible Biomass Woody Fuel. Verification by the Department shall follow the recommendations of the Advisory Panel and Forest Impact Statement, as established in 225 CMR 14.05(8)(b)1.: *Advisory Panel* and 2.: *Forest Impact Assessment.*

(c) A Generation Unit that uses Eligible Biomass Woody Fuel or Manufactured Biomass Fuel must report to the Department the following information on a quarterly basis, and will be provided RPS Class II Renewable Generation Attributes as a function of its Overall Efficiency as calculated in 225 CMR 15.05(5)(c)2. and 3.

1. Each quarter, the designated independent Third-party Meter Reader of a Generation Unit approved by the Department, must report the following information to the Department; Biomass Input Heat Content, Useful Thermal Energy, Merchantable Bio-products, Renewable Generation, Renewable Generation utilized behind-the-meter, and the Overall Efficiency as calculated in 225 CMR 15.05(5)(c)2. and 3. For all reported data and prior to the calculation of Overall Efficiency, all energy units must be expressed in MWh. For Useful Thermal Energy and Biomass Input Heat Content the conversion of energy units shall consider that each 3412 thousand BTUs is equivalent to one MWh. For Merchantable Bio-products the product shall be prescribed an energy content based on its enthalpy of reaction, as determined by a standard independent laboratory analysis, and those units of energy appropriately converted to MWhs.

2. The Overall Efficiency of the Generation Unit each quarter shall be calculated as: the sum of:

a. Renewable Generation not utilized behind-the-meter;

b. Renewable Energy utilized behind-the-meter divided by one minus the average distribution and transmission line losses of the electrical grid for which for this purpose shall be 8%;

c. Useful Thermal Energy; and

d. Merchantable Bio-Products; divided by Biomass Input Heat Content

3. A Generation Unit shall be provided on the NEPOOL GIS each quarter an amount of Renewable Energy Attributes calculated as follows:

a. A Generation Unit achieving 70% or higher Overall Efficiency in a quarter will receive one RPS Class II Renewable Energy Attribute for each MWh of RPS Class II Renewable Energy Generation.

b. A Unit achieving less than 70% Overall Efficiency shall not be eligible to receive RPS Class II Energy Attributes.

(d) Annual Compliance of Generation Units using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel. An Owner, Operator, or Authorized Agent of a Generation Unit using Eligible Biomass Woody Fuel or Manufactured Biomass Fuel shall provide to the Department by January 31st of each year a Biomass Unit Annual Compliance Report and be subject to the following:

1. Within the Biomass Unit Annual Compliance Report, in a format set forth in the Overall Efficiency and Greenhouse Gas Analysis Guideline, the Owner, Operator, or Authorized Agent shall identify the Owner's ownership of Biomass Fuel Certificates denoting the fuel consumption for the Compliance Year by the Generation Unit by tons of fuel, categorized as Forest Derived Residues and Non-forest Derived Residues. The Owner, Operator, or Authorized Agent shall retain copies of all Biomass Fuel Certificates for five years. The Report must explain any variances with the proposed Fuel Supply Plan filed with the Department for that Compliance Year.

2. The Biomass Unit Annual Compliance Report must include a greenhouse gas analysis for the Compliance Year. The analysis shall be prepared in accordance with the Overall Efficiency and Greenhouse Gas Analysis Guideline and the fuel use as represented by the Biomass Fuel Certificates owned for the Compliance Year. This Report must also document the Unit's performance with respect to the lifecycle greenhouse emissions requirements in 225 CMR 15.05(1)(a)8.e.iii., including the actual percent lifecycle greenhouse gas emissions reduction over 20 years, as determined in the Guideline. The Report shall document any under-compliance and the Percent Under-compliance with the lifecycle greenhouse gas emission reduction requirement.

3. For Generation Units that report a Percent Under-compliance in 225 CMR 15.05(5)(d)2., the Unit's Statement of Qualification will be revoked, as provided under 225 CMR 15.06(7).

225 CMR 15.06: Statement of Qualification Process for RPS Class II Renewable Generation Unit

(1) Statement of Qualification Application (SQA). An SQA shall be submitted to the Department by the Owner or Operator of the Generation Unit or Aggregation. The applicant must use the most current forms and associated instructions provided by the Department, and must include all information, documentation, and assurances required by such forms and instructions.

(2) Review Procedures.

(a) The Department will notify the applicant when the SQA is administratively complete or if additional information is required pursuant to 225 CMR 15.06(1).

(b) The Department may, in its sole discretion, provide an opportunity for public comment on any SQA.

(3) Issuance or Non-issuance of an SQ.

(a) If the Department finds that all or a portion of the electrical energy output of a Generation Unit or of an Aggregation meets the requirements for eligibility as RPS Class II ~~Renewable~~ Generation pursuant to 225 CMR 15.05, the Department will provide the Owner or Operator of such Generation Unit or Aggregation with an SQ.

(b) The Statement of Qualification shall include any applicable restrictions and conditions that the Department deems necessary to ensure compliance by a particular Generation Unit or Aggregation with the provisions of 225 CMR 15.00.

(c) If the Generation Unit or Aggregation does not meet the requirements for eligibility as an RPS Class II ~~Renewable~~ Generation Unit, the Department shall provide written notice to the Owner or Operator, including the Department's reasons for such finding.

(4) RPS Effective Date. The RPS Effective Date shall be the earliest date on which electrical energy output of an RPS Class II ~~Renewable~~ Generation Unit ~~or Waste Energy Generation Unit~~ can result in the creation of RPS Class II GIS Certificates, with the following limitations:

(a) In the case of a Generation Unit using Eligible Biomass Fuel, the RPS Effective Date shall not be earlier than the date on which the Department determines that the Biomass Generation Unit has commenced compliance with the low-emission conditions in its SQ;

(b) In the case of a Hydroelectric Energy Generation Unit, the RPS Effective Date shall not be earlier than the date on which the Department determined that the Generation Unit has commenced compliance with the environmental conditions in its SQ.~~; and~~

~~(c) In the case of a Waste Energy Generation Unit, the RPS Effective Date shall not be earlier than the date on which the Department determines that the Waste Energy Generation Unit has commenced compliance with the recycling program conditions in its SQ.~~

In no instance shall the RPS Effective Date occur before January 1, 2009.

(5) Notification Requirements for Change in Eligibility Status. The Owner or Operator of an RPS Class II ~~Renewable~~ Generation Unit ~~or Waste Energy Generation Unit~~ shall notify the Department of any changes in the technology, operation, emissions, fuel sources, energy resources, or other characteristics of the Generation Unit that may affect the eligibility of the Generation Unit as an RPS Class II ~~Renewable~~ Generation Unit ~~or Waste Energy Generation Unit~~. The Owner or Operator shall submit the notification to the Department no later than five days following the end of the month during which such changes were implemented. The notice shall state the date the changes were made to the RPS Class II ~~Renewable~~ Generation ~~Unit or Waste Energy Generation Unit~~ and describe the changes in sufficient detail to enable the Department to determine if a change in eligibility is warranted.

(6) Notification Requirements for Change in Ownership, Generation Capacity, or Contact Information. The Owner or Operator of an RPS Class II ~~Renewable~~ Generation Unit ~~or Waste Energy Generation Unit~~ shall notify the Department of any changes in the ownership, operating entity, generation capacity, NEPOOL GIS account, independent verification system for the Generation Unit's or Aggregation's electrical energy output, or contact information for the Generation Unit or Aggregation. The Owner or Operator shall submit the notification to the Department no later than five days following the end of the month during which such changes were implemented.

(7) Suspension or Revocation of Statement of Qualification. The Department may suspend or revoke a Statement of Qualification if the Owner or Operator of an RPS Class II ~~Renewable~~ Generation Unit ~~or Waste Energy Generation Unit~~ fails to comply with 225 CMR 15.00 or if a Generation Unit does not operate during a consecutive 12-month period.

225 CMR 15.07: Renewable Energy Portfolio Standard -- Class II

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~~(2) RPS Class II Waste Energy Minimum Standard. The total annual sales of each Retail Electricity Product sold to Massachusetts End-use Customers by a Retail Electricity Supplier, under contracts executed or extended on or after January 1, 2009, shall include a minimum percentage of electrical energy sales with RPS Class II Waste Energy Generation Attributes. The RPS Class II Waste Energy Minimum Standard shall be equal to 3.5% of electrical energy sales in the Compliance Years 2009 through 2020. In Compliance Years 2021 through 2025, the RPS Class II Waste Energy Minimum Standard shall be equal to 3.7% of electrical energy sales. In 2026 and all subsequent Compliance Years, the RPS Class II Waste Energy Minimum Standard shall be equal to 3.5% of electrical energy sales. Beginning in 2025 and every five years thereafter, the Department shall conduct a review of the RPS Class II Waste Energy Minimum Standard and consult with MassDEP on the standard to ensure consistency with the solid waste master plan. Following stakeholder comment and input on the review of the RPS Class II Waste Energy Minimum Standard, the Department may modify the Minimum Standard for the following five years.~~

225 CMR 15.08: Compliance Procedures for Retail Electricity Suppliers

(1) Standard Compliance. Each Retail Electricity Supplier shall be deemed to be in compliance with 225 CMR 15.00 if the information provided in the Compliance Filing submitted pursuant to 225 CMR 15.09 is true and accurate and demonstrates compliance with 225 CMR 15.07. A Retail Electricity Supplier shall demonstrate to the satisfaction of the Department that RPS Class II ~~Renewable~~ Generation Attributes ~~and RPS Class II Waste Energy Generation Attributes~~ used for compliance have not otherwise been, nor will be, sold, retired, claimed, used or represented as part of electrical energy output or sales, or used to satisfy obligations in jurisdictions other than Massachusetts.

~~(2) Banked Compliance. A Retail Electricity Supplier may use RPS Class II Renewable Generation Attributes and RPS Class II Waste Energy Generation Attributes produced in one Compliance Year for compliance over the course of the following two subsequent Compliance Years, subject to the limitations in 225 CMR 15.08(2) and provided that the Retail Electricity Supplier is in compliance with 225 CMR 15.00 for all previous Compliance Years. In addition, the Retail Electricity Supplier shall demonstrate to the satisfaction of the Department that such Attributes:~~

~~(a) were in excess of the RPS Class II Renewable Generation Attributes and RPS Class II Waste Energy Generation Attributes needed for compliance in the Compliance Year in which they were generated, and that such excess Attributes have not previously been used for compliance with 225 CMR 15.00;~~

~~(b) do not exceed 30% of the RPS Class II Renewable Generation Attributes and 30% of the RPS Class II Waste Energy Generation Attributes needed by the Retail Electricity Supplier for compliance with the RPS Class II Renewable Generation Minimum Standard, and RPS Class II Waste Energy Minimum Standard in the year they were generated, subject to 225 CMR 15.09(2)(d) and subject to the following limitations:~~

~~1. In Compliance Years 2014 and 2015 no excess RPS Class II Waste Energy Generation Attributes shall be available as Banked Compliance; and~~

~~2. Commencing with Compliance Year 2016, bankable excess RPS Class II Waste Energy Generation Attributes shall not exceed 5% of the RPS Class II Waste Energy Generation Attributes needed by the Retail Electricity Supplier for compliance with the RPS Class II Waste Energy Minimum Standard in the year they were generated; and.~~

~~(c) were produced during the Compliance Year in which they are claimed as excess by the generation of electrical energy sold to End-use Customers in the ISO-NE Control Area, by the generation of electrical energy on End-use Customers' sides of retail meters in the ISO-NE Control Area, or by the generation of electrical energy from Off-grid Generation Units in Massachusetts; and~~

~~(d) have not otherwise been, nor will be, sold, retired, claimed or represented as part of electrical energy output or sales, or used to satisfy obligations in jurisdictions other than~~

~~Massachusetts.~~

(~~3~~2) Alternative Compliance for RPS Class II ~~Renewable~~ Generation Minimum Standard. A Retail Electricity Supplier may discharge its obligations under 225 CMR 15.07(1), in whole or in part, for any Compliance Year by making an ACP to the MassCEC. Such funds shall be held in an account separate from other accounts of the MassCEC.

…

~~(4) Alternative Compliance for RPS Class II Waste Energy Minimum Standard. A Retail Electricity Supplier may discharge its obligations under 225 CMR 15.07(2), in whole or in part, for any Compliance Year by making an ACP to the MassCEC. Such funds shall be held in an account separate from other accounts of the MassCEC.~~

~~(a) Procedures. A Retail Electricity Supplier shall receive Alternative Compliance Credits from the Department, subject to the following:~~

~~1. The quantity of Alternative Compliance Credits, specified in MWhs, that can be applied to its obligations under 225 CMR 15.07(2) shall be determined by calculating the ratio of the total of ACPs paid for the Compliance Year to the ACP Rate for that Compliance Year.~~

~~2. The ACP Rate for the RPS Class II Waste Energy Minimum Standard shall be $10 per MWh for Compliance Year 2009. For each subsequent Compliance Year, the Department shall publish the ACP Rate by January 31st of the Compliance Year. The ACP Rate shall be equal to the previous year's ACP Rate adjusted up or down according to the previous year's Consumer Price Index. In Compliance Year 2021 through 2025, the ACP Rate for the RPS Class II Waste Energy Minimum Standard shall be equal to the ACP Rate for the RPS Class II Renewable Energy Minimum Standard set pursuant to 225 CMR 15.08(3)(a)2., but shall be $11.50 per MWh beginning in 2026.~~

~~3. The Retail Electricity Supplier shall include with its Annual Compliance Filing copies of any ACP receipt(s) for ACPs made to the MassCEC during the Compliance Year.~~

~~(b) Use of Funds. The Department shall oversee the use of ACP funds by the MassCEC.~~

(~~5~~3) Beginning in 2025 and every five years thereafter, the Department shall conduct a review of the ACP Rate and consult with DEP on the ACP Rate for the RPS Class II ~~Waste Energy~~ Minimum Standard to ensure consistency with the solid waste master plan. Following stakeholder comment and input on the review of the ACP Rate, the Department may modify the rate for the following five years.

225 CMR 22.1.00: [Re] Scope and Administration

Section R103 Construction Documents

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11. Solar-Ready Zone in accordance with Appendix RB, or Solar Zone Area when complying with Appendix RC ~~for *mixed fuel buildings*~~.

225 CMR 22.2.00: [Re] Definitions

Section R202 General Definitions

…

LOW AND MODERATE INCOME HOUSING. Any housing subsidized by the federal or state government under any program to assist the construction of low or moderate income housing as defined in the applicable federal or state statute, whether built or operated by any public agency or any nonprofit or limited dividend organization.

~~**MIXED-FUEL BUILDING.** A *building* that contains *combustion equipment* or includes piping for such *equipment*.~~

225 CMR 22.4.00: [Re] Residential Energy Efficiency

…

TABLE R404.04 EV-READY SPACE REQUIREMENTS

Type of Building	~~Number of Parking~~ Minimum Number or Percentage of EV-Ready Spaces	EV Charging Performance Requirements
1 & 2 family dwellings and town homes with one allocated parking space per dwelling unit	~~At least one 50-amp branch circuit~~ One space per dwelling unit ~~to provide for AC level II charging~~	50-amp branch circuit to provide for AC level II charging
1 & 2 family dwellings and town homes with more than one allocated parking space per dwelling unit	At least two spaces per dwelling unit	At least one 50-amp branch circuit to provide for AC level II charging and at least one 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA
All other Group R-use buildings, except low and moderate income housing	~~At least 20~~ 100% of spaces ~~served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA.~~	60% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA; and 40% of spaces served with a 50-amp branch circuit to provide for AC level II charging
Low and moderate income housing	100% of spaces	60% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA; 25% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 4.1 kVA; and at least 15% of spaces served by 50-amp branch circuits to provide for AC level II charging.

R406.5 ERI-based Compliance. Compliance based on an ERI analysis requires that the rated proposed design and confirmed built dwelling be shown to have an HERS index rating less than or equal to the appropriate value indicated in Table R406.5 when compared to the HERS index

reference design for each dwelling unit prior to credit for onsite renewable electric generation.

TABLE R406.5 MAXIMUM ENERGY RATING INDEX

Clean Energy Application	**Maximum HERS Index score [a], [b]**		
	New construction until June 30, 2024	New construction permits after July 1, 2024	Major alterations, additions, or Change of use [c]
~~*Mixed-Fuel Building*~~	~~52~~	~~42~~	~~52~~
Solar Electric Generation	55	42	55
All-Electric Building	55	45	55
Solar Electric & All-Electric Building	58	45	58

[a] Maximum HERS rating prior to onsite renewable electric generation in accordance with Section R406.5

[b] The building shall meet the mandatory requirements of Section R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or Table R402.1.4 of the 2015 International Energy Conservation Code.

[c] Alterations, Additions or Change of use covered by Section R502.1.1 or R503.1.5 are subject to this maximum HERS rating.

APPENDIX RC: MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED STRETCH CODE 2023

RESIDENTIAL LOW-RISE BUILDING PROVISIONS

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RC101.1 Compliance. Existing residential buildings shall comply with Chapter 5 of the stretch energy code. New residential buildings shall ~~be Net Zero Buildings and~~ comply with Section R404.4 (EV wiring) and either Section R405 (Passivehouse) or Section R406 (HERS) in accordance with RC101.2, as well as one of the following Specialized code pathways:

1. Section RC102 Zero Energy pathway

2. Section RC103 All-Electric pathway

~~3. Sections RC104 and RC105 Mixed-Fuel pathway~~.

RC101.2 Application. New dwelling units over 4,000 square feet in conditioned floor area shall comply with either RC101.1 option 1. *Zero Energy Pathway* or option 2. *All-Electric Pathway,* and follow either Section RC102 or Section RC103.

R-use buildings with total conditioned floor area greater than 12,000 square feet shall comply with the provisions of Section R405 Passivehouse Building Certification Option, and any of the pathways in Section RC101.1.

New residential buildings using *clean biomass heating systems* may comply with either:

1. HERS certification: Sections RC 102 or RC 103; and RC105

2. Passivehouse pre-certification: Section R405.

Biomass heating that does not meet the performance standards of *clean biomass heating systems* shall not be permitted as a primary heating system.

RC101.3 Definitions.

~~**NET ZERO BUILDING**. A building which is consistent with achievement of MA 2050 net zero emissions, through a combination of highly energy efficient design together with being either a *Zero Energy Building*, or an *All-electric Building*, or where fossil fuels are utilized, a building fully pre-wired for future electrification and that generates solar power on-site from the available Potential Solar Zone Area.~~

ZERO ENERGY BUILDING. A building which through a combination of highly energy efficiency design and onsite renewable energy generation is designed to result in net zero energy consumption over the course of a year as measured in MMBtus or KWheq, on a site energy

basis, excluding energy use for charging vehicles.

RC102 *Replace Section RC102 and Table RC102.2 as follows*:

SECTION RC102 ZERO ENERGY PATHWAY

…

RC102.2 Energy Rating Index Zero Energy Score. Compliance with this section requires that the final HERS rated design be shown to have a score less than or equal to the values in Table RC102.2 when compared to the HERS reference design determined in accordance with RESNET/ICC 301 for both of the following:

1. HERS value not including on-site power production (OPP) calculated in accordance with RESNET/ICC 301.

2. HERS value including on-site power production calculated in accordance with RESNET/ICC 301 with the OPP in Equation 4.1.2 of RESNET/ICC 301.

TABLE RC102.2 MAXIMUM HERS RATING INDEX [a]

FUEL USAGE	HERS RATING INDEX NOT INCLUDING OPP	HERS RATING INDEX INCLUDING OPP
All Electric	45	0
~~Mixed Fuel~~	~~42~~	~~0~~

[a] The building shall meet the requirements of Table R406.2, and the building thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or R402.1.3.

RC102.3 One- and Two-family Dwellings and Townhouses. One- and two-family dwellings and townhouses shall install an on-site renewable energy system with a nameplate DC power rating measured under standard test conditions, of no less than 4kW per dwelling unit.

Exception: A building where the potential solar zone area is less than 300 square feet.

RC102.4 Other Group R Occupancies. Buildings in Group R-2, R-3 and R-4 shall install an on-site renewable energy system with a rated capacity of not less than 0.75 W/ft^2 multiplied by

the gross conditioned floor area.

Exceptions:

1. A building with a permanently installed domestic solar water heating system with a minimum solar savings fraction of 0.5.

2. A building where the potential solar zone area is less than 300 square feet.

…

~~***RC104** dd Section RC104 and Table RC104.2 as follows:*~~

~~**SECTION RC104 MIXED-FUEL PATHWAY**~~

~~**RC104.1 General**. This section establishes requirements for new *residential mixed-fuel buildings* with any space heating systems, water heating systems or appliances capable of using fossil fuels such as natural gas, heating oil or propane fuel. All buildings shall comply with either:~~

~~1. HERS certification: Sections RC104.2 through RC104.5 and RC105~~

~~2. Passivehouse pre-certification: Section R405 and Section RC104.3~~

~~**RC104.1.1 Biomass Heating**. New *residential buildings* using *clean biomass heating systems* may comply with this section. Biomass heating that does not meet the performance standards of *clean biomass heating systems* shall not be permitted as a primary heating system.~~

~~**RC104.2 HERS Rating Index Score**. Compliance with this section requires that the rated design be shown to have a HERS Index score less than or equal to the values in Table RC103.2 when compared to the HERS reference design determined in accordance with RESNET/ICC 301 for both of the following:~~

~~1. HERS value not including on-site power production (OPP) calculated in accordance with RESNET/ICC 301.~~

~~**TABLE RC104.2 MAXIMUM HERS RATING INDEX [a]**~~

~~**FUEL USAGE**~~	~~**HERS RATING INDEX NOT INCLUDING OPP**~~
~~Mixed-Fuel building~~	~~42~~

~~[a] The building shall meet the requirements of Table R406.2, and the building~~

thermal envelope shall be greater than or equal to the levels of efficiency and SHGC in Table R402.1.2 or R402.1.3.

- **C104.3 Electric Readiness**. Any installed gas, fuel oil or propane furnaces, boilers, water heaters, dryers, or cooking equipment shall comply with the requirements of Sections RC104.3.1 through RC104.3.4. Capacity for the future electric circuits required in this section shall be included in the load calculations of the original installation of electric service to the building and each *dwelling unit*.

- **RC104.3.1 Space Heating**. The building and each *dwelling unit* shall be provided with a designated exterior location(s) in accordance with the following:

- Natural drainage for condensate from cooling equipment operation or a condensate drain located within three feet (914 mm), and

- A dedicated branch circuit in compliance with IRC Section E3702.11 based on heat pump space heating equipment sized in accordance with R403.7 and terminating within three feet (914 mm) of the location with no obstructions. Both ends of the branch circuit shall be labeled "For Future Heat Pump Space Heater."

- **Exception**: Where an electrical circuit in compliance with IRC Section E3702.11 exists for space cooling equipment based on heat pump space heating equipment sized in accordance with R403.7.

- **RC104.3.2 Household Ranges and Cooking Appliances**. An individual branch circuit outlet with a minimum rating of 250 volts, 40 amperes shall be installed within three feet of each gas or propane range or permanently installed cooking appliance.

- **RC104.3.3 Household Clothes Dryers and Water Heaters**. An individual branch circuit outlet with a minimum rating of 250 volts, 30 amperes shall be installed within three feet of each gas or propane household clothes dryer and water heater.

- **RC104.3.4 Water Heating Space**. Any permanently installed domestic hot water heating equipment shall be installed in an indoor space:

    - with a minimum volume of 700 cubic feet (20,000 L) or the equivalent of one 16-inch (406 mm) by 24-inch (610 mm) grill to a heated space and one 8-inch (203 mm) duct of no more than 10 feet (3048 mm) in length for cool exhaust air.

    - that is at least 3 feet (914 mm) by 3 feet (914 mm) by 7 feet (2134 mm) high surrounding or within 3 feet (914 mm) of the installed water heater.

RC104.4 On-site Renewable Energy. New buildings shall comply with either RC104.4.1 or RC104.4.2. Buildings following HERS certification shall comply with the requirements of RC105 solar-roof zone. Buildings following the Passivehouse pre-certification shall comply with

~~Appendix RB solar ready provisions.~~

- ~~**RC104.4.1 One- and Two-family Dwellings and Townhouses**. One- and two-family dwellings and townhouses shall install an on-site renewable energy system with a nameplate DC power rating measured under standard test conditions, of no less than 4kW per dwelling unit.~~

- ~~**Exception**: A building where the potential solar zone area is less than 300 square feet.~~

- ~~**RC104.4.2 Other Group R Occupancies**. Buildings in Group R-2, R-3 and R-4 shall install an on-site renewable energy system with a rated capacity of not less than 0.75 W/ft^2 multiplied by the gross conditioned floor area.~~

- ~~**Exceptions**:~~

- ~~A building with a permanently installed domestic solar water heating system with a minimum solar savings fraction of 0.5.~~

- ~~A building where the potential solar zone area is less than 300 square feet.~~

- ~~**RC104.5 Electric Vehicle Readiness**. All buildings shall comply with Section R404.4 *Wiring for Electric Vehicle Charging Spaces*.~~

225 CMR 23.2.00: [Ce] Definitions

Section C202 General Definitions

…

LOW AND MODERATE INCOME HOUSING. Any housing subsidized by the federal or state government under any program to assist the construction of low or moderate income housing as defined in the applicable federal or state statute, whether built or operated by any public agency or any nonprofit or limited dividend organization.

225 CMR 23.4.00: [Ce] Commercial Energy Efficiency

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TABLE C405.13 EV-READY SPACE REQUIREMENTS

Occupancy Classification	Minimum percentage of EV-Ready Spaces	EV Charging Performance Requirements
Group R ~~and Group B~~, except low and moderate income housing	~~20~~ 100%	~~40-amp dedicated branch circuit or larger branch circuit with ALMS in accordance with Table C405.13.1~~ 60% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA; and 40% of spaces served with a 50-amp branch circuit to provide for AC level II charging
Low and Moderate Income Housing	100%	60% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 9.6 kVA; 25% of spaces served with a 40-amp, 208/240-volt circuit with a minimum capacity of 4.1 kVA; and at least 15% of spaces served by 50-amp branch circuits to provide for AC level II charging
All Other Occupancies	~~10~~ 100%	40-amp dedicated branch circuit or larger branch circuit with ALMS in accordance with Table C405.13.1

APPENDIX CC – MASSACHUSETTS MUNICIPAL OPT-IN SPECIALIZED ENERGY CODE 2023

COMMERCIAL BUILDING PROVISIONS

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CC101.3 Compliance. New buildings shall demonstrate compliance with Sections CC101.4, CC101.5 and one of the following pathways:

1. **Zero Energy Pathway**: Buildings shall comply with Section CC103 and demonstrate that they are *Zero Energy Buildings* in accordance with Equation CC-1. *Mixed Fuel Buildings* with any capacity for on-site fossil fuel use shall be pre-wired for future electrification of all fuel uses in accordance with Section CC10~~5~~6.

2. **All-Electric Pathway**: Buildings shall comply with Section CC104.

~~3. **Mixed Fuel Pathway**: *Mixed Fuel Buildings* other than *Zero Energy Buildings* with any capacity for on-site fossil fuel use shall comply with CC105 and CC106. The following uses shall be excluded when determining whether new buildings will have on-site fossil fuel use:~~

~~a. On-site back-up generators using fossil fuels~~

~~b. On-site refuelling of vehicles or outdoor equipment using fossil fuels~~

…

~~***CC105** Add Section CC105 as follows:*~~

~~**SECTION CC105 MIXED-FUEL BUILDING PATHWAY**~~

~~**CC105.1 General**. This section together with Section CC106 establishes additional minimum requirements for new *mixed-fuel buildings*.~~

~~**CC105.1.1 Biomass Heating**. New buildings using *clean biomass heating systems* may comply with this section without meeting CC105.3.1 and CC105.3.2. Buildings with any *combustion equipment* using biomass that does not meet the performance standards of *clean biomass heating systems* shall be deemed *mixed-fuel buildings* and shall comply with this section in full.~~

~~**CC105.2 On-site Renewable Energy**. New mixed-fuel buildings shall have equipment installed for on-site renewable energy with a rated capacity of not less than 1.5 W/ft^2 (16.1 W/m^2) multiplied by the sum of the gross conditioned floor area of the three largest floors.~~

~~**Exception:** Where the building site cannot meet the requirement in full with an on-site renewable energy system, the building site shall install a partial system sized to not less than 75% of the *Potential Solar Zone Area*.~~

CC105.3 Additional efficiency requirements. Additional efficiency requirements for compliance with this Section are set forth in Sections RC105.3.1 through RC105.3.3

CC105.3.1 More efficient HVAC equipment performance. Primary heating and cooling *equipment* shall meet the following efficiencies as applicable:

CC105.3.1 More Efficient HVAC Equipment Performance. Primary heating and cooling *equipment* shall meet the following efficiencies as applicable:

1. Space heating *combustion equipment* shall be rated at greater than or equal to 95 AFUE.

2. All refrigerant-based air conditioning equipment shall be a heat pump with greater than or equal to 10 HSPF rated heating performance and greater than or equal to 16 SEER rated cooling performance.

3. Ground source heat pump systems shall be rated at greater than or equal to 3.5 COP at design temperature.

For multiple cooling systems, all systems shall meet or exceed the minimum efficiency requirements in this section and collectively shall be sized to serve 100% of the cooling design load. For multiple heating systems, all systems shall meet or exceed the minimum efficiency requirements in this section and collectively shall be sized to serve 100% of the heating design load.

Exception: *Clean biomass heating systems* used as the primary heating system.

CC105.3.2 Reduced Energy Use in Service Water-heating. The hot water system shall meet one of the following efficiencies:

1. than or equal to 82 EF *combustion equipment* service\ water-heating system.

2. Greater than or equal to 2.0 UEF electric service water-heating system.

3. Greater than or equal to 0.4 solar fraction solar water-heating system.

4. *Clean biomass heating system* supplied water-heating system.

780 CMR 202 Definitions

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"Department" means the Massachusetts Department of Energy Resources.

"Embodied Carbon" means the greenhouse gases emitted in material extraction, transportation and manufacturing of a material corresponding to life cycle stages A1 (extraction and upstream production), A2 (transportation), and A3 (manufacturing). Definition is as noted in ISO 21930 and as defined in the Product Category Rule for Concrete by NSF dated February 22nd, 2019."

"Environmental product declaration" means a supply chain specific type III environmental product declaration as defined by the international organization for standardization standard 14025 or similarly robust life-cycle assessment methods that have uniform standards in data collection consistent with the international organization for standardization standard 14025, industry acceptance, and integrity. Environmental product declarations must have at least a "cradle to gate" scope (which covers product life cycle from resource extraction to the factory).

780 CMR 13 C408.1: Carbon Limits for Building Materials Procurements

All new buildings or major renovations shall be subject to the following requirements covering the supply of following product categories: Ready-mix concrete; precast concrete elements; cement; reinforcement steel; structural steel; bricks, glass; gypsum board; and insulation.

(1) For all products in the above categories supplied for public works, the project shall implement the following embodied carbon transparency requirement: Projects shall require all suppliers to provide company-specific environmental product declarations in compliance with ISO 21930 and ISO 14025 with minimum scope A1-A3 manufacturing; and the environmental product declarations must be valid at point of specification and cover product(s) supplied.

(2) Transportation emissions and calculations must be included in the environmental product declarations.

(3) Projects may apply for waiver for the embodied carbon transparency requirements until January 1, 2024 for up to three product categories. Thereafter, projects may apply for waiver for products that are used in small quantities only, defined as less than 5% of applicable materials by mass for the project.

(4) For each product type, the maximum global warming potential will be:

(a) Concrete:

	Cement Limits	**Embodied Carbon Limits**
Minimum Specified Compressive Strength f'_c, psi (1)	Maximum ordinary Portland cement content, lbs/yd^3 (2)	Maximum embodied carbon kg CO_2e/m^3, per environmental product declaration
Up to 2500	362	260
3000	410	289
4000	456	313
5000	503	338
6000	531	356
7000	594	394
7001 and higher	657	433
Up to 3000 light weight	512	578
4000 light weight	571	626
5000 light weight	629	675

Notes:

(1) For concrete strengths between the stated values, use linear interpolation to determine cement and/or embodied carbon limits.

(2) Portland cement of any type per ASTM C150. L

(b) Hot-rolled structural steel sections: 1.01 MT CO_2 eq./MT

(c) Hollow structural sections: 1.71 MT CO_2 eq./MT

(d) Steel plate: 1.49 MT CO_2 eq./MT

(e) Concrete reinforcing steel: 0.89 MT CO_2 eq./MT

(f) Flat glass: 1.43 MT CO_2 eq./MT

(g) Light-density mineral wool board insulation: 3.33 kg CO_2 eq./1 m^2

(h) Heavy-density mineral wool board insulation: 8.16 kg CO_2 eq./1 m^2

(5) All new buildings or major renovations that use bricks shall only use sun dried clay bricks.

(6) All new buildings or major renovations that use gypsum board shall only use gypsum board that is both lightweight and made with compressed agricultural fibers.

(7) Projects may apply for waiver for the carbon performance requirements until January 1, 2024 for all product categories. Thereafter, projects may apply for waiver for one product category. Any waiver for carbon transparency automatically also waives carbon performance requirement.

(8) Product embodied carbon transparency and performance data, including environmental product declarations, shall be recorded and submitted as part of the project documentation.

(9) Projects achieving more than 25% reduction from the defined maximum values that did not apply for any category waivers are eligible for further performance bonus."

780 CMR 13 C408.2 Low-Embodied Carbon Concrete

The Department shall not set prescriptive requirements for water to cement ratios or minimum quantity of cement or types of cement to use. Instead, all requirements shall be expressed as performance-based requirements. For new buildings and major renovations, the Department shall require:

(1) For each concrete strength class used, the highest allowed embodied carbon emissions from the raw materials and supply of the concrete for scope A1-A3 as defined in ISO 21930 is not higher than 80% of the cement embodied carbon if the compressive strength is achieved by pure ordinary Portland cement whose embodied carbon impact is 1 kg CO2e / kg cement. Example: for concrete strength class normally requiring 320 kg of cement per cubic meter, the highest allowable embodied carbon impact shall be (320 kg x 1 kg CO_{2e} / kg x 0,8) = 256 kg CO_{2e} / m^3.

(2) Projects to achieve same technical and functional performance characteristics as stipulated in the tender and other documents.

(3) Designers and construction planners to plan concrete compressive strength evaluation times based on project critical path need. Strength evaluation time shall be 90d or 60d, where early strength development is not required. This allows higher ratios of secondary binders.

(4) Projects using less than 50 cubic meters of concrete may apply for a waiver from these requirements.

(5) Projects are allowed to deviate from these requirements for a maximum of 5% of total volume of the concrete used. All deviations must be documented and reason for deviation be justified and reported.

(6) Projects may seek an advance written waiver for deviations exceeding 5% for reasons including pouring in particularly cold conditions, high exposure class or salinity conditions, cases where early strength development is critical or other cases making these requirements unfeasible. For any waiver request, the project must state quantities concerned and reason for not being able to use low carbon concrete.

(7) Acceptable methods to demonstrate concrete compliance with these requirements are

> (a) A company and product specific environmental product declaration prepared in compliance with ISO 14025 and ISO 21930 which must not be expired at point of specification. The environmental product declaration shall either be able to demonstrate a variability no higher than 10% or be plant-specific to the plant supplying the concrete.
>
> (b) A cement content that is at least 30% below the cement content the concrete strength class would normally require.

(8) Concrete performance data shall be recorded and submitted as part of the compliance documentation.

780 CMR 13 C408.3 Establish a Materials Reuse Facility

(1) The Department, in collaboration with the Massachusetts Department of Environmental Protection, shall create a center to facilitate the recovery, reuse, and recycling of building materials, as well as business assistance, basic and applied research and development, and policy analysis, to further the development of domestic processing and markets for salvaged and recycled building materials and commodities. The Department shall establish and manage the Center for Building Material Reuse and Recycling to collect, process, and distribute salvaged building materials, as well as to research, incentivize, and develop new markets and expand existing markets for salvaged materials.

(2) In fulfilling its intent, the center must initially direct its services to businesses that transform or remanufacture reusable materials into usable or marketable materials or products for use rather than disposal. The center will perform the following activities:

(a) Establish partnerships with existing material reuse facilities or establish a new physical facility for the collection, processing, and distribution of salvaged materials.

(b) Develop an annual work plan. The work plan must describe actions and recommendations for developing markets for commodities comprising a significant percentage of the building material waste stream.

(c) Initiate, conduct, or contract for studies relating to market development for recycled and reused building materials, including but not limited to: applied research, technology transfer, and pilot demonstration projects

(d) Provide grants or contracts to local governments, agencies, or other public institutions to further the development or revitalization of recycling markets in accordance with applicable rules and regulations.

(3) Wherever necessary, the center shall work with: material recovery facility operators; public and private sector recycling and solid waste industries; packaging manufacturers and retailers; local governments; environmental organizations; interested colleges and universities; and state/provincial agencies.

780 CMR 13 C408.4 Carbon Reduction or Salvaging Requirement for Demolitions

Demolition permits shall be granted only in the following cases:

(1) The contractor can show that the demolition and new construction project for which a construction permit is filed at the same time reduce life-cycle carbon by at least 30% compared to maintaining the existing structure on per square meter of area basis over 60-year period using methodology described in Life-cycle carbon limits for new buildings. The applicant must demonstrate this achievement on project completion by submitting a life-cycle carbon performance calculation of the completed building.

(2) The contractor commits to minimum 90% reuse and recycling rate by weight, excluding hazardous waste. The applicant must demonstrate this achievement on project completion by submitting a waste disposal report.

(3) The applicant can show that the building contains asbestos or other health harming contaminants, is posing other health risks, or is structurally damaged or derelict. Applicants pay in a green demolition guarantee which is set at minimum $11,000, or for buildings above 200 m^2 (2,150 sq.ft), at $5.15 per sq.ft. The green demolition guarantee is returned when the applicant has successfully demonstrated the achievement of the requirements on completion.

780 CMR 13 C408.5 Renovation vs. Knock-Down and Rebuild Comparison

All projects, where a demolition and rebuild option is proposed, must consider also a renovation option. The renovation option must achieve comparable use as the new building, or an alternative equally valuable use.

Both options must demonstrate having calculated life-cycle carbon footprint in line with a national methodology. Where national methodology does not provide more detailed guidance, the calculation shall cover:

(1) Operational energy as per applicable building regulations, matching the calculated and reported energy performance calculation, using the energy emission factors issued in the national methodology.

(2) Construction materials for sub- and superstructure, building envelope, foundations and parking structures (omitting finishes and services).

(3) The minimum required life-cycle modules are A1-A3 Construction materials, B4-B5 Replacement of materials in use, B6 Operational Energy, and C1-C4 End of life. The calculation shall not deduce the end of life benefits (D).

(4) If the used energy carbon emission factors are not degressive in function of time, the assessment shall be performed for calculation period of 30 years. Otherwise, the assessment shall be performed for a period of 60 years.

(5) Methodological compliance and choices as well as used key data are reported as part of the conclusions.

Projects may also complete a life-cycle cost calculation in line with ISO 15686-5, or a comparable national methodology, for a 60-year period using a 3 % discount rate and energy inflation forecast of 4% and general inflation forecast of 2 %.

Both the renovation and rebuild option shall be compared for the functionality they deliver and not per built area basis. The capacity shall be defined based on type of building as number of homes, occupants, customers or another appropriate unit.

The rebuild option may be retained only if it demonstrates a life-cycle carbon reduction. If the rebuild option is retained, it shall be required deliver a full pre-demolition audit. Also, to salvage at least 5% of materials (by mass) from the demolished building and use at least 5% of salvaged or reused materials (by mass) in the new building.

This policy shall not apply to buildings that contain dangerous substances or have been declared unfit to occupy due to health hazards (e.g. due to actinomycete).