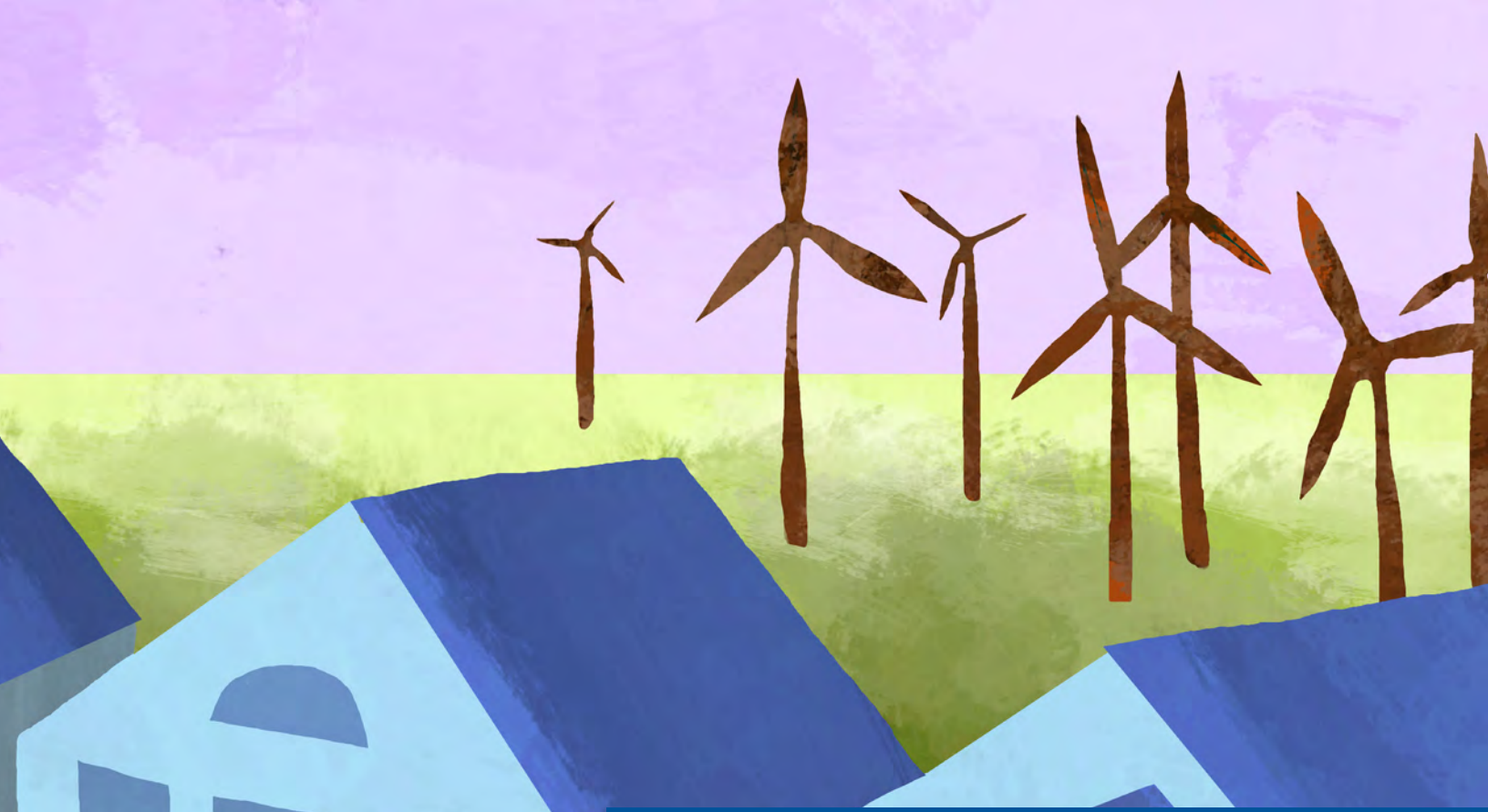


Green Municipal Aggregation in Massachusetts

Second Edition

By Larry Chretien, Daria Mark, Eugenia Gibbons, Yaima Braga, and Kate Marcellino

February 2020

GREEN ENERGY CONSUMER ALLIANCE

www.greenenergyconsumers.org

Cover image: Original artwork from Massachusetts College of Art and Design student, Melanie Viens, created for Green Energy Consumers.

Preface

This is the second edition of the Green Municipal Aggregation in Massachusetts status report, the first we published in March 2018. A lot has happened in the field necessitating this update:

- The cities and towns pioneering the Green Municipal Aggregation model have moved onto their second contract and we have collected performance data on their progress.
- Many other cities and towns have followed their suit. The aggregation map is getting greener.
- There is a clear trend towards higher percentages of renewable energy content than when the pioneers began in 2016.
- The data shows how consumers are saving money. The report also touches on reports from Attorney General Maura Healey pointing out how consumers who have chosen an electricity supplier outside the aggregation model have not been well served.

This status report contains explanation of the municipal aggregation model, potential for greenhouse gas reductions, best practices for starting a basic aggregation program, savings, duration, and rate options from current aggregations, and discussion on pathways to expand the service offerings to include inventive, impactful local generation projects. It is intended to benefit people in communities who have an interest in energy and climate change, as well as public officials who have the authority and, in our view, the responsibility to move solutions forward.

We are not shy about saying that this report covers municipal aggregation or community choice aggregation, whichever you prefer to call it, from our perspective here at Green Energy Consumers Alliance. We know more about the communities that we are working with directly and we are purists at heart, but when we refer to cities and towns outside our sphere, we have tried to be accurate.

Working on green municipal aggregation is at the core of our mission. We look forward to serving even more cities and towns in the years ahead as we, in the Commonwealth, transition from fossil fuels to renewable electricity sources.

Finally, we have worked hard to spread Green Municipal Aggregation in Rhode Island. As a result of successful changes to state law and a concerted effort in terms of outreach and education to cities and towns, we will soon be able to report on progress in the Ocean State! Stay tuned.

If you have any questions, please reach out to us at **hello@greenenergyconsumers.org** with the subject line Green Municipal Aggregation.

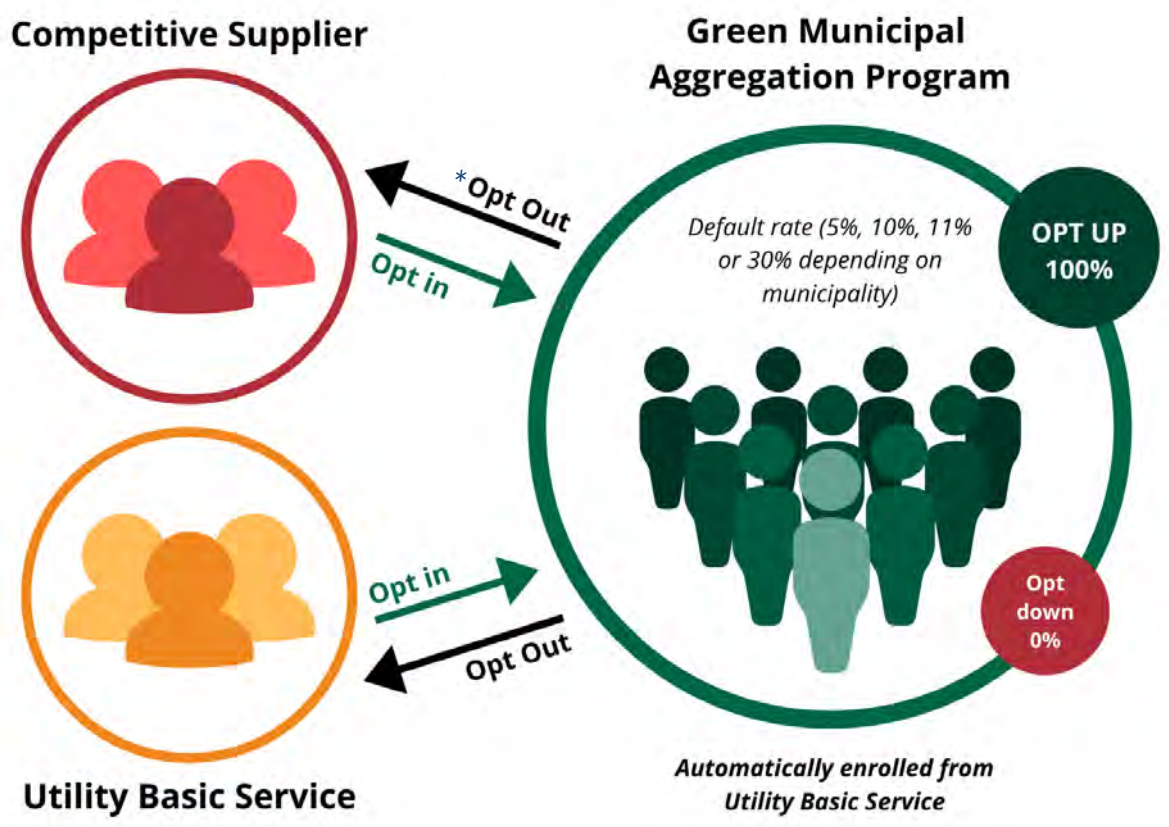
Executive Summary

Green Municipal Aggregation

Municipal aggregation, first enabled in Massachusetts in 1997, is the bulk purchase of electricity supply by a city or town on behalf of the residential and small business customers. Aggregation offers an alternative to Basic Service – the default electricity supply provided by utilities – or products offered by competitive suppliers. Aggregation is frequently undertaken to stabilize or reduce the cost of electricity for those customers.

An enhancement of the municipal aggregation program is Green Municipal Aggregation (GMA), which has a default option that includes at least 5% more Class I REC content than required by the state's Renewable Portfolio Standard (RPS). GMA empowers cities and towns to choose electricity supply that is significantly greener than their utility's default offering, while also delivering price stability and potential cost-savings to residents and small businesses.

GMA has been successfully implemented in communities across Massachusetts under different program names, but the basic design of the program remains the same in all communities we serve: a base electricity aggregation that includes more Class I REC content than required by state law.



*Depending on the contract with a competitive supplier, the supplier may charge an early termination fee for a customer to leave their program. No penalty is ever applied to customers who choose to leave green municipal aggregation.

GMA Greenhouse Gas Reductions and Additionality

GMA creates ***additionality***, which is defined as the result of increased purchases of green power with verifiable GHG emission reductions over and above the state's mandates. When a GMA purchases Class I RECs, it is essentially playing "keepaway" with the electricity suppliers that need Class I RECs to comply with the law. For example, if Somerville's aggregation is fed by wind RECs generated in Plymouth, MA, those RECs are not available for purchase by Eversource, National Grid, or another electricity supplier. Those companies therefore have to work a little bit harder to secure the RECs they need. The increase in demand for RECs then has to be met by supply.

It is crucially important to understand that not all aggregations are created equal, particularly when it comes to leveraging community purchasing power to accelerate adoption of Class I resources. Some community aggregation programs rely on **out of region** RECs or Massachusetts Class II RECs to make their green claims. REC purchases of this sort do nothing to transform the renewable content of the regional electric grid. The programs also do a disservice to consumers within those communities and cause confusion among people who are trying to chart a course to a greener electricity grid.

Green Municipal Aggregation as a Cost-Saving Alternative

Communities where GMA has been implemented are demonstrating that additional renewable energy can be delivered to Massachusetts residents and businesses affordably. As illustrated in the table below, several Massachusetts communities have leveraged their purchasing power to negotiate an alternative to Basic Service that is less expensive yet delivers more renewable content than the utility's Basic Service.

Adding Class I RECs to the mix does come with an additional cost, but the record shows that even this incremental cost has been less than the incremental savings on electricity that the aggregations have been able to achieve. As a result, the net cost of GMA has been lower than Basic Service: in 2019 alone, with eleven active Green Municipal Aggregation programs under Good Energy's purview (Arlington, Brookline, Dedham, Gloucester, Hamilton, Melrose, Rockland, Stoneham, Somerville, Sudbury, Winchester) the programs saved ratepayers over $8M.

Town	Contract Length	Default % above requirement	Savings
Arlington	Aug 2017 - Nov 2019	5%	$2,127,450
Brookline	Jul 2017 – Dec 2019	25%	$2,978,090
Somerville	Jul 2017 – Dec 2019	5%	$5,178,628
Sudbury	Aug 2017 – Aug 2020	5%	$1,566,348
Winchester	Jul 2017 – Dec 2019	5%	$1,306,555

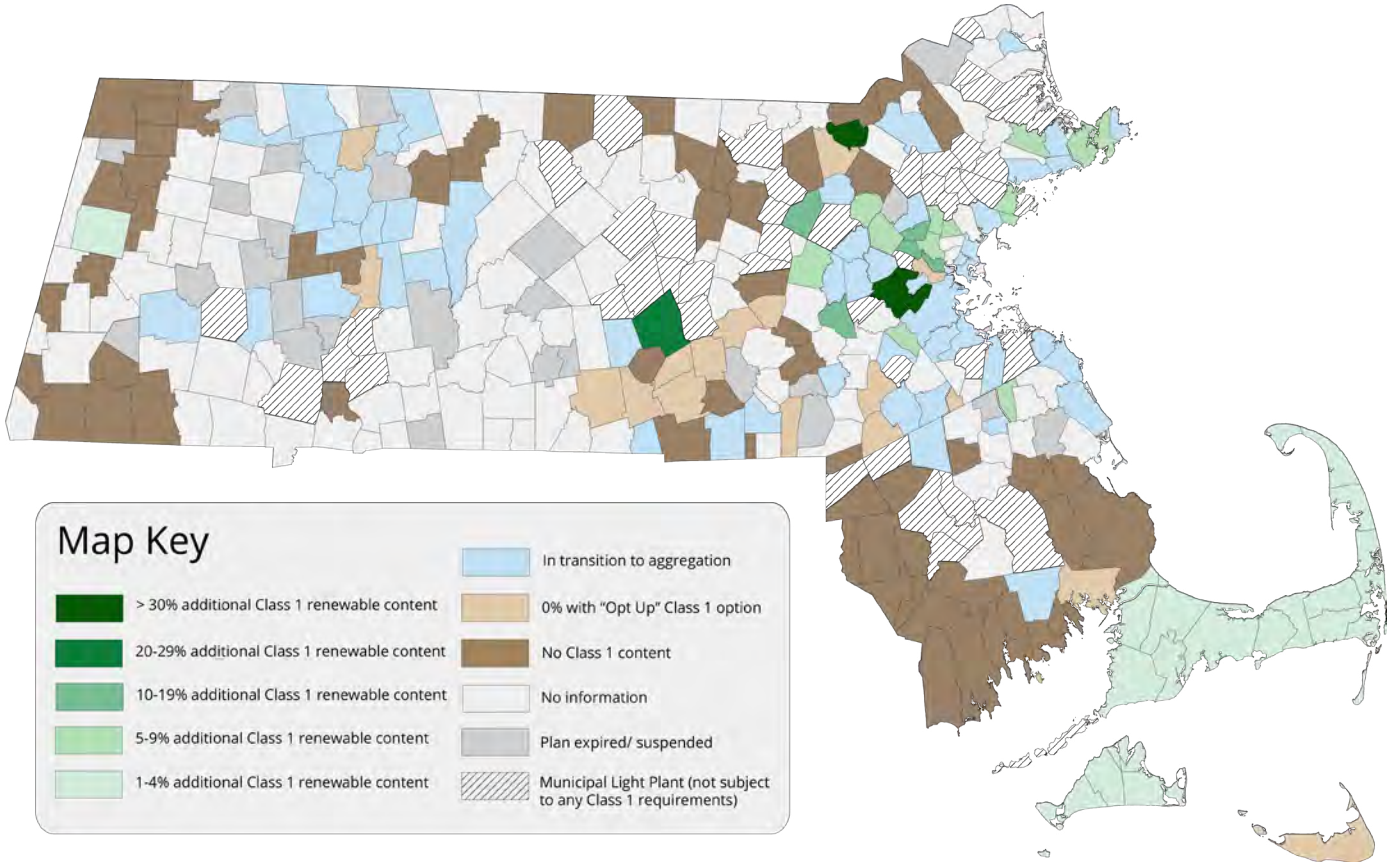
Savings delivered to customers through green municipal aggregation programs

In contrast to the savings afforded by aggregation programs, the competitive suppliers of electricity who operate in Massachusetts and sign up consumers one at a time, have cost consumers $253M over the course of three years, between July 2015 and June 2018 according to the report commissioned by Massachusetts Attorney General Maura Healey.[1]

1 *https://www.mass.gov/news/ag-healey-report-massachusetts-residents-who-switched-to-competitive-electric-supplycontinue*

Growth of Green Municipal Aggregation

As illustrated in the map below, over 150 cities and towns in the Commonwealth have an approved aggregation program or are in the process of developing an aggregation plan. Not all communities are using their bulk purchasing program to add new local renewable energy. Many of these aggregations have a supply that is the same as Basic Service: "brown power" including the minimal RPS/CES requirements. Some have negotiated an aggregation whose default offers less than or equal to 1% more renewable content than the RPS/CES or whose standard aggregation includes an optional offer to opt up to more Class I RECs. Seventeen of the 150 communities, shown in darker green, have aggregations whose default supply includes five percent or more Class I content, exceeding the minimum required to comply with the state's RPS and creating the additionality needed to change our grid.



Note that we are only counting what we believe to be demand for Class I Renewable Energy Certificates (RECs), which is the proper standard for New England. According to our analysis, in 2022 the aggregation programs in Massachusetts will add well over 500,000 megawatt-hours per year of demand for Class I renewable energy. That's truly remarkable!

Several aggregations are adding five percent Class I green power, but increasingly we are seeing aggregations come in at ten percent additional Class I green power or more. If the trend towards high percentages is sustained, we might see 700,000 megawatt-hours per year of additional renewable energy attributable to municipal aggregation by 2022.

A good-sized, well-sited wind turbine can generate about 3500 megawatt-hours per year, so by 2022 aggregations will be supporting the equivalent of about 200 such wind turbines.

GMA Implementation Steps

Utilizing municipal aggregation to increase renewable energy content is still a relatively new concept. To ensure success of the program, follow the key these steps and best practices:

1. Form an aggregation committee to steer the process
2. Authorize aggregation by City/Town Council or Town Meeting vote
3. Hire an energy broker with deep experience in GMA
4. Create an aggregation plan with public review process
5. Tell the community about the aggregation program through public outreach channels
6. Secure state regulatory approval for the aggregation plan
7. Procure electricity & renewable energy through competitive bidding process
8. Enrollment announcement and Opt-Out periods
9. Monitor program participation and market Opt Up to 100% option

Table of Contents

About Green Energy Consumers and Green Municipal Aggregation

Our mission at Green Energy Consumers Alliance is to harness the power of consumers to speed the transition to a low-carbon future. We do so by attempting to influence public policy and by operating programs that consumers may participate in that would result in greenhouse gas (GHG) reductions. This paper describes a program, Green Municipal Aggregation (GMA), which we pioneered and has proven to be effective at reducing carbon emissions cost-effectively by increasing demand for renewable energy.

Municipal aggregation is the process by which a municipality (a town or city) purchases electricity in bulk from a competitive supplier on behalf of the residents and businesses within the community. The fundamental characteristic of GMA is a default electricity supply option exercised at the municipal level that includes more Class I renewable content than is required by the Massachusetts Renewable Portfolio Standard (RPS) and Clean Energy Standard (CES).

As of February 2020, Green Energy Consumers serves several GMA communities by supplying them with renewable energy over and above the amount required to meet the state mandates - Arlington, Bedford, Brookline, Dedham, Gloucester, Hamilton, Medford, Melrose, Rockland, Stoneham, Somerville, Sudbury, and Winchester. Green Energy Consumers also supplies additional Class I RECs for consumers who opt-up to 50% or 100%[1] as an even cleaner choice.

Our work in aggregation stems from a long history of offering consumers effective and affordable clean energy solutions. In 1998, our organization became one of the first in the country to market a retail green power product, offering consumers the opportunity to support electricity from renewable energy separately from their utility bill (solar and landfill gas). In 2002, we launched a product called *New England Wind*. The Hull 1 wind turbine was the first wind project in our portfolio (it was the first utility-scale wind turbine in the northeast). Our purchase of Renewable Energy Certificates (RECs) from Hull was probably the first of its kind in New England. Today, our *Green Powered* program serves thousands of households and businesses who have decided to voluntarily buy green power. The *Green Powered* program is the foundation upon which we have built the Green Municipal Aggregation (GMA) model with Good Energy, LLC.

This paper is intended to serve as a resource to citizens and public officials wishing to understand GMA and communities considering GMA as part of a comprehensive community-scale clean energy and climate plan. Additional resources for technical assistance and next steps are included at the end.

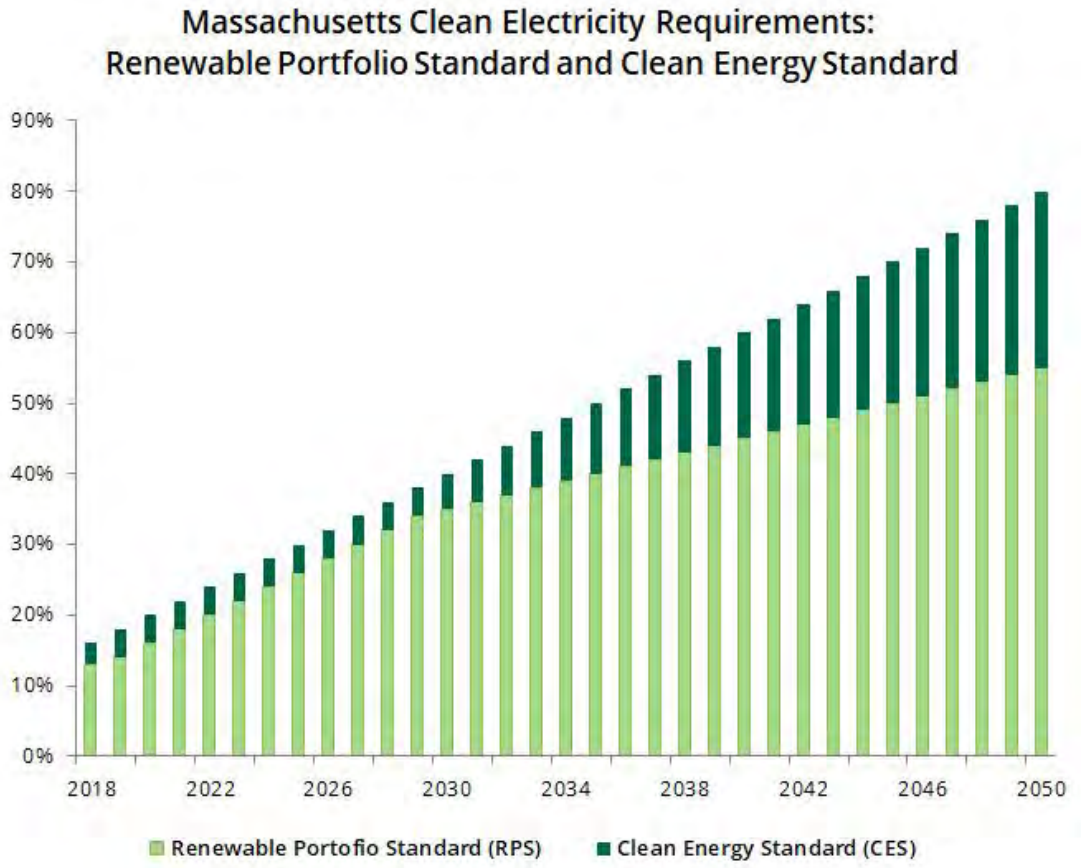
For more information, visit **www.greenenergyconsumers.org/aggregation**.

1 The Class I RECs offered by Green Energy Consumers for the 100% option are above and beyond the state's requirement through the RPS and CES, making the product even more impactful.

Green Municipal Aggregation Speeds Up the Transition from Fossil Fuels and Does so Affordably

The Massachusetts Global Warming Solutions Act (GWSA) (2008) mandates economy-wide greenhouse gas (GHG) emission reductions of 25% below 1990 level by 2020 and 80% below 2050. However, there is growing political momentum outside and within the State House for changing the 2050 goal to 100% "net zero emissions". This means we need to reduce emissions by 55-75% in thirty years, or about 3% per year. Meeting any of these mandates will require action taken in all sectors, but *greening up*, or decarbonizing the electricity supply is a key strategy for achieving deep GHG reductions. We believe this to be especially true in the relative near-term, meaning the 2021-2030 decade.

The Commonwealth's Renewable Portfolio Standard (RPS) is the primary policy in this regard and has been in effect since 2003. The RPS requires regulated distribution companies (e.g., National Grid, Eversource, and Unitil) and competitive suppliers to provide customers with a minimum percentage of renewable energy content. Since 2018, it has been supplemented by a variation entitled the Clean Energy Standard (CES). The graph below shows how the RPS and CES will progress over time, bringing new renewables onto the grid at increments of 2% more per year which, as stated above, is not sufficient. However, mandates can be complemented by the voluntary purchase of renewable electricity to speed the transition from dirty energy to clean sources and that is where municipal aggregation can play a key role.



Clean electricity percentage included in the Massachusetts electricity mix from now to 2050

In the standard form of aggregation, a city or town purchases electricity in bulk on behalf of its residents and small businesses. This has often been done to deliver cost-savings and/or price stability relative to the utility's Basic Service option. But municipal aggregation can also be leveraged to dictate the content of a community's electricity supply. With this in mind, Green Energy Consumers and Good Energy, LLC developed a model intended to help cities and towns choose electricity supply that is significantly greener than Basic Service, while also delivering cost-savings and price stability. We call this model Green Municipal Aggregation (GMA). **The fundamental characteristic of GMA is a default electricity supply option that includes more Class I renewable content than is required by the state's RPS & CES.**

Additional Benefits of Green Municipal Aggregation

GMA has other benefits, too. The process fosters civic engagement and is a tool for outreach and education about clean energy. This is crucial at a time when public consensus is needed on how to mitigate climate change and create a new energy paradigm. GMA also spurs the development of new, in-region renewables (primarily wind and solar) that contribute to a faster transition to clean energy. This is because GMA creates ***additionality***, which is defined as the result of increased purchases of green power with verifiable GHG emission reductions over and above the state's mandates.

When a GMA purchases Class I RECs, it is essentially playing "keepaway" with the electricity suppliers that need Class I RECs to comply with the law. For example, if Somerville's aggregation is fed by wind RECs generated in Plymouth, MA, those RECs are not available for purchase by Eversource, National Grid, or another electricity supplier. Those companies therefore have to work a little bit harder to secure the RECs they need. The increase in demand for RECs then has to be met by supply.

As it happens, the track record of GMA shows that it has been able to put more renewables onto the grid at a lower cost to ratepayers than either utility Basic Service or products offered to individual consumers by competitive power suppliers. As more cities and towns turn to aggregation to decarbonize their electricity supply, the collective impact will be even more substantial and the resulting voluntary demand for new renewables will become a strong factor in the New England energy market.

Tour of the wind turbines at the Mann Family Cranberry Bog in Plymouth, MA. Two of the four turbines contribute RECs to aggregation supported by Green Energy Consumers.

Understanding Municipal Aggregation

With the passage of the 1997 Electric Restructuring Act, Investor Owned Utilities (IOUs), such as Eversource, National Grid, and Unitil, were required to sell off generation assets and operate solely as distribution companies by maintaining power lines and providing customer services such as metering and billing to electricity customers. Consumers were given the opportunity to choose a competitive electricity supplier that might offer better rates or content. A competitive supplier is an entity licensed by the Department of Public Utilities (DPU)[2] to sell electricity supply to customers as an alternative to Basic Service[3]. When an individual, business, or community contracts with a new electricity supplier, the transmission, distribution, and billing components of the system are maintained by the incumbent utility. Under the Restructuring Act, the IOUs would continue to offer Basic Service to customers who did not choose a competitive supplier, either on their own or from a municipal aggregation.

Since the law passed, many large energy users – manufacturers, office buildings, universities, hospitals – have chosen to contract with a competitive supplier, but residential and small business customers have tended to rely on Basic Service. Municipal aggregation offers a third alternative for consumers. It is the process by which a municipality (meaning a town or city) purchases electricity in bulk from a competitive supplier on behalf of the residents and businesses within the community. Aggregation, also known as community choice, restores transparency and consumer protection to the energy purchasing process by offering a well-vetted program and the ability to opt-out at any time without penalty.

A community may elect to pursue aggregation for a variety of reasons, most notably to reduce electricity prices and to achieve cost stability. Municipal aggregation also empowers communities to have more influence over where their energy supply comes. Thus, aggregation can be utilized to help a community increase the renewable energy content of its electricity supply or to reduce GHG emissions. This is the premise upon which GMA is based and why it is major aspect of the work we do at Green Energy Consumers.

Aggregation is a Cost-Saving Supply Alternative for Residential and Small Business Customers

Basic Service is the default electricity supply service provided to customers of a regulated distribution company who have not signed up with a competitive supplier. Most small electricity customers assume that Basic Service is the best deal available, but the Basic Service rate is volatile. This volatility is primarily tied to the cost of natural gas. The figure below illustrates the fluctuations in Basic Service for the state's two major utilities, Eversource and National Grid[4].

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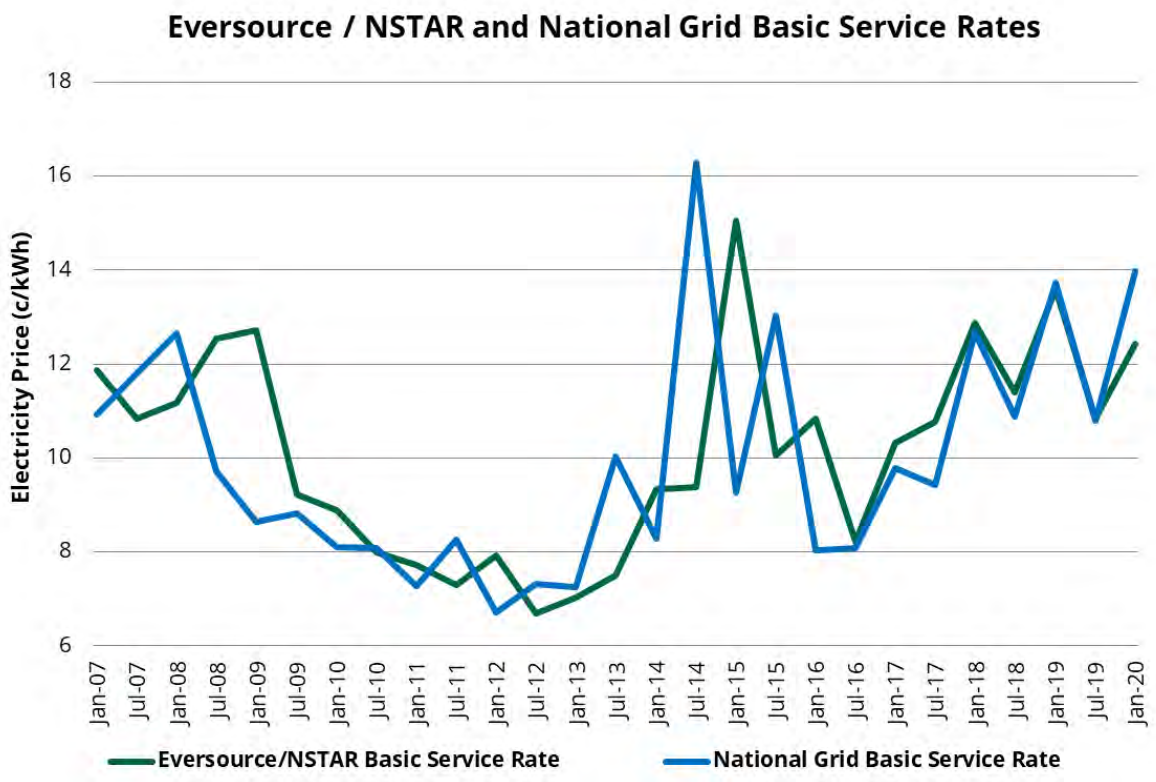
2 The DPU grants licenses to competitive suppliers based on a review of their technical and financial ability to offer such products. For additional information see www.energyswitchma.gov/#/faq/glossaryterms.

3 It is difficult for competitive suppliers to recoup customer acquisition costs while offering a product that legitimately provides value to the customer. Competitive suppliers may offer initial low rates, but consumers may be caught off guard to find those low rates adjusted upwards soon thereafter. As a consumer advocacy organization, Green Energy Consumers cautions against contracting with competitive suppliers for this reason. This is also why we argued in favor of aggregation twenty years ago.

4 www.mass.gov/service-details/basic-service-information-and-rates



Basic service rates for the two largest utilities in Massachusetts between 2007 and 2020

Citing this volatility, competitive suppliers often entice consumers with strategically timed and initially low variable rates that are less than the current Basic Service rate. Consumers who overlook the fine print can be caught off guard when the competitive supply rate is adjusted upward soon thereafter. By and large, individual residential customers and small businesses have been unable to find competitive electricity suppliers offering a better option than utility Basic Service over an extended period of time.

Massachusetts Attorney General Maura Healey has commissioned reports demonstrating how residential consumers have been hurt by competitive power supply companies. The AG's second report[5], released in August of 2019, expanded upon her office's original report[6] on the industry from March 2018 and found that Massachusetts electric customers who switched to a competitive electric supplier paid $76.2 million more than if they remained with their existing service during the one-year period from July 2017 to June 2018[7]. This new data brings the total net losses to $253 million for Massachusetts customers over the course of three years (July 2015 – June 2018). The AG's report also showed that low-income residents and communities of color are disproportionately negatively impacted.

Citing these reports, the attorney general has called upon legislators to stop the competitive suppliers from making direct solicitations to residential consumers. To be clear, the AG is talking about the market in which suppliers enroll customers one at a time rather than through municipal aggregation.

5 *https://www.mass.gov/doc/2019-ago-competitive-electric-supply-report*
6 *https://www.mass.gov/news/ag-healey-calls-for-shut-down-of-individual-residential-competitive-supply-industry-to-protect*
7 *https://www.mass.gov/news/ag-healey-report-massachusetts-residents-who-switched-to-competitive-electric-supply-continue*

The August report shows that of the 500,000 residents in the state that receive their electricity directly from a competitive supplier, low-income minority residents living in many of the state's gateway cities including Boston, Brockton, Fall River, Lawrence, Lowell, Lynn, New Bedford, Quincy, Springfield, and Worcester are continuing to be hit particularly hard by these companies. Low-income households participate in the individual residential electric supply market at twice the rate of non-low-income households, and on average pay rates that are 25 percent higher. The new report found that low-income households lost an average of $166 in the one-year period from 2017–2018.

Evidence in the AG's report suggests that consumers are usually better off sticking with their utility's Basic Service than signing up with a competitive supplier. However, a more complete analysis shows that consumers are generally best off when their community adopts municipal aggregation. Even communities with 5% or 10% more Class I RECs than required by law have been able to deliver savings over Basic Service.

Municipalities with aggregation programs are better able to ensure cost stability and price reductions because they are able to time their procurement advantageously. By contrast, IOUs are ordered by the MA Department of Public Utilities (DPU) to make their procurements within narrow windows in order to set a new price every six months on a fixed schedule.

Good Energy, the energy aggregation consultant for the communities supported by Green Energy Consumers, attributes the ability of aggregation to produce savings to the flexibility that aggregations have compared to Eversource and National Grid. The utilities are required by state law to procure power in six month increments. To do that, the utilities have to enter the market during fairly short windows of time. In some cases, they may hit favorable market conditions. In other cases, the IOUs may be forced to procure at an unfortunate time in the marketplace. By contrast, aggregations are allowed flexibility to time their purchase commitments for when, based upon their expert judgment, market conditions are more favorable for a contract of any length.

Town	Contract Length	Default % above requirement	Savings
Arlington	Aug 2017 - Nov 2019	5%	$2,127,450
Brookline	Jul 2017 – Dec 2019	25%	$2,978,090
Somerville	Jul 2017 – Dec 2019	5%	$5,178,628
Sudbury	Aug 2017 – Aug 2020	5%	$1,566,348
Winchester	Jul 2017 – Dec 2019	5%	$1,306,555

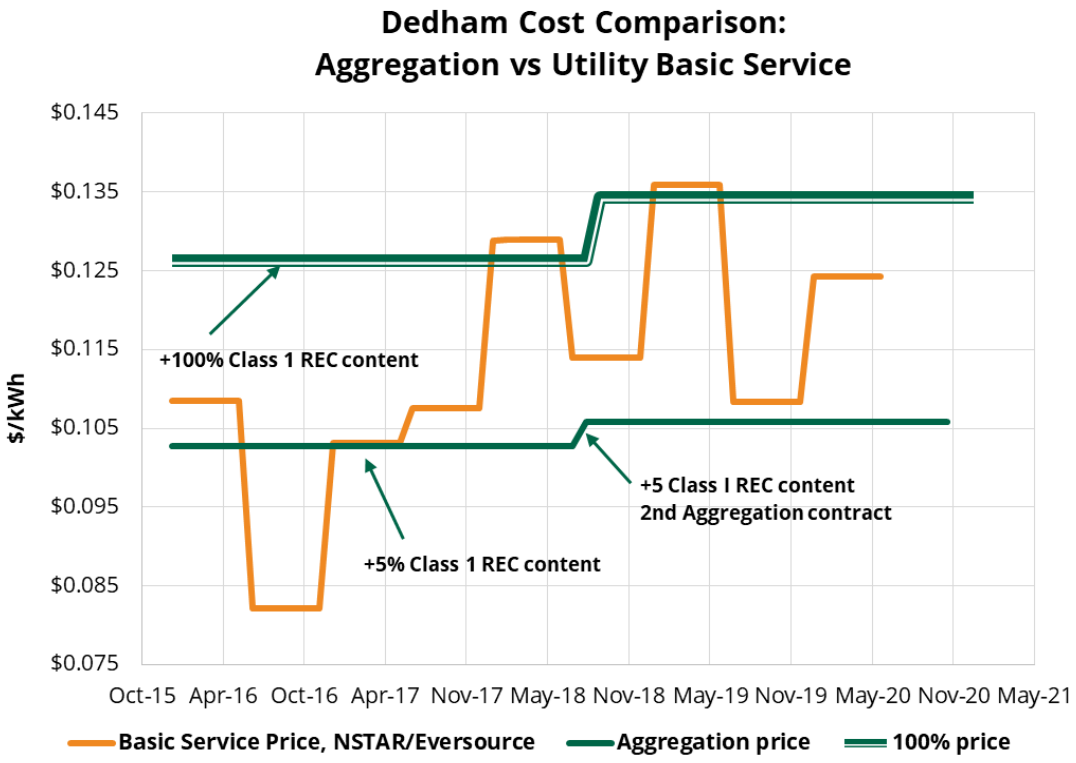
Savings delivered to customers through green municipal aggregation programs

Communities where GMA has been implemented are demonstrating that additional renewable energy can be delivered to Massachusetts residents and businesses affordably. As illustrated in the table on the previous page, several Massachusetts communities have leveraged their purchasing power to negotiate an alternative to Basic Service that is less expensive yet delivers more renewable content than the utility's Basic Service.[8]

Adding Class I RECs to the mix does come with an additional cost, but the record shows that even this incremental cost has been less than the incremental savings on electricity that the aggregations have been able to achieve. As a result, the net cost of GMA has been lower than Basic Service: in 2019 alone, with eleven active Green Municipal Aggregation programs under Good Energy's purview (Arlington, Brookline, Dedham, Gloucester, Hamilton, Melrose, Rockland, Stoneham, Somerville, Sudbury, Winchester)[9] the programs saved ratepayers $8,159,485.

Dedham and Brookline Savings Case Studies: Representative Examples

In January 2016, one of the first communities to launch GMA in partnership with Green Energy Consumers Alliance and Good Energy was the town of Dedham, which added 5% Class I renewable content to its aggregation mix. Now in its second aggregation contract, Dedham's program has provided a savings to the ratepayers between 2016, when it launched, and 2019, well into its second aggregation contract, totaling $2,352,239. As shown in the chart below, even though in some 6-month periods the utility's basic rate is lower than aggregation, over the length of the aggregation contract considerable savings are possible.

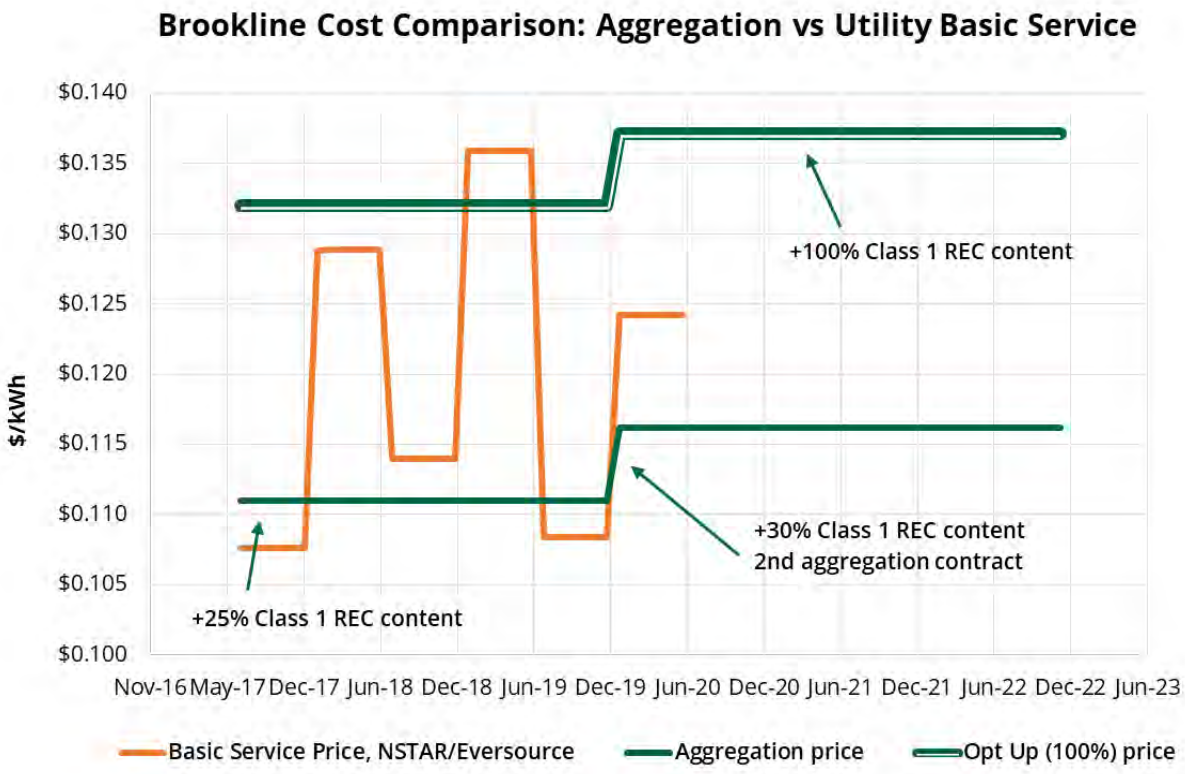


Cost comparison for the town of Dedham's aggregation program, including the 100% Opt Up option

8 Disclaimer. There is no guarantee of savings under the aggregation program as compared to the utility basic service rate because the utility electric supply charge changes every 6 months for residential and small business customers and every 3 months for large business customers

9 Bedford and Medford programs started in December 2019, thus their savings will be calculated starting in January 2020.

The town of Brookline, which launched its aggregation program in July 2017, made an even larger commitment to Class I REC purchases with 25% clean electricity above the state's RPS requirement and has maintained high participation rates. With the much bigger renewable electricity addition, the town program still saved its ratepayers $2,978,090 from 2017-2019. In January 2020, Brookline launched the second aggregation contract with 30% additional Class I RECs, which puts the total renewable electricity supplied to Brookline residents at 50% in 2020: the state's RPS and CES mandates add up to 20%, and 30% additional purchases goes beyond that requirement.



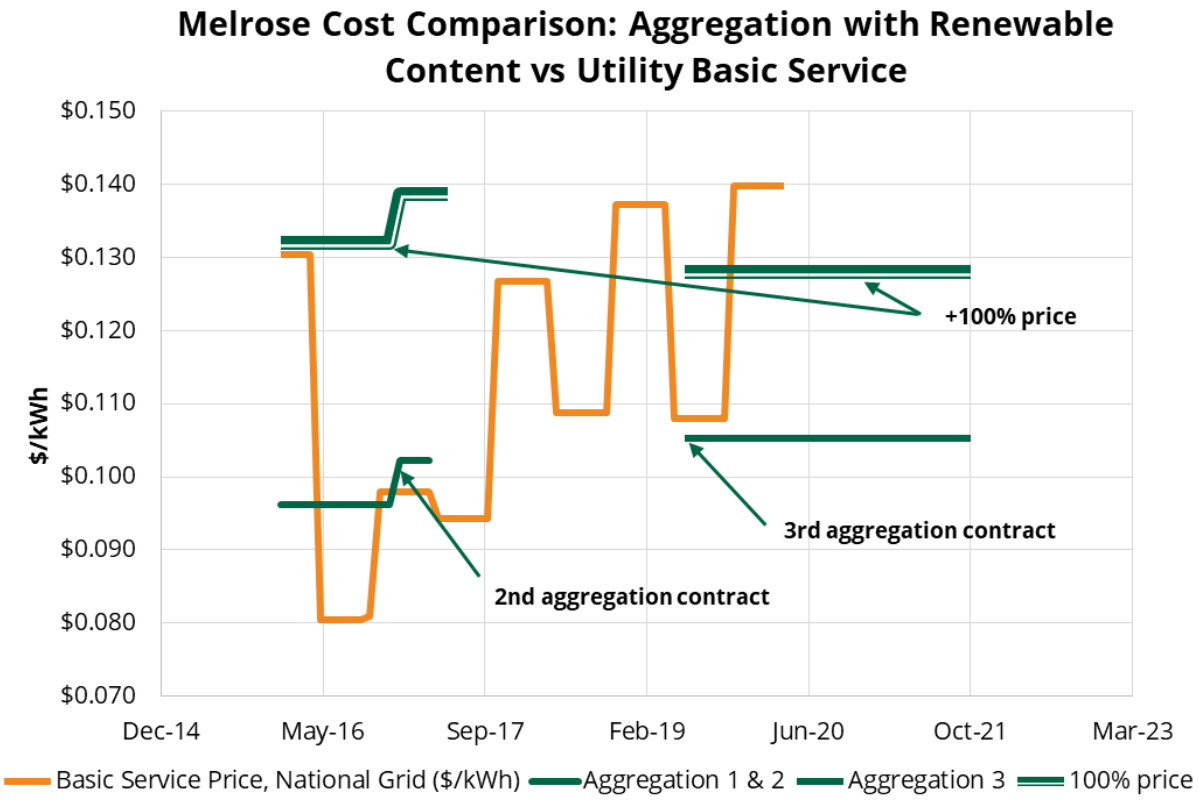
Cost comparison for the town of Brookline's aggregation program, including the 100% Opt Up option

Melrose & Gloucester Case Studies: Timing Can Be a Factor

The aggregation in Melrose saved its ratepayers approximately $200,000 for 18 months from January 1, 2016 through June 30, 2017. Unfortunately, circumstances in the electricity market caused Melrose to suspend their aggregation, switching ratepayers back to National Grid's Basic Service. In the summer of 2017, the wholesale electricity market in the Northeast Massachusetts (NEMA) load zone, where Melrose is located, saw a spike in rates due to an increase in the cost of capacity, a significant component of the cost of electricity supply.

The capacity charge, determined in the Forward Capacity Market (FCM), is a reliability charge paid by retail customers to power generators. It is intended to ensure that there will be sufficient generation capacity to meet demand on the hottest and coldest days of the year. The spike in the FCM was expected to last a year or two in the NEMA load zone and more than doubled in price, which represents over 30 percent of the overall supply rate and therefore has a substantial impact on electricity rates. When procuring supply bids to renew the Melrose aggregation program, bidding suppliers offered rates based on the higher cost of capacity costs from across the state, average low cost power for Western and Central Massachusetts (WCMA) and Southeast Massachusetts (SEMA) with higher cost power

for NEMA. As a result, for a short time, National Grid's Basic Service became the lower cost option for consumers in Melrose. However, when the capacity market returned to more normal levels, Melrose was able to restart its aggregation, which took effect in June 2019.



Cost comparison for the town of Melrose's aggregation program, including the 100% Opt Up option

In a related situation, the City of Gloucester's aggregation was approved by the MA DPU in January 2017 but Good Energy determined that it was prudent to delay activation until the FCM settled down. As a result of the patience displayed by both Good Energy and Gloucester, the aggregation has resulted in very significant savings since it began operation in December 2018.

Finally, in all of the aggregations coordinated by Good Energy, consumers are given the right to opt-down to an electricity mix that includes only the amount of Class I RECs required by state law. This choice is available to a consumer who might be especially price-sensitive. And by state law, consumers are also afforded the right to opt-out at any time without penalty.

Good Energy serves many towns and cities with aggregation programs: some are brown (i.e. no additional renewable content), some are green with at least 5% renewable content. Between 2016 and 2019, the programs saved over $65M to the ratepayers in participating communities. Aggregation is a powerful tool for savings and Green Municipal Aggregation is a powerful tool to harness those savings to speed the transition from fossil fuels to renewable electricity generation.

Green Municipal Aggregation in Massachusetts

Municipal aggregation has been possible since 1997, but Green Municipal Aggregation (GMA) was a new concept until a few years ago.

It all began in late 2014 when energy broker Good Energy, LLC. entered the Massachusetts market offering consulting services to cities and towns exploring municipal aggregation. Good Energy saw that some communities were interested in using aggregation to advance their clean energy goals and went to Green Energy Consumers for support. The two entities, one for-profit and the other non-profit, collaborated to develop the GMA model, which focused on incorporating additional Class I renewable energy into the supply mix of aggregation programs.

In early 2015, the Metropolitan Area Planning Council (MAPC), acting on behalf of the City of Melrose, issued a Request for Proposal (RFP) to help the city select an aggregation consultant. Good Energy was selected and Melrose was the first community to adopt the GMA model. The town of Dedham followed closely behind. On January 1, 2016, Melrose and Dedham began their aggregations with electricity supply that cost less than Basic Service while also providing five percent more Class I RECs than required by the RPS.

In September 2015, MAPC issued another aggregation RFP with a call for proposals aimed at creating additionality and GHG emissions reduction. Through a competitive process, Good Energy was again selected as the preferred vendor for all of the 101 communities in the MAPC service area.[10] In the summer of 2017, several more communities adopted the GMA model and hired Good Energy as their consultant: Arlington, Brookline, Somerville, Sudbury, and Winchester. Good Energy worked with the communities to develop plans, garner approval from the Department of Public Utilities, to aggregate their electricity supply with more renewable energy than required by state law.

For their first aggregation contracts, Melrose, Dedham, Arlington, Somerville, Sudbury, and Winchester created a default electricity product which included 5% more Class I renewables above the RPS. By default electricity product, we mean that everyone in the community who was on their utility's Basic Service rate plan, which is used by most residents and small businesses, would be brought into the aggregation program unless they opted-out. In each community, consumers were also given the opportunity to "opt-up" to a 100% renewable energy option. Arlington also created a 50% option. For its first contract, Brookline raised the bar to 25% with its default product. In all these cases, Green Energy Consumers provided the incremental percentage of RECs above the state's standard. The aggregation's electricity supplier was responsible for the RECs required to meet the RPS.

In 2018 and 2019, Good Energy and Green Energy Consumers added several more communities to their roster - the cities of Gloucester and Medford, and the towns of Bedford, Hamilton, Rockland, and Stoneham, all at 5%.

10 Good Energy's selection by the screening committee does not obligate any city or town to hire Good Energy and some communities have chosen different consultants.

Also in 2019, several of the 2017 communities signed contracts to extend their aggregations from 2020-2022, becoming the first group in the state to do so with the GMA model. These communities were – Arlington, Brookline, Somerville, and Winchester. Furthermore, those communities elected to increase the percentages of Class I RECs in their default products: Somerville and Winchester went from 5% to 10%; Arlington went from 5% to 11%; Brookline from 25% to 30%.

The Impactful Math of Aggregation

In 2016, Melrose and Dedham started with 5% or more renewable energy in their default product compared to the utility's Basic Service. At that time, the state mandate was 11%, so the 5% increase actually resulted in **45% more** renewables than required by the RPS.

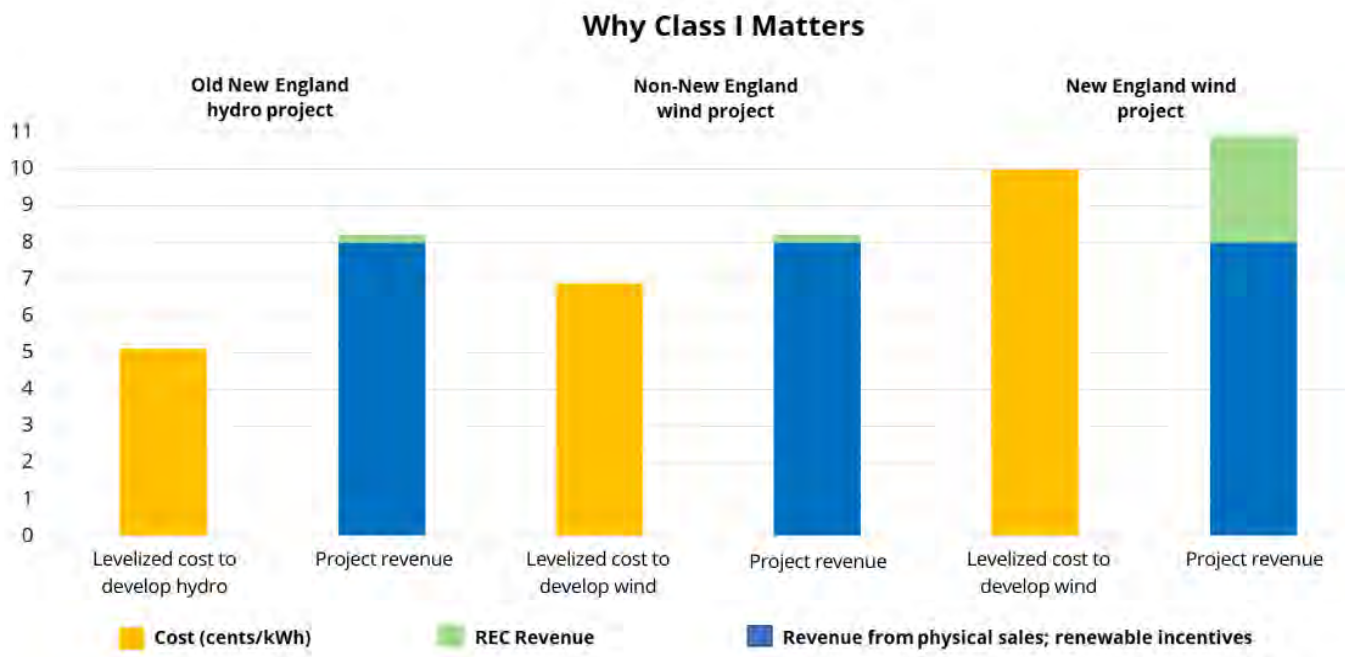
In 2020, the RPS/CES combined standards require 20% Class I resources. So communities such as Somerville with a 10% default product, are demanding **50% more** Class I renewables than required by the RPS/CES mandates. And Brookline with a 30% default product, actually demands **150% more** renewables than the RPS/CES.

It is important to note that until the RPS/CES requirements become much higher, the incremental addition in demand caused by GMA is very significant.

The communities mentioned above are demonstrating that additional renewable energy generated within the region can be procured in a manner that promotes GHG emission reductions while delivering savings to consumers. When clean energy is prioritized and requirements for the source or type of supply are layered into the contract, municipal aggregation becomes an excellent tool to help increase demand for renewables and reducing GHG emissions, while also allocating costs and benefits equitably.

We cannot emphasize enough that the benefits of GMA are produced without public subsidy. The benefits of stable and lower rates with increased renewable energy content are produced through market forces. The term managed competition applies well in this case.

It is crucially important to understand that not all aggregations are created equal, particularly when it comes to leveraging community purchasing power to accelerate adoption of Class I resource. Some community aggregation programs rely on **out of region** RECs or Massachusetts Class II RECs to make their green claims. REC purchases of this sort do nothing to transform the renewable content of the regional electric grid. These programs do a disservice to consumers within those communities and cause confusion among people who are trying to chart a course to a greener electricity grid.



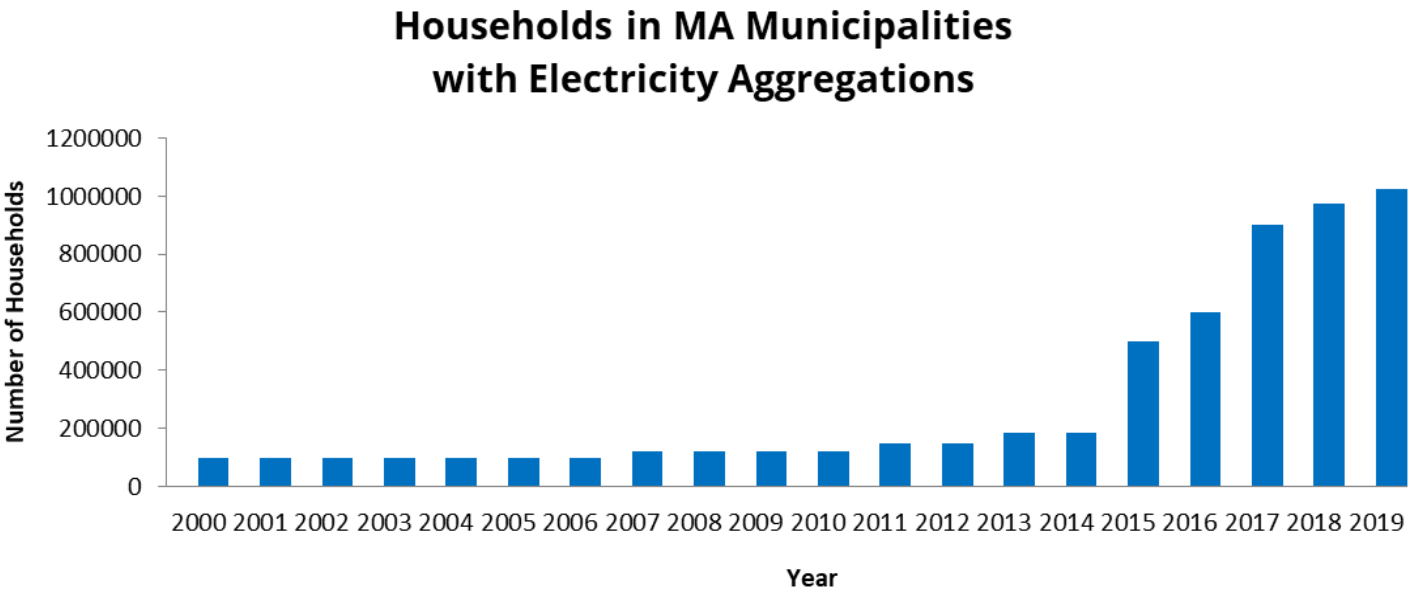
This graphic illustrates the importance of New England Class I RECs relative to other types of RECs available on the market. Class I REC revenue is necessary to make projects financially viable in New England.

This graphic illustrates that the whole point of the REC purchase is to be the difference maker in a market for renewable energy, to act as a driver for development of additional renewable resources above what is currently required by the RPS. Only then does the resource have the ability to displace fossil fuels in New England.

In a couple of cases when aggregation started rolling out in 2017, some community aggregation programs were making a claim that their aggregation includes "25% more solar than required by state law". While that seems appealing at first impression, the details of their aggregation are such that they are adding 25% more only to the solar requirement portion of just 4.5% of the RPS for 2017, which amounts to an overall increase of just over one percent more renewable energy in the final mix. Green Energy Consumers and Good Energy exclusively operate procurements of Class I RECs. As you contemplate what type of resources to include in your community's mix, beware of greenwashing.

Aggregation's Growth in Massachusetts and its Renewable Energy Demand

The number of households served by municipal aggregations has more than quintupled since 2015. At the end of 2019, about half the households in the Commonwealth were served by municipal aggregation.



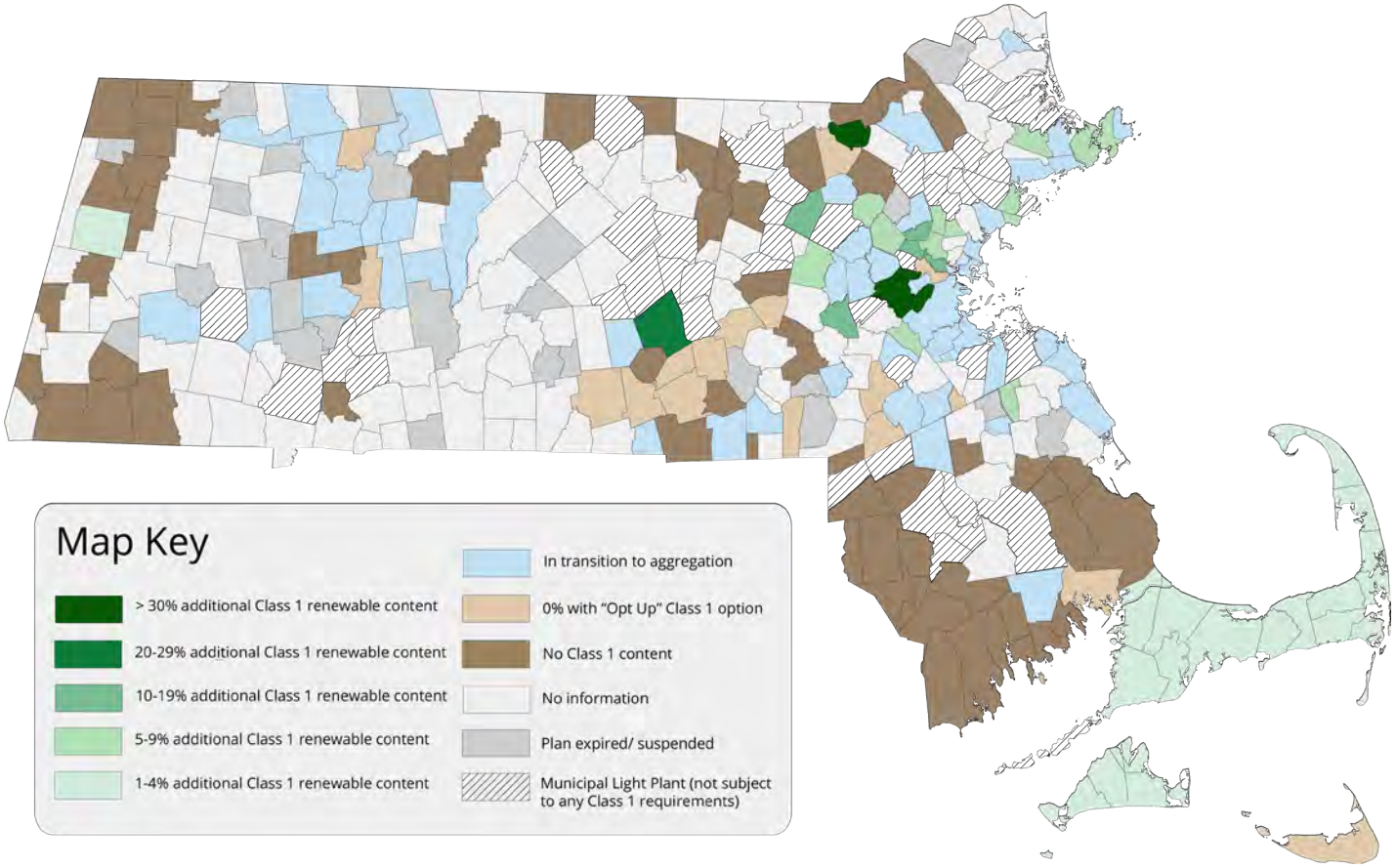
Households in Massachusetts that are served by municipal aggregation increased substantially once Good Energy entered the market and then added Green Municipal Aggregation

The Commonwealth's leading environmental organizations also agree that Class I RECs are paramount.

"We hereby recommend that voluntary renewable energy purchases result in the retirement of Massachusetts RPS qualified Class I RECs."

greencambridge
Vineyard Power Our Energy Co-op
Clean Water Action
Mass Audubon
MCAN Mass Climate Action Network
Acadia Center
Environmental League of Massachusetts
Mothers Out Front Mobilizing for a Livable Climate
American Lung Association Fighting for Air
clf Conservation Law Foundation
CABA Climate Action Business Association
Sierra Club Founded 1892

Below is a map of the **145 cities and towns** in the Commonwealth that have an approved aggregation program or are in the process of developing an aggregation plan. Not all communities are using their bulk purchasing program to add new local renewable energy. Many of these aggregations have a supply that is the same as Basic Service: "brown power" including the minimal RPS/CES requirements. Some have negotiated an aggregation whose default offers less than or equal to 1% more renewable content than the RPS/CES or whose standard aggregation includes an optional offer to opt up to more Class I RECs. Seventeen of the 145 communities, shown in dark green, have aggregations whose default supply includes 5% or more Class I exceeding the minimum required to comply with the state's RPS and creating the additionality needed to change our grid.



The map shows communities with various shades of aggregation, not just the ones served by Good Energy and Green Energy Consumers. For communities we do not serve, we are making educated guesses about their aggregation's renewable energy content based on the size of the community and renewable content information on their program websites.

Note that we are only counting what we believe to be demand for **Class I Renewable Energy Certificates (RECs)**[11], which is the proper standard for New England. We took our knowledge of the communities we serve, the guesses about the communities we do not serve, and estimates of when all those communities listed as *In Progress* on the map above will go into operation and did some math. According to our analysis, by 2022, aggregation programs in Massachusetts will add well over 500,000 megawatt-hours per year of demand for Class I renewable energy. That's truly remarkable!

11 *blog.greenenergyconsumers.org/blog/class-i-recs*

Several aggregations are adding five percent Class I green power, but increasingly we are seeing aggregations come in at ten percent additional Class I green power or more. If the trend towards high percentages is sustained, we might see 700,000 megawatt-hours per year of additional renewable energy attributable to municipal aggregation by 2022.

For some perspective, that's enough power to meet the needs of over 100,000 homes. To put it yet another way, a good-sized, well-sited wind turbine can generate about 3500 megawatt-hours per year, so aggregation is supporting the equivalent of about 200 such wind turbines.

We should also note that the town of Concord, which has its own municipal utility, has committed to zero-emission electricity by 2030 and will be ramping up its purchases of Class I RECs. Municipal utilities are exempt from the Renewable Portfolio Standard that applies to National Grid, Eversource, Unitil, and competitive electricity suppliers. That's a policy mistake that the legislature should fix, but we should give Concord credit for what it is procuring even beyond what the Renewable Portfolio Standard would have required.

Top of a wind turbine in Scituate, Massachusetts

In 2019, the MA Renewable Portfolio Standard (RPS) obligated electricity suppliers to purchase about 6.7 million RECs. Therefore, we are seeing the possibility that the voluntary market in Massachusetts will create about ten percent of the overall demand for renewable energy. This is meaningful.

Another key point is that many of the aggregations we serve have expressed a preference to buy RECs from what they deem to be the best eligible sources – such as wind, solar, anaerobic digestion, and low-impact hydro. Class I has a broader definition, but communities can exercise discretion. They have also expressed preference for projects that are local. Buyers who need Class I RECs can technically buy from projects located in New York and Canada, but we prefer projects close to home. Think of it this way: you can go to the grocery store and buy tomatoes from anywhere. Or you can buy better tasting, organic tomatoes from a nearby farm.

Facts: According to the Mass. Department of Energy Resources, in 2017, 38% percent of the Class I renewable energy used to comply with the state's Renewable Portfolio Standard was from projects located in Massachusetts[12]. In comparison, in 2019, 86% of the Class I renewable energy supplied by Green Energy Consumers Alliance to aggregations was from projects located in Massachusetts.

The environmental and economic benefits are tangible and significant, but are intangibly enhanced in a big way when you consider how people in so many cities and towns are engaging in the necessary discussions about where their energy should come from. The civic participation that comes out of this is as powerful as the electrons. By itself, the green aggregation model is not enough to end the climate crisis. But it's undeniably a success story.

12 *https://www.mass.gov/doc/rps-aps-annual-report-2017/download*

Greening the Municipal Load is a Logical Extension of GMA

Communities looking to GMA do so with a particular purpose in mind – which is to cost-effectively add more renewables onto the grid. GMA does so generally by harnessing the purchasing power of residential and small commercial accounts. Most large customers prefer to buy from a competitive power supplier. And more often than not, cities and towns buy electricity for their municipal functions (i.e. schools, fire stations, streetlights) from competitive power suppliers because they can get a better deal than utility Basic Service. GMA can and should include the city or town electricity accounts as well. At a minimum, those accounts should receive the same renewable energy content as the GMA's default offering. We recommend that communities leverage the heft of the public accounts to purchase 100% green power through long-term contracts for these reasons:

It's a simple matter of leading by example.

The electricity load for the municipality is already subject to the state's Renewable Portfolio Standard and Clean Energy Standard. So over the life of the long-term contract, an increasing portion of the RECs from a long-term contract could be applied to the obligation of meeting the state mandates. In other words, the municipality already has to pay for RECs, whether directly through mechanisms like this or indirectly as part of the electricity supply they get from a competitive power supplier. If the municipality already has the RECs it needs to meet the RPS/CES mandates, the electricity supplier it hires can take those costs out of the price it charges the municipality for the electricity service.

The community will have rights to the RECs from the project and could, if it wanted to, sell those RECs that are not required by the RPS/CES to the aggregation. That would contribute to the aggregation's renewable energy content and reduce the cost to the city or town's budget.

Long-term contracts are especially helpful in terms of helping new projects get built. The long-term contract will be useful in securing equity and debt investment into the project. A city or town could select a project under development and be patient as the project proceeds along the process of getting financing, permits, interconnection with the grid, and construction.

The project itself could be located within the community or possibly even on public property in order to maximize local public benefits. A positive variation on this is for one or more communities to jointly participate in such a project as a regional collaboration.

The direct purchase of RECs from a municipality separate from an aggregation does not require approval from the Department of Public Utilities.

"Somerville is committed to leading by example and reaching net zero emissions as soon as possible, no later than 2050, and a big part of that is reducing the fossil fuel component of our electricity consumption. RECs are an impactful way to do that, and they also provide economic and environmental benefits in our region."

- Oliver Sellers-Garcia, Director, Office of Sustainability and Environment at the City of Somerville

The city of Somerville is an example of a municipality that has started to address the greenhouse gas emissions in their municipal electricity supply through the voluntary additional purchase of RECs for their electricity usage. Following an analysis funded by a Municipal Energy Technical Assistance (META) grant from the Department of Energy Resources, the city's decision makers chose to hold a competitive procurement for Class I RECs, which was won by Green Energy Consumers Alliance. The purchase, which was executed for the first six months of electricity in 2020, covers approximately 16% percent of the city's electricity usage. This percentage is even higher than the municipality's green aggregation program for Somerville's residents and small businesses, which added 10% Class 1 REC content for that same time period. Somerville's first green municipal aggregation program, which ran from July 2017 to December 2019 with 5% additional Class I contribution, retired approximately 18,580 RECs and has been renewed for another 3 years with 10% additional REC purchases.

The city has started planning for the short and long term of their energy usage by hiring an Energy Manager whose sole focus will be the energy consumption of city operations and moving them to a net zero emissions commitment.

Aggregation Allows for Innovation

As we discuss further in Appendix 1, Massachusetts is part of the New England Power Pool. A consumer in any one of the six states of New England can be served by a supplier procuring electricity from any power plant serving the region, as well as the adjacent control areas of Canada and New York that export power into our region. In New England, the marginal resource, meaning the last one needed to meet additional demand, is natural gas. For this reason, putting more renewable energy onto the New England grid displaces fossil fuel generation, consumption, and GHG emissions. For this fundamental reason, Green Energy Consumers strongly prefers wind turbines anywhere in New England, New York, or Canada over fossil fuels. We discourage activists from framing a debate as a battle over which is better, out-of-state wind or local solar. Both are needed, along with energy efficiency, to reach our GHG reduction goals.

Nonetheless, for communities wanting to fight climate change by making the shift from fossil fuels to clean energy, a healthy impulse is to develop solutions right within the city limits. This creates all sorts of opportunities for resilience, job creation, and price stability.

What the Statute Says About Innovation

The Massachusetts 1997 legislation that enables aggregation allows a community to develop energy programs that go far beyond electricity supply procurement. It states that a community may petition the Department of Public Utilities for control of funds collected for demand-side management. This means the aggregation could potentially administer the Mass Save energy efficiency program rather than the investor-owned distribution company. A community may go further or broader and "group retail electricity customers to solicit bids, broker, and contract for electric power and **energy services** for such customers." It also states the aggregation "is not prohibited from proposing for certification an energy plan which is **more specific, detailed, or comprehensive or which covers additional subject areas** than any such state-wide conservation goals."[13]

13 *malegislature.gov/Laws/GeneralLaws/PartI/TitleXXII/Chapter164/Section134*

This should be interpreted to mean that DPU approval of innovative approaches is possible but not automatic. It would behoove a community to be explicit in its plan about how ratepayer dollars would be spent, not just to garner DPU approval but also to build a strong consensus within the community.

The legislation also allows a municipality to apply to the Massachusetts Clean Energy Center (Mass CEC) for additional funds to be used for clean energy programming. But again, Mass CEC approval is not guaranteed.

The Concept of the Adder in Aggregation Programs at a High Level

Innovation usually requires money. The statute allows communities to petition the DPU to charge an adder on top of the electricity supply charge that can then be used to finance one or more activities. Some communities in the Commonwealth already have such an adder. Those that are served by Good Energy and Green Energy Consumers do not at this time.

An adder could be any amount, perhaps on the order of $.001/kWh, or 1/10 of a penny. It would be collected through the customer's bill and could help finance activities such as:

- the time of municipal staff or consultants for tasks such as energy planning;
- supporting promotional activities for things such as solar, heat pumps, Mass Save, and electric vehicles;
- direct investment in renewable energy projects that might feed into the aggregation;
- direct investment into community energy projects such as storage, micro-grids, and electric vehicle charging stations.

It is important to acknowledge that a community wishing to include an adder into its aggregation program should be prepared for a higher level of scrutiny from the DPU.

An Adder Specifically Dedicated to a Long-term REC Contract

We recommend that consideration be given to an adder that would support a long-term contract for RECs. Aggregations in Massachusetts have generally been based upon a series of 1-3 year contracts with energy suppliers. Contracts of that length are capable of financing the purchase of RECs, but not through long-term contracts. Long-term contracts are more useful to generators insofar as securing investors to give the money to build their project and they could be useful to a community wishing to support a specific project in its own backyard.

The scenario that we envision would have an adder dedicated to a long-term, say 10-year, contract for RECs. The adder would be collected over the 3-year term that the aggregation would have with its electricity supplier. In each year, 10 percent of the total adder receipts would be used to buy the RECs that it could assign to the aggregation. The balance would be placed in an escrow account that could only be used to purchase RECs. As long as the project in question was producing RECs, it could be paid from the escrow account. If the project fails to produce, for whatever reason, the escrow account would not have to pay the generator in default. But the money in escrow could be reallocated to purchase RECs from another source. In either event, it would be relatively straightforward to ensure that people got what they paid for, which is more renewable energy than required by state mandates.

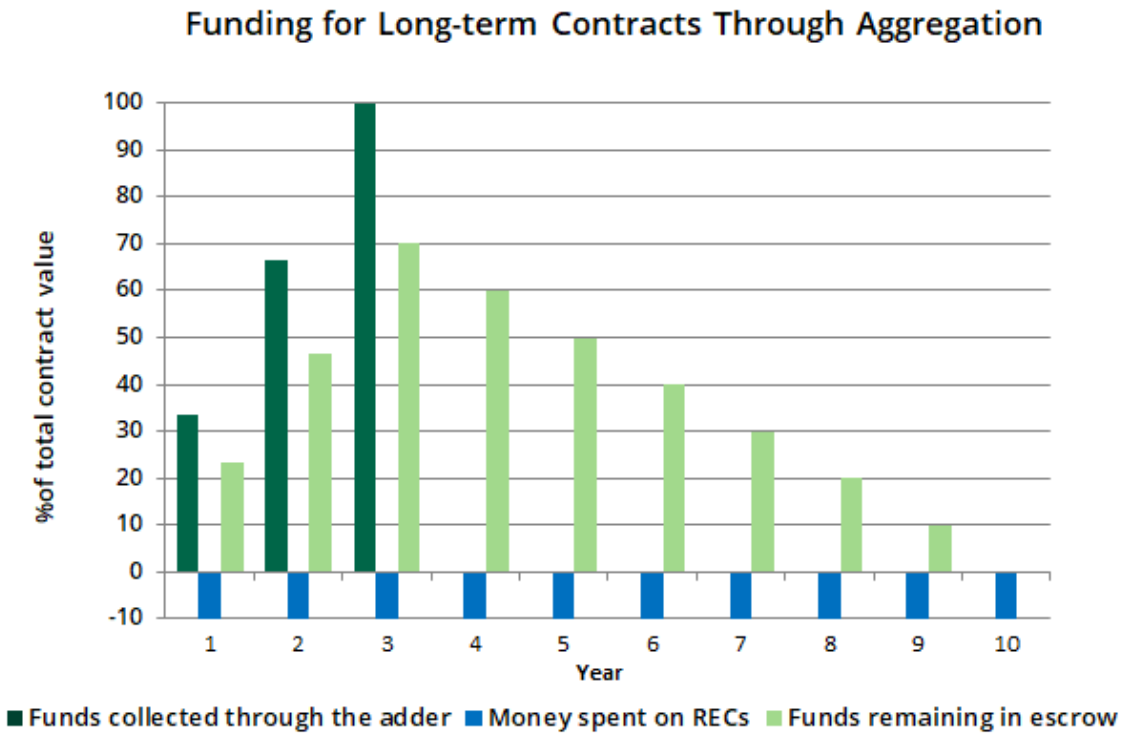


Illustration of project financing possible through the adder in an aggregation program

Over time, the aggregation could enter into additional such arrangements and overlay each one on top of the other. Eventually, a considerable portion of the aggregation's load could be met by long-term contracts.

As with any other type of adder, the details of this kind of plan would be subject to scrutiny by the DPU.

Energy Efficiency

Amory Lovins, co-founder of the Rocky Mountain Institute and perhaps the most influential person in the field of clean energy, has said that energy efficiency is "the lunch you're paid to eat." This means that money spent on efficiency yields a rate of return. That is why efficiency should be at the top of the priority list at all levels – world, nation, state, community, and personal. It can also play an important role in municipal aggregation.

Many communities looking to aggregate may take notice of the pioneering work of the Cape Light Compact, the state's longest running aggregation, serving 21 towns on Cape Cod and Martha's Vineyard. The Compact focuses just as much effort on efficiency as supply and actually launched its efficiency program in 2001 before its supply program. As an aggregator, the Compact successfully petitioned the DPU for the right to administer revenue (i.e., ratepayer funds earmarked for efficiency, proceeds from Regional Greenhouse Gas Initiative auctions, and Forward Capacity Market payments) to finance its local version of the Mass Save energy efficiency programs.[16] Some communities might be contemplating following the Compact's example. But Green Energy Consumers suggests caution, based

upon our experience closely monitoring performance statewide of the Mass Save program.[14] There are two fundamental points, somewhat working in opposite directions, worth acknowledging before drawing hard conclusions:

1. Massachusetts has the #1 rated efficiency program nine years in a row. Eversource, the Cape Light Compact, National Grid, Unitil, and the state's gas utilities have been the program administrators all this time. From this perspective, a new municipal aggregation ought to think about its ability to improve upon the performance of the incumbents.

2. Notwithstanding the #1 ranking, the Mass Save program has substantial room for improvement. There are two state laws that should be driving program goals. The Green Communities Act says that we should capture all energy savings that are cost-effective (i.e. costing less than purchasing supply). It is an established fact that the Mass Save program falls far short of that directive. Program evaluations show that the Mass Save electricity and gas programs have Benefit-Cost Ratio much higher than required, which indicates that much more energy could be saved before costs exceed benefits.[18] Because we have higher supply costs to avoid here in the Bay State than most other states, we are still not optimizing our investment in efficiency.

So, from the perspective of meeting the needs expressed by the two key statutes, the operative question is whether an aggregation can add value by becoming an efficiency program administrator. At Green Energy Consumers, we come down on these questions by suggesting to municipalities that instead of taking over total administration of the efficiency programs, a community dedicate itself to becoming more deeply engaged in efficiency policy development and implementation in ways that are more likely to add value. There are economies of scale in program administration that a community should acknowledge. The Cape Light Compact has 200,000 customers. Other than Boston, no single community in Massachusetts is at that scale.

We encourage aggregators to participate in the process of developing the Three-Year Plans for Mass Save required under the GCA. Aggregators would also do well by operating strong community-based social marketing campaigns directed at increasing participation in the Mass Save program. Regardless of which category a community finds itself in, the operative question is what an aggregation could do to substantially improve energy savings above the historical record.

Towards that end, the Mass Save program would benefit from more transparency and monitoring by informed citizens across the Commonwealth. Access to program data at the community level has improved recently, but still has a ways to go. We encourage aggregations to demand from their utilities richer and more timely data than is currently available at **www.masssavedata.com** and *reports submitted to the Energy Efficiency Advisory Council.* [15]

14 We recommend reading the Green Communities Act which governs the energy efficiency program. www.mass.gov/energy-efficiency-activities-of-utilities. Information about RGGI may be found at www.rggi.org. Information about the Forward Capacity Market may be found at www.iso-ne.org.

15 ma-eeac.org/results-reporting/

Solar

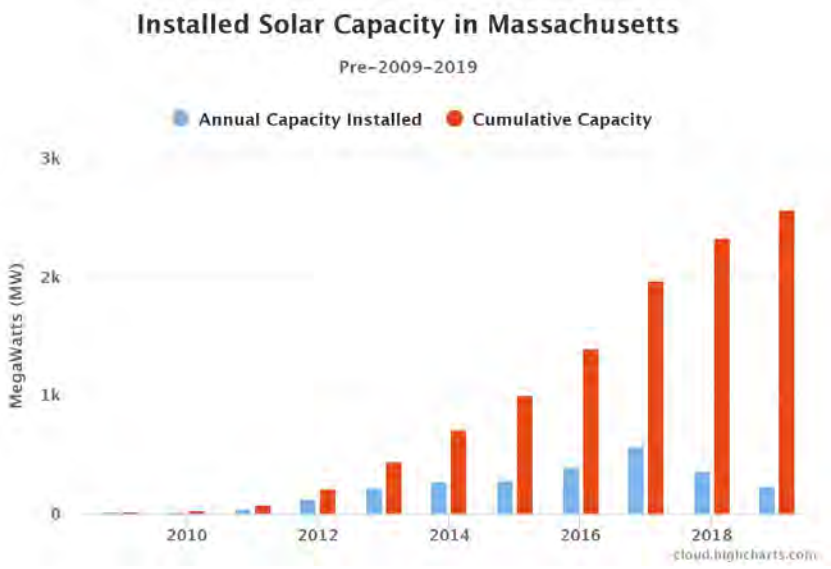
We often hear advocates claim solar is not going onto everyone's rooftop and that we need policies to make photovoltaics more broadly accessible so that we can "bring the sun to everyone." There are some excellent models being developed regarding solar on affordable housing and microgrids. But we think it is critical to remember that solar is already a part of everyone's mix thanks to the RPS. We are all paying for it in proportion to our consumption, and we are all enjoying its environmental benefits.

GMA and solar can definitely go together, but the details are more complicated than one might expect because of the complexity in the ways the Commonwealth of Massachusetts incentivizes solar.

Before the Green Communities Act was passed in 2008, all resources eligible for the Class I Massachusetts RPS were placed into the same market. Wind, solar, landfill gas, and other eligible projects all competed against one another and all fetched the same value on the REC market. Because solar was and remains more expensive than the other eligible resources, the "old-RPS" was not effective at driving solar development until the Green Communities Act (passed in 2008) changed the RPS beginning in 2010.

To provide a deeper subsidy than other Class I resources, the Green Communities Act created a Solar Carve-Out within the RPS. Starting in 2010, solar RECs (SRECs) began earning about ten times what other Class I RECs are earning.

The graph to the right clearly illustrates that the Solar Carve-Out has had a dramatic effect on the amount of solar generation installed in Massachusetts.



An aggregation will not get a very big bang for its buck by purchasing SRECs because they are so much more expensive than the other resources. However, after 10 years, a solar facility becomes ineligible for SRECs creation; instead it can earn a basic Class I REC. This means that solar facilities built between January 2010 and November 2018 will eventually create Class I RECs that will be added onto the market and those could become a feature of a green aggregation.

For 2018, Massachusetts made yet another change to the solar market by launching the Solar Massachusetts Renewable Target (SMART) program, which will reduce the effective REC value of new projects below what SRECs are earning, but keep them significantly higher than Class I RECs.[16]

In the SMART program, the energy and RECs from a solar project are bundled together and sold to the distribution company (i.e., Eversource, National Grid, or Unitil) at one compensation rate. Rates differ by size, category and distribution.

16 On January 11, 2018, MA Department of Energy Resources announced initial compensation rates for the SMART program, ranging from 15 cents to 40 cents per kWh depending upon the project size and category. These rates include the imputed REC value.

The 1997 legislation enabling aggregation opens the door to placing an adder on the supply portion of the retail bill in order to assist in the financing of energy projects, including solar installations. But it is important to understand how an aggregation might support solar within the context of the state's new Solar Massachusetts Renewable Target (SMART) program. With SMART, the distribution company will place solar RECs into their portfolio for the purpose of meeting their Class I obligation. There does not appear to be a way for a municipal aggregation to plan to directly buy RECs that originate within the SMART program. Should the utility end up having more Class I RECs than they need to comply with the RPS in a given year, they would then sell excess Class I RECs into the market.

A direct investment in a solar project by an aggregation that involves selling energy and RECs to the local distribution company under the SMART program would have these key attributes and questions:

- Presumably there would be a positive rate of return assuming the project's costs were less than the revenue it would earn over time. Additionally, there is a question about whom that rate of return would benefit. Would it be to the site host, whether it is the municipality itself or a private entity? Or would it somehow flow back to the aggregation.
- What would happen if the direct investment incurred a financial loss? How would that impact ratepayers in the aggregation? There are some risks to direct investment. With direct investment, it is more difficult to guarantee to a ratepayer that they will "get what they pay for" than it is through a REC Purchase Agreement, in which the buyer only pays for the RECs that are delivered.
- If the project is developed through SMART and REC is sold to the distribution company, there would be no *additional* solar brought to the Commonwealth as a result of this transaction because the SMART program is currently authorized to support a limit of 1600 MW of new solar for the entire state. The transaction could, however, be credited with causing solar to be built within the community.
- A REC sold to the distribution company so that the utility may comply with the Massachusetts RPS means that the aggregation may not claim GHG reduction for the term of the SMART contract, which could be up to twenty years. That would be double counting. It is critical to avoid double counting because it creates an impression to the general public that more progress is being made on clean energy than is actually occurring.

Direct Solar Investment Outside the SMART Program

Developing solar projects outside the SMART program would allow a GMA to claim credit for the GHG reduction and add to the amount of solar developed within the Commonwealth.

Depending upon the size of the project and how much incentive is paid to the developer, a local solar project would cause a GMA to incur a premium of about five times that of purchasing a Class I REC at today's prices. Solar costs are expected to continue falling over time, so the differential should fall as well. A community may want to occasionally explore its options through Requests for Proposals to determine whether the premium is affordable. Whether a solar project is developed through SMART or outside SMART and whether the REC would be retained for local GHG credit or not, a key practical consideration is whether an adder placed on the retail supply charge for consumers in a GMA would (a) provide enough capital to develop projects at a meaningful scale, and (b) come at a cost acceptable to the community.

Other Solarize Models: Many communities in Massachusetts have successfully worked with the Massachusetts Clean Energy Center (Mass CEC) on the Solarize Massachusetts model, which seeks to increase the adoption of small-scale solar electricity in participating communities through a competitive solicitation process that aggregates homeowner buying power to lower installation prices for participants.[17] Green Energy Consumers endorses the Solarize Model and has worked with Mass CEC twice on a similar concept called Solar Connect. In our second **Solar Connect**[18] program, we partnered with **Energy Sage**[19], an on-line platform for consumers. A sustained effort over many years could develop a substantial amount of local solar and GHG reduction in the out-years. An aggregation might want to consider supporting such a program.

Backyard solar array in Andover, Mass.

Electrification of Transportation and Heating

The time has come to shift transportation from oil and diesel to electrification. That means electric passenger cars, buses, and more. As mentioned above, a vehicle running on Basic Service is responsible for just 25% of the emissions of an electric vehicle running on gasoline or diesel. The difference will grow over time as the Renewable Portfolio Standard and Clean Energy Standard displace fossil fuels with zero-emission power. But a car powered through GMA would always have even lower emissions.

Aggregation plans could leverage the low-emission profile of their supply to include components designed to increase EV adoption. Potential ideas:

- Encourage off-peak charging for those charging at home;
- Build out public charging stations;
- Support the purchase and/or charging of electric school buses.

Another form of beneficial electrification is shifting buildings from oil- and gas-fired space heat to high-efficiency, cold climate air source heat pumps. Heat pumps are now supported by both the Mass Save program and the Massachusetts Clean Energy Center. Some communities have already conducted programs for heat pumps patterned after the Solarize model under the **HeatSmart**[20] brand with support from the Clean Energy Center. Green Energy Consumers also operates a group buy for heat pumps.

Storage is increasingly becoming an energy solution that can be adopted at the local level. Costs are coming down rapidly, business models are developing, and the challenge now is to look for applications that make sense economically given current market rules. Communities may consider developing storage applications combined with electric vehicle charging, local solar installations, demand response programs, and micro-grids for local resilience. Aggregation plans could also include components involving demand reduction, smart meters, and time of use pricing. All these ideas should be seen as potential supplements or complements to aggregating electricity supply. A key question will always be whether it makes sense to put these ideas into an aggregation plan or if the community should support such activities outside the aggregation.

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17 *www.masscec.com/solarize-mass*
18 *www.masscec.com/mass-solar-connect*
19 *www.energysage.com*
20 *www.masscec.com/heatsmart-mass*

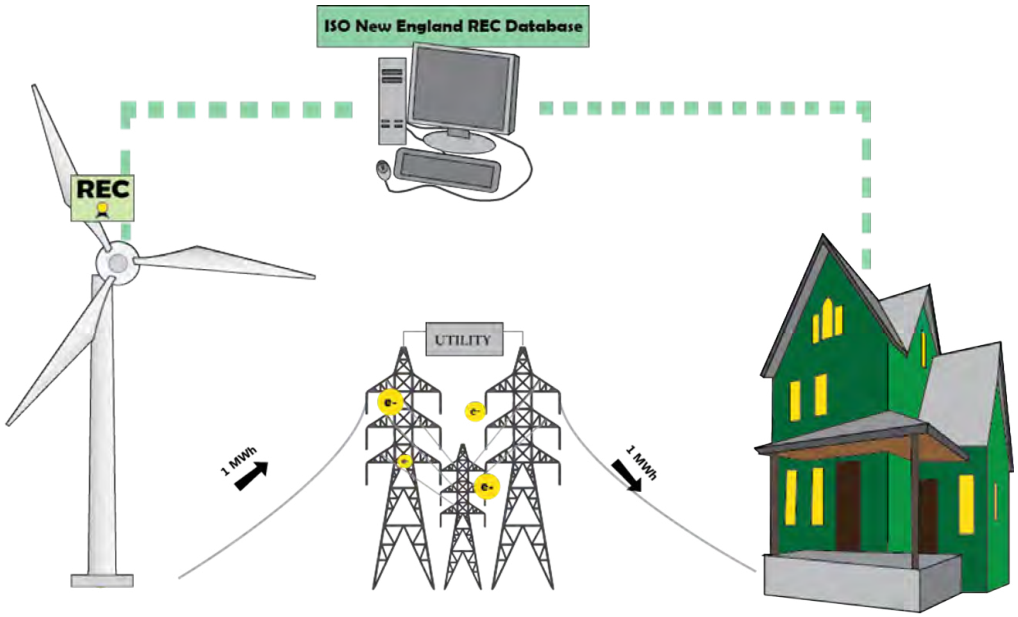
GMA Implementation Steps

Utilizing municipal aggregation to increase renewable energy content is still a relatively new concept. To ensure success of the program, follow the key these steps and best practices:

1. Form an aggregation committee to steer the process
2. Authorize aggregation by City/Town Council or Town Meeting vote
3. Hire an energy broker with deep experience in GMA
4. Create an aggregation plan with public review process
5. Tell the community about the aggregation program through public outreach channels
6. Secure state regulatory approval for the aggregation plan
7. Procure electricity & renewable energy through competitive bidding process
8. Enrollment announcement and Opt-Out periods
9. Monitor program participation and market Opt Up to 100% option

Appendix 1: RECs in The New England Electric Grid

Electricity consumers in the six New England states are served by a regional power grid. The grid accepts electrons from generators throughout the region – natural gas facilities, hydroelectricity plants, nuclear, and more. Once an electron leaves its source and enters the power grid, it is moved to the nearest transmission station or electricity user at the moment, but one can never know precisely which generator produced an exact electron. However, when renewable electricity is generated, it creates two things: electrons and a REC. The holder of the REC is entitled to claim the environmental and other non-energy attributes of the generation. Once on the grid, there is no way to track specific electrons, but the REC is quantifiable and traceable.



One REC is produced for every megawatt hour (MWh) of electricity generated by a wind turbine, solar panel, or other renewable generator.[9] Once created, a REC is sent to an electronic database administered by **NEPOOL**[21]. This database is known as the "Generation Information System" (GIS) and serves as a tracking mechanism that helps to avoid double counting claims of green power purchases.

We know how many MWhs a given resource feeds into the regional electric grid, and thanks to RECs, we know who is claiming to use each and every one. Therefore, if an entity wishes to claim it is consuming renewable energy, it must purchase one REC for every MWh it consumes, and that REC must be retired rather than resold. This process is illustrated in the image above.

The GIS was created to facilitate a trading system that would allow renewable energy generators to be paid a production incentive or extra revenue over and above what the electricity market could provide. It is based upon a policy construct that acknowledges the additional value that renewable energy promises in comparison to fossil fuels.

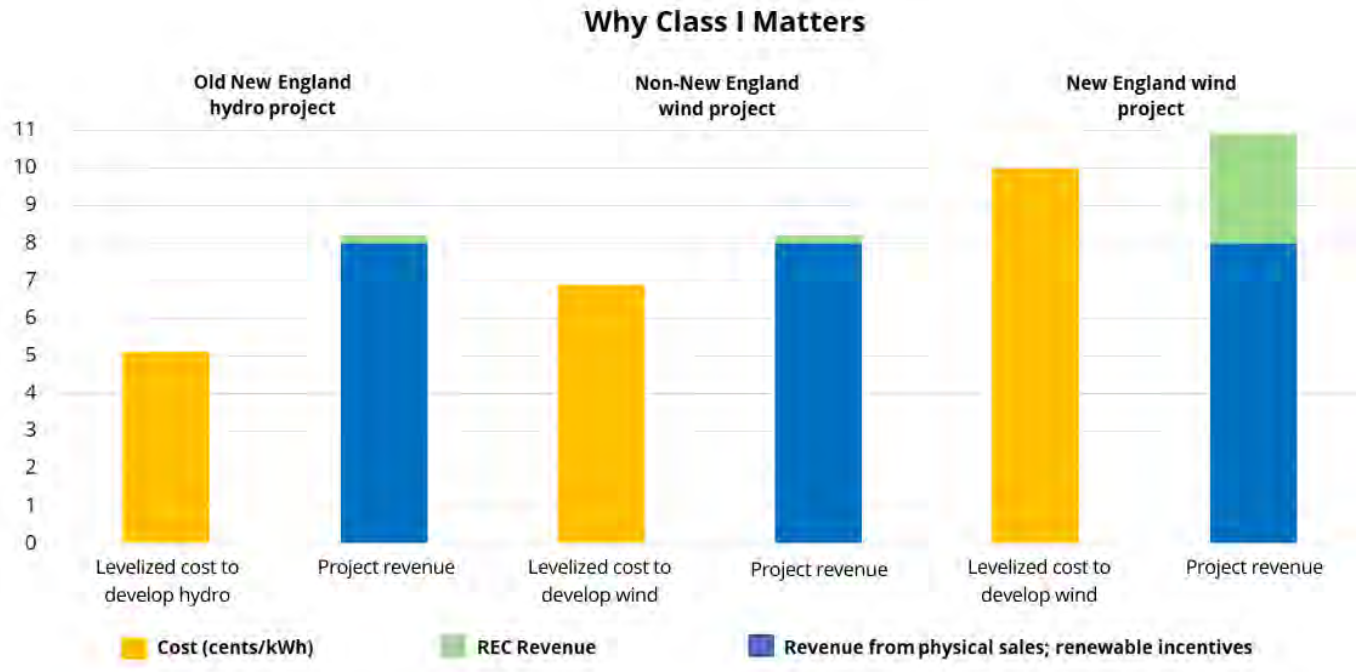
21

Appendix 2: The Importance of Going First Class

There is a lot of renewable energy that would be produced *whether or not someone bought the REC*. The salient question is whether the REC **purchase** is promoting *additionality*, or creating the demand necessary to bring one more renewable MWh onto the grid and verifiably reducing greenhouse gas reductions.

In places like Texas,[22] huge renewable energy projects can be sited and built for less per kWh than it costs to build in New England. Because of the low cost to build the project and other renewable incentives, revenue from RECs is not necessary for project feasibility in these places. Furthermore,these areas tend to have weak RPS mandates because actual supply has surpassed mandated supply, and the law was not revised to keep up. As a result, the voluntary market has been rendered ineffective. Purchasing a REC from Texas certainly has no impact on New England's electric grid. The REC purchase is not even shifting Texas's grid away from fossil fuels; it does absolutely nothing other than enrich a generator who did not require the REC revenue to build and operate.

Purchasing RECs from an old hydropower project located in New England is as ineffectual as buying RECs from a Texas wind project. Some New England hydro facilities have been operating for one hundred years and produce electricity profitably with little or no REC revenue. In fact, large hydropower projects built before 1998 are not eligible for the RPS. Texas wind and old hydro RECs are available on the market for a fraction of a penny per kilowatt hour (kWh). While non-Class I RECs are inexpensive, the purchase of non-Class I RECs do not certifiably result in a displacement of fossil fuels. In reality, selling non-Class I RECs is *greenwashing*.



This graphic illustrates the importance of New England Class I RECs relative to other types of RECs available on the market. Class I REC revenue is necessary to make projects financially viable in New England.

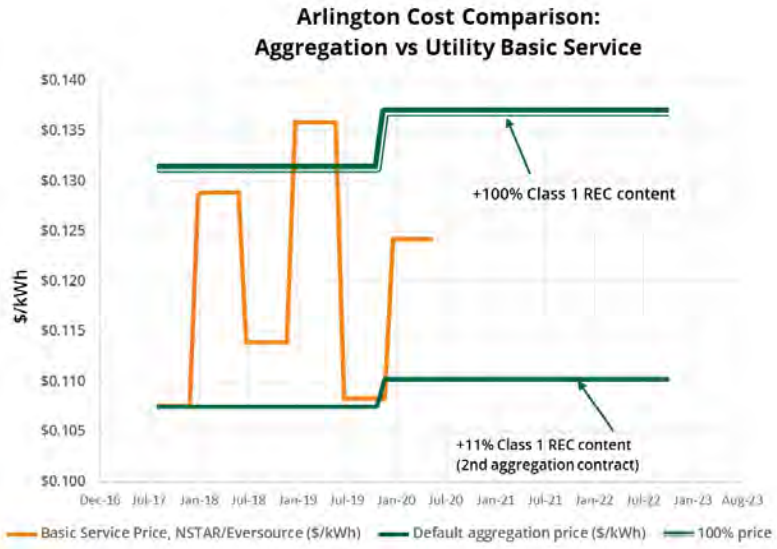
22 Not just Texas, but Iowa, Pennsylvania, and several other states where wind power supply far exceeds the state's portfolio standard.

It is not that those **projects** are unproductive; it is that any **REC sales** from such projects produce surplus profits for developers and are not consequential to the project economics and therefore do not lead to additionality. Dr. Michael Gillenwater is a leading expert on climate change and renewable energy, with a specific focus on greenhouse gas (GHG) measurement, reporting, and verification issues. According to Gillenwater, the purchase of a REC from such a project **does not impact** project development. The price of the REC is simply too small to make a difference in project economics. In other words, if a RECs' value is close to zero, you get what you pay for.

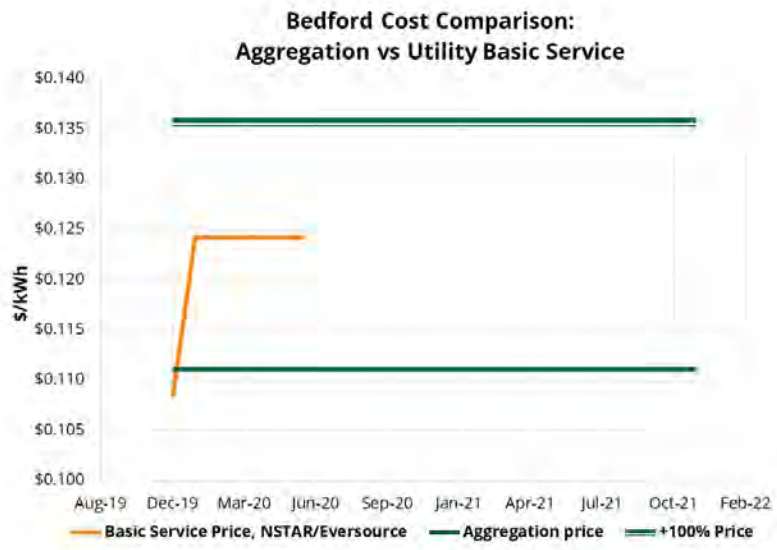
By contrast, Massachusetts Class I REC prices have rarely fetched less than $10 per MWh and have often traded for more than $50 per MWh or 5 cents per kWh. For Massachusetts Class I projects, the REC market is essential. Therefore, buying one Massachusetts Class I REC has a greater impact than buying a thousand RECs that are not Class I. We see RECs that qualify for the Massachusetts Class I standard to be the exceptions to Dr. Gillienwater's rule.

Appendix 3: Cost Comparisons Between Aggregation Rates and Utility Basic Service Rates

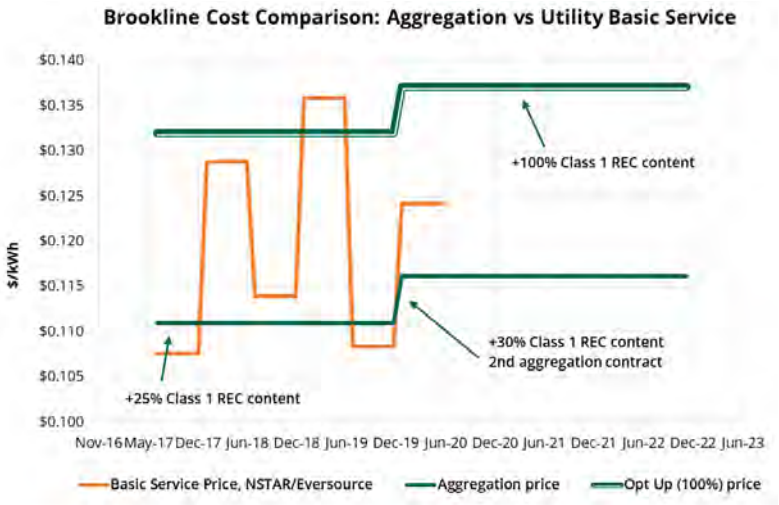
The graphs shown below represent the prices for aggregation contracts that are supported by Good Energy and Green Energy Consumers Alliance, in alphabetical order as compared to the rates for basic service delivered by Eversource and National Grid utilities. Many of these programs are on their second aggregation contract: those changes are indicated on each graph.



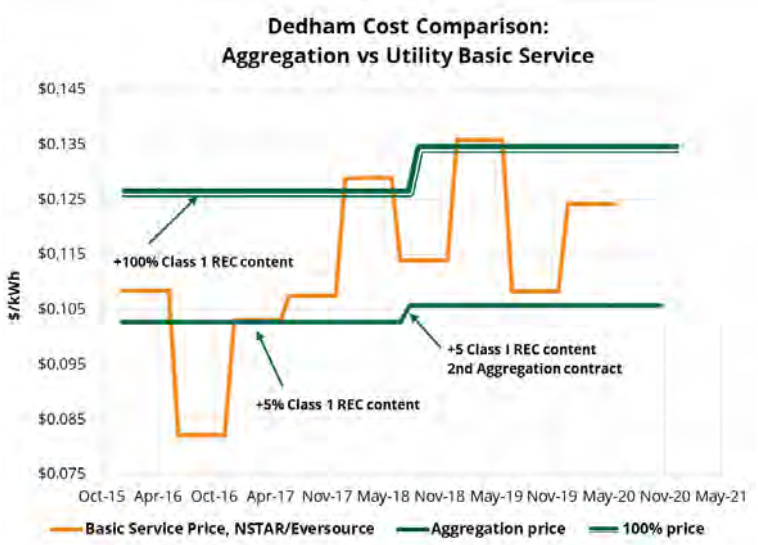
Cost comparison for the town of Arlington's aggregation program, including the 100% Opt Up option



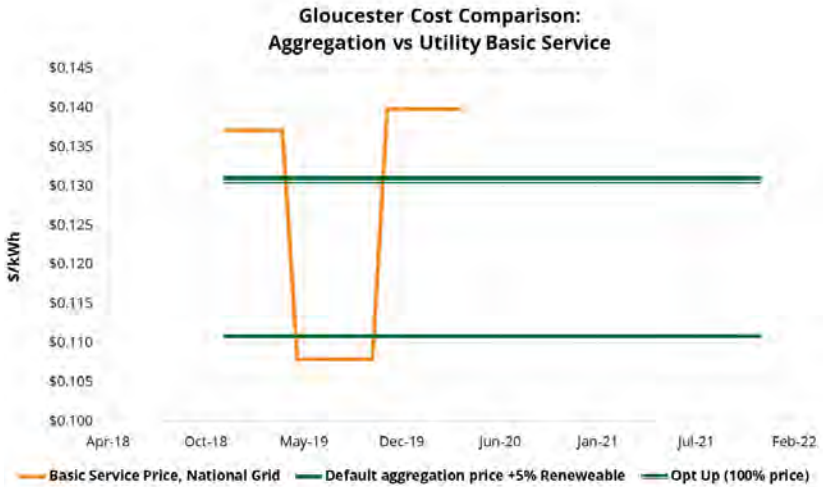
Cost comparison for the town of Bedford's aggregation program, including the 100% Opt Up option



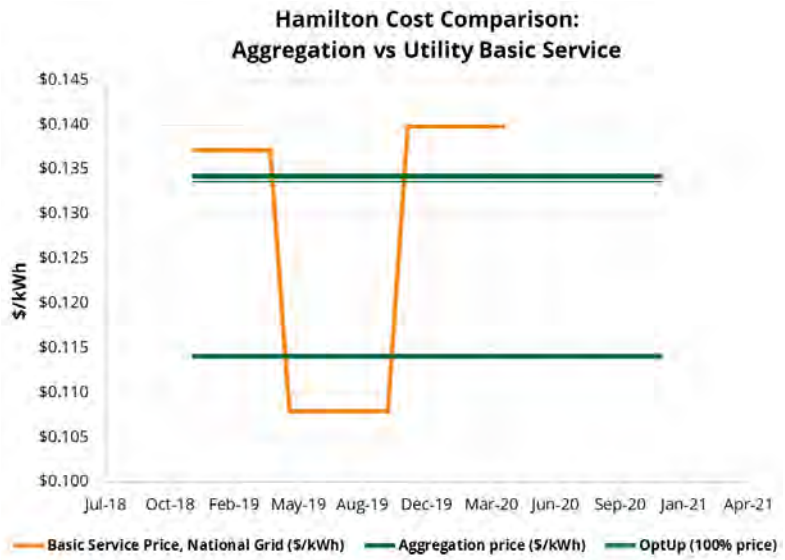
Cost comparison for the town of Brookline's aggregation program, including the 100% Opt Up option



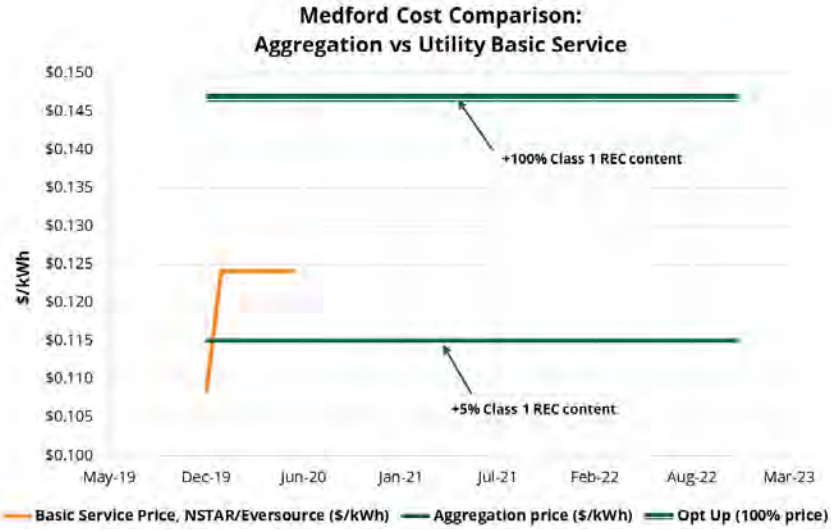
Cost comparison for the town of Dedham's aggregation program, including the 100% Opt Up option



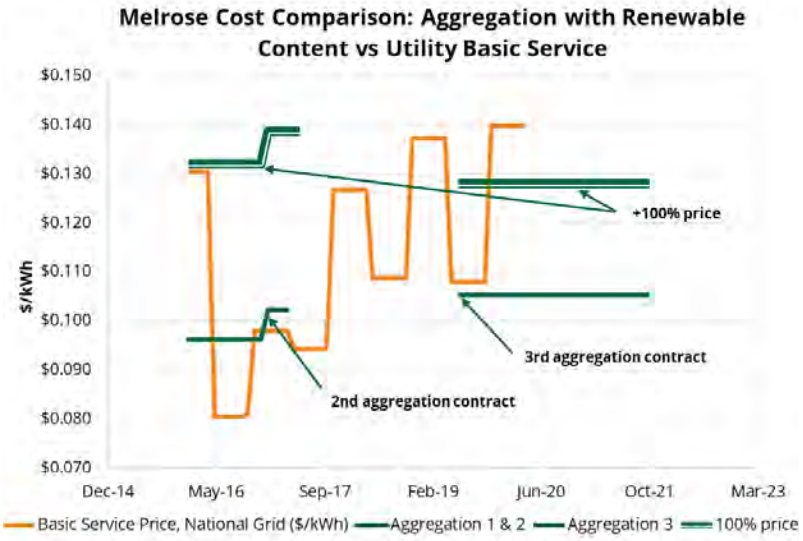
Cost comparison for the town of Gloucester's aggregation program, including the 100% Opt Up option



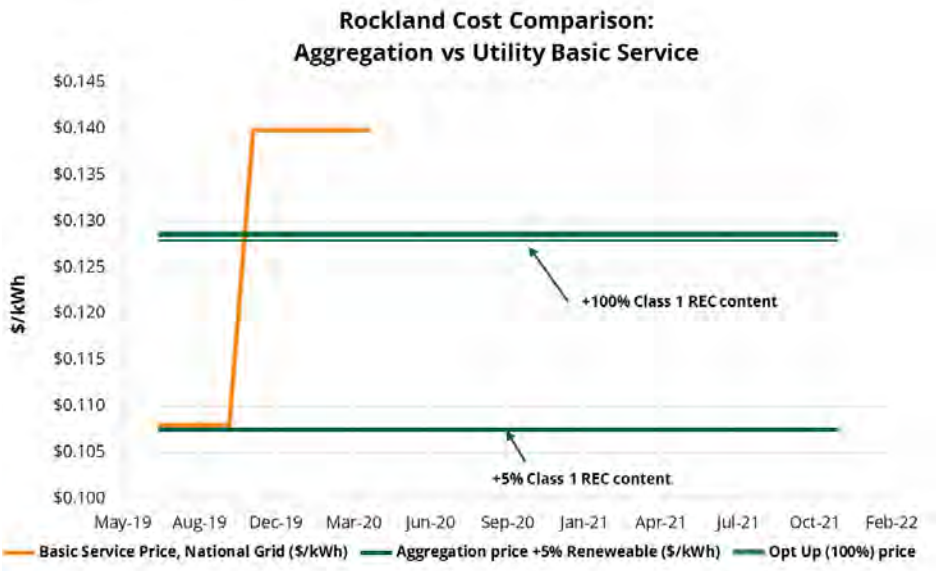
Cost comparison for the town of Hamilton's aggregation program, including the 100% Opt Up option



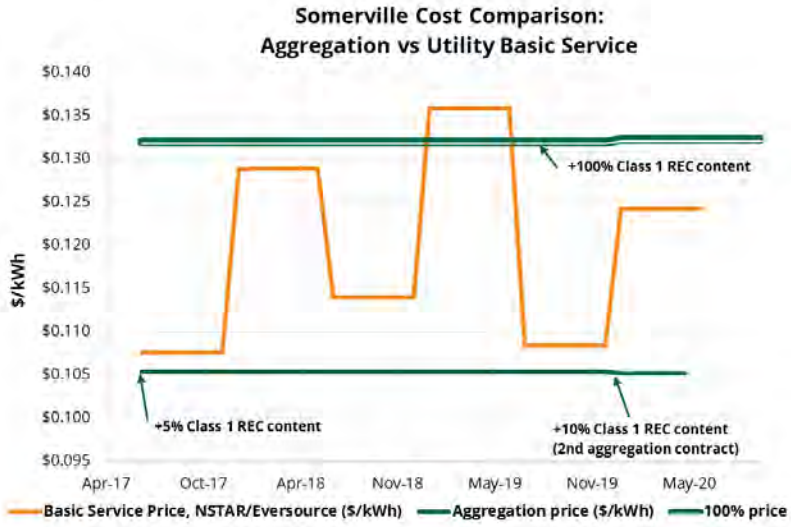
Cost comparison for the town of Medford's aggregation program, including the 100% Opt Up option



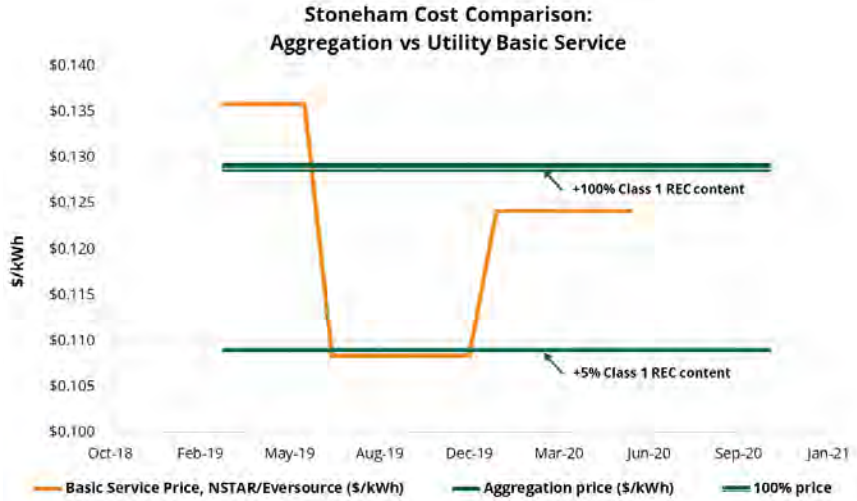
Cost comparison for the town of Melrose's aggregation program, including the 100% Opt Up option



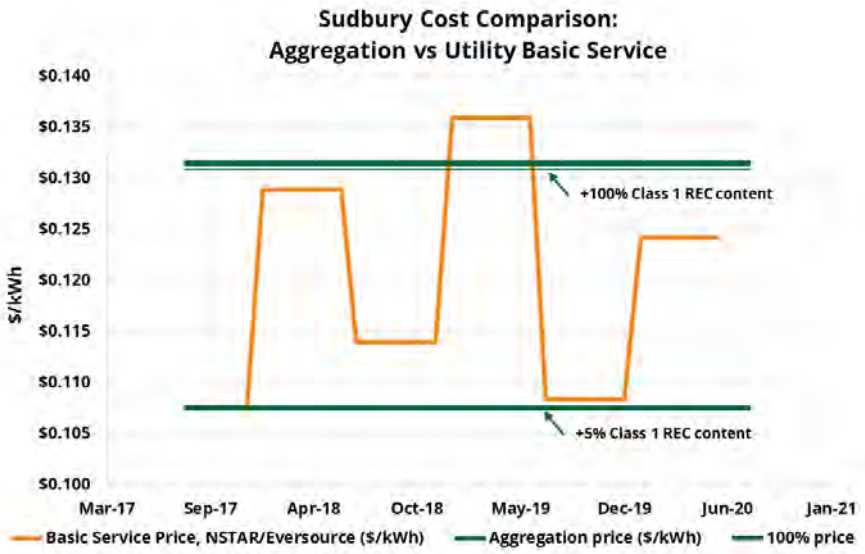
Cost comparison for the town of Rockland's aggregation program, including the 100% Opt Up option



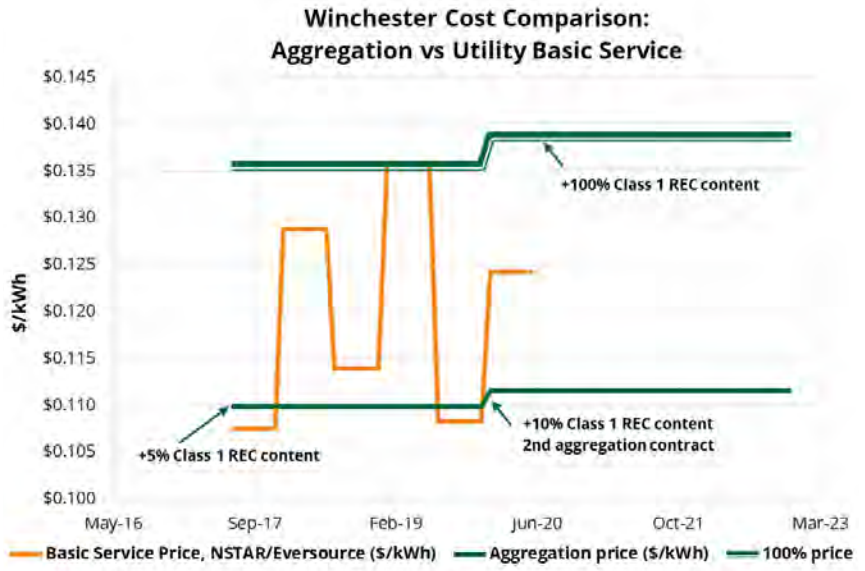
Cost comparison for the town of Somerville's aggregation program, including the 100% Opt Up option



Cost comparison for the town of Stoneham's aggregation program, including the 100% Opt Up option



Cost comparison for the town of Sudbury's aggregation program, including the 100% Opt Up option



Cost comparison for the town of Winchester's aggregation program, including the 100% Opt Up option

For further evidence of success, we encourage readers of this white paper to also read "An Analysis of Community Energy Choice for Boston," published in October 2017 by Applied Economics Clinic,[1] which reports on several measures of success – rates, renewable energy content, price stability, administrative costs, and emission reduction.

1 aeclinic.org/publicationpages/2017/9/29/an-analysis-of-community-choice-energy-for-boston

Appendix 4: Green Municipal Aggregation Bid Process

Following approval from the Department of Public Utilities, Good Energy puts out to bid municipal aggregations' electricity supply in order to secure competitive pricing. Suppliers who are invited to the bidding process are vetted through a stringent process to ensure their reliability and solvency for the length of the aggregation contract. To prepare their bids, competitive suppliers receive information about the number of service accounts in the municipality, electricity profile (when and how much electricity customers use) and desired green component. For this green component, suppliers receive pre-renegotiated terms with Green Energy Consumers Alliance in order to secure RECs from preferred sources at competitive market rates. Depending on the municipality's interest, Green Energy Consumers can provide rates for various levels of renewable energy content for the default product once a community goes out to bid. This way, community decision makers can choose a percentage green that is aligned with their climate goals while also keeping their community's rate competitive compared to basic service. On bid day, suppliers present binding prices to communities which include all three parts: energy, capacity and renewable content.

Below, is a sample list of communities that have been serviced through competitive procurements conducted by Good Energy since the start of the GMA program.

Community	Supplier	Contract Length
Melrose	Constellation New Energy	1/1/16 - 12/31/16
		1/1/17 - 6/30/17
	NextEra Energy Services	6/1/19 - 11/30/21
Dedham	Consolidated Edison	1/1/16 - 8/31/18
	Public Power	9/1/19 - 1/31/21
Brookline	Dynegy	7/1/17 - 12/31/19
	Direct Energy Services	1/1/20 - 12/31/22
Somerville	Dynegy	7/1/17 - 12/31/19
	Direct Energy Services	1/1/20 - 12/31/21
Winchester	Dynegy	7/1/17 - 12/31/19
		1/1/20 - 12/31/22
Arlington	Dynegy	8/1/17 - 11/30/19
	Direct Energy Services	12/1/19 - 11/30/22
Sudbury	Dynegy	8/1/17 - 8/31/20
Gloucester	Direct Energy Services	12/5/18 - 12/1/21
Hamilton	NextEra Energy Services	12/5/18 - 12/1/20
Stoneham	NextEra Energy Services	3/1/19 - 11/30/20
Rockland	Dynegy	7/1/19 - 12/31/21
Bedford	Dynegy	12/1/19 - 12/31/21
Medford	Dynegy	12/1/19 - 12/31/22

Appendix 5: Municipal Aggregation in Other States

Seven states have passes opt-out municipal aggregation laws. In addition to Massachusetts, they are: Rhode Island, Illinois, New York, New Jersey, Ohio, and California.

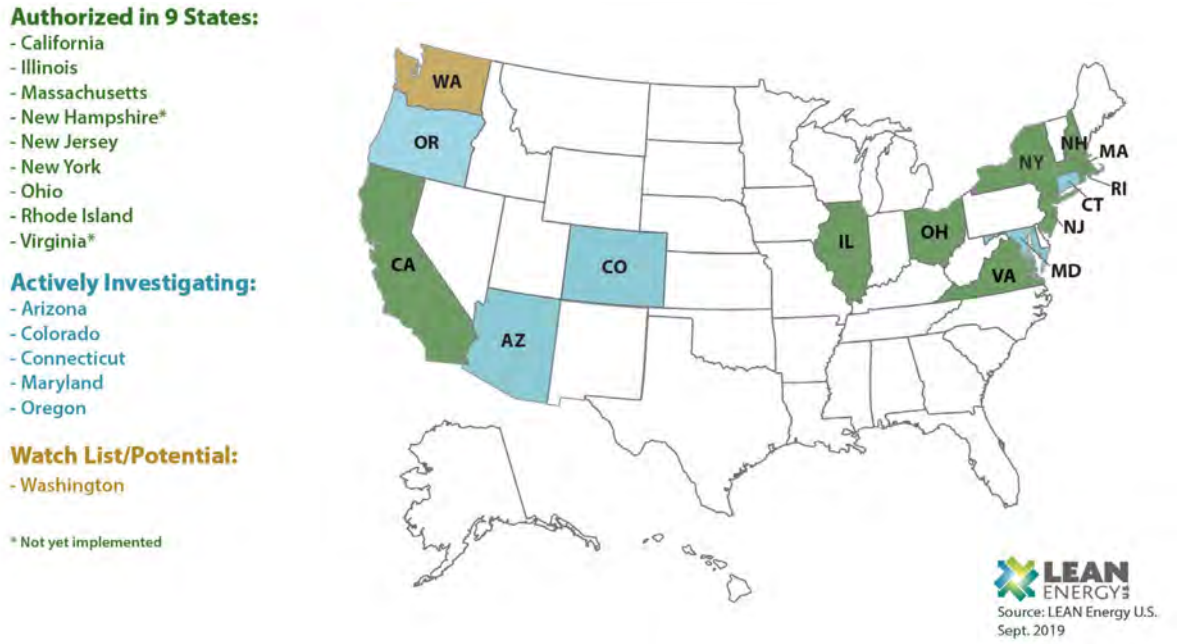


Image source: https://leanenergyus.org/cca-by-state/

Rhode Island's old law, the **Utility Restructuring Act of 1996**, allowed residents to choose their own electricity suppliers, but had procedural hurdles that prevented the implementation of aggregation in the state. A revision to the law passed in a special session in September 2017 (House Bill 5536 and Senate Bill 877 Sub A) enables aggregation while maintaining key consumer protections and transparency. We are expecting increased municipal interest and activity around aggregation in Rhode Island in 2020 and beyond.

New York houses one municipal aggregation through Westchester Power that services over 100,000 customers across 20 municipalities. In 2016, the New York Public Service Commission published a decision in Case 14-M-0224 to ease the process for communities trying to create municipal aggregations.

New Jersey has had legislation in place for "Government Energy Aggregation (GEA)," as they call it, since 1999 during the electricity deregulation movement. Due to procedural barriers, however, the first aggregation programs did not start until 2012 in townships, such as Plumstead and Toms River. New Jersey's GEA statute requires that aggregation rates be cheaper than the utility's default rate unless the program provides a higher percentage of renewable energy than required by the New Jersey renewable portfolio standard.

Ohio authorized municipal aggregation as part of the Energy Choice Act of 1999. SB 221 helped catalyze aggregation in 2008 by requiring utilities to support large-scale programs. Over 200 communities have adopted aggregation in Ohio, primarily as a tool to reduce costs for their ratepayers. The cities of Cleveland and Cincinnati do offer green power options.

Illinois leads the way in "Municipal Electricity Aggregation," with over 2 million customers and 700 communities. This trend was enabled by the Electric Service Customer Choice and Rate Relief Law of 1997.

California's electricity market was only deregulated for a short time due to an electricity crisis in the early 2000s which bankrupted the 3 largest investor-owned utilities (IOUs). Now "Community Choice Aggregation (CCA)," established by AB 117, is the only alternative to buying electricity from IOUs. As in Massachusetts, aggregation is not an option in cities that operate a municipal electric utility, such as Los Angeles.

Appendix 6: Additional Resources

Green Energy Consumers Alliance website on Green Municipal Aggregation:

www.greenenergyconsumers.org/aggregation

Good Energy, LLC: www.goodenergy.com/Community-Energy-Aggregation/massachusetts

GMA Community Websites

Arlington: www.arlingtoncca.com

Bedford: bedfordcca.com

Brookline: www.brooklinema.gov/1340/Brookline-Green-Electricity

Dedham: masscea.com/dedham

Gloucester: gloucester-cea.com

Hamilton: hamiltoncca.com

Medford: medfordcea.com

Melrose: melrose-cea.com

Rockland: www.dynegy.com/municipal-aggregation/communities-we-serve/Massachusetts/Rockland

Somerville: www.somervillecce.com

Stoneham: stonehamcea.com

Sudbury: sudbury-cea.com

Winchester: www.winpowerma.com

Laws, filings, and general government information about municipal aggregation

Statute authorizing towns and cities to participate in aggregation:

malegislature.gov/Laws/GeneralLaws/PartI/TitleXXII/Chapter164/Section134

Summary of the RPS from the Renewable Energy Division:

www.mass.gov/service-details/program-summaries

Department of Public Utilities: Docket List

To find Municipal aggregation submissions, select Municipal Aggregation Plan from the CaseType list: eeaonline.eea.state.ma.us/DPU/Fileroom/dockets/bycasetype

Appendix 7: Glossary

Additionality: The increased demand for renewables with verifiable Greenhouse Gas (GHG) emission reductions over and above what is required by law. In Massachusetts the pertinent law is called the Renewable Portfolio Standard (RPS). Additionality is the fundamental difference between aggregations that claim to be green and those that displace fossil fuels on the regional electricity grid.

Basic Service: The default electricity supply product provided by the electric company and delivered to customers who do not purchase an alternative from a competitive supplier or through a municipal aggregation.

"Brown" Aggregation/Standard Aggregation: "Brown" power refers to electricity generated from non-renewable sources, as opposed to "green" power, which is renewable. A "brown" or standard aggregation is the bulk purchase of electricity supply by a city or town whose content is the same as Basic Service. A standard aggregation includes only the amount of renewable electricity required by the RPS and CES.

Clean Energy Standard (CES): Following the decision by the state's Supreme Judicial Court (SJC) in May 2016 and Executive Order 569 (EO 569) signed by Governor Baker in September 2016, the Massachusetts Department of Environmental Protection (DEP) finalized regulations aimed at achieving compliance with Global Warming Solution Act of 2008 . One of the regulations stipulates that all for-profit utilities and competitive suppliers are required to comply with a new CES by buying Class I eligible resources (above what is required by the RPS), hydroelectricity imports or nuclear generation so long as the power is made from projects that were in operation after December 31, 2010. As of this writing, there are no hydroelectricity imports or nuclear generation facilities that have been added to the grid, thus the full requirement of the CES must be met through Class I resources.

The CES standard became a requirement in 2018 with 3%, bringing the total to 16% of all electricity required to be met with compliant sources. In 2020, at the time of this writing, CES adds 4% to the mix bringing the total to 20% of all electricity coming from renewable sources.

Competitive Supplier: An entity that sells electricity supply to consumers as an alternative to a utility's Basic Service offerings. Competitive suppliers are licensed to operate by the Massachusetts Department of Public Utilities, but they are not regulated in the same way as electric distribution companies like Eversource, National Grid, or Unitil.

Class I Resource: New RPS- or CES-eligible projects like wind, solar, and anaerobic digester gas that began commercial operation after December 31, 1997 and that are directly fed into the New England grid.

Class II Resource: Existing, or old, RPS-eligible projects that were in commercial operation before January 1, 1998.

Green Communities Act (GCA): Enacted in 2008, GCA enhanced the Massachusetts' RPS by creating a distinction between Class I (new) and Class II (existing, old) resources. GCA also established a requirement that the percentage of Class I supply should increase 1% per year, indefinitely. The law created the Energy Efficiency Advisory Council (EEAC) comprised of stakeholders from multiple sectors who inform the development and implementation of DPU-approved energy efficiency programs that regulated gas and electric utilities are mandated to provide. Finally, GCA established the Green

Communities Division housed at the Executive Office of Energy & Environmental Affairs (EOEEA) and responsible for helping cities and towns in the Commonwealth increase energy efficiency and renewable energy toward achieving net zero energy.

Greenhouse Gas(es) (GHG): A gas, such as carbon dioxide or methane, that contributes to climate change when emitted into the atmosphere. GHGs are emitted in high concentration through the burning of fossil fuels and must be curbed in order to combat climate change.

Green Municipal Aggregation (GMA): A model of aggregation in which the default option – the alternative to Basic Service into which all participants are automatically entered – includes a commitment to at least five percent (5%) more Massachusetts Class I resources than the minimum percentage required by the state's RPS. GMA enables communities to affordably increase the renewable energy content of their electricity supply relative to Basic Service in a manner that drives demand for new, in-region renewable resource.

Global Warming Solutions Act (GWSA): Enacted in 2008, GWSA requires that Massachusetts reduce its statewide greenhouse gas emissions 25% below 1990 levels by 2020 and 80% below 1990 levels by 2050.

Investor-Owned Utility (IOU): A private business organization that provides a utility (public product or service). In this context we are speaking of IOUs presiding over electricity, such as Eversource, National Grid, and Unitil.

Independent System Operator of New England (ISO-NE): ISO-NE is a non-profit regional transmission organization (RTO) charged with maintaining reliable electricity to all six New England states. ISO replaced NEPOOL in 1997 following restructuring and is responsible for operating the region's bulk electric power system, implementing wholesale markets, and ensuring open access to transmission lines. It is overseen by the Federal Energy Regulatory Commission (FERC).

Megawatt (MW): A unit of power equal to one million watts and often the output measurement from a power station. We have found that one megawatt of wind power is enough to power an average Massachusetts home for two months.

Megawatt hour (MWh): An amount of energy over time and equal to 1,000 kilowatt hours (kWh) or one thousand kilowatts (kW) of electricity used continuously for one hour. Megawatt hours is the standard unit for how wholesale power is bought and sold between utility companies and power generators.

New England Power Pool (NEPOOL): A voluntary association of market participants from the six New England states established in 1971 to foster coordination across utilities in the region. ISO-NE replaced NEPOOL in 1997 and now oversees regional grid operation, but NEPOOL's governing body, the Participants Committee, considers and acts on all matters affecting the region's wholesale electric power arrangements. NEPOOL also manages NEPOOL GIS database used for tracking RECs.

New England Power Pool Generation Information System (NEPOOL GIS): Issues and tracks renewable energy certificates for all MWh of generation and load production in ISO-NE's control area and MWh imported from adjacent control areas. NEPOOL GIS also tracks emissions attributes for generators in the region.

Renewable Energy Certificate(s) (REC): Certificates that represent the environmental attribute of electricity produced from a renewable source. RECs are used as tracking mechanisms for renewable energy. One REC is equivalent to one megawatt hour of renewable energy generated. RECs are tradable commodities, but each REC can only be claimed once and it is retired after use. In Massachusetts, RECs are classified into categories based on specific criteria outlined in the state's RPS.

Renewable Portfolio Standard (RPS): Massachusetts law that requires a certain percentage of the state's electricity to come from renewable energy. Different kinds of RECs are separated into classes based on criteria in this law. Class I RECs come from certain types of New England renewable energy generators built since 1997 (mostly wind and solar, but also some forms of hydro and biomass). Per the RPS, all electricity suppliers (such as Eversource, National Grid and competitive power suppliers, but excluding municipal utilities) must source a certain percentage of their electric load from Class I projects. The percentage required goes up 2% every year from 2020 to 2029 and reverts back to 1% starting in 2030.