MUNICIPAL LIGHT PLANT ENERGY MIX REPORT

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Introduction

An energy transition is underway in Massachusetts. With the acceleration of the Renewable Portfolio Standard (RPS), the adoption of a net zero target by 2050, and the implementation of aggressive interim targets for 2030 and 2040, the Commonwealth is taking significant steps to drastically reduce emissions and transition to clean energy. For the State to effectively accomplish this transition, *every part of the electricity sector* must participate.

Municipal Utilities (also known as Municipal Light Plants (MLPs)) represent 14% of the energy grid in the Commonwealth. Unlike Investor-Owned Utilities (IOUs), MLPs are not required to adhere to the Renewable Portfolio Standard. In fact, prior to the adoption of *An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* which was passed in March 2021, they were not required by the State to meet any emissions standards for clean or non-emitting energy. The lack of regulatory oversight has meant that, historically, MLPs have varied in their level of emphasis on reducing emissions and transitioning to clean and non-emitting energy.

> MUNICIPAL UTILITIES REPRESENT **14%** OF THE ENERGY GRID IN THE COMMONWEALTH.

Using the most recent data publicly available, this report analyzes MLPs' energy mixes from 2020 and discusses the implications of the progress that has been made up to this point. In order to establish the context, the report begins by defining and discussing relevant definitions, policies, and terms. It then outlines the methods used to conduct the report's analysis and presents the results in a series of tables. Based on the information provided in the tables, this report highlights a series of conclusions that can be drawn from MLPs' energy mixes in 2020.

IMPORTANT DEFINITIONS

Renewable energy credits (RECs)

Credits representing the positive environmental attributes associated with energy production. One REC is created each time a qualified facility generates one mega-watt-hour (MWh) of electricity.[1]

Class I RECs

Renewable energy credits from facilities that began operating after 1997 and generate electricity using any of the following technologies: solar photovoltaic, solar thermal electric, wind energy, small hydropower, landfill methane and anaerobic digester gas, marine or hydrokinetic energy, geothermal energy, and eligible biomass fuel.[2]

Class II RECs

Generation units that use eligible renewable resources, including all energy types eligible for Class I RECs as well as waste energy, but have an operation date prior to January 1, 1998.[3]

Emissions-free energy credits (EFECs)

Credits that track the zero-carbon generation attributes associated with emission-free generation. While renewable energy can be eligible for EFECs, some non-renewable resources (e.g., nuclear) are also eligible for such credits.[4]

Clean energy

Class I eligible energy sources including solar photovoltaic, solar thermal electric, wind energy, small hydropower, landfill methane, anaerobic digester gas, marine or hydrokinetic energy, and geothermal energy. MCAN does not consider biomass to be a clean energy source.

1 "Program Summaries: Program Summaries Summaries of All the Renewable and Alternative Energy Portfolio Standard Programs." (Commonwealth of Massachusetts), accessed May 26, 2021, https://www.mass.gov/service-details/program-summaries.

2 "14.07: Renewable Energy Portfolio Standard - Class I ," 225 CMR 14.00: RENEWABLE ENERGY PORTFOLIO STANDARD - CLASS I (Department of Energy Resources, n.d.), https://www.mass.gov/doc/rps-class-i-regulations-clean/download, pg 36.

3 "Program Summaries: RPS Class II Renewables" (Department of Energy Resources, n.d.), , accessed April 12th, 2022 https://www.mass.gov/service-details/program-summaries

4 "How Emission-Free Energy Certificates (EFECs) Help Companies Achieve Their Carbon Goals" (Constellation, July 29, 2021), https://blogs.constellation.com/sustainability/how-emission-free-energy-certificates-efecs-help-companies-achieve-their-carbon-goals/.

IMPORTANT DEFINITIONS

Non-emitting energy

Energy sources that are considered non-emitting include nuclear energy, hydro-power, solar photovoltaic, solar thermal electric, wind energy, small hydro-power, landfill methane and anaerobic digester gas, marine or hydrokinetic energy, geothermal energy, eligible biomass fuel, and more. In other words, non-emitting energy is generally energy that is eligible for MA Class I RECs, Class II RECs, or EFECs.

Relevant Policies

Massachusetts Renewable Portfolio Standard

In 2003, Massachusetts was one of the first U.S. states to adopt a renewable portfolio standard (RPS). According to the Department of Energy Resources (DOER), "The Massachusetts Renewable Energy Portfolio Standard requires retail electricity suppliers ... [to] obtain a percentage of the electricity they serve to their customers from qualifying renewable energy facilities."[5] This percentage of renewable energy started at 1% and has increased incrementally on an annual basis. The minimum RPS percentage was 16% in 2020 and is 20% in 2022.[6] A utility's renewable energy percentage is determined

5 "Program Summaries: Program Summaries Summaries of All the Renewable and Alternative Energy Portfolio Standard Programs." (Commonwealth of Massachusetts), accessed May 26, 2021, https://www.mass.gov/service-details/program-summaries.

6 "14.07: Renewable Energy Portfolio Standard - Class I ," 225 CMR 14.00: RENEWABLE ENERGY PORTFOLIO STANDARD - CLASS I (Department of Energy Resources, n.d.), https://www.mass.gov/doc/rps-class-i-regulations-clean/download, pg 36.

by the ownership and retirement of Class I renewable energy credits (RECs).

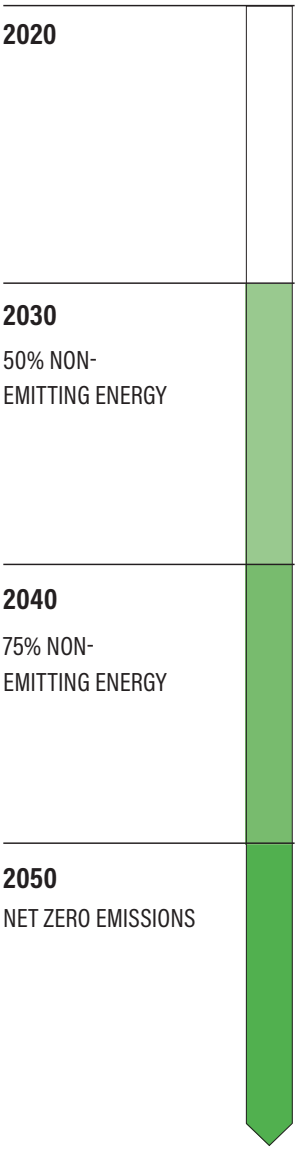
Whereas IOUs and competitive suppliers must adhere to the RPS, MLPs do not.[7] Clean energy adoption and integration into energy mixes have therefore not been uniform across the Commonwealth's MLPs.

Next-Generation Climate Bill

In 2021, Governor Baker signed An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy into law. For numerous reasons, this legislation was historic and made substantial progress in advancing efforts to mitigate the climate crisis. Notable advancements include increasing the state's emissions targets to net zero by 2050,[8] implementing incremental and sector-specific targets,[9] and enabling the adoption of a net zero stretch energy code for municipalities.[10] For the purposes of this report, the most important policy advancement of this legislation was the adoption of an MLP Greenhouse Gas Emissions Standard (GGES). This mandate requires that MLPs be powered by 50% non-emitting energy by 2030, 75% non-emitting by 2040, and net zero by 2050.[11] This guidance marks the first time in the Commonwealth's history that MLPs have been required to meet a standard emissions level.

While this emissions standard represents meaningful progress, substantial differences remain in the standards that IOUs and MLPs must meet. The GGES has looser requirements and is less prescriptive than the RPS and other IOU regulations. For exam-

MLP GREENHOUSE GAS EMISSIONS STANDARD
TIMELINE



7 "14.07: Renewable Energy Portfolio Standard - Class I ," 225 CMR 14.00: RENEWABLE ENERGY PORTFOLIO STANDARD - CLASS I (Department of Energy Resources, n.d.), https://www.mass.gov/doc/rps-class-i-regulations-clean/download, pg 9

8 "An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy," Chapter 8 (Commonwealth of Massachusetts, 2021), https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8, Section 5(b).

9 Ibid. Sections 3A(a) & 5(b)

10 Ibid. Sections 31(14)

11 Ibid. Sections 11F3/4 (b)

ple, the GGES includes more energy sources compared with IOU regulations. In addition to all energy sources that qualify for the Class I and Class II RPS, the GGES includes energy types such as nuclear energy and "efficient" natural gas facilities that meet certain criteria.[12] The GGES also does not specify what percentage of non-emitting energy resources should come from Class I sources (i.e., new, clean energy sources such as solar and wind energy).

Terminology:

Energy Mix and Power Supply

In multiple instances, this report refers to MLPs' energy mixes. An energy mix is different from a power supply. For the purposes of this report, these distinctions are based on the following definitions.

Power supply:

The combination of the various energy sources used to meet demand within MLPs. The power supply is based solely on the actual energy being used by an MLP; it does not account for environmental attributes (i.e., RECs) of an energy source and whether that source was retired by the MLP, sold, or purchased and accounted for by another entity.

Energy mix:

The energy mix represents the legally accepted method of quantifying the percentage of clean and non-emitting energy based on the number of megawatt-hour (MWh) retired that are given MA Class I attributes, MA Class II attributes, or emission-free energy credit attributes. In the utility sector, RECs represent the renewable characteristic of energy generation. When decoupled from energy generation (i.e., they are sold or are not purchased directly with the energy), that generation – no matter the source – cannot be represented as clean or non-emitting energy.[13] [14] The clean and renewable characteristic of an energy source is only considered when RECs are retired. In accor-

12 Ibid. Sections 11F3/4 (c)(i)-(ii)

13 Todd Jones, Robin Quarrier, and Maya Kelty, "The Legal Basis for Renewable Energy Certificates" (Center for Resource Solutions, June 17, 2015), http://resource-solutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf.

14 "Renewable Energy Certificates (RECs)," Green Power Partnership (Environmental Protection Agency, May 13, 2019), https://www.epa.gov/greenpower/renewable-energy-certificates-recs.

dance with this legal practice, an MLP's energy mix reflects its actual mix based on the number and types of RECs that have been retired.

Methods

In order to calculate MLP's energy mixes in 2020, MCAN used the legally accepted practice of tracking the number of RECs and Emissions-Free Energy Credits (EFECs) that MLPs retired in 2020 to determine the percentage of clean and non-emitting energy in their portfolio. In the utility sector, RECs represent the renewable characteristic of energy generation. EFEC's represent the emissions-free characteristics of non-renewable resources (e.g., nuclear energy). When decoupled from energy generation (i.e., RECs are sold or are not purchased directly with the accompanying energy), that generation – no matter the source – **cannot be represented as clean energy**.[15] [16] The clean and renewable characteristic of an energy source is only considered when RECs are retired. The clean energy of MLPs, and their progress in clean energy as measured in this report, was based on the number of RECs that MLPs retired in 2020. Similarly, when determining non-emitting energy, only the non-emitting MWh that were retired by MLPs (including Class I RECs, Class II RECs, and EFECs) were considered.

> "THE CLEAN AND RENEWABLE CHARACTERISTIC OF AN ENERGY SOURCE IS ONLY CONSIDERED WHEN RECS ARE RETIRED.

To determine the percentage of clean energy in MLPs' energy mix, MCAN examined the total retired Class I RECs that were reported by each MLP in their AQ31 Reports (supplied to MCAN by the Department of Environmental Protection (DEP)),[17] which lists all RECs that were retired by power source and energy type. Each of the power sources listed where RECs had been report-

15 Todd Jones, Robin Quarrier, and Maya Kelty, "The Legal Basis for Renewable Energy Certificates" (Center for Resource Solutions, June 17, 2015), http://resource-solutions.org/wp-content/uploads/2015/07/The-Legal-Basis-for-RECs.pdf.

16 "Renewable Energy Certificates (RECs)," Green Power Partnership (Environmental Protection Agency, May 13, 2019), https://www.epa.gov/greenpower/renewable-energy-certificates-recs.

17 At the time of this report's publication, the Department of Environmental protection had not reviewed the AQ31 reports.

ed as being retired was searched in the Class I Renewable Generation Units spreadsheet. The sum of the total number of Class I RECs retired from all energy sources (in MWh) was divided by the total energy sold by the MLP (in MWh) (displayed on pg 57, line 17 of MLPs' DPU annual reports) to determine the percentage of clean energy in an MLP's energy mix in 2020.

To determine non-emitting energy for MLPs, MCAN included RECs and EFECs that are tracked by the DEP in their AQ31 report.[18] This includes non-emitting MWh from municipally owned generators, MWh from a generator with which an MLP has an electricity contract, and MWh that are eligible for the Massachusetts RPS (either Class I or Class II).[19] MWh that qualified as Class II RECs in other Northeastern states and were purchased without the associated energy were not considered. The sum of the total number of non-emitting MWh retired from all energy sources was divided by the total energy sold by MLPs (in MWh)[20] to determine the percentage of non-emitting energy in an MLP's energy portfolio in 2020.

To ensure data accuracy to the fullest extent possible, MCAN conducted a one-week review process during which each MLP could review and suggest revisions to the information we had collected. MCAN evaluated each of the suggested revisions and incorporated as many as possible while remaining consistent with our data collection methods across all MLPs. Thirteen out of 40 MLPs either submitted revisions or confirmed our data. The remaining MLPs were notified that no response to our correspondence was taken to mean that the information that they had submitted to the DEP was accurate. Suggested changes were made in every instance when those changes aligned with our methods.

It is worth noting that MLPs, through their capacity to own energy generation, have invested in clean energy projects across the Commonwealth and the Northeast.[21, 22, 23] However, MCAN maintains that the RECs for these projects must be retired by MLPs

18 "AQ 31 Optional Greenhouse Gas Emissions Reporting Form and Spreadsheet for Municipal Retail Sellers of Electricity" (Massachusetts Department of Environmental Protection, n.d.), https://www.mass.gov/doc/instructions-aq31-optional-ghg-reporting-for-municipal-retail-sellers/download, pg 3, No. 6.

19 Ibid.

20 Displayed on pg 57, line 17 of MLP DPU annual reports

21 "Spruce Mountain Wind" (Patriot Renewables, LLC), accessed May 26, 2021, https://www.patriotrenewables.com/projects/spruce-mountain-wind/.

22 "Wind" (Massachusetts Wholesale Electric Company), accessed May 26, 2021, https://www.mmwec.org/how-we-are-green/wind-2/.

23 D. E. Shaw Renewable Investments, "Energy New England and D. E. Shaw Renewable Investments Complete 50 MW Solar Agreement," (Cision PR Newswire, September 28, 2020), https://www.prnewswire.com/news-releases/energy-new-england-and-d-e-shaw-renewable-investments-complete-50-mw-solar-agreement-301138544.html.

on an annual basis in order for the projects' renewable characteristics to be accounted for as part of an MLP's energy mix. If our analysis were to represent any RECs that came from these projects and had been sold by MLPs, we would be double counting; that is, the RECs would have been purchased by an IOU or another actor and thus already accounted for in the energy sector.

Methods Disclaimers:

In order to ensure transparency, this section highlights three important disclaimers that should be taken into account when interpreting the results of the analysis presented in the following sections.

The first disclaimer is that, at the time of this report's publication, the AQ31 reports had not been reviewed by the DEP. As such, while our calculations are directly based on the information that MLPs submitted to the Department, there is a possibility that the calculations and totals that they provided contain errors that were not identified in our analysis.

Second, as noted above, our methods aligned with the DEP's AQ31 Form and, as such, did not account for MWh that qualified as Class II RECs in other Northeastern states and were purchased without the associated energy. While MCAN, as well as the Department, favors Massachusetts-eligible Class II RECs and questions the impact that the purchase and retirement of out-of-state Class II RECs (without energy contracts) will have on the State's climate mitigation efforts, it is important to note that these RECs are eligible for consideration when determining MLPs' compliance with the GGES. As such, the results in this report might *underrepresent* MLPs' non-emitting percentage in accordance with the GGES if they have retired out-of-state Class II RECs. MLPs that MCAN is aware of which have utilized this strategy include but are not limited to Hingham, Shrewsbury, Belmont, and Chicopee.

Finally, MCAN used the total retail electricity sold rather than total MWh reported as the denominator when calculating percentages of clean and non-emitting energy. The reason we chose to use total retail electricity sold was because it aligns with relevant language in the Commonwealth's climate laws.[24] [25] However, it is important to note that

24 "An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy," Chapter 8 (Commonwealth of Massachusetts, 2021), https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8, Section 5(b). Section 11F3/4 (b)

25 "14.07: Renewable Energy Portfolio Standard - Class I (1)," 225 CMR 14.00: RENEWABLE ENERGY PORTFOLIO STANDARD - CLASS I (Department of Energy Resources, n.d.), https://www.mass.gov/doc/rps-class-i-regulations-clean/download, pg 36.

using this metric has an effect on calculated percentages. While there are exceptions, in the vast majority of cases using total retail electricity sold causes MLPs to have higher percentages of clean and non-emitting energy than they otherwise would have if total MWh were used.

2020 Municipal Light Plant Energy Mix Overview

The following information represents the results of MCAN's analysis of MLPs' energy mixes. **Table 1** breaks down the clean energy and non-emitting energy percentage in each MLP's energy mix. Additionally, it lists the change in the percentage of clean energy and non-emitting energy in MLPs' energy mixes between 2019 and 2020.

Table 2 breaks down the clean and non-emitting energy in MLPs' energy mix by energy type, including the percentage of the energy mix that was accounted for by solar energy, wind energy, hydroelectric power, nuclear energy, and biogas.

TABLE 1

SUMMARY OF CLEAN AND NON-EMITTING ENERGY IN MLPS' ENERGY MIX

MUNICIPAL UTILITY	2020 CLEAN ENERGY (%)	2020 NON-EMITTING (%)	CHANGE IN CLEAN ENERGY - 2019-2020 (%)	CHANGE IN NON-EMITTING ENERGY - 2019-2020 (%)
ASHBURNHAM	0.02%	36.69%	0.02%	-1.48%
BELMONT	17.64%	33.48%	1.08%	2.28%
BOYLSTON	0.16%	40.63%	0.16%	-3.41%
BRAINTREE	10.44%	47.37%	0.06%	6.02%
CHESTER	0.00%	12.27%	0.00%	0.71%
CHICOPEE	0.004%	6.34%	0.00%	-0.28%
CONCORD	36.64%	51.39%	-6.16%	0.76%
DANVERS	0.00%	49.06%	0.00%	-4.87%
GEORGETOWN	0.004%	30.83%	0.00%	-9.43%
GROTON	0.02%	29.17%	0.02%	-1.61%
GROVELAND	9.32%	23.92%	4.24%	6.14%
HINGHAM	0.06%	52.99%	0.06%	6.33%
HOLDEN	0.00%	54.61%	-0.88%	-2.33%
HOLYOKE	0.00%	77.70%	0.00%	-7.62%
HUDSON	0.03%	79.34%	0.03%	-14.80%
HULL	0.00%	53.01%	0.00%	-2.65%
IPSWICH	0.12%	29.89%	0.12%	6.95%
LITTLETON	0.03%	10.21%	0.03%	0.01%
MANSFIELD	0.14%	50.17%	0.14%	-3.83%

CLEAN ENERGY CHANGE >-1.0% | -0.01% - -1.0% | 0 | 0.01% - 1.0% | >1.0%

NON-EMITTING CHANGE >-3% | -0.01% - -3.0% | 0 | 0.01% - 3.0% | >3.0%

MUNICIPAL UTILITY	2020 CLEAN ENERGY (%)	2020 NON-EMITTING (%)	CHANGE IN CLEAN ENERGY - 2019-2020 (%)	CHANGE IN NON-EMITTING ENERGY - 2019-2020 (%)
MARBLEHEAD	0.03%	37.25%	0.03%	-1.67%
MERRIMAC	0.04%	10.57%	0.04%	-1.24%
MIDDLEBOROUGH	2.46%	67.22%	-0.18%	29.08%
MIDDLETON	0.00%	47.99%	0.00%	-4.54%
N. ATTLEBORO	0.00%	32.25%	0.00%	-0.56%
NORWOOD	0.01%	12.85%	0.01%	8.78%
PAXTON	0.00%	55.80%	0.00%	-4.78%
PEABODY	0.00%	35.17%	0.00%	-1.42%
PRINCETON	0.00%	10.94%	0.00%	-7.27%
READING	0.03%	20.40%	0.00%	0.60%
ROWLEY	0.09%	22.15%	0.09%	11.36%
RUSSELL	0.00%	10.11%	0.00%	0.91%
SHREWSBURY	0.12%	35.54%	0.00%	-0.84%
SOUTH HADLEY	0.08%	87.11%	0.08%	-3.15%
STERLING	0.04%	42.76%	0.04%	-3.57%
TAUNTON	1.55%	18.76%	-0.26%	-2.36%
TEMPLETON	0.01%	46.36%	0.01%	-3.84%
WAKEFIELD	0.11%	41.84%	0.11%	-0.97%
WELLESLEY	16.84%	52.74%	9.96%	36.84%
WEST BOYLSTON	0.00%	51.34%	0.00%	-3.62%
WESTFIELD	0.00%	43.46%	0.00%	-2.32%
TOTAL	2.43%	38.22%	0.18%	1.47%

CLEAN ENERGY CHANGE >-1.0% | -0.01% - -1.0% | 0 | 0.01% - 1.0% | >1.0%

NON-EMITTING CHANGE >-3% | -0.01% - -3.0% | 0 | 0.01% - 3.0% | >3.0%

TABLE 2

BREAKDOWN OF MLPS' CLEAN AND NON-EMITTING ENERGY BY ENERGY TYPE

MUNICIPAL UTILITY	SOLAR (%)	WIND (%)	HYDROPOWER (%)	NUCLEAR (%)	BIOGAS (%)
ASHBURNHAM	0.02%	0.00%	9.25%	27.41%	0.00%
BELMONT	0.42%	17.46%	15.60%	0.00%	0.00%
BOYLSTON	0.16%	0.00%	7.65%	32.81%	0.00%
BRAINTREE	0.01%	10.42%	11.96%	24.97%	0.00%
CHESTER	0.00%	0.00%	12.27%	0.00%	0.00%
CHICOPEE	0.004%	0.00%	6.34%	0.00%	0.00%
CONCORD	3.80%	27.65%	13.71%	2.75%	3.48%
DANVERS	0.00%	0.00%	4.36%	44.70%	0.00%
GEORGETOWN	0.004%	0.00%	7.86%	22.97%	0.00%
GROTON	0.02%	0.00%	7.35%	19.79%	0.00%
GROVELAND	0.00%	9.32%	14.60%	0.00%	0.00%
HINGHAM	0.06%	0.00%	11.95%	40.98%	0.00%
HOLDEN	0.00%	0.00%	10.89%	43.72%	0.00%
HOLYOKE	0.00%	0.00%	49.62%	28.08%	0.00%
HUDSON	0.03%	0.00%	0.03%	79.31%	0.00%
HULL	0.00%	0.00%	12.16%	40.85%	0.00%
IPSWICH	0.12%	0.00%	15.02%	14.75%	0.00%
LITTLETON	0.03%	0.00%	3.47%	6.71%	0.00%
MANSFIELD	0.03%	0.11%	5.17%	44.86%	0.00%
MARBLEHEAD	0.03%	0.00%	10.06%	27.15%	0.00%

MUNICIPAL UTILITY	SOLAR (%)	WIND (%)	HYDROPOWER (%)	NUCLEAR (%)	BIOGAS (%)
MERRIMAC	0.04%	0.00%	10.53%	0.00%	0.00%
MIDDLEBOROUGH	0.03%	2.43%	7.61%	57.16%	0.00%
MIDDLETON	0.00%	0.00%	10.13%	37.86%	0.00%
N. ATTLEBORO	0.00%	0.00%	6.96%	25.29%	0.00%
NORWOOD	0.01%	0.00%	4.48%	8.36%	0.00%
PAXTON	0.00%	0.00%	8.95%	46.85%	0.00%
PEABODY	0.00%	0.00%	5.49%	29.69%	0.00%
PRINCETON	0.00%	0.00%	10.94%	0.00%	0.00%
READING	0.03%	0.00%	5.06%	15.32%	0.00%
ROWLEY	0.09%	0.00%	11.85%	10.21%	0.00%
RUSSELL	0.00%	0.00%	10.11%	0.00%	0.00%
SHREWSBURY	0.12%	0.00%	7.43%	27.99%	0.00%
SOUTH HADLEY	0.08%	0.00%	7.61%	79.41%	0.00%
STERLING	0.04%	0.00%	6.43%	36.30%	0.00%
TAUNTON	0.02%	1.35%	15.83%	1.56%	0.00%
TEMPLETON	0.01%	0.00%	5.73%	40.62%	0.00%
WAKEFIELD	0.11%	0.00%	7.24%	34.49%	0.00%
WELLESLEY	0.07%	16.52%	11.23%	24.92%	0.00%
WEST BOYLSTON	0.00%	0.00%	7.09%	44.25%	0.00%
WESTFIELD	0.00%	0.00%	5.11%	38.35%	0.00%
TOTAL	0.12%	2.17%	10.13%	25.73%	0.08%

Results and Observations

Based on the information provided in **Table 1** and **Table 2**, MCAN has made six general observations about the state of clean energy and non-emitting energy across MLPs. These are discussed below.

1 In 2020, 29 MLPs retired Class I RECs. However, for most MLPs, the percentage of Class I REC retirement is still very low.

In 2020, 29 MLPs Retired Class I RECs. This number increased significantly compared to 2019 when only nine MLPs reported retiring any Class I RECs. While this progress is significant, it is worth noting that the percentage of total energy sold that can be accounted for by retired Class I RECs is still very low. Of the 29 MLPs that retired Class I RECs, only seven retired enough Class I RECs to account for 1% or more of their total energy sold. As a result, **in 2020 the vast majority of individual MLP's energy mixes (33 of 40) had a percentage of clean energy that was either 0% or less than 1%.** When aggregating MLPs, the percentage of clean energy was equal to 2.43% of total energy sold. This is a slight improvement from 2019, where the percentage of clean energy was 2.25%. However, it is still significantly lower than the percentage of clean energy that IOUs were legally required to meet in 2020, which was 16%. Because of the lower percentage of clean energy in MLPs' energy mixes, which collectively accounts for approximately 14% of Massachusetts' energy sector, the total percentage of clean energy in the Commonwealth was equal to approximately 14.10% in 2020 - down approximately 2% Statewide from what would otherwise be expected.[26] Furthermore,

> IN 2020, **29** MLPS RETIRED CLASS I RECS. THIS IS UP SIGNIFICANTLY COMPARED TO 2019 WHEN ONLY NINE MLPS REPORTED RETIRING ANY CLASS I RECS.

26 This estimate is based on a simple calculation of the 2020 RPS level multiplied by the IOU's estimated share of the electricity sector plus the collective clean energy percentage of MLPs multiplied by the MLPs' estimated share of the electricity sector. As such, it should not be considered a comprehensive estimate. The estimate does not include any of the additional RECs that are retired by communities that have established Green Community Aggregation programs or other programs whereby residents, businesses, and other entities pay to retire additional Class I RECs.

TABLE 3 MLPS WITH CLEAN ENERGY GREATER THAN 1% IN 2020

MUNICIPAL UTILITY	CLEAN ENERGY IN 2020 (%)	CHANGE BETWEEN 2019 AND 2020 (%)
CONCORD	36.64%*	-6.16%
BELMONT	17.64%*	+1.08%
WELLESLEY	16.84%*	+9.96%
BRAINTREE	10.44%	+0.06%
GROVELAND	9.32%	+4.24%
MIDDLEBOROUGH	2.46%	-0.18%
TAUNTON	1.55%	-0.26%

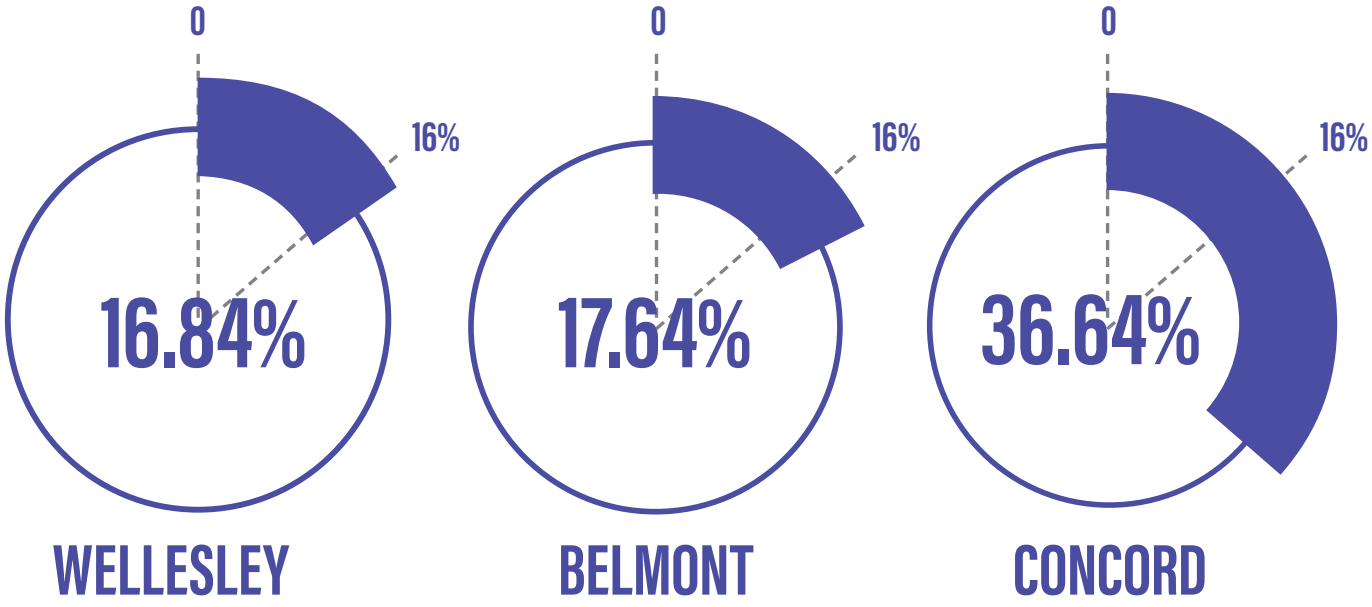
Note: * MLPs that met or exceeded the 2020 RPS of 16%

because MLP communities, on average, have a substantially higher median income than the rest of the State, the lack of clean energy in MLPs as a result of failing to retire Class I RECs implies that lower income residents in our Commonwealth are likely bearing more of the financial burden of the clean energy transition than are higher income residents living in MLP communities that do not retire Class I RECs at a level that is on par with the RPS.

2 Five MLPs are making significant progress in Class I REC retirement, with three MLPs exceeding the RPS

While MLPs are collectively lagging behind the rest of the State in Class I REC Retirement, several made significant progress and demonstrated leadership in the clean energy transition by retiring a substantial percentage of Class I RECs. **Three MLPs (Wellesley, Belmont, and Concord) met and exceeded the 2020 RPS level of 16% clean energy with 16.84%, 17.64%, and 36.64% clean energy in their energy mixes**

> BELMONT, WELLESLEY, AND CONCORD MET AND EXCEEDED THE 2020 RPS STANDARD OF 16% CLEAN ENERGY



respectively. These percentages clearly indicate that MLPs are and can be leaders in the transition to clean energy when they choose to adopt a strategy that combines Class I REC retirement with clean energy procurement.

In addition, several other MLPs made significant progress integrating clean energy into their energy mix. While they did not meet the RPS, Braintree and Groveland showed respectable percentages of clean energy in their energy mix with 10.44% and 9.32% respectively. While Braintree's percentage shows relative consistency between 2019 and 2020, this represented a substantial increase for Groveland which increased their clean energy by approximately 4.24% between 2019 and 2020.

Middleborough and Taunton also had a higher percentage of clean energy relative to their counterparts with 2.46% and 1.55% respectively. These values represent relative consistency between 2019 and 2020.

Considerable work remains to be done to increase the percentage of clean energy across MLPs and ensure that the entire Commonwealth rapidly transitions to clean energy. Even so, significant improvements are being made. Since MCAN started track-

ing clean energy in MLPs' energy mix in 2017, we have seen consistent progress from one year to the next. While this progress is not at a rate necessary to meet the scale of the climate crisis, it does show that MLPs are capable of leading in clean energy if they adopt aggressive policies and integrate Class I REC retirement.

3 **12 MLPs have already met their 2030 legal requirements for non-emitting energy under the GGES. Three MLPs have met their 2040 requirements.**

As we have observed in previous years, several MLPs have invested considerably in non-emitting energy sources such as nuclear energy, hydropower, wind, and solar which has positioned them to be leaders in transitioning away from fossil fuels. Based on

TABLE 4 MLPS EXCEEDING THE GGES 2030 REQUIREMENTS

MUNICIPAL UTILITY	NON-EMITTING ENERGY (%)	CHANGE BETWEEN 2019 AND 2020 (%)
South Hadley	87.11%*	-3.15%
Hudson	79.34%*	-14.80%
Holyoke	77.70%*	-7.62%
Middleborough	67.22%	29.08%
Paxton	55.80%	-4.78%
Holden	54.61%	-2.33%
Hull	53.01%	-2.65%
Hingham	52.99%	6.33%
Wellesley	52.74%	36.84%
Concord	51.39%	0.76%
West Boylston	51.34%	-3.62%
Mansfield	50.17%	-3.83%

Note: * MLPs that met or exceeded the 2040 GGES non-emitting percentage requirement of 75%

MCAN's methods of calculation,[27] **12 MLPs (or 30% of all MLPs studied) have already exceeded the 2030 requirement set forth in the GGES of being 50% non-emitting by 2030.** When factoring in Class II out-of-state RECs that were purchased without the associated energy, the number of MLPs meeting this threshold is likely to be higher. **Additionally, in 2020, three MLPs went even further and exceeded the 2040 GGES requirement of being 75% non-emitting by 2040.** The MLPs that exceeded 2040 levels are Holyoke, Hudson, and South Hadley with approximately 77.70%, 79.34%, and 87.11% non-emitting energy respectively.

While the non-emitting percentage of leading MLPs benefits local communities and the Commonwealth's efforts to transition away from fossil fuels, it is important to make a few additional observations. First, as of 2020 there are still many MLPs that will need to make large increases in their use of non-emitting energy in order to meet the required 2030 standard set forth by the GGES. Of the 40 MLPs studied, 11 had non-emitting percentages in their energy mixes that were less than 25% in 2020.

"AS OF **2020** THERE ARE STILL MANY MLPS THAT WILL NEED TO MAKE **LARGE INCREASES** IN THEIR USE OF **NON-EMITTING ENERGY** IN ORDER TO MEET THE REQUIRED 2030 STANDARD SET FORTH BY THE GGES."

The second important aspect of this progress to consider is the strength of the GGES itself. While the implementation of the GGES was an important and necessary development in State policy, the GGES has looser requirements and is less prescriptive than the RPS and other IOU regulations. Specifically, it includes more eligible energy sources compared to IOU regulations. In addition to all energy sources that qualify for the Class I and Class II RPS, the GGES includes energy types such as nuclear energy and "efficient" natural gas facilities that meet certain criteria.[28] The GGES also does not specify what percentage of non-emitting energy resources should come from Class I sources (i.e., new, clean energy sources such as solar and wind energy). Thus, while meeting the GGES will require important progress for many MLPs and should be considered an

27 Please be aware that these conclusions can only be considered estimates based on our methods.

28 Ibid. Sections 11F3/4 (c)(i)-(ii)

achievement, MLPs' efforts to decarbonize and transition to clean energy should not and must not end once they have achieved the required emissions reductions. Rather, the GGES requirements should be seen as bare minimum reduction targets that MLPs should strive to meet and exceed prior to respective target years.

4 **Overall, MLPs increased their percentage of non-emitting energy from 2019 to 2020. At the same time, over 60% of MLPs saw a decrease in non-emitting energy.**

From 2019 to 2020, MLPs collectively increased their percentage of non-emitting energy from 36.75% to 38.22% (an increase of 1.47%). When aggregated, this shows clear progress, but a closer look reveals that this increase was not uniform across MLP districts. In fact, of the 40 MLPs included in this report, **26 MLPs (65% of all MLPs) showed a decrease in their non-emitting energy between 2019 and 2020**. Half of these 26 MLPs only reported marginal decreases of between 0% and 3%. However, the other 13 MLPs saw decreases in non-emitting energy that was greater than 3%. Four

TABLE 5 MLPS WITH THE LARGEST INCREASES IN NON-EMITTING ENERGY BETWEEN 2019 AND 2020

MUNICIPAL UTILITY	NON-EMITTING ENERGY IN 2020 (%)	CHANGE BETWEEN 2019 AND 2020 (%)
Wellesley	52.74%	36.84%
Middleborough	67.22%	29.08%
Rowley	22.15%	11.36%
Norwood	12.85%	8.78%
Ipswich	29.89%	6.95%
Hingham	52.99%	6.33%
Groveland	23.92%	6.14%
Braintree	47.37%	6.02%

of these MLPs observed a decrease in the percentage of non-emitting energy greater than 5%. The cause of these decreases are not immediately clear. They may have been a result of the unique dynamics and circumstances MLPs faced as a result of the COVID19 pandemic. Similarly, they may be due to operation and maintenance outages in 2020 for nuclear and other non-emitting facilities owned by or serving MLPs. Regardless of the cause, we must acknowledge that, when thinking about the severity of the climate crisis, these decreases are a step in the wrong direction, especially if they represent a trend rather than an exception.

Of the 14 MLPs that increased their percentage of non-emitting energy in their energy mix from 2019 to 2020, six increased their total percentage by between 0% - 3% and eight increased their percentage by greater than 5% (no MLPs increased their percentage between 3% and 5%). Of these eight MLPs, several saw increases in non-emitting energy that were significantly greater than 5%. Specifically Wellesley, Middleborough, and Rowley experienced increases of approximately 36.84%, 29.08%, and 11.36% respectively. These outsized increases are likely what negated the reported decrease in non-emitting energy from the majority of MLPs and led to an overall increase in the percentage of non-emitting energy across all MLPs.

5 MLPs' non-emitting energy mix depends heavily on nuclear energy

When breaking down the energy sources that make up the non-emitting percentage in MLPs' energy mixes, it quickly becomes apparent that nuclear energy makes up a large portion of the non-emitting energy. **In 2020, 25.73% of MLPs' collective energy mix was nuclear energy. When comparing this to MLPs' collective non-emitting energy percentage of 38.22%, we find that approximately 67.32% of the non-emitting energy across all MLPs came from nuclear energy.** The remaining 32.68% of the non-emitting percentage is divided up between wind energy, solar energy, hydropower, and biogas.

This outsized reliance on nuclear energy is only increasing. From 2019 to 2020, MLPs' percentage of nuclear energy increased by approximately 2.54% - an increase that exceeded the aggregate increase in the percentage of non-emitting energy between the same period. **However, this observed increase was not equally distributed.** In fact, of the 40 MLPs observed in this report, 25 MLPs decreased their percentage of nuclear

TABLE 6 MLPS THAT INCREASED NUCLEAR RELIANCE BETWEEN 2019 AND 2020

MUNICIPAL UTILITY	NUCLEAR ENERGY IN 2020 (%)	CHANGE IN NUCLEAR BETWEEN 2019 AND 2020 (%)
Middleborough	57.16%	32.43%
Shrewsbury	27.99%	27.87%
Wellesley	24.92%	24.92%
Rowley	10.21%	10.21%
Hingham	40.98%	9.17%
Norwood	8.36%	8.36%
Braintree	24.97%	4.94%
Concord	2.75%	2.75%

TABLE 7 MLPS THAT DO NOT HAVE NUCLEAR ENERGY

MUNICIPAL UTILITY	NUCLEAR ENERGY IN 2020 (%)
Belmont	0%
Groveland	0%
Chicopee	0%
Chester	0%
Princeton	0%
Merrimac	0%
Russell	0%

energy and seven MLPs had no change because they had no nuclear energy in their mix in either year. Instead, the increase in reliance on nuclear power across MLPs was a result of an increase in the percent of nuclear power in just eight MLPs. Six of these MLPs saw substantial increases of 5% or more. Of these six, three MLPs saw dramatic increases in their nuclear energy usage. Specifically, Middleborough, Shrewsbury, and Wellesley saw an increase in the percentage of nuclear energy of approximately 32.43%, 27.87%, and 24.92% respectively.

MLPs' reliance on nuclear energy is based on their ownership of two large nuclear facilities in the Northeast - the Seabrook Station nuclear power plant and the Millstone Unit 3 nuclear power plant. Participation and execution of long-term contracts for nuclear energy was done primarily through the Massachusetts Municipal Wholesale Electric Company (MMWEC) which has a 11.59%[29] ownership stake in Seabrook[30] and a 4.8% ownership stake in Millstone.[31] Seabrook and Millstone came online in 1990 and 1986 respectively, and are licensed to operate until 2050 and 2045.[32] [33] Many MLPs have contracts for energy from Seabrook and Millstone that last for the duration of their license period, meaning that they cannot substantially decrease their reliance in the near future.

When it comes to the nuclear reliance across MLPs, **MCAN acknowledges the need to rapidly transition away from fossil fuel sources while also recognizing the danger that nuclear energy poses to communities, both in the operation of nuclear facilities as well as in the storage and disposal of nuclear waste. These activities disproportionately affect low-income communities, communities of color, and non-English speaking communities.** In order for MLPs to advance environmental justice and energy justice, MCAN firmly believes that these energy sources must be replaced with clean energy technologies such as wind, solar, and geothermal. We encourage MLPs that are heavily dependent on nuclear energy to consider the adverse impacts of these energy sources on vulnerable people and to take steps to transition away from these sources as they are able. At the very least, we advocate for MLPs not to renew their contracts or sign contracts for new nuclear energy.

29 Taunton Municipal Light Plant (0.01%) and Hudson Light & Power Department (0.08%) also own a portion of the Seabrook Nuclear Plant

30 https://www.mmwec.org/our-energy-assets/seabrook-nuclear/

31 https://www.mmwec.org/our-energy-assets/millstone-nuclear/

32 https://www.mmwec.org/our-energy-assets/seabrook-nuclear/

33 https://www.mmwec.org/our-energy-assets/millstone-nuclear/

6 MLPs' clean energy and non-emitting energy percentages fluctuate significantly from year to year. This demonstrates the need for long term policies and plans that clearly outline MLP's REC retirement strategy.

Our analysis show that, year to year, many MLP's clean and non-emitting energy percentages fluctuate significantly. This fluctuation is most clearly observable when examining changes in non-emitting energy percentages. From 2019 to 2020, changes in the percentages of non-emitting energy were observed in every MLP's energy mix. Given the fluctuation in consumption, some level of change is normal. What is surprising is the fact that more than half of all MLPs (21) saw changes that were greater than 3% (in either direction) and 30% of all MLPs saw changes that were greater than 5% (in either direction).

When looking at clean energy percentages it was observed that all 29 MLPs that had clean energy in their portfolio saw a change in their percentage between 2019 and 2020. Unlike in the case of non-emitting energy, only 3 of those MLPs saw changes that were greater than 3%. However this is more a result of the limited percentage of clean energy in the vast majority of MLPs' energy mixes and less of an indication that there is, or will be, less fluctuation in clean energy percentages over time.

While fluctuations in percentages of clean and non-emitting energy are, in and of themselves, not problematic, it does raise questions about the extent to which MLPs are integrating and accounting for REC retirement in their financial and operational planning. With the passage of the Next Generation Roadmap Bill and the implementation of the GGES, MLPs will no longer have the flexibility to fluctuate substantially in their clean and non-emitting energy from year to year. Additionally, many of them will need to make substantial increases in their non-emitting resources to meet the GGES targets. In order to do this and ensure that they are meeting their required targets in the long term, plans and policies will need to be in place that provide clear non-emitting and clean energy integration into MLPs' energy mixes. While these plans and policies will at a minimum need to identify how MLPs will meet their GGES non-emitting requirements, MCAN believes that such tools should also be used as a means to plan for and integrate more clean energy resources specifically (i.e. wind, solar, geothermal, etc.).

From MCAN's perspective, the adoption of a Power Supply Policy is an effective means of integrating clean and non-emitting resources into long-term planning. Power Supply Policies have already been adopted in Belmont,[34] Concord,[35] and Shrewsbury.[36] Such policies are a transparent way to establish clear energy mix goals, outline a REC retirement schedule, and provide a clear process for public input on revising and updating emissions reduction targets. While they don't always do so, **Power Supply Policies should include information about both MLPs' clean energy (Class I) percentage targets as well as non-emitting energy (Class I, Class II, EFEC, etc) targets over time.** An example of a policy that does this effectively is Belmont's 2019 Policy.[37]

Conclusion

With the passage and adoption of the Next Generation Road Map, it is clear that a clean energy transition is underway in the Commonwealth. In order to track participation among MLPs in this transition, this Report provides a snapshot of the percentage of clean and non-emitting energy in MLPs' energy mixes. This information was based on the 2020 AQ31 reports that each MLP submitted to the DEP in November of 2021. Based on the information in these reports, MCAN found that more MLPs are retiring Class I RECs than ever before and that three are meeting and exceeding the 2020 RPS. While this is a significant improvement compared to 2019, the vast majority of MLPs (33 of 40) still had a percentage of clean energy that was less than 1% in 2020. Because MLP communities, on average, have a substantially higher median income than the rest of the State, MLPs' limited retirement of Class I RECs raises a concern that lower income residents across our Commonwealth in IOU territories are bearing more of the financial burden of the clean energy transition than are higher income residents living in MLP communities that do not retire Class I RECs.

In addition to our initial findings, we also found that while 60% of MLPs decreased their percentage of non-emitting energy from 2019 to 2020, the overall percentage of non-emitting energy across all MLPs increased. Of all of the sources considered to be

34 https://www.belmontlight.com/wp-content/uploads/2019/07/BMLD-Power-Supply-Policy-Updated-July-2019.pdf

35 https://45971892-f07e-4880-bdd9-93c0a3b608e7.filesusr.com/ugd/5d892c_1c13eebfe3c544f4a89c8e787961ffa3.pdf

36 https://45971892-f07e-4880-bdd9-93c0a3b608e7.filesusr.com/ugd/5d892c_1c13eebfe3c544f4a89c8e787961ffa3.pdf

37 https://www.belmontlight.com/wp-content/uploads/2019/07/BMLD-Power-Supply-Policy-Updated-July-2019.pdf, pg 2

non-emitting, MLPs continue to be significantly more reliant on nuclear energy than any other source. Finally, we found that, with the new GGES established through the Next Generation Road Map, MLPs could greatly benefit from implementing Power Supply Policies (or policies that serve the same purpose) that publicly outline their emissions goals and planned REC retirement schedules for both clean and non-emitting energy. Such policies will prepare MLPs to meet and exceed the GGES and continue to increase the overall percentage of clean energy in their energy mixes.

MLPs are an essential part of the Commonwealth's solution to the climate crisis. They are well positioned to take action and are capable of being leaders in the Commonwealth. This Report is proof of that potential. As we look towards the future, MCAN is committed to working with advocates, MLP staff, MLP associations, and state officials to ensure that this potential is fully realized.