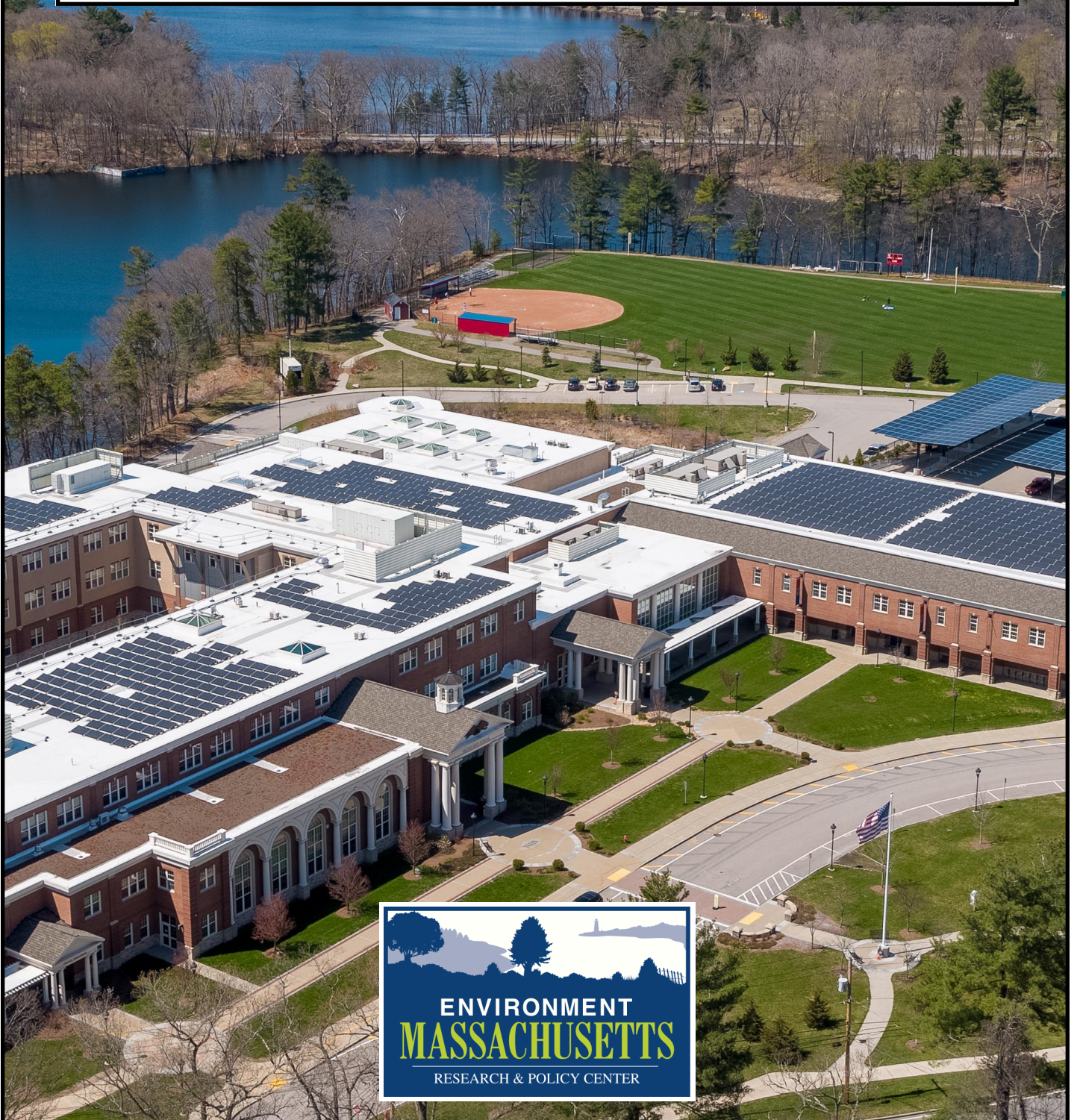


Renewable Communities 2021

**Massachusetts cities and towns
leading the way to 100% renewable energy**



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Introduction

Across Massachusetts, cities and towns are leading the way to a future powered entirely by clean and renewable sources of energy. Municipal officials and staff — working with citizen activists, volunteers, nonprofit organizations, and businesses — are taking action to reduce fossil fuel consumption and increase the use of renewable energy.

This is the fourth edition of *Renewable Communities*, previously published in 2016, 2019, and 2020. This year's report includes seven new case studies of cities, towns, and regional agencies that have adopted innovative programs to promote renewable electricity, energy storage, clean heating, and energy efficiency.

While not an exhaustive survey of municipal clean energy action, these case studies illustrate ways in which action at the local level can accelerate Massachusetts' progress toward 100 percent renewable energy. We hope this report will inspire more communities to follow the example of the cities and towns featured here.

Case studies

Arlington and Winchester: A community outreach campaign resulted in 224 contracts signed for the installation of clean heating systems like air source heat pumps.

Chelsea: A proposed microgrid, managed by an innovative cloud-based system, would ensure clean, reliable power for buildings that provide key services to the community.

CVEC (Cape and Vineyard Electric Cooperative): A coordinated approach to renewable energy deployment, bringing together dozens of municipalities and government agencies, has led to more than 50 megawatts of solar capacity built or in development.

Mendon and Upton: A Solarize Mass Plus program offered residents a choice of six different clean energy technologies, including solar, battery storage, and air source heat pumps

Natick: Town officials have pursued several strategies to increase the deployment of solar on municipal buildings and on homes.

Springfield: A 4.7-megawatt community solar array, built on a former landfill, is providing affordable electricity to hundreds of low-income residents.

Worcester: The city's Community Choice Aggregation Program is providing residents with a higher percentage of renewable electricity from sources in New England.



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Arlington and Winchester: HeatSmart

In 2019, the towns of Arlington and Winchester ran the most successful HeatSmart campaign to date.

HeatSmart Mass, a partnership between the Massachusetts Clean Energy Center (MassCEC) and the Massachusetts Department of Energy Resources (DOER), is modeled on the successful Solarize Mass program. Launched in 2018, HeatSmart helps cities and towns increase the adoption of clean heating and cooling technologies. Participating communities select an installer and implement a community marketing strategy.¹ By taking advantage of group purchasing power, the program can lower the cost of installation for technologies like air source and ground source heat pumps.² Additionally, rebates and loans offered by MassCEC and MassSave have helped reduce upfront costs for residents.³

The Arlington-Winchester HeatSmart campaign sought to increase participation through a combination of virtual and in-person outreach. The marketing plan included town hall information sessions and open houses for residents to learn about the technologies, as well as one-on-one conversations at parks, sporting events, farmers' markets, and libraries.⁴

Ultimately, through this program, more than 1,100 residents and businesses expressed interest and 224 contracts were signed for clean heating systems.⁵

This campaign relates to the sustainability goals of both towns. Winchester's Climate Action Plan aims to reduce emissions 80 percent by 2050 and calls for improving energy efficiency and eliminating fossil fuel use in existing

buildings.⁶ Arlington's climate plan, released this February, calls for retrofitting all 12,000 buildings in the town to be net zero emissions buildings by 2050, including energy efficiency upgrades, electric heating, and a 100 percent clean electricity supply.⁷

Although MassCEC and DOER are not currently enrolling new communities in the HeatSmart program, a toolkit is available for communities to run their own campaigns modeled on HeatSmart.⁸

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2. "Arlington selected for HeatSmart Mass clean heating and cooling program," WickedLocal Arlington, 11 February 2019, <<https://arlington.wickedlocal.com/news/20190211/arlington-selected-for-heatsmart-mass-clean-heating-and-cooling-program>>.

3. "HeatSmart Arlington-Winchester," <<http://wepowr.com/heatsmartaw>>.

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5. "HeatSmart Mass," Massachusetts Clean Energy Center, <<https://www.masscec.com/heatsmart-mass-0>>.

6. Climate Action Plan 2020, Town of Winchester, <<https://www.winchester.us/DocumentCenter/View/4633/Climate-Action-Plan-2020>>, 22-27.

7. Arlington's Net Zero Action Plan, Town of Arlington and Metropolitan Area Planning Council, <<https://www.arlingtonma.gov/home/showpublisheddocument/55139/637507913474030000>>, 12-13.

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Chelsea: Community microgrid

In 2018, the Massachusetts Clean Energy Center awarded grants to study the potential for community microgrids in Chelsea and 13 other communities.¹

A microgrid is a localized energy grid that can be disconnected from the larger grid. Microgrids typically include a source of electricity generation to keep a building or group of buildings powered during a power outage. Some microgrids use a combination of energy storage and renewable energy resources like solar panels.²

The Green Justice Coalition, together with Resilient Urban Neighborhoods, a collaborative of organizations with technical expertise, completed a feasibility assessment for a microgrid in Chelsea in June 2020.³ The assessment examined three facilities in detail: an elderly housing facility owned by the Chelsea Housing Authority, a health care center, and Chelsea City Hall. The study also identified more than a dozen other buildings that expressed interest in joining the microgrid, with a focus on buildings that provide important services and protect vulnerable residents during emergencies.⁴

While typical microgrids include buildings that are physically adjacent and connected to each other with wires, the Chelsea microgrid would allow non-contiguous properties to participate, with the generation and consumption of energy managed by a cloud-based algorithm. During a power outage, each building would function independently, with renewable energy generation and energy storage located on-site. This design reduces regulatory obstacles to the creation of a microgrid by installing assets behind the meter, and allows for greater

flexibility in adding buildings to the project in the future.⁵ The Chelsea microgrid project has empowered community groups to make decisions around the project's design.⁶

In June 2021, the city of Chelsea issued a request for proposals (RFP) to begin building a microgrid. The project described in the RFP includes solar, battery storage, energy efficiency improvements, and electric vehicle charging stations at the police station, city hall, and a housing complex, as well as a cloud-based system to manage the microgrid elements.⁷ The RFP also asks respondents to identify other locations in Chelsea suitable for solar and battery storage installations.⁸ The city expects to approve a contract for the project in September.⁹

1. "Community Microgrids Program: Feasibility Assessment Award Summary," Massachusetts Clean Energy Center, <<https://files.masscec.com/Community%20Microgrid%20Awardee%20Summary.pdf>>.

2. "How Microgrids Work", Allison Lantero, U.S. Department of Energy, 17 June 2014, <<https://www.energy.gov/articles/how-microgrids-work>>.

3. *Chelsea Community Microgrid Feasibility Assessment*, Clean Energy Solutions Inc., June 2020, <<https://greenjusticecoalition.org/wp-content/uploads/2021/04/RUN-GJC-Task-6-Chelsea.pdf>>.

4. *Ibid.*, 11–15.

5. *Chelsea Community Microgrid Feasibility Assessment*, Clean Energy Solutions Inc., June 2020, <<https://greenjusticecoalition.org/wp-content/uploads/2021/04/RUN-GJC-Task-6-Chelsea.pdf>>, 16; and "Getting onto the New Grid in Greater Boston," Meg Wilcox, Next City, 7 December 2018, <<https://nextcity.org/daily/entry/getting-onto-the-new-grid-in-greater-boston>>.

6. Email communication with Jen Stevenson Zepeda, Associate Director, Climable.org, 6 August 2021.

7. "Request for Proposals for Clean Energy Systems and Energy Services Chelsea Microgrid Project," City of Chelsea, June 2021, <https://www.chelseama.gov/sites/g/files/vyhlif396/t/pages/rfp_2021-425_clean_energy_systems_and_energy_services_chelsea_microgrid_project.pdf>, 26–27.

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9. *Ibid.*, 44.



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CVEC: Cooperative solar and storage development

The Cape and Vineyard Electric Cooperative (CVEC), founded in 2007, has grown in size from three initial members – the Cape Light Compact, Barnstable County, and the town of Barnstable – to 25 municipal members and 11 governmental participants.¹ As of June 2020, CVEC had saved its members roughly \$16.9 million in energy costs.²

CVEC is a non-profit cooperative with authority to enter into agreements with towns, school districts and other government entities to develop large-scale power generation and storage facilities without burdening municipal debt capacity, as developers pay project capital costs.³ In addition to the benefits of sharing project costs, CVEC provides members and participants with solar project expertise and access to industry and government leaders.⁴

Since its formation, CVEC has completed three rounds of solar and battery development, totaling 28 megawatts of capacity.⁵

CVEC's fourth and fifth rounds of solar and battery development are now underway, and will bring the cooperative's total portfolio up to 54.8 megawatts. Of the 11 Round 4 projects, six will include battery storage; and of the 14 final Round 5 projects, nine will include battery storage.⁶ These upcoming projects include solar canopies over parking lots, roof-mounted panels on public buildings, and ground-mounted arrays.⁷

The rooftop solar installation at Monomoy High School, the first project to be completed in Round 4, has generated 187 megawatt-hours of electricity as of August 12, 2021.⁸

CVEC's request for proposals for its sixth round of solar projects, scheduled to be bid in August 2021, consists of 14 projects totaling 4.4 megawatts of solar capacity. Several of these projects will include battery storage.⁹ In addition, CVEC plans to install a 250-kilowatt battery at the Dennis-Yarmouth Regional High School, which serves as the region's emergency shelter, funded through a \$1.4 million grant from the state's Community Clean Energy Resiliency Initiative.¹⁰

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5. *CVEC project summary*, Cape and Vineyard Electric Cooperative, May 2021, <<https://cvecinc.org/wp-content/uploads/2021/05/CVEC-project-summary.pdf>>.

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10. Ibid.



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Mendon and Upton: Solarize Mass Plus

Between August 2020 and June 2021, the towns of Mendon and Upton jointly ran a Solarize Mass Plus program.

Both communities had previously participated in Solarize Mass. In 2012, Mendon's Solarize Mass program resulted in 22 systems contracted and 170 kilowatts of solar capacity installed, while Upton's program led to 32 systems contracted and 264 kilowatts installed in 2016.¹

Solarize Mass Plus, launched as a pilot program by the Massachusetts Clean Energy Center and the Massachusetts Department of Energy Resources in 2017, uses the same community outreach and installer selection model as Solarize Mass, but allows communities to offer other clean energy technologies alongside solar photovoltaics (PV).²

For Solarize Mass Plus, Mendon and Upton provided residents with six different technology options. These technologies included solar PV, battery storage, solar hot water, air source heat pumps, ground source heat pumps, and electric vehicles.³

With restrictions on in-person activities due to the COVID-19 pandemic, the Solarize Mendon-Upton team had to use creative strategies to recruit residents to participate in the program. Their outreach campaign included a website with information about the campaign, articles in the local newspaper, mailings, and online raffles with prizes from local businesses. The team conducted limited in-person outreach at the Mendon and Upton town meetings, and hosted a series of webinars to share information.⁴ As a result of this outreach, hundreds of

residents learned about green technologies and expressed interest in adopting them.⁵

Residents have signed 65 contracts with the program so far, including 31 contracts for air source heat pumps and 30 for solar PV systems.⁶ Because the program met its goal of installing 250 kilowatts of solar, a local nonprofit or school will receive a donated 25-kilowatt solar installation.⁷

1. "Solarize Mass Program Results," Massachusetts Clean Energy Center, <<https://www.masscec.com/solarize-mass-program-results>>.

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3. "Mendon-Upton Solarize Mass Plus," <<https://www.solarizemendonupton.com/>>.

4. Email communication with Anne Mazar, Mendon Municipal Representative for Solarize Mendon-Upton, 30 July 2021.

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7. "Mendon Upton Solarize Mass Plus In the News", Mendon-Upton Solarize Mass Plus, <<https://www.solarizemendonupton.com/news-and-events/in-the-news>>; and email communication with Anne Mazar, Mendon Municipal Representative for Solarize Mendon-Upton, 30 July 2021.



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Natick: Municipal and residential solar

Natick has pursued a wide range of strategies to increase solar installations in town, including on public buildings and on homes.

Natick was one of the first communities in Massachusetts to add solar panels to municipal buildings.¹ By August 2020, solar panels had been installed on the roofs of ten schools and municipal buildings, including the public works building and the Lilja Elementary School.²

The new Kennedy Middle School will feature 403 kilowatts of solar capacity, including a rooftop installation and a parking lot canopy, and 223 kilowatts of battery storage.³

To increase residential solar installations, Natick has hosted three group-purchase programs. For the first program, in 2012, the town partnered with a solar company to offer discounts to residents.⁴

In 2016 Natick participated in Solarize Mass, an initiative of the Massachusetts Clean Energy Center and the Green Communities Division of the Massachusetts Department of Energy Resources to accelerate the adoption of solar energy on the community level.⁵ Through Solarize Mass, thousands of people in over 70 communities have installed solar energy systems. Natick's Solarize program led to 156 solar installations totaling 1.2 megawatts of capacity added, more than any other Solarize program to date.⁶

Natick is currently participating in the MetroWest Solar + Clean Heat Challenge, alongside Ashland, Holliston, and Framingham. The program, which runs from June–December 2021, connects homes and small businesses to

discounted solar installations as well as air-source and ground-source heat pumps.⁷

Natick's solar endeavors are consistent with its Net Zero Action Plan, published this April, which calls for net zero greenhouse gas emissions by 2050 and 100 percent carbon-free electricity through the town's municipal aggregation program by 2030.⁸ To achieve these goals, Natick will take several steps to increase electricity generation from solar. These actions include installing more solar on municipal and school properties, requiring the owners of large buildings to reduce their emissions over time, and mandating "climate-ready" features, such as solar panels or green roofs, on the roofs of new buildings.⁹

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2. "New solar projects could save Natick \$2M," Henry Schwan, MetroWest Daily News, 19 August 2020, <<https://www.metrowestdailynews.com/story/news/environment/2020/08/19/natick-possible-2-million-savings-from-solar-projects/42576313/>>.

3. *Natick's Net Zero Action Plan*, Town of Natick, April 2021, <<https://www.natickma.gov/DocumentCenter/View/11352/Final-Natick-Net-Zero-Action-Plan-2021-2025>>, 24.

4. "Natick Solar Challenge to Begin Soon," Robert Rosen, Patch, 26 December 2012, <<https://patch.com/massachusetts/natick/natick-solar-challenge-to-begin-soon>>.

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Springfield: Community solar

In December 2019, a 4.7-megawatt community solar array was powered on in the city of Springfield, providing energy to 500 subscribers.¹

The solar project was built on top of a former landfill that was capped in 2012.² In March 2018, the Springfield city council approved the sale of the site for development as a solar array. Tom Matthews, project manager for Springfield's Office of Planning and Economic Development, said at the time that "the blighted lots will be transferred into productive parcels that will improve the area."³

Low-income residents participating in this community solar project receive a 50 percent discount in their energy costs under Citizens Energy Corporation's JOE-4-SUN program, resulting in savings of up to \$300 per person each year.⁴

The project is also expected to reduce municipal energy costs. Springfield is purchasing a portion of the solar array's output at a 20 percent discount, allowing the city to save roughly \$1.2 million over twenty years.⁵

These efforts align with Springfield's climate action and resilience plan. The plan, adopted in 2017, aims to reduce emissions by 80 percent by 2050 and increase solar power to 10 percent of the community's energy consumption by 2022 and 50 percent by 2050.⁶ The climate plan calls for increased access to solar for low-income residents, with a goal of signing up half of all low-income accounts to receive discounted electricity through community solar projects.⁷

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Worcester: Community Choice Aggregation Program

In 2020, the city of Worcester launched its Community Choice Aggregation Program (CCAP). This program takes advantage of bulk purchasing power to provide renewable energy to residents and businesses at an affordable rate.¹

Through municipal aggregation, also known as community choice energy, a city or town can purchase electricity from a competitive supplier on behalf of its residents and businesses. More than 160 Massachusetts cities and towns have adopted municipal aggregation.² Although local governments often focus on reducing energy costs through these programs, some cities and towns are using municipal aggregation to increase the percentage of renewable electricity provided to the community.³

Under Worcester's CCAP, "Standard Green" is the default for all residents. In 2021, the Standard Green option consists of 38 percent renewable electricity, 20 percent more than state law currently mandates.⁴ As the state's required baseline increases, the percentage of renewable energy for the Standard Green option will increase with it, by 2 percentage points each year.⁵ Residents can upgrade to a 100 percent renewable energy option, or opt out of the program altogether and pay the basic service rate offered by National Grid, the electric utility serving the city.⁶

The renewable energy provided to residents under both Standard Green as well as the 100 percent renewable energy option will consist of Massachusetts Class I renewable energy certificates (RECs), primarily sourced from wind power in New England.⁷ At the time the program was launched, city manager Edward Augustus said that the city's goal was to "significantly increase the

amount of renewable electricity in Worcester's supply while charging electricity customers about the same as what they would pay with National Grid's basic service."⁸

The city council approved community choice energy in 2017, and in 2019 the Massachusetts Department of Public Utilities (DPU) signed off on the details of Worcester's program.⁹ The CCAP is a key part of Worcester's strategy to eliminate carbon emissions. The Green Worcester Plan, adopted in April 2021, commits the city to achieve 100 percent renewable electricity by 2035 and 100 percent renewable energy in all sectors by 2045.¹⁰

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3. *Green Municipal Aggregation in Massachusetts: 2nd Edition*, Larry Chretien et al., Green Energy Consumers Alliance, February 2020, <<https://info.greenenergyconsumers.org/gmareport2>>.

4. "Options and Prices," Worcester Community Choice Aggregation, <<https://masspowerchoice.com/worcester/options-prices>>.

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6. 100 percent renewable option: "Worcester Community Choice Aggregation," MassPowerChoice, <<https://masspowerchoice.com/worcester>>.

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