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How Is Energy Justice Built Into Community Choice Aggregation? A Comparative Case Study of the Lowell Community Choice Power Supply Program and Cape Light Compact, Massachusetts

Felicity Monk
Antioch University of New England

ANTIOCH UNIVERSITY
NEW ENGLAND

Department of Environmental Studies

THESIS COMMITTEE PAGE

The undersigned have examined the thesis entitled:

How is energy justice built into Community Choice Aggregation? A comparative case study of the Lowell Community Choice Power Supply Program and Cape Light Compact, Massachusetts.

Presented by **Felicity R. G. Monk**
Candidate for the Degree of Master of Science and hereby certify that it is accepted*.

Committee Chair: **Abigail Abrash Walton, PhD**
Title/Affiliation: Antioch University New England, Environmental Studies

Committee member: **David Hess, Ph.D**
Title/Affiliation: Professor, Sociology Department, Vanderbilt Institute for Energy and the Environment

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*Signatures are on file with the Registrar's Office at Antioch University New England.

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Abstract

Community Choice Aggregation represents a potential opportunity to meet climate change mitigation aims through bulk buying renewable energy, but there remain challenges to deliver energy justice for low income communities. This thesis researched how two CCA programs - the Lowell Community Choice Power Supply Program and the Cape Light Compact - are building energy justice into their mission and activities. Archival research was conducted and eleven in-person interviews took place with experts, advocates and practitioners across the two CCA programs. Questions centered around five energy justice themes - community control, community ownership, local green jobs, low income assistance, and the tension between 100% renewable energy and energy justice - corresponding to the three tenets of energy justice: 1) procedural justice; 2) distributive justice and 3) recognition justice. Research findings highlighted key structural differences between the two programs that enabled differing levels of support for low income communities. While the Lowell program was able to negotiate much lower prices for customers, there remains little in the way of low income support, and the decision-making process seemingly lacked inclusion and authentic participation. The Cape program in contrast has taken the Mass Save energy efficiency program in-house, creating a comprehensive entity that arguably goes further in meeting the needs of the community. These research findings highlight the tools available for other future CCAs in Massachusetts looking to further energy justice.

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1. Introduction

As the climate crisis escalates (Masson-Delmotte et al., 2019), there are renewed calls from energy scholars and practitioners to transform the energy system to be more just. Proponents of energy justice argue for an energy system that: a) equally distributes the costs and benefits of energy policy across society; b) creates just, inclusive decision-making processes; and c) recognizes that historically marginalized communities have borne the brunt of environmental harms. Yet there remains limited understanding of how communities can practically achieve this while transitioning towards 100% renewable energy.

This thesis analyzes how energy justice is built into two Community Choice Aggregation (CCA) programs in Massachusetts. CCA is a legislative mechanism allowing energy customers to pool their purchasing power to buy energy directly from an energy provider instead of an individual contract with a private utility. CCA was initially designed to create competition within the energy sector but is increasingly being used by environmental advocates to reduce greenhouse gas emissions through bulk renewable energy procurement. It has also been used recently by environmental justice advocates to push for energy justice principles in the electricity sector in California.

The Lowell Community Choice Power Supply Program was launched in October 2019 after an eight month process culminating in a City Council vote of approval in

summer 2019. The new CCA contract offers enrolled residents 45% additional renewable energy - the second highest renewable energy percentage in the state. The Cape Light Compact has been operating since 1997, and serves residents across the 21 towns and two counties of Cape Cod and Martha's Vineyard. Its CCA program offers residents 1% additional renewable energy, with the option of opting up to 50% and 100%. The two case studies are interrogated through a mixture of archival research and semi-structured interviews with key stakeholders involved in both programs. Analysis around five key themes - community control, community ownership, local green jobs, low income assistance, and the overall tension between 100% renewable energy and energy justice for low income communities - highlights key implications for scholars and practitioners to interrogate the different models of CCAs that offer different tools for energy justice.

This thesis will proceed as follows. Chapter 2 is split into two parts that provide necessary background for the case studies: first, a discussion of the policy background that covers the history and varied structure of CCAs in the US; and second, a literature review that examines the loose relationships between energy justice, energy democracy, and CCAs, and highlights the gap in scholarship around these topics in particular. Chapter 3 is an overview of methods, including the data gathering and analysis process, noting in particular the limitations of this study. Chapter 4 provides case study evidence of the Lowell Community Choice Power Supply Program and how it relates to the five energy justice themes outlined above, with key research findings particularly related to

the perceived limitations of the Council-run decision-making process. Chapter 5 highlights the case of the Cape Light Compact, with key research findings focusing on how the organisational structure of the CCA lends itself to greater community participation and local job creation in particular. Chapter 6 attempts to draw the case study evidence together, contrasting the key research findings of each case and reflecting on how they relate to the literature on energy justice. It also includes a discussion on implications for practitioners, emphasizing how important participative decision-making processes are for community buy-in, and the strengths of each of the CCA models in terms of inclusion. Finally, a discussion on future research argues for more inclusive case studies on this topic as well as wider scholarship on the practical applications of scholarly frameworks like energy democracy.

2. Policy and theoretical background

Policy background

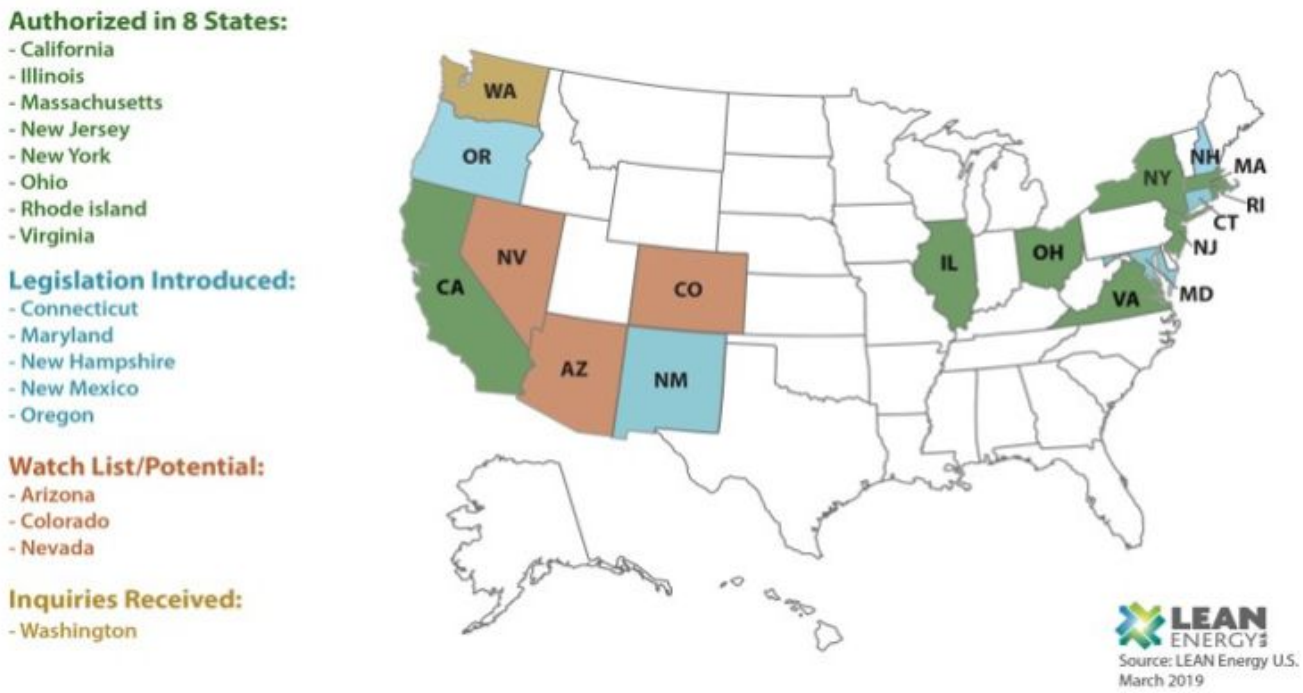
This section provides an overview of the policy background of Community Choice Aggregation (CCA). It first defines and describes CCA, highlights its purpose, charts its brief history and explores the various policy developments of CCA across the US.

CCA is a legislative mechanism allowing energy customers to pool their purchasing power to buy energy directly from an energy provider instead of private energy contracts between individual consumers and investor-owned utility companies. The term also describes the specific programs that the legislation allows; in this case both the Lowell Community Choice Power Supply Program and the Cape Light Compact are described as 'CCAs'. CCA is known by various different names depending on regional and state context, including Municipal Aggregation, Green Municipal Aggregation, and Community Choice Energy. The term Community Choice Aggregation was chosen in this thesis because it was the term that most interviewees were familiar with.

CCA legislation currently exists in eight states – California, Massachusetts, Ohio, Rhode Island, New York, New Jersey, Illinois and Virginia – but California and Massachusetts have seen the majority of activity. In Massachusetts alone, more than one

hundred communities have enacted CCA projects with various aims of saving money, expanding consumer choice, and increasing renewable energy content.

Figure 1: Map of Community Choice Aggregation policy across the US.



Reprinted from "California Community Choice Aggregators Bid For Partial PG&E Takeover" by Clean Technica, 2019 (https://cleantechnica.com/2019/04/03/california-community-choice-aggregators-bid-for-partial- pge-takeover/). Copyright 2019 by LEAN Energy. Reprinted with permission.

Purpose and aims

The overall purpose of CCA legislation is to give consumers more power to set lower prices through aggregated, competitive contracts with energy generators. In recent years however, the policy has been used to buy more renewable energy as part of wider efforts on behalf of municipalities and their residents to reduce greenhouse gas

emissions in response to the climate crisis. The state of California in particular has seen the emergence of a movement that seeks to deliver deep decarbonization through policies like CCA. Some advocates of CCA also see the potential of the policy to help democratize the state's energy system as part of a broader campaign towards energy democracy (Weinrub, 2017).

History

The introduction of CCA legislation in the US took place as part of the restructuring of the electricity markets within many states in the late 1990s. Though dependent on local, regional and state dynamics, the decades preceding the 1990s saw electricity supply being predominantly handled by large, private utility companies within a strict regulatory framework. Alongside these were many more smaller municipalized and/or state-owned utilities as well as rural cooperatives, legacies from the New Deal and Great Society reforms of the 1930s and 1960s (Hess, 2011). Broadly throughout the 1990s, consumers saw energy prices rising – in some cases like Massachusetts, exponentially so (Wadsworth, 1998). Energy utilities highlighted that heavy regulation was stifling their ability to innovate or take advantage of new gas turbine technological advances (Wadsworth, 1998), curtailing their ability to keep prices competitive. In reality, many dynamics were at play, including: a) slowing demand; b) the inability to predict demand; c) cost overruns from nuclear energy construction; and d) spikes in oil prices due to

geopolitical movements (Hess, 2011). These events helped set the agenda by federal and state governments to radically overhaul the energy system.

Restructuring the energy system took the form of market deregulation, a move broadly in line with the 'neoliberal pattern of deregulation that occurred in the airline, natural gas, railroads, telecommunications, and financial industries' (Hess, 2011, p. 1066) throughout the 1990s, sold to the public as 'beneficial to small consumers because competition would lead to lower rates and thus offer some redistributive benefits' (Hess, 2011, p. 1067). In most states, energy companies were broken up into whole-sale energy suppliers, transmission and distribution companies, and utilities that dealt with customer retail. Various additional provisions to encourage competition were introduced, including through CCA mechanisms, designed as projects that could compete with utilities over whole-sale energy procurement. The first CCA law was written into the Massachusetts' Utility Restructuring Act of 1997 (Lichtenstein & Reid-Shaw, 2017), with other states following suit over the next decade.

The CCA movement has seen most growth in California, although it has faced a series of obstacles to fully getting off the ground throughout the 2000s. This was largely due to attacks, political and policy-based, from investor-owned utilities who feared they would lose customers to aggregation (Hess, 2019); California's energy market is not structured competitively, meaning that CCAs represent a threat to a utility's customer base that is not the case in other states. By the 2010s, however, dozens of CCA projects

had been set up across the state, representing a significant percentage of statewide energy consumption.

Policy evolution

The introduction of CCA legislation did not originate from within an explicitly environmental policy framework, but rather as a consumer-choice mechanism within the general trend towards privatization and market competition in the 1990s. Since then, CCA as a policy has evolved considerably. Early proponents of CCA in California and Massachusetts saw the legislation as not only a chance to build more accountability and transparency into the energy sector, but as a way to decarbonize away from fossil fuels as part of the wider effort to tackle climate change. Thus, CCA was linked to the environmental movement as early as 2006 (Hess, 2019). However, CCAs are still being set up that focus almost exclusively on price, with proponents highlighting that the key benefit is the bulk buying of energy that usually results in lower prices. Overall, different types of CCAs have evolved that reflect these different priorities and aims.

CCA 1.0, 2.0 and 3.0

Three different models of CCAs have emerged relating to the structural differences, administrative functions and political priorities of different CCA programs, variously categorized as 1.0, 2.0 and 3.0 (Hess & Lee, 2020). These different models are best

conceived of as on a conceptual continuum, and not all CCAs pass through each stage (Hess & Lee, 2020). CCAs within the 1.0 model can be seen more as a simple contract between the municipality and external energy services company, rather than creating a whole new organization to manage operations. In fact, most of their responsibilities are assigned to external brokers or consultants to deliver competitive electricity prices from an external power supplier. CCAs using this structure can also bulk buy renewable energy, but the majority of them - as in the case of Illinois - are primarily focused on achieving lower prices for the customers.

CCA 2.0s have developed beyond this narrow remit to become more akin to public power entities that work to prioritize "local distributed energy development, local democratic control over energy decision-making, and greater managerial control" (Hess & Lee, 2020, p. 5). These CCAs often manage long-term energy contracts, with some even owning the means to generate their own electricity. Many CCAs in California have developed into this type of model to become "full government agencies with dedicated staff" providing valuable expertise in managing risk and navigating state regulation (Hess & Lee, 2020, p. 5).

Finally, there are different visions for CCA 3.0 currently under discussion. One approach represents the idea for groups of CCAs to collaborate together and share expertise across regions and municipalities, for example through joint power agencies (Golding, 2019). This type of model is still at the conceptual stage, but it highlights the ambition for many CCA 2.0s to work together on challenges and opportunities.

Illinois: a cautionary tale for CCA

The case of Illinois highlights some of the potential challenges and pitfalls of the 1.0 model of CCA, in contrast with the 2.0 model that is evolving primarily in California (Hess & Lee, 2020). CCA legislation came into effect in Illinois in 2010, and the state saw hundreds of municipalities pass local referendums to set up individual CCA programs (Bartling, 2018). Crucially, these CCAs were created using the 1.0 model, and framed primarily around price.

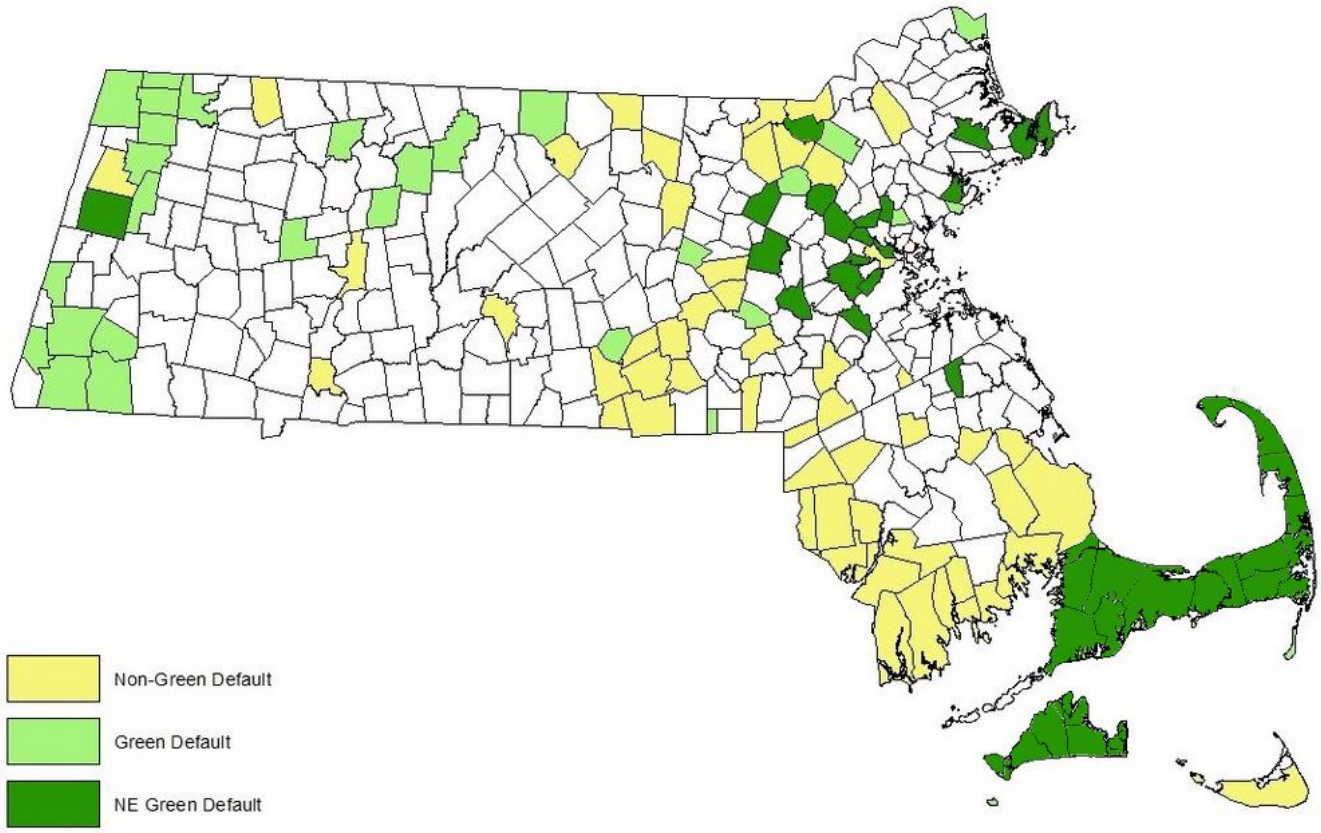
Significant challenges to the Illinois CCA movement have since emerged. Initially, the new CCA contracts were able to undercut the energy prices offered by the investor-owned utilities, offering cheaper energy prices to their newly enrolled customers (Bartling, 2018). However, a mixture of changing market dynamics and increased competition by the utility companies meant that over time, the utilities could offer even cheaper prices than their CCA competitors. As a consequence, many CCA programs were suspended (Rockrohr, 2017), or never went into effect after their initial referendum (Bartling, 2018). The experience helps to highlight the potential vulnerability of framing CCA only around price, given that market conditions can change very quickly.

Proponents of CCA in California have been cognizant of the case of Illinois, and have attempted to frame CCAs more widely to include renewable energy and meeting local community needs (Hess & Lee, 2020). Thus, many of California's CCA programs fall under the 2.0 model, both because some advocates wish to transform the energy system

to be more just and centered around calls for energy democracy (Weinrub, 2017), and also because other advocates are keen to protect CCA programs from competition with utility companies solely on the basis of price.

CCA in Massachusetts

Figure 2: CCA communities in Massachusetts.



Adapted from "Cost and Emission Impacts from Community Choice Energy: Renewable Energy Options from the City of Chelsea" by B. Woods, S. Alisalad and H. Brown, 2019, Applied Economics Clinic (https://static1.squarespace.com/static/5936d98f6a496 3bcd1ed94d3/t/5dd6ed6e21c70d2a207d72b3/1574366574876/GreenRoots+Chelsea+CCE+Draft+AEC+Policy+Brief+21Nov2019.pdf). Copyright 2019 by Applied Economics Clinic. Adapted with permission. Note that the 'NE Green Default' refers to CCAs purchasing Class 1 Renewable Energy Credits from specifically New England power generators.

The Cape Light Compact - the subject of Chapter 5's case study - was the first CCA to be set up in Massachusetts in 1997. By 2005, it offered both a municipal aggregation and energy efficiency program for Cape and Vineyard customers. CCAs began to be set up in other parts of Massachusetts in the early 2010s, although most of the initial CCA projects like Nattick and New Marlborough did not offer additional renewable energy content and were primarily created to offer lower prices to their customers. By the mid 2010s, dozens of CCAs were being set up offering a range of green content for customers. There are now 158 communities with established or planned CCA programs (Mass.gov, 2019). The Lowell Community Choice Power Supply Program - the subject of Chapter 4's case study - confirmed a new contract that went live in October 2019.

Theoretical background

By investigating how energy justice is built into two Massachusetts-based CCA projects, this thesis will build on energy justice scholarship and debate. While the concept of energy justice has seen significant development and expansion within recent academic literature (Jenkins, McCauley, Heffron, Stephan, & Rehner, 2016; Sovacool & Dworkin, 2015), there is currently relatively limited literature on CCAs generally, with most scholarly attention focusing on case studies in California in particular. Scholarship on energy democracy relates to both CCA and energy justice concepts in key ways, and has been explicitly connected to CCA movements by activist movements in the US.

Energy justice

The concept of energy justice has emerged in the last two decades within literature on energy policy, energy security and climate change to provide a comprehensive framework for understanding decisions related to various aspects of the energy system (Sovacool, Burke, Baker, Kotikalapudi & Wlokas, 2017). It builds on environmental justice, a concept developed through the 1970s by communities of color who were disproportionately situated next to waste incinerators and fossil fuel infrastructure and so suffered high levels of air pollution and other environmental inequities (Schlosberg, 2009). A key aim of environmental justice scholarship and activism is to ensure:

> fair treatment and meaningful involvement of all people regardless of race, color, national origin or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies (Bullard, 2000, p. 7).

Sovacool and Dworkin (2015) built on these environmental justice foundations but turned their focus specifically to energy. They brought together issues of energy and ethics in an attempt to highlight and address the huge inequities present in local, regional, national and global energy systems (Sovacool & Dworkin, 2015). Their work also built on decades of scholarship highlighting the ways that the energy system creates and reinforces social, economic and political oppression and injustice at different stages, from energy extraction processes to combustion, consumption and eventual disposal

(Heffron & McCauley, 2018; Jenkins et al., 2016; McCauley, Ramasar, Heffron, Sovacool, Mebratu & Mundaca, 2019). Sovacool and Dworkin (2015) argued that having a comprehensive framework to understand how energy decisions are made would help foster a more energy-just world, defined as one that:

> … equitably shares both the benefits and burdens involved in the production and consumption of energy services, as well as one that is fair in how it treats people and communities in energy decision-making. In other words, we see importance to both substantive outcomes and decisional procedures (Sovacool & Dworkin, 2015, p. 441).

This more holistic approach focusing on both outcomes and processes within energy decision-making has been further defined to incorporate the necessary conditions for its practical application in energy decisions. Jenkins et al. (2016) and McCauley et al. (2013) defined energy justice using three lenses: a) distribution, b) procedural, and c) recognition, or the "what, who and how" of energy issues (Jenkins et al., 2016, p. 176). The main tenets of each lens will now be outlined, drawing on a review article by Heffron, McCauley & Sovacool (2015) that sought to expand these concepts further.

First, energy justice requires distributional justice. This refers to the equal allocation of benefits, costs and responsibilities related to an energy system that impacts specific populations in specific localities (Walker, 2009). The concept highlights how certain communities currently and historically have experienced distributional injustice

because they have been forced to bear the brunt of environmental harms (Jenkins et al., 2016), for example at sites of production like petrochemical plants that produce high levels of air pollution that affect health and wellbeing. Issues of race, class and gender are tied into distributional justice, with working class, low income and communities of color disproportionately located next to fossil fuel extraction sites in the US (Allen, 2001), Europe (Steger, Antypas, Atkins, Borthwick & Cahn, 2007), and globally (Sovacool, Heffron, McCauley & Goldthau, 2016; Walker, 2012). Benefits are similarly unevenly distributed, for example the profits that utility company shareholders make whilst utility customers remain in fuel poverty. Energy justice is thus a call for an equal distribution of costs and benefits regardless of class, race etc. (Heffron et al., 2015).

Second, energy justice requires procedural justice wherein processes of decision-making are open, accessible and inclusive to all impacted and concerned stakeholders regardless of race, class and other identities or characteristics (Bullard, 2005). This concept necessitates meaningful, authentic and long-term engagement and participation from all groups, requiring decision-makers, power-holders and industry representatives to fully disclose information about energy infrastructure or policy decisions (Davies, 2006; Sovacool & Dworkin, 2015). Due process, and appropriate appeal mechanisms for all stakeholders are important tenets to energy decisions being made at local, national and international levels (Heffron et al., 2015). Procedural justice is also linked to the concept of energy democracy, discussed below.

Third, recognition justice refers to the populations, communities and individuals who are systematically denied recognition in decision-making on issues of energy procurement, extraction, and consumption. As already discussed, issues of race and class play distinct roles in denying meaningful recognition of marginalized populations by power holders and decision-makers. Examples in the US include fossil fuel expansion projects on the lands of Indigenous nations and communities (Pastor, Sadd & Hipp, 2001; Jenkins et al., 2016). Indigenous leaders regularly face violence and intimidation for exercising their rights to protest and participate in decision-making processes, something that they would not be denied if they were duly recognised under an energy justice framework (Schlosberg, 2003).

Besides these three tenets of energy justice, scholars have made calls to widen the concept further to include cosmopolitan and intergenerational justice, where the rights of those in different countries and future generations are taken into account in decision-making (Heffron et al., 2015). Scholars highlight that, particularly in relation to climate change, energy decisions in one country add to emissions that push up global temperatures around the globe (Vanderheiden, 2008). Similarly, decisions to not cut emissions deeply in the early twenty-first century may create catastrophic repercussions for generations to come, who had no say in decisions around mitigation.

Heffron et al. (2015) argued that the concept of energy justice can overcome difficult tradeoffs inherent in energy policy and law creation. One trade-off is the so-called ‘energy trilemma’, a concept that originated within the field of energy security

studies. It highlights the three competing demands that nation-states must satisfy: that of energy security, climate change mitigation, and reducing energy poverty (Gunningham, 2013), or in more broad terms, between the competing aims of economics, politics and the environment (Heffron et al., 2015). This trilemma is particularly pressing in Global South nations (Gunningham, 2013) but also can be seen in conflicts and trade-offs within regional and municipal energy policy-making in Global North countries, for example through local energy efficiency programs seeking to reduce fuel poverty (Guertler, 2012). The ability of energy justice to overcome tradeoffs between reducing carbon emissions and meeting the needs of low income communities is a central question of this thesis.

Energy democracy

Energy democracy builds conceptually on environmental and energy justice scholarship but focuses specifically on 'democratizing' the energy system, especially where it impacts those communities, groups and individuals with little power. Unlike the concept of energy justice that emerged primarily from scholarship (Jenkins, 2018), energy democracy emerged from grassroots, environmental and social justice movements in specific contexts in the US and Europe, and has been used in CCA campaigns in California and elsewhere. As a scholarly concept, it is most closely related to the 'procedural justice' aspect of energy justice, but is also grounded in questions around the

distribution of costs and benefits. This section will discuss its various definitions and briefly review its central arguments.

Burke and Stephens' (2018) detailed review on energy justice highlighted that while energy democracy defies specific definition, it can be broadly defined as the 'process of ongoing struggles for economic and political democratization as expressed through energy transitions' (p. 79). Its focus is on making energy systems more 'just, democratic, and sustainable… in different contexts' (Becker & Naumann, 2017, p. 2). Energy democracy highlights how the current energy system is highly centralized with the vast majority of people in society having little power or say in decisions of infrastructure, price, ownership or environmental responsibility, resulting in the unjust distribution of costs and benefits, as well as a slow pace of climate change mitigation overall. The energy democracy agenda thus seeks to advance:

> democratization and participation through democratically-planned and public and community-owned and -operated renewable energy systems that serve the public interest and deliver tangible community benefits (Burke & Stephens, 2018, p. 79).

The concept of 'democracy' within the energy democracy framework is primarily a form of 'associative democracy,' wherein small, localized constituencies made up of engaged citizens act together for a collective good (Van Veelen & Horst, 2018).

Particular focus is on communities that are already disproportionately bearing the impacts of the unjust energy system. This idea has its foundation in environmental justice

frameworks, namely that there should be no decision made without the participation of impacted communities and individuals. Energy democracy further argues that "those most marginalized are well-positioned to envision and lead toward different energy futures" (Burke & Stephens, 2018, p.79). There is a presumption within energy democracy that historically marginalized, front-line communities will make energy decisions that benefit both their own localities and also deliver more sustainable, low carbon energy solutions.

Energy democracy literature highlights two central arguments: first, that the energy system (particularly the electricity system) embedded within society should be inclusive, equitable and environmentally sustainable; and second, that decision-making and political power should be localized (Van Veelen & Horst, 2018). Various related strategies inform this vision including: widening access to the electricity grid through small scale renewable generation (Szulecki, 2018); widening alternative forms of ownership that are not based on models of investor-owned monopolies; and creating devolved structures and processes to achieve wide participation in decision-making at the local level (Van Veelen & Horst, 2018).

Burke and Stephens (2018) outlined a series of tensions within energy democracy based on their literature review. One broad set of debates centers around the competing tensions between the state and market in energy provision, and the need for the energy democracy agenda to make explicit its critique of unlimited economic growth (Kunze & Becker, 2015). Burke and Stephens (2018) highlighted how proponents of energy

democracy seek to challenge the corporatism of the fossil fuel system, but are less clear on how to break existing dependencies on these systems. Underpinning these debates is also a pragmatic concern on the need to radically scale up financing and investment in renewable energy in the race against the escalating climate crisis, while resisting the ideology of neoliberalism (Sweeney & Treat, 2018).

Other tensions that Burke and Stephens (2018) highlighted in their review include: 1) what 'democracy' looks like in practice for energy systems, and whether democratic procedures necessarily result in democratic outcomes (Hendriks, 2008; Jasanoff & Kim, 2013; Moss, 2014); 2) the necessity, and practicality, for an engaged citizenry to become energized in the long-term by questions around local energy provision and justice (Tokar, 2015; Mascarenhas-Swan, 2017; Johnson & Lewis, 2017); 3) whether a centralized energy system based on fossil fuels is inherently anti-democratic or – vice versa – whether a decentralized energy system based on renewable energy is inherently democratic (Smil, 2004; Laird, 2013); and 4) the practicality of extending energy democracy throughout the supply chains and life cycle of renewable energy technologies, and the relating power dynamics these processes involve (Jones, 2013; Massari & Ruberti, 2013).

Energy democracy activism

The energy democracy agenda has served as a foundational framework for several US environmental NGO campaigns working at the local level (Fairchild & Weinrub, 2017). Three movements in particular have garnered widespread support in many communities and the wider public: a) the remunicipalization of energy procurement including CCA (Weinrub, 2017); b) the redemocratization of rural electrical cooperatives (Johnson & Lewis, 2017); and c) a wider call for the renationalization of the energy sector in general (Riofrancos, Shaw & Speck, 2018; Speck, 2018; Hasan, Harrington & Speck, 2019). All three of these campaigns see the goals of energy democracy – collective ownership, democratic accountability, equity, local job creation – as fundamental to the process of decarbonization.

Community Choice Aggregation (CCA)

There has been limited literature written on CCA as a phenomenon to date, and that which exists largely focuses on case studies of CCA projects and movements within California. This section will briefly summarize the scholarship on CCA and outline key themes, before linking CCA to energy justice and energy democracy frameworks.

CCA has been subject to discussion and analysis within the domain of policy studies, with a particular focus on how CCA can be used by local governments to reduce greenhouse gas emissions as part of wider efforts to address climate change. Armstrong

(2019) highlighted that widespread adoption of CCA projects in California by counties and cities is likely to result in these municipalities exceeding emissions reduction targets by 2025. Case data from California highlights how CCA policy diffuses through different political, economic and social communities, showing the capacity of governments to affect state-wide mitigation (Armstrong, 2019).

Other scholars have included CCA within debates on economic and political theory as it relates to energy decisions. Hess (2011) described CCA within his broader discussion of neoliberalism and the energy sector as "a reform movement that operates overtly as a form of redistributive politics but also shifts across a continuum of neoliberal and social liberal politics" (Hess, 2011, p. 1070). In effect a consumer union, the CCA's ability to get cheaper electricity helps to redistribute the profits of investor-owned utilities while still staying within a neoliberal framework. The CCA can also use this bargaining power to purchase additional renewable energy content at a scale that impacts state-wide emissions reductions efforts (Hess, 2011).

The majority of case studies on CCA focus on social movement theory and framing, particularly in relation to energy democracy. Hess' (2019) detailed history of CCA in California focused on the role that changing coalitions, alliances and narrative framing played in the decade-long fight between CCA advocates and the incumbent investor-owned utility companies. Smith (2019) documented the rise of Californian CCAs by focusing on social movement theory through three different lenses: 1) political opportunity structures, 2) mobilizing structures, and 3) framing processes. Framing

processes in particular played a key role both on the need to tackle climate change and the role that decentralized energy could play in furthering local democracy. Frames and narratives around energy democracy have proved particularly powerful in appealing to specific constituencies yet face key obstacles from structural constraints of CCA policy itself (Clegg, 2019). Indeed, Faulkner (2010) documents the series of obstacles facing communities who decide to aggregate their energy to procure more green content.

There is little in the literature to suggest that CCA has been analyzed in relation to energy justice. CCA efforts in California are often situated within wider calls for more participatory, democratic energy systems in line with an energy democracy agenda. Yet discussions around energy justice - a framework that focuses on just distribution, procedure and recognition in relation to energy questions - has not emerged significantly from the limited scholarship on CCA. This thesis aims to fill this gap by drawing predominantly on energy justice and related frameworks to understand how CCAs in Massachusetts are dealing with questions of energy justice in the day-to-day operations.

3. Methods

Overview

This study analyzed how energy justice was part of the initial vision of the Lowell Community Choice Power Supply Program (hereafter 'the Lowell program') and Cape Light Compact ('the Cape program'), and how equity continues to impact the mission, vision and operations of the two programs. Two primary data sources were used: 1. archival data; and 2. semi-structured interviews with key stakeholders involved in the two CCAs and others in Massachusetts. This section details the case selection, data gathering and analysis stages.

Case selection

I chose two CCA cases in order to explore my research question, in keeping with Yin's (2009) definition of a case study as an in-depth investigation of a phenomenon within real-life context.. This section will briefly introduce them and set out the key reasons for why they were chosen.

The Lowell program was initially launched in 2014 as a CCA to serve the City's population of approximately 110,000. In July 2019, Lowell City Council voted to support a 45% increase in the proportion of renewable energy to a total of 59% renewable energy

content. Lowell is the largest city in the Commonwealth of Massachusetts to adopt such an ambitious green energy program, and the 45% increase is the second highest renewable energy percentage out of all CCAs in the state. The increase is in line with a non-binding City Council resolution for the city to become 100% renewable by 2035.

The Cape program was set up in 1997 and now serves approximately 205,000 customers across the twenty-one towns and two counties on Cape Cod and Martha's Vineyard. The Cape program was the first CCA project after the 1997 Massachusetts Restructuring Act allowed towns and cities to municipalize their energy procurement. CLC oversees a Department of Public Utilities-approved Energy Efficiency Program, and helped to found a solar cooperative, Cape and Vineyard Electric Cooperative, in 2007.

I chose the Lowell and Cape programs as case studies for three main reasons. First, the two cases represented very different models of CCA programs in Massachusetts. The Cape program's organisation and structure of a Joint Powers Entity with in-house staff and the ability to raise revenue is in contrast with the Lowell program that is managed primarily through external contracts between the City Council and private contractors. These key differences impact each CCAs' ability and capacity to further energy justice within their programs. These differences also highlight the opportunities and challenges for future CCAs to focus on energy justice.

Second, the two case studies represented interesting contrasts in terms of their longevity that helped to explore the research question from different angles. The Lowell program's new contract was approved in June and launched in October 2019, allowing

rich investigation of the process and motivations of CCA advocates. The Cape program's municipal aggregation launched in 2005, enabling exploration about how the organisation and program had sought to address questions of equity over time. These two cases provided an opportunity for in-depth analysis of how energy just considerations have evolved.

Third, both the Lowell and Cape programs serve large communities with mixed income and demographics. Lowell is a former industrial city home to a large non-white population. The Cape program serves twenty-one municipalities, ranging from high income to low- and medium-income. Selecting these two cases supports the investigation into how energy justice issues play out in mixed income communities, particularly as many CCAs in Massachusetts are located in relatively prosperous neighborhoods like Newton, Cambridge and Brookline where equity issues may be less pressing.

Data gathering

Theoretical framework

Five energy justice 'themes' were chosen to approach the data gathering stage that are based on important debates within energy justice scholarship. They can be seen as practical examples of the three tenets of energy justice - distribution, procedural, and

recognition justice (Jenkins et al., 2016; McCauley et al., 2013) – that help build a picture of how energy justice is built into the two CCA cases.

Table 1: Energy justice themes and corresponding tenet of energy justice

Energy justice theme	**Tenet of energy justice**
Community control	Procedural justice
Community ownership	Procedural justice; distributive justice
Local green jobs	Distributive justice
Low income assistance	Distributive justice; recognition justice
100% renewable energy vs energy justice	Distributive justice

The first theme is 'community control' and is most clearly connected to procedural justice within the energy justice framework. Community control relates to a community's ability and capacity to control energy decisions. This theme highlights issues of procedure and public participation, both in the decision to create a CCA as well as the ongoing oversight and control that a community has over a CCA program long-term.

The second theme is 'community ownership'. This theme relates to both procedural and distributive justice and is concerned with the structures of ownership that exist in the two CCA programs. It could refer to the physical ownership of critical energy infrastructure (the 'wires and bolts' of transmission lines, for example) or municipal ownership of contracts or Renewable Energy Credits.

The third theme is 'local green jobs', and relates closely to distributional justice. Analysis of this theme included how many jobs are created through the CCA program, what type of jobs these are (union, prevailing wage etc) and where they are located.

The fourth theme is 'low income assistance' and relates to distributional and recognition justice. This theme analyzes how the CCA relates to its low income population, including how they are defined and supported as a group, for example through extra financial support or targeting for energy efficiency assistance.

The final theme concerns the tensions between the transition towards 100% renewable energy and delivering energy justice, particularly for low income households. This relates to issues of distributional justice and runs as a central theme throughout the inquiry. Analysis of this theme involved understanding the different trade offs and dilemmas of offering higher renewable energy options for residents in Lowell, the Cape and Martha's Vineyard, and the strategies that were adopted to lessen these tensions.

These five themes structured the research process during the three stages of data gathering - archival data-gathering, interview data-gathering, and data analysis.

Archival data

I gathered archival data to build a comprehensive picture of the two CCA projects, as well as the CCA movement in Massachusetts more generally. For Lowell, archival data

included: a) City Council and Subcommittee minutes and presentations, b) local newspaper editorials about CCA, c) online information about the terms and conditions of the new Lowell program contract, and d) the new municipal aggregation plan that has been approved by the Massachusetts Department of Public Utilities (DPU). For the Cape program, archival information primarily came from three sources: a) the program's website which detailed the program's history, structure, missions and aims, among other dimensions of the programb) the foundational documents of the Joint Powers Entity that governs the Cape program, and c) documentation into the background of the CCA and energy efficiency programs, for example from the Massachusetts Department of Public utilities website that housed statutes on the Mass Save program.

The bulk of archival research focused on the bigger policy, political and advocacy landscape of CCA in Massachusetts. This included conducting an initial overview of all CCA projects operating in Massachusetts to understand their structure, green energy content, and energy consultants, using documentation on the Massachusetts Statehouse website and the websites of the individual CCA projects currently operating. It also involved extensive research on federal and state environmental policies that interacted with CCA policy and the research question, including: a) the Solar Massachusetts Renewable Target program (including different sections under Low Income Community Solar), b) the Mass Save energy efficiency program and c) the federal Low Income Home Energy Assistance Program. Further research was done on understanding how the Massachusetts energy and electricity sectors are structured and regulated. This included

an investigation of the role that Renewable Energy Credits play in providing an accounting method for Massachusetts-wide renewable energy generation, and the difference between Renewable Energy Credit 'classes' that influence renewable energy markets in New England and elsewhere. Finally, research was conducted on the CCA advocacy movement using online data and video sources to understand which NGOs and campaign groups were pushing CCA, where and how. This also provided groundwork in reaching out to key individuals involved in the Lowell campaign to set up interviews.

Interview data

Overview

Interviews were chosen as a primary methodology to build a comprehensive picture of the two CCA cases in Massachusetts through in-depth, quality discussion (Rubin and Rubin, 2012). After an initial pilot interview in September 2019, eleven in-person and phone interviews were conducted during a three week period in October 2019. Interviewees included:

- Five CCA advocates who had been involved in the Lowell program campaign. Four individuals were residents of Lowell and belonged to local environmental campaign groups and initiatives; one belonged to a state-wide environmental advocacy NGO.

- One community organizer and resident of Lowell who was running for City of Lowell Council
- One staff member of the Cape program who worked specifically on the power supply / aggregation program
- One staff member of the Cape program's 'sister' organization Cape and Vineyard Electric Cooperative
- One resident of Martha's Vineyard who advocates for the Community Empowerment Bill, and who also sits on the Board of the Cape program
- One solar energy expert who works specifically on Low Income Community Solar initiatives under the Solar Massachusetts Renewable Target program
- One community organizer who works on energy democracy projects statewide
- One CCA advocate who has been active in CCA campaigns in Newton (pilot interview)

One 350 Lowell meeting and one Lowell Sustainability Council meeting were attended, the latter of which included a presentation on CCA and other sustainable initiatives by the Lowell Council Energy Manager, providing the opportunity for a brief, informal chat with her. All interviews except two were conducted in person in Lowell, the Cape or downtown Boston. Interviews lasted between forty minutes and two and a half hours, with most lasting around an hour and a half. Interviews were followed up with email communications to exchange documents, links and contacts. Interviewees were asked to

read through the thesis sections relating to their thoughts, and confirm that they were happy with the wording of quotes from their interviews.

Table 2: Interviewees

Program	**Interviewees**
Lowell	4 CCA advocates
	1 community organizer and resident
Cape	1 staff member
	1 staff member of Cape and Vineyard Electric Cooperative
	1 resident and Board Member
State-wide	1 CCA advocate
	1 Low Income Solar expert and practitioner
	1 community organizer on energy democracy
Newton Power Choice	1 CCA advocate (pilot interview)

Selection and recruitment

Interviewees were selected after research into different stakeholders of the Lowell program, the Cape program and the CCA movement in Massachusetts more generally. The initial research design proposed to interview at least twelve stakeholders across three different categories who are involved in the Lowell and Cape programs. These categories were:

1. Administrators of the two CCA programs. For the Lowell program, this could include employees of CCA consultant Colonial Power Group or City Council staff who oversee the program. For the Cape program, this could include its employees and also those of Cape and Vineyard Electric Cooperative.

2. Individuals from key community, environmental and political campaign groups that pushed for the creation of both programs
3. Lowell and Cape Cod/Martha's Vineyard residents enrolled in the two CCA programs, particularly low income customers.

Outreach reflected these three categories. After attending an initial meeting of 350 Lowell group - who had been instrumental in pushing for the new CCA aggregation contract - a number of helpful contacts were established who agreed to be interviewed. From there, snowball sampling techniques were used wherein contacts provided details of other key players in Lowell City Council as well as other advocates who worked on CCA statewide. For the Cape program, contacts from my summer internship at Better Futures Project were utilized to reach out to key people on the Compact's Board, who eventually agreed to be interviewed and also provided additional contacts within the organisation. This enabled the selection and recruitment of several interviewees who both worked for the CCAs or had been involved in advocacy efforts to establish them or other related initiatives.

Outreach efforts largely failed to recruit individuals within the third category in Lowell or the Cape. Communication was done via email and phone to organizations serving low income customers in various ways, but little response was received from individuals with follow-up emails remaining unanswered. One interview with a community organizer from Lowell was secured, who was able to speak about the

experiences of those he talks to everyday, that helped provide additional context for how Lowell residents feel about CCA and energy justice issues.

Interview protocol

Interviews began with an overview of my background, MS degree, and an introduction to the research on energy justice. Each participant was asked to sign a consent form and also to provide verbal consent to audio record.

Interview questions were generally structured into two separate sections. First, questions were asked relating to the background of the interviewee and the connection to the CCA project. For the CCA advocates in Lowell, questions were asked about the stakeholder process that took place in summer 2019 that led up to the decision to adopt 45% additional renewable energy.

The second section was structured around a series of open-ended questions on the CCA itself, in terms of structure, aims and activities. Questions were roughly framed around five overall themes related to the energy justice and energy democracy literature as outlined in the literature review including: community control, community ownership, green jobs, low income assistance and the tension between achieving 100% renewable energy and making sure low income residents are not negatively impacted in the process.

Interviews took place in person at various locations convenient for the interviewees in Lowell, on the Cape, and in downtown Boston. Interviews were audio recorded, first using the phone and web-based app Otter that transcribed the audio recordings live, and second on a hand-held dictaphone for backup. Although the Otter technology helped to transcribe the vast majority of audio recordings, considerable time was spent editing each transcript for mistakes and to write out sections where the app had not transcribed properly. Interview transcriptions were uploaded into a secure Google Drive folder while the audio recordings were held on the password-protected Otter website and also uploaded into a locked file on a laptop.

Data analysis

Data analysis was conducted during and after the interview stage. Each interview was followed by a brief one page written note about the main ideas gathered and data gaps that needed to be addressed in subsequent interviews or follow-up communication (Miles & Huberman, 1984). Following the conclusion of the interview stage, transcripts were written and edited to reflect audio recordings.

First, transcripts were analyzed to spot key themes and patterns (Yin, 2009; Lapan & Quataroli, 2009). A mixture of bottom up, emergent pattern finding and top-down, pattern-matching was used (Strauss & Corbin, 1998). This meant searching for responses to questions in the five research categories - community control, community ownership,

local green jobs, low income assistance and the tensions between 100% renewable energy and energy justice - as well as other themes that had emerged during the interview, for example around the perceived limitations of the council-led stakeholder process in the run up to Lowell's new aggregation contract.

Second, once these themes had emerged, further analysis was conducted to compare the themes and patterns between the interviews. A master document was compiled that highlighted key ideas from each interview under separate headings like 'stakeholder motivations', 'challenges with the process', 'community control' etc. Analysis was also conducted on themes that seemed to be absent despite being central in the literature - for example, around conceptions of community ownership being integral to the underlying motivations of the CCA. Finally, an evaluation was conducted as to whether additional clarification was needed with participants over their answers to some concepts (Gay, Mills & Airasian, 2006).

Limitations

There are several limitations in this case study. First, and as already discussed, the failure to recruit residents who could speak to CCAs from a lived experience in both Lowell and the Cape/Vineyard leaves a real gap in understanding how energy justice is being addressed by the Lowell and Cape programs. The Lowell community organizer who was interviewed could speak to a certain extent about the concerns of residents and

communities he works with in Lowell, particularly as he was interacting with hundreds of people during his campaign to become a City Councillor. However, there was an overall failure to secure any interviews with residents on the Cape and Vineyard who could discuss the Cape program's different projects and how they impact their lives. This is a major shortcoming to this study and future scholarship should seek to address this limitation by having a more comprehensive outreach strategy.

A second limitation pertains to the overall number of interviews that were conducted. As outlined in the initial proposal, the plan was to interview at least two people from each category to provide a comprehensive view of the many different stakeholder motivations and understanding of energy justice and CCA. For Lowell, a major shortcoming was the failure to interview the Energy Manager, who declined to be interviewed out of a mixture of time constraints and past negative experience with researchers. As she is the resident expert on CCA in the City and is overseeing the whole program, this was a huge limitation in terms of data gathering, and one that was only partially rectified after attending her public presentation on the CCA program and briefly talking to her afterwards, as well as email exchanges on key questions. Outreach strategies also failed to result in any interviews with sitting City Councillors who had taken part in the unanimous vote on CCA - again, a major shortcoming. This meant that interview data for the Lowell case skewed very heavily towards those CCA advocates who had been active in the campaign, and who were willing to participate in the study.

Key reasons help give some context to why outreach strategies failed particularly in Lowell. First, the timing was particularly unfortunate given that nearly all of the Councillors were in the middle of running for reelection to City Council (in November 2019) and the one Councillor who had been repeatedly recommended to talk to, who is known widely as the 'environmental advocate', stepped down from her Council role for health reasons in October 2019. Second, a key bit of context that emerged from the interview process itself was that the Lowell City Council had recently been sued for discrimination on the grounds that its at-large voting system cut out the votes of its large people of color communities. The case had prompted a full overhaul of its electoral system, still ongoing at time of writing, as well as some negative local publicity. It is possible that there was a general unwillingness on behalf of the Council to risk even more exposure, or that Councillors and staff were barred from talking publicly under the terms of the lawsuit.

For the Cape program, the number of interviewees was also low. However, the interview with the Cape program staff member was a comprehensive two and a half hour discussion into minute detail of the organization's operations, so to a certain extent gave a very clear picture about how energy justice is built into its CCA program. Overall however, the small number of interviews was a real limitation to understanding energy justice from many different perspectives. Given that such limited data was collected, there are real questions as to the generalizability of the two case studies.

A final limitation concerns the type of data that was collected and its capacity for comparison between case studies. The research design was structured to investigate two very different projects at two very different stages, with the Cape having had years of operations and programs and Lowell's new contract of 45% renewable energy having just recently been voted on. Though this provided a real richness in terms of understanding the two cases, it also meant that interview data collected was very different in scope. Interviews conducted on the Lowell program were focused heavily on process, particularly - as shall become clear - the various limitations felt by advocates to be a key part of their experience. Interviews on the Cape program centered much more on the structure and program offering of the organization, with very little discussion on the initial process of its creation that was well before the time of my interviewees. Overall, this means that the opportunities to fully contrast and compare the two sets of data on each case are somewhat limited.

4. Lowell Community Choice Power Supply Program

Introduction

This chapter will explore how and to what extent energy justice has been built into Lowell's Community Choice Power Supply Program ('the Lowell program'). It will proceed in three sections. First, it will introduce Lowell's background as a working class city that is nevertheless taking action on the environment. Second, it will introduce the Lowell program by highlighting the initial motivations for advocates that pushed for CCA in the spring and summer of 2019, and to what extent these motivations related to issues around energy justice. Third, it will interrogate the further central themes related to energy justice that run through this thesis - community control, community ownership, local green jobs, low income assistance, and tensions between 100% renewable energy and energy justice for those on low incomes - to help build a detailed picture of how different CCA stakeholders relate to the issue of energy justice and how the concept has been built into the new aggregation contract. Interview extracts will highlight key points, themes, tensions and views from various stakeholders, as well as archival information that was gathered during the research process.

Background

History

Lowell was founded in 1822 as a series of textile mills powered by water power from the nearby Merrimack River, becoming the largest center for textile manufacturing in the US. Its population grew as the mills rapidly expanded over the next fifty years, with extensive canal systems built to service the textile industry. The city has a rich history of trade union organizing, and was the site of key historical labor struggles as impoverished, immigrant communities fought with mill managers and owners for better pay and working conditions. The fortunes of Lowell declined along with the textile industry during the early twentieth century. More efficient, modern factories in the south outcompeted the northern textile industry in the 1920s and 30s, and Lowell saw factories shut and hundreds of jobs lost. The city was plunged into deep recession and the population shrank over the next two decades.

The 1970s saw the city's prospects turn around somewhat through several urban renewal projects that sought to celebrate and capitalize on Lowell's industrial history. In 1974, Lowell Heritage State Park was founded and in 1978, Lowell National Historical Park was established throughout the city, saving many of the former industrial buildings and the downtown canal system. Lowell was also a beneficiary of the Massachusetts Miracle as tech companies located to the area and brought new jobs and investment. During the 1970s and 80s, Lowell become home to the second largest populations of Cambodian and

Khmer Americans - around 25,000-30,000 individuals, or around 13% of Lowell's population today - that relocated to the US after the Cambodian genocide in the 1970s as part of a government refugee resettlement project.

Downtown Lowell today is a grid of former factory buildings interlaced with an extensive canal system, smokestacks and new builds, sitting on the southern shore of the Merrimack River. Many of the former mills have been converted into apartment units that are now occupied, although there remain a number of old factories that stand ruined, too toxic to either renovate or demolish. The city is rapidly gentrifying, with several mill conversions advertised as luxury apartments in the downtown area. The UMass Lowell campus is located on the north side of the Merrimack River and has a student population of around 18,000 students.

Demographics and environmental justice

Today, Lowell's population is around 110,000. Demographically, whites make up 49.1% of the city's population; Asian Americans 20.9%; Hispanic or Latinos 20.3%; and Black or African American residents make up around 6.69% (DataUSA, 2019a). More than forty-five languages are spoken by students currently enrolled into Lowell's public school system (Lowell Public Schools, 2019).

Lowell is a working class city that faces key economic and environmental issues. According to the Environmental Protection Agency's EJScreen tool (Environmental Protection Agency [EPA], 2019a), 42% of Lowell's population are low income, nearly twice

the state average of 24%. Fourteen percent of the population is linguistically isolated while 20% of the population have less than a high school education. The city sits in the 82nd percentile for both hazardous waste proximity and traffic proximity and volume, and is in the 94th percentile for superfund proximity.

Environmental action

Notwithstanding Lowell's economic and environmental challenges that stem from its industrial past, the city has made significant efforts to reduce carbon emissions and act on the environment. In 2010, the city signed an agreement with Ameresco to complete over $21 million in energy conservation measures in its municipal buildings (Massachusetts Climate Action Network, 2016), and has also used around $546,000 in Green Communities grants to fund projects like retrofitting LED lighting and electronic thermostats. In 2013, the city unveiled its comprehensive Sustainable Lowell 2025 plan (Office of the City Manager, 2013) that laid out various aims of reducing carbon emissions through energy efficiency and the adoption of alternative fuels including renewable power. According to a 2018 progress report, since 2008 these measures have saved a total CO_2 equivalent of 25,319 metric tons in municipal operations, and since 2007 have saved a total CO_2 equivalent of 700,229 metric tons in city-wide emissions (Moses, 2019).

In August 2018, the City Council unanimously adopted a non-binding resolution to use 100% renewable energy in Lowell by 2035. As part of this effort, the city committed to a range of projects including community choice aggregation, municipal solar projects,

continuing its energy efficiency upgrades, municipal fleet replacement, and installing public electric vehicle charging stations. On July 9, 2019, after a four month stakeholder and information-gathering process, the City Council unanimously voted to adopt a new electricity aggregation contract that included 45% additional renewable energy, the second highest level of renewable content for a municipality in Massachusetts.

Initial motivations for CCA: price and climate

In order to appreciate how energy justice has been built into Lowell's new aggregation contract, this section will interrogate the key motivations and factors leading up to its decision that emerged from interviews with key stakeholders, as well as additional archival research. This section will discuss how the issue of price in particular formed a key initial motivation for advocates pushing CCA as well as the decision makers on the City Council, although a range of other factors like additional renewable content proved crucial to the final decision.

Price was a key factor in galvanizing the initial coalition of environmental and climate change advocates to start pushing for a new CCA contract that would save money for ratepayers while also delivering additional renewable energy. A series of circumstances led to price playing such a key role. Lowell first entered into an aggregation contract in 2014, which was managed by Hampshire Power and offered 100% of its supply in Renewable Energy Credits - the first carbon neutral supply in

Massachusetts. However, this changed in May 2018 when “due to unexpected expenses incurred by the aggregation supplier”, the supply stopped offering additional renewable energy content above state requirements (Moses, 2019). Detailed information about the City’s motivations for entering into this past contract proved difficult to find, though a couple of interviewees mentioned that they thought saving money had been a key motivation for the City. In any case, research conducted by environmental advocates pushing for CCA in Massachusetts highlight that by spring 2019, Lowell residents were paying significantly higher prices for their aggregated energy contract compared to the Massachusetts default rate (around $0.137/kWh in May 2019 as opposed to the default rate at around $0.1043/kWh). In fact, Lowell ratepayers were paying such high prices that a new aggregation contract, including additional renewable energy, would actually turn out to be much cheaper, given the price of renewable energy at that time. This highly unusual situation meant that advocates pushing for additional renewable energy could argue that aggregation would actually save ratepayers money compared to what they were currently paying.

Each interviewee who had been involved in the advocacy process for the CCA was candid about the fact that a new aggregation that could offer a cheaper price proved a huge selling point to both the general public and to the City Councillors who voted unanimously in favor of the new, less expensive contract. This was especially the case after it became clear that Lowell residents could pay a cheaper price with a new aggregation contract and still have additional renewable energy content - a win-win for

the City that did not want to increase costs on ratepayers but wanted to be seen acting on the environment. One interviewee who had been involved in the advocacy campaign commented that it would have been a much harder sell - both to the public and to the City Council - to argue for additional renewable content if that meant a correspondingly higher price. As they put it:

> *I think a couple city councillors would have said, oh, yeah, renewables, like, let's fight for this. But a lot of them would say, no, I'm not going to charge working people more.*

Two or three interviewees similarly reflected that their campaign had been boosted by the "good bit of luck" of the highly priced initial aggregation, meaning that a newer contract was much cheaper by comparison and therefore easy for ratepayers to support.

Yet price was not the only motivation during the advocacy process and final decision to adopt the new CCA contract. For many advocates, the price argument was a useful framing device that helped sweeten the main aim of buying cheaper renewable energy that would have a large scale impact on greenhouse gas emissions as part of a wider effort against climate change. As one interviewee argued:

> *If you can get the city to buy renewable energy, that's like putting solar panels on everybody's house! But you don't have to put solar panels on everybody's house.*

Thus, CCA advocates conducted public outreach that led with arguments about renewable energy and climate change, but made it clear that Lowell residents could actually be paying cheaper prices in the process - an argument that, according to several interviewees, the public in Lowell were generally receptive to.

City Councillors who voted unanimously for the new contract that included 45% additional renewable energy also appeared motivated by both price and the need to act on the environment. As already discussed, no interviews with City Councillors were secured and so data came primarily from the environmental advocates pushing for CCA. One advocate felt strongly that the Council had been swung predominantly by the opportunity for cheaper prices:

> *Oh, what matters is the money, for sure. For sure... "Okay, what's the price going to be? Oh, it's cheaper than what we're paying now?" Because that's how we got everyone to vote on it.*

Yet other interviewees held a more nuanced understanding of the situation, highlighting that the Councillors they had spoken to were motivated by the desire to take some action on climate change, an issue that had gained popularity in the months leading up to the decision. This view is given credence by the fact that the City Councillors could have opted for a less high renewable energy percentage - for example, 5% or 25% - that would have cost ratepayers even less money. Councillors could have

chosen to sign a contract that would have saved Lowell ratepayers $12 a month on average. And yet they took the unanimous decision to vote on the highest percentage option for renewable energy, meaning that ratepayers only saved $6 a month on average. Thus, although price was a key factor in Council discussions and an overall frame for the decision- making process, Councillors were clearly motivated to increase Lowell's renewable energy content based on the perceived environmental merits of having higher renewable content for the city's energy load.

Energy justice themes

This section will discuss how different aspects of energy justice have been built into the aggregation contract, decision-making process and the different stakeholder motivations. It will highlight five different energy justice themes that served to structure the interview questions including: community control; community ownership; local green jobs; low-income assistance programs and the underlying tensions between moving towards 100% renewable energy and energy justice.

Community control

Having the ability to influence key decisions over energy policy and services is strongly connected to energy justice. This section will discuss the extent that meaningful public participation was present in the decision-making process that led up to Lowell's new

aggregation contract, and how the CCA is structured to encourage ongoing participation, accountability and community control.

Process

The process of creating Lowell's new aggregation contract took place over several months and saw a variety of different stakeholders come together to participate, including environmental advocates, residents who wanted a better price for their energy, City Councillors and City staff. In doing so, the City followed the legislation that governs the creation of CCAs in Massachusetts that sets out a detailed community stakeholder process ending with a decision by the City Council or relevant executive body over the details of a new contract and future direction. This process will be briefly outlined, before turning to a fuller discussion on community control and public participation as it relates to energy justice.

In early spring of 2019, a core group made up of members of 350 Lowell, Lowell's Sustainability Council, the Sierra Club and other concerned residents pushed CCA onto the Council's agenda. Over the subsequent months, this core group interacted with the Council process to determine the new aggregation contract through a small group advocacy strategy aimed at key Council members, and public outreach. This included a presentation by the Executive Director of the Massachusetts Climate Action Network at the Technology and Utilities Subcommittee, who successfully persuaded several Councillors that a greener aggregation contract was the right thing to do both in terms

of price and also environmental responsibilities. At the same time, CCA advocates conducted an outreach campaign in an attempt to educate the public on the issue and increase public support, and used this activity to base-build on energy and climate change issues more generally. At subsequent meetings of both the Technology and Utilities Subcommittees and the full Council meeting, advocates publicly expressed their support for CCA with additional renewable energy, while the Councillors discussed related issues around renewable energy jobs, pricing, and contract lengths etc. For the City's part, work was undertaken to understand the different pricing options, contract lengths and other key details, and report these to the relevant Council bodies making the decision. The final Council meeting took place on July 9, when around twenty supporters of CCA attended to publicly display their support for the green aggregation. The meeting saw a presentation by the City of Lowell's Energy Manager on different options including 0%, 5%, 25%, 35% and 45% additional renewable energy content, and ended with a unanimous vote in favor of a new aggregation contract with 45% additional renewable energy content above the state mandated Renewable Portfolio Standard.

The fact that the aggregation contract included such a high percentage of renewable energy - the second highest in the Commonwealth - was felt by some advocates to be a testament to the power of the community participation, where advocates were able to clearly input into decisions that affect their community and call for more renewable energy as part of wider efforts to increase greenhouse gas emissions. As one interviewee put it:

> *In the past, there was no public involvement. And they got zero renewable energy and terrible price…. As soon as the public was involved, well, guess what, you know, with… public participation in some form, we got a good deal. Without it, it would have been status quo, without question.*

Clearly, the core coalition of environmental advocates that had pushed for CCA had made a significant impact in, first, bringing the issue to the Council's attention and second, successfully persuading the council to adopt a high percentage of renewable energy.

Although this process was clearly more participative than previous decisions over energy aggregations, interviewees were also upfront about the fact that the vast majority of residents in Lowell either did not participate in any meaningful way, or were entirely unaware of both the process and what a CCA meant for Lowell. Interviewees brought up a range of factors that had an impact on this, which will now be discussed.

First, there appeared to be serious shortcomings with the Council-led process leading up to the CCA decision, which interviewees felt had impacted their own, and more widespread, community participation and control. Interviewees described the Council's process as lacking in transparency, having an unclear and generally rushed timeline that affected their ability to outreach to the general public, and difficulty communicating with the Energy Manager and other key Council employees over crucial

information about the various CCA options. Two of the CCA advocates mentioned that the only reason that anyone knew the date of the crucial - and supposedly public - final vote was that a few days before it took place, the Energy Manager just happened to be walking past where the advocates were having a meeting, wherein they immediately "buttonholed her" into giving them the key details. Summing up the process in general, one interviewee said:

> *We were assured [by the City] we'd be, you know, sitting at the table when it came time to negotiate the next contract, which we had to constantly fight for and remind [the City] about.*

Given that the CCA advocates felt like they were themselves struggling to keep up with the internal Council process, wider public participation for residents not actively engaged was felt to be extremely limited. To a certain degree, a small group of actors - in this case, the CCA advocates - worked extremely hard to exploit the Council process as best they could, with most other Lowell residents unable to effectively engage in the process in any meaningful way.

One specific criticism that was repeated in several interviews, and that the Energy Manager was challenged on during a Sustainability Council meeting, was around language inclusion within the CCA process. One CCA advocates felt that the City was not doing nearly enough to include non-English speaking communities into the

decision-making process and educational outreach about CCA, even in just providing basic information about what aggregation is. As already mentioned, Lowell is home to a diversity of ethnic and language communities, with for example forty-five different languages spoken across Lowell high schools. The recent opt-out letters that were delivered to each household about the new contract went out in English, although there was one line in Khmer that, according to the Energy Manager, instructed readers to have the leaflet translated. The Energy Manager also highlighted that information was translated on the website - although on further inspection it only contained a general option of Google translate, that did not satisfy the interviewee who was concerned that a generic translation tool may be unable to communicate the complexities of energy information contained on each page. This perceived lack of adequate communication prompted the CCA advocates to outreach to several non-English speaking communities within their limited capacity and time constraints.

Lowell's apparent lack of outreach and inclusivity is not without precedent - during one interview, it was brought up that the City of Lowell has recently faced a lawsuit on the grounds that its current city council and school committee electoral system is discriminatory, because it dilutes the votes of minority residents and communities (Lawyers for Civil Rights, 2019). General scepticism towards the Council's willingness and capacity to provide truly inclusive and participatory processes to minority communities on any issues was a recurring theme during interviews.

Second, wider public participation and community control were likely lessened because of the type of advocacy strategy that the CCA advocates undertook, given the time constraints of the Council process. Two interviewees discussed how their advocacy strategies had been structured around the "small group advocacy" approach as opposed to a mass movement approach. Instead of building a large mass of people to show the City Councillors the level of support for CCA, the core group of advocates worked instead to put pressure on specific City Councillors who sat on the relevant subcommittees, mostly through continuous lobbying to keep the issue on their agenda. As one interviewee explained:

> *We did not provide an overwhelming social movement to push it over the goal line, but we did do the other things. We did create the issue, we clarified the issue, and we kept the issue up front… That's what small groups can do.*

The public outreach efforts of the CCA advocates should not be underestimated, however. In the limited time available, the core group tabled at Lowell's many festivals, outreached to the Khmer and Spanish speaking communities with educational flyers, appeared on radio and local television stations, spread the word through Lowell's social justice networks, and organized public presentations on the opportunities of CCA. Yet whether this educational outreach translated into a wider level of community participation is an open question; one interviewee expressed some scepticism as to

whether it made much difference to the eventual outcome of the vote, though she felt it was the right thing to do in any case as part of a larger base-building effort for his organization. Several interviewees expressed the view that they would have done a more sustained public outreach campaign with a clearer and longer timeframe for the process, that would perhaps have had more of an impact on wider participation and given communities in Lowell a greater opportunity to shape the decision.

Third, a recurring theme that emerged during interviews was the difficulty of encouraging Lowell residents to become active on energy issues in general, whether from the perspective of CCA advocates or the City Council. Interviewees brought up the challenge of communicating the complexities of different issues within the energy system including regulation, ownership, how renewable energy interacts with the grid, and the importance of Class 1 Renewable Energy Certificates. This sentiment was often discussed in connection with Lowell residents facing a multiplicity of competing priorities - work, childcare, paying energy bills - and was in no way derogatory towards individual residents. Instead, there appeared a general, shared frustration during several interviews at the complexities of the energy system that makes it very daunting for the average resident to understand and take action on. One interviewee predicted, for example, that the majority of people would not read the opt-out letter - not necessarily a negative thing given that he was in support of residents staying in the aggregation, but it did highlight the large structural challenges of working on energy issues:

> *The challenge with it is no one really thinks about this stuff until they learn about it… Because everyone's a ratepayer, but like not everyone cares about their electricity bill… and getting people excited about electricity bills, and energy and stuff like that is kind of hard.*

Structure

Lowell's CCA contract is, in theory, structured with democratic oversight and ratepayer accountability. Similar to the majority of CCAs being initiated throughout Massachusetts that fall under the CCA 1.0 model, activities relating to the aggregation are conducted primarily between the Energy Manager on behalf of the City and its ratepayers, and external consultants. In Lowell's case, an initial contract was signed between the City of Lowell and consultant Colonial Power Group, a company that specializes in delivering energy services, particularly CCAs. This consultant company - also termed a 'broker' - works to deliver the City's aggregation needs, in this case 45% additional Renewable Energy Credits, by finding a suitable energy supplier. A contract is then written between the supplier and the City that forms the aggregation contract. In this case, the Mayor of Lowell signed a CCA contract with energy supplier Constellation New Energy Inc. to deliver electricity with 45% renewable energy on behalf of Lowell ratepayers starting in October 2019. The broker then works with the city to manage communication to ratepayers, including issuing the initial 'opt out' letter where residents can choose to opt out of the aggregation and instead switch back to the default rate set by the utilities. The

aggregation rate of $0.11874/kWh includes two adders: 1) a consultant fee of $0.001/kWh that goes to Colonial Power, and 2) an Operational Adder of $0.001/kWh that helps fund the Energy Manager position within the City.

Given that the aggregation is under the City's remit, and the contract is overseen by the Energy Manager who continues to work with the broker throughout the contract period, it can be argued that the community of Lowell has more of a degree of control over the aggregation program than they would if they were on the utility default rate or a third party option. For example, a resident can contact the Energy Manager at the City of Lowell directly to share their views about the program and the rates, or they can contact Constellation Energy, the supplier, with any questions they may have. Further, because the management of the aggregation contract is under the City Council, residents of Lowell can exercise their democratic rights through the local elections that set the council agenda and future direction on energy.

On the other hand, for the individual ratepayer, very little will have actually changed; apart from the different supplier name on the physical bill, the utility National Grid will still handle billing and transmission of the energy and are the main point of contact if there is a problem. Interestingly, on the webpage for the Lowell program, Colonial Power Group - who brokered the CCA contract on behalf of the City of Lowell - directs customers with queries to contact Constellation Energy who are based in Texas, although they do provide contact details for Colonial Power too on a separate webpage. But for ratepayers and residents who want to have a greater degree of control over

energy decisions during the contract period, there is very little within the structure of the CCA program that offers an opportunity to do so. Outside of the stakeholder process that led to the CCA contract being agreed, it is not clear - from the Lowell program website, for example - of how residents of Lowell can offer even feedback about the program or even who to direct it to.

Community ownership

Lowell's CCA is not structured around community ownership in any physical sense; ratepayers in Lowell's aggregation do not own the energy or related infrastructure either privately or collectively through their municipality. Lowell's CCA works within the existing ownership structure in Massachusetts wherein the vast majority of transmission and distribution wires are owned by the utility companies National Grid and Eversource. Energy is created from generators in New England and beyond, and then transmitted and distributed to individual households and businesses that pay for that service.

Very little was mentioned about community ownership during the majority of interviews, and the issue did not appear to be a key motivating factor for setting up the new CCA contract for most advocates. However, one CCA advocate did feel strongly that the energy grid should be nationalized, along with other services that the interviewee deemed vital for the functioning of society - health, transportation etc. Yet they also appeared to interpret the question as more related to the need for greater community

participation and ownership of local decisions on energy than physical or financial ownership:

> *So to the degree that people participate and take some kind of ownership, whether it's actual ownership or whether it's ownership of the responsibility to pay attention, it's a positive thing. Real ownership would be better. But... I mean, it's, you know, same as anything else, if you just let it happen, you know, very few number of people are going to take advantage. So more widespread the responsibility, the better it is, as far as I'm concerned.*

On the other hand, another interviewee was sceptical about the public in Lowell prioritizing community or public ownership of energy services:

> *The left thinks that people should own their own energy and we'll all make better decisions. And I'm sympathetic, I agree with that generally and on a philosophical basis. But do people care about that? I don't think so. I think people want cheaper prices, and they want to do something about climate change. And how they prioritize them I have no idea... I didn't detect this, like, "Yeah, we should take over the energy, it'd be better if we control it."*

One other key issue mentioned several times in relation to questions on community ownership was Municipal Light Plants. In Massachusetts, there are two types of electric utilities that distribute electricity to households and businesses; investor owned utilities like Eversource and National Grid, and Municipal Light Plants that are fully owned by municipal governments. There are forty-one Municipal Light Plants in Massachusetts that serve fifty municipalities, and many of them own the electricity generators too - a practice that utilities are prohibited from doing. To a certain extent, their municipal ownership structure gives the opportunity for greater democratic decision-making and community participation; communities can have a direct say on how their local Municipal Light Plant is run through Council elections and decision-making processes. However, as became clear during several interviews with CCA advocates, Municipal Light Plants have come under sustained criticism for their lack of environmental action. Crucially, they are exempt from the Renewable Portfolio Standard (RPS) - the statewide regulation that requires all utilities (and CCA programs) to buy a certain percentage of renewable energy. This means Municipal Light Plants are not mandated to buy additional renewable energy like other utilities are. Apart from three, no other Municipal Light Plants are acting to green their energy content, presumably because this would require communities to vote to increase their energy bills and they are unwilling to do so. Even though the additional cost would simply bring their energy prices in line with what other communities pay across Massachusetts, Municipal Light Plant communities have not been supportive of this move, and have blocked progress.

By bringing up Municipal Light Plants, the CCA interviewees implied that community ownership and local control did not necessarily translate into more environmentally-friendly decisions. In fact, in the case of Municipal Light Plants, the opposite proved true. As one interviewee put it:

> *The interesting thing to me is, those folks who believe that the people should own their own energy, how do you account for the fact that when the people do own their own energy, they're backwards? … [Municipal Light Plants] won't agree to the RPS, nevermind 45% more than RPS… What should be the most socially progressive is actually the least socially progressive.*

Overall then, community ownership was not a key motivation driving most of the CCA advocates through the creation of the aggregation program, even if one person felt strongly about public ownership in a more general sense. In fact, the interviewees were more likely to hold a degree of scepticism towards community ownership being useful for CCA, given the past experience of municipally-owned Municipal Light Plants being a block on climate action in other parts of Massachusetts.

Local green jobs

The fact that Lowell's energy content now includes 45% additional renewable energy from Massachusetts generators can be seen as a win for local green energy jobs. From

the outset, the CCA advocates who were interviewed had put considerable effort into convincing City Councillors of the desirability of purchasing renewable energy under the Renewable Energy Certificate (RECs) system that operates in New England. This system will now be explained before turning to a discussion on local green job creation.

In the US, a system of RECs has been created in order to track renewable energy generation and provide a mechanism to increase generation on a large scale. When renewable energy is generated (from wind turbines, solar panels, hydro etc), two products are created: the actual energy itself and a REC which acts as a receipt proving that renewable energy has been generated. These RECs can be bought and sold on REC markets by energy generators, suppliers and consumers and act in a way to keep track of renewable energy generation. As part of the effort to reduce greenhouse gas emissions, several states have mandated that utility companies must buy - or 'retire' - a certain number of RECs as a percentage of their overall load, called the Renewable Portfolio Standard (RPS). The RPS in Massachusetts was at 14% when research was conducted, meaning that utility companies need to meet 14% of their energy supply by retiring RECs, or face a state fine.

There are also different types of RECs, called 'Classes', that are directly relevant to the Lowell program's new contract. For simplicity, Class 1 RECs will be the focus here. Class 1 RECs are widely considered by environmental campaigners to have the most impact on new renewable energy generation in Massachusetts and New England. This is because Class 1 RECs are Renewable Energy Credits created specifically in New England

renewable energy generators since 1997. Buying a Class 1 REC therefore means supporting renewable generation in New England, a region generally harder to produce renewable energy because of its geography (compared to, say, states like Texas that have huge commercial windfarms). Class 1 RECs are generally more expensive than those for renewable energy generation elsewhere.

Lowell's decision to adopt a CCA contract that includes 45% additional Class 1 RECs generated in Massachusetts, above the 14% state mandated Renewable Portfolio Standard, therefore has significant ramifications for new renewable energy generation in New England. When CCAs buy a Class 1 REC 'voluntarily', i.e. they choose to purchase RECs above the Renewable Portfolio Standard, it means that the utility has less options to buy RECs to meet its Renewable Portfolio Standard, and so must find additional RECs from somewhere else or face a penalty. Thus, the more Class 1 RECs bought voluntarily by organizations like CCAs, the more demand there is for them from utilities that are required to buy them, spurring investment and development of new renewable energy generators. However, non-Class 1 RECs - those created outside of New England in, for example, Texas wind farms that are cheap to generate and may have been on the market for decades - do not spur additional renewable energy generation in New England, and therefore do little for local clean energy jobs.

Although the Lowell program's 45% additional RECs is likely to have a significant impact on the creation of new renewable generation in Massachusetts and New England generally, the number of jobs resulting from the CCA are nevertheless hard to quantify.

For example, interviewees provided several different definitions of what a 'local' job could constitute - be it New England-based, Massachusetts-based, or within the City of Lowell boundary or surrounding County. Interviewees stated several times that 'new generation' based in Massachusetts was clearly important for local jobs, but the CCA as it stands does not provide additional jobs for people in Lowell because the 'additional' jobs are based on state-wide projections of increasing demand of new generation, which hasn't necessarily been built yet.

Perhaps the most concrete aspect of additional jobs as a result of the CCA comes from the aggregation's Operational Adder that helps fund the Energy Manager position at the City of Lowell. A jobs argument could possibly be made in relation to the role of the energy consultant - in this case Colonial Power - although without having a clear understanding of staffing levels at the company before and after the CCA decision was made, it is hard to quantify concrete impact on jobs.

Low income assistance programs

The Lowell program does not provide any additional support for low income families, besides now offering a much cheaper price on electricity. The aggregation does not affect the Massachusetts Low Income Home Energy Assistance Program, that provides low income households with help for winter heating bills through fixed winter payments.

Creating new or furthering existing low income assistance programs was not a high priority for the CCA interviewees. Interviewees told me that, although issues of

equity were central to their discussions on outreach and participation, little time was put into thinking about how the CCA could be structured in a way that could serve low income households specifically through specific assistance programs. There were several reasons for this that emerged during interviews: first, given that the decision-making process around the implementation of the new aggregation contract was felt to be unclear, rushed and untransparent, the advocates spent much of their limited time working on just trying to keep up with the process. Second, the advocates felt that a simple message - more renewable energy for a better price - would help convince Councillors who might be sceptical or confused about how energy markets and aggregations work. Third, discussions around equity and serving low income populations have been largely absent from the CCA movement in Massachusetts, meaning that CCA advocates lack tools or awareness as to what options there are available. However, the CCA advocate interviewees were generally interested in finding out more about how CCAs could serve low income households.

100% renewable energy vs energy justice

The challenge of Lowell moving towards 100% renewable energy while not leaving low income households behind was a theme that emerged strongly in all my interviews with CCA advocates and other stakeholders. The issue was highlighted particularly when discussing the percentage of Renewable Energy Credits that the final aggregation should include. On the one hand, some CCA advocates worried that a higher percentage would

push up the price too much and so detrimentally impact low income families, especially given that Lowell is a working class city with a high level of poverty. As one interviewee put it:

> *This is where the justice and equity piece comes into it, because I think the most important thing is making it accessible to the most amount of people that we possibly can. And if, you know, getting 45% renewable is increasing people's electricity bills to the tune of, you know, money that really makes a difference and is better in their pockets, then, I don't really think that's fair, or equitable.*

As it turned out, the new contract that included the additional 45% renewable energy was still substantially cheaper than the previous contract, meaning that ratepayers were still saving money compared to what they had been paying. However, several CCA advocates interviewed were still conflicted about the fact that even more money could have been saved with a lower renewable energy content than 45%. As one interviewee put it:

> *You know, we struggled with the equity issue, because here we are actually telling people to pay more for their electricity, even though we were doing it in a context where actually they would be paying less for their electricity - they could be paying* less *less, and we were asking them to pay* more *less…*

On the other hand, other CCA advocates felt that the higher level of renewable energy was the right decision. Three arguments were generally used for this position: 1) that low income residents could opt-out any time from the aggregation, freely and relatively easily; 2) that, given the need for serious climate action, 45% additional renewables would have a huge impact on spurring new renewable energy generation and reducing Lowell's climate emissions; and 3) $6 a month (the difference between the aggregation and standard default rate offered by the utility companies) was a very small price to pay for the majority of families, particularly given that energy bills fluctuate every six months on the default rate anyway.

The urgency of climate change action was highlighted several times in response to questions of equity. One interviewee in particular felt that it was more important to show leadership on climate change - particularly in working class Lowell - so that other communities felt they could follow suit, than to go for a less ambitious target that would save families slightly more money:

> *I think that in order to make big things happen, you have to try to take advantage of where the drama is in your proposal. So I think the fact that Lowell has 45% [Renewable Energy Credits] plus another 14% [Renewable Portfolio Standard], we got 59% green energy content now is something that can be used in other communities to propel their own cases, move them forward. Now, you know, six bucks a month is...*

> *a couple of coffees. Sure, I mean, that's money that low income participants are going to look at more carefully, But I – will they really notice? So for me, it's better to provide the big scale, splashy, 45% potential and… gamble that some people will opt out, than it is to go for something that is not so much of a stretch, something that's safer, something that's easier, something that is less exciting, and… doesn't make the same splash. I think Lowell is making a splash across the state.*

The decision to go with such a high percentage of renewables at the expense of more savings to ratepayers was publicly criticised in an editorial of the local newspaper, the Lowell Sun. The piece argued that wealthy cities like Cambridge who have done CCAs with additional renewable content are very different from Lowell's working class and low income character. The piece also questioned why, given this context, Lowell residents are expected to pay for environmental action. The interviewees were mindful of this criticism, but also felt that it was not shared by the majority of Lowell residents. Instead, they felt that the issue had not become too controversial in local politics, which was perhaps a testament to the CCA going some way to meet both aims of increased renewable energy and energy justice through lower electricity prices.

5. Cape Light Compact

Introduction

This section will present case study findings on how energy justice is built into the Cape Light Compact ('the Cape program'), the CCA that serves Cape Cod and Martha's Vineyard customers. The chapter will proceed in three stages: 1) background information introducing the Cape and Islands and past climate and environmental action; 2) exploration of the initial motivations for setting up the Cape program including how they related to energy justice; and 3) discussion of the various characteristics of the Cape program in relation to the five energy justice themes: a) community control, b) community ownership, c) local green jobs, d) low income assistance, and e) tensions between 100% renewable energy and supporting low income residents on the Cape. Discussion will be interlaced with quotes from my various interviews from Cape program stakeholders to enrich the case study findings.

Background

Cape Cod is a 339 square mile geographic cape extending from south eastern Massachusetts into the Atlantic Ocean, while the two large islands of Martha's Vineyard and Nantucket Island are situated to its south. Politically, the Cape is referred to as

Barnstable County that comprises fifteen towns while Dukes County covers Martha's Vineyard.

History

Cape Cod was one of the first places settled by European colonialists in the seventeenth century. Its glacially deposited soils were ill-suited for intensive agriculture and livestock and its lack of significant water power meant that, unlike many places in Massachusetts, steam-powered industry did not take hold in the area. Instead Cape Cod became the center for an extensive fishing and whaling industry. The fortunes of the whale industry declined in the late nineteenth century when whale oil began to be replaced by fossil fuel products. The fishing industry was almost decimated in the mid twentieth century through overfishing, though the Cape is still home to small and large commercial fishing businesses.

Today, Cape Cod is known locally for its tourism during the summer season with its population doubling between January and August. Many wealthy families in Massachusetts and beyond own second homes on the Cape, including for example the Kennedy's who own a large and famous 'compound' on the southern shore. The Cape Cod National Seashore sits to the east, with its wide, sandy beaches protected from development and open for public recreation. Other wetlands and bays across the Cape attract wildlife enthusiasts. At the bottom of the Outer Cape, Provincetown has become a prime tourist resort for LGBT+ populations.

Demographics and environmental justice

Around 231,000 people live across Barnstable and Dukes Counties. Demographically, Cape Cod's population is 90.2% White, 5.87% Hispanic or Latino, and 2.7% Black or African American (DataUSA, 2019b). One of the Cape and island's key challenges is a rapidly ageing population - according to the EPA EJ Screen (Environmental Protection Agency [EPA], 2019b), over 28% of Cape Cod's population is over 64. Its low income population is around 21%, just below the state average of 24%.

Environmental action

Town and county councils on the Cape and Vineyard have responded to the issue of climate change primarily in the form of adaptation and resilience building. As a maritime community, Cape Cod is on the frontline of climate change impacts including sea level rise, more intense storms and flooding events. A recent Boston Globe special report on climate change on Cape Cod profiled Cape Codders attempting to deal with their business properties being repeatedly flooded, or washed away altogether as the coast erodes at a rapidly increasing pace (Ramos, 2019). Various biological feedback loops are worsening conditions - for example marsh crab populations are booming, likely driven by overfishing and warmer oceans, that decrease vegetation through overgrazing. With less vegetation to hold the sand dunes together, the sand is more susceptible from erosion and further sea level rise driven by climate change.

Although the majority of environmental action has been focused around resilience planning, communities on the Cape and Islands have also used state-funded Green Community Grants to retrofit buildings in an effort to conserve energy with Yarmouth, Harwich and Orleans the latest towns to be granted this funding.

In 1997, the Cape Light Compact was formed with its triple aim of delivering a comprehensive energy efficiency program for the Cape, to procure energy on behalf of Cape residents in the first example of municipal aggregation in Massachusetts, and to advocate on behalf of their consumers at the state level. Formed first as an intergovernmental agreement between several towns, it is now structured in the form of a Joint Powers Entity made up of twenty-one member towns and one member county. The aggregation contract buys 1% additional renewable energy above the state-mandated 14%, and has recently started offering opt-up energy products where residents can choose to buy more renewable energy for a premium.

Initial motivations: price

Understanding the initial motivations and aims of setting up the Cape program is key to uncovering how it connects to energy justice. This section will present interview data that highlighted that price was a key initial motivation for the Cape program, that impacts how the CCA takes action to further energy justice on the Cape.

The Cape program's aggregation contract was set up between 1998 and 2001 as part of a wider effort by the towns and counties on the Cape to administer the state-wide energy efficiency program that would later become Mass Save. At the time of the Cape program's creation, town and county council leaders on the Cape were concerned that residents on the Cape were paying more into the state-wide system than they were receiving back, particularly given the Cape's geography, infrastructure and demographic challenges. Taking the energy efficiency program in-house would help make sure that Cape residents were getting back just as much as what they were paying in. As one interviewee stated:

> *[It] was really about keeping the dollars that Cape and Vineyard customers are paying on their bills for energy efficiency, and having local control of those funds, rather than having it be decided by… utility executives who may be really focused on the greater Boston area.*

The 1997 Restructuring Act requires that municipal aggregators must be operating a power supply program to administer energy efficiency programs. In 1998, the Cape program began the process of aggregating energy on behalf of the Cape and launching its energy efficiency program.

Once established as a CCA, keeping the aggregation price as low as possible was and remains a central objective for the Cape program. Its power supply program was set

up to track the utility base rate - the only power supply product offered by utilities National Grid and Eversource throughout Massachusetts, that changes every six months - as closely as possible. One Cape program employee stated throughout the interview that achieving a price in line with the default was the primary aim of the power supply program for the first 12 years of the program, with other motivations like renewable energy very much secondary considerations. Price was and remains such a key factor because of the all-important opt-out clause of Massachusetts-based municipal aggregations; if prices rise too much above the base rate offered by utilities, the Cape program's customers may simply switch en-masse to either the basic service offered by the utilities, or to third-party competitive supply through a private contract. This would mean the organisation would lose custom, affecting both its aggregation and energy efficiency programs. This was clearly a pressing concern for the Cape program, particularly given that staff members often receive direct feedback (usually in the winter-time) from customers unhappy if prices are even half a cent above the utility base rate. As will be discussed further below, keeping prices as close to the base rate as possible creates a real challenge of 'greening' the electricity supply through the purchase of - often a lot more expensive - renewable energy from Massachusetts and New England.

Energy justice themes

This section will discuss how the Cape program is structured in relation to energy justice, based on evidence collected through interviews and archival research. It will then highlight the five different energy justice themes that served to structure my interview questions: community control; community ownership; local job creation; low-income assistance programs and the underlying tensions between moving towards 100% renewable energy and meeting the needs of low income communities.

Community control

The Cape program is structured to provide some level of community control for Cape Cod and Martha's Vineyard residents. First, there are continuous opportunities for community members to share feedback on the Cape program's activities. The organization is governed by representatives of the twenty-one member towns and one member county that make up the Governing Board. As such, members of Cape and Vineyard communities can directly lobby their governing bodies' representatives (all of which are Boards of Selectmen except one member town which has a Town Council) about how the Cape program is run and governed. On a more day-to-day level, residents can contact program staff directly about any issue they might have - as already discussed, power supply staff often receive phone calls in the winter from customers

unhappy if prices have risen above the default rate set by the utilities. This direct channel of communication was felt to be important for the Cape program's staff member interviewed, who felt that it provided useful feedback for the organization that sought to meet the needs of its paying residents.

Second, on a larger level, the way that the Cape program is structured arguably provides a greater degree of oversight and accountability than a CCA that contracts most of its operational services to external consultants like an energy broker. This difference helps highlight the differing models of CCAs, with the Cape program arguably having some characteristics more akin to CCA 2.0 than 1.0. At the Cape program, a staff of 15 people are employed to run the organization's activities. One staff member is specifically dedicated to the power supply program, playing the role of broker while working with an external power supplier, with the rest working primarily on the energy efficiency program. Staff members work to deliver the various aims of the program set by the town and county representatives, for example looking into buying more renewable energy or keeping price as low as possible. This is different from the Lowell model, where the majority of the aggregation contract operations is done by a private, external consultant who may, as in the case of Colonial Power, be delivering energy services for several other communities who have aggregation contracts. The interviewee felt that this consultant relationship did not lend itself to encouraging wider community participation on an ongoing basis. This was because, once the community stakeholder process is over and the aggregation contract is signed, there is relatively little incentive for the consultant to

work hard to improve the aggregation, or work with the town to deliver the different needs of the town or communities - whatever they might be. For the interviewee, the Cape program was continuously tied to delivering what the towns wanted - whether from their Board of Directors, or responding to feedback from customers contacting them directly. This connection was felt by the Cape program's staff to be an important aspect of service delivery to Cape and Vineyard customers.

However, the Cape program's structure of governance has a significant drawback in terms of creating opportunities for Cape and Vineyard residents and customers to enact changes to the CCA's direction and programs. As the Board of Directors is made up of a Council representative from each of the Cape and Vineyard's 21 towns and one county, any grassroots constituencies pushing for change need to pressure a number of representatives from the different locales, requiring a high level of coordination and capacity. In fact, it represents a significant barrier for change. As will be discussed below, there is a degree of tension between the Cape program's mission to support its customers through offering low priced electricity, and moving towards 100% renewable energy. Residents who would like to see the Cape program providing more renewable energy in its standard product need to effectively lobby a majority of the Board of Directors - quite an undertaking given its large size. This issue highlights the potential drawbacks of building decision-making processes across different regions, creating real barriers for one community's ability and capacity to shape and control energy decisions.

Community ownership

Very little discussion with the Cape program interviewee centered around issues of community ownership, suggesting that the concept was not a key driver in the initial creation of the Cape program nor a current focus. Instead, discussion centered around an interpretation of community ownership that was more to do with community buy-in and participation, with the interviewee highlighting that engaged towns, particularly those that had energy committees driven by highly engaged volunteers and officials, were more likely to have successful CCA programs. Other comments around community ownership were connected to the challenges of financing renewable energy projects at scale, that will be further discussed in the following section on local green jobs.

Local green jobs

The Cape program model arguably lends itself to local job creation in four main ways. First, it is set up as an organisation that employs staff, and does not simply contract out its power supply side to another company. There are currently 15 staff, one of whom works on the power supply program and the rest who work administering the energy efficiency program.

Second, the Cape program actively attempts, where it can, to procure local businesses on the Cape for its in-house energy efficiency program. As already discussed, most of the Cape program's work is delivering the Massachusetts-wide Mass Save energy

efficiency program on behalf of Cape and Vineyard residents (even those who are not participating in the aggregation). This work includes vetting energy conservation specialists to do initial energy audits in residents' homes who then deliver the appropriate energy efficiency upgrades. The Cape program interviewee discussed how a previous decision to hire an energy efficiency vendor outside of the Cape attracted criticism from those arguing that local vendors should have been offered preference. However, for this particular hiring decision, the contract specified that the vendor had to open an office on the Cape, which they did, subsequently outgrowing it. So, although the Cape program interviewee highlighted that they do not have official location-specific criteria when choosing vendors, they do tend to choose local companies where they can, promoting the local economy on the Cape in the process.

The Cape program would also prefer to procure local businesses for energy generation projects like commercial solar installations, though this can prove challenging because of issues of financing. As the Cape program interviewee explained, there might not be large scale renewable energy developers located on the Cape, because large-scale renewable energy developers are usually located in larger cities close to large banks who finance their operations. Although local installers might be used during a project and for longer term maintenance, the vast majority of the economic benefit does not stay local. The Cape program interviewee highlighted a possible solution would be a hybrid where local installers were financed nationally:

> *… we don't want to be spending millions of dollars on one of our programs that's not benefiting some firm on the Cape that can be doing that work. So we're interested in a model where you have a nationally based financier, but they are qualifying and hiring local firms to do the work and to maintain them over their lifetime.*

This is a key challenge to being able to support the local Cape economy and grow renewable energy sector jobs locally.

Third, similar to the Lowell program, local jobs are created indirectly from the purchase of Renewable Energy Credits. The aggregation purchases 1% additional Class 1 Renewable Energy Credits from Massachusetts renewable energy generators, with the additional 99% non-regional Renewable Energy Credits also helps to finance multiple projects in New England (discussed more below), though none on the Cape or Vineyard. As with the Lowell program, it is difficult to quantify exactly how many jobs and where this financing actually creates. Interestingly, the Cape program staff interviewee felt that the local renewable energy jobs argument was not particularly important for many of the CCA customers, even if the Cape program itself attempted to use its powers to create as many local jobs as possible.

Fourth, the Cape program helped found its now sister organization Cape and Vineyard Electric Cooperative, that provides renewable electrical generation and services to the Cape program and Cape and Vineyard municipalities. This Cooperative mainly operates solar farms (these supply the Cape program with a percentage of their

load) and have also developed Low Income and Community Solar initiatives. Three full and part-time staff members oversee operations

Finally, wider questions were brought up around how a CCA could become an economic driver in a local community beyond what was happening already. The Cape program staff interviewee discussed that this could possibly happen in two ways. First, that a new CCA on Nantucket was testing a model where a proportion of the aggregation is put towards a rebate for solar energy which, paired with other state incentives, goes directly to residents and supports the local island economy. Second, funds could be set aside for developing a renewable energy project or through signing either a Renewable Energy Credit Purchase Agreement or a Power Purchase Agreement with a developer for a project in the town. However, a key limitation to either of these options is the ability to leverage large-scale financing - because the CCA has an opt-out mechanism, banks are unwilling to finance anything too big because of the risk of customers opting out en masse (to date, the Cape program has signed a Power Purchase Agreement for a solar farm in Maine, but for a relatively small amount of energy and Renewable Energy Credits). Unless towns are willing to fully backstop a development, or they gain ownership of the 'poles and wires' of energy infrastructure like Municipal Light Plants have, there are significant limitations to a CCA's capacity to support large economic development - and creating local green jobs - through renewable energy projects.

Low income assistance programs

The Cape Light Compact offers a low income assistance program through its energy efficiency program and other projects. As with the other utilities delivering the Mass Save program, customers are split into three categories - commercial industrial, residential, and low income residential. Around 10% of the Cape program's energy efficiency budget is dedicated to low income residential customers, paid for through local ratepayer funds. In addition, the federal Low Income Home Energy Assistance Program that provides financial assistance and weatherization grants to low income eligible customers is also leveraged in combination with the ratepayer energy efficiency funds. The Cape program's definition of low income is slightly more flexible than other utility program administrators: it can choose whether residents meet the low income requirements in terms of either the State Median Income or the Area Median Income - whatever works out to be more advantageous for customer participation. After a pre-vetted vendor that specifically audits low income homes, low income eligible customers are typically offered 100% rebates (paid through energy efficiency program dollars) on highly-priced conservation products like more efficient fridges or boilers, with a sliding scale for rebates for different income bracket qualified customers. In 2018, the Cape program offered $3,464,650 of incentives to low income customers, generating annual electricity savings of 20,543MWh and total financial savings of $11,846,681 (Mass Save Data, 2019).

The Cape program also works in partnership with external organisations to deliver a range of projects that help support low income residents. One project is a long-term partnership with Habitat for Humanity, a religious non-profit that builds affordable homes for income eligible residents. A key challenge for Habitat was installing Solar PV without increasing the price of the home, which would be counter to Habitat's aim of creating affordable, decent-quality homes for those on low incomes. The Cape program partnered with Habitat to overcome this challenge by installing solar panels in exchange for the Solar Renewable Energy Credits (SREC)- a Massachusetts-wide designation of specifically solar Renewable Energy Credits (REC) that preceded the current Solar Massachusetts Renewable Energy Technology program - for a ten year period. Because SRECs sell for a much higher price than normal Class 1 RECs, the deal meant that the Cape program could sell the SRECs at a good price on the REC market and use the resultant money to fund future, similar solar installations. Under this partnership, the resident of the home benefits because they are getting the electricity and associated cost savings, which also furthers Habitat's affordable housing aim while not costing them additional money, while the Cape program is able to sell the SRECs for a high price.

A second project that is currently at the proposal stage was also highlighted as providing innovative low income assistance solutions to Cape residents. The project would work to strategically electrify homes that are deed-restricted to low-income homeowners. For participating households, any delivered fuel (propane or oil), or electric baseboard heat systems would be replaced with mini-split heat pumps, with the rising

cost of the electric heating bill offset by installing solar photovoltaics that would also help offset added load on the grid in wintertime when fossil fuel emissions are high. Finally, battery storage would be added for demand response and resiliency in the case of power outages, something that the Cape program interviewee felt specifically benefited low income customers:

> *… that would be a benefit to them to be able to not have to go to a shelter potentially for a short outage event, instead be able to stay in their home and still have their [medical] equipment operating and not lose a fridge full of food, which is a much greater impact to them than it would be for a non-low income customer.*

This proposal has been commended in concept by the Department of Public Utilities, and is currently being refined and developed with additional stakeholder engagement. Overall, the project highlights how the Cape program is providing creative and innovative support to their low income customer base through the state-wide Mass Save program.

The Cape program does face challenges in delivering its low income assistance program to all participating Cape Cod customers. The Cape program interviewee stated that although 10% of their budget is set aside for low income eligible customers, the organization often struggles to spend the entire low income budget. One obstacle in spending the Low Income Home Energy Assistance Program funds is simply the challenge of finding income-qualified customers who go through with the whole

program of energy efficiency upgrades. Residents in the low income bracket are generally “hard to reach” for a range of reasons, for example their economic situation means they are often out working at times when energy audits and retrofitting work needs to be completed, or they simply lack awareness of the program and the potential for savings on offer. Outside of the low income eligible bracket are families and households that may sit just above the low income threshold, but they are still at or below 80% of the State Median Income which means they are still very financially precarious. This group is also hard to reach - there may be two full time working adults, or one adult with two jobs who doesn’t have the time to research energy efficiency programs. Moreover, these families do not qualify for the very rich incentives offered to lower income households, even though they may be living paycheck to paycheck and so struggle with cash flow issues to pay for energy upgrades. Finally, there are challenges associated with offering rich incentives for energy generation projects because of the different types of buildings that residents occupy - multifamily units, for example, are difficult to institute net-metering systems, while the rental sector in general is challenging because of the temporary nature of residents versus the need for long-term financing and managing of net-metering systems.

100% renewable energy vs energy justice

Similar to the case of Lowell’s CCA, tension existed between the Cape’s aggregation program offering a higher percentage of renewable content, and making sure customers

across the Cape are not hit by higher energy prices. Currently, the Cape program's aggregation base rate included around 1% additional Massachusetts Class 1 Renewable Energy Credits (RECs) above the state-mandated Renewable Portfolio Standard, currently at 14% and set to rise annually by 1%. From 2018, these Class 1 RECs have been purchased from Massachusetts-based wind installations. The remaining 99% of the load was made up from non-Class 1 RECs purchased by NextEra Energy Services, who diverts the premium, alongside the supplier and retail fees, into a third-party administered trust called the Earth Era Trust, that is used to finance renewable energy development in New England. In addition to the standard power supply offering of 1% additional Class 1 RECs, the Cape program now offers a 50% and 100% opt up product for a premium.

The fact that the Cape program's base load includes only 1% Class 1 RECs above the Renewable Portfolio Standard has attracted criticism from environmental advocacy organisations and concerned residents. State-wide environmental campaigning non-profits highlight that given that more CCAs in Massachusetts are now offering additional content in the range of 5% (as in the case of Dedham) and 46% (in the case of Newton), the Cape program should follow suit and increase its percentage - a move that would have a large impact on encouraging new renewable energy generation in New England. Second, environmental advocates point to the fact that REC prices have been particularly cheap on the energy market in recent months, meaning that CCAs like the Cape program should take advantage in locking in favorable prices while also doing their part to purchase additional RECs (although it is worth highlighting that in late 2019, REC

prices actually soared, highlighting if nothing else the volatility of REC markets in general). Finally, criticism is aimed at the Cape program for using non-Class 1 RECs - that make up 99% of the load of the standard offering product - as being a form of 'greenwashing' because they are purchased from less 'tight' energy markets in places like Texas and are not encouraging New England renewable energy development as much as Class 1 RECs would.

These criticisms present a challenge for an organisation that was set up primarily to deliver cost savings to Cape and Vineyard customers in the form of energy prices and energy efficiency services, but that is also trying to act on the environment today. The Cape program interviewee highlighted that unlike in towns like Lowell, Dedham and Brookline where residents actively voted to increase their renewable energy load after a months-long stakeholder engagement and educational process, renewable energy was never a core part of the original discussions when setting up the CCA. Consequently, there remains little buy-in from customers on the Cape who want the program to deliver the cheapest aggregation prices every six months and, as already discussed, often give direct feedback when prices rise above the default. The Cape program's resistance to purchase additional RECs that may increase prices is also strategic; if prices go up too much, and large numbers of customers opt-out of the aggregation and go on to the cheaper utility base rate, the aggregation contract will actually be delivering less energy overall, and thus retiring less RECs overall, defeating the very purpose of an increasing REC percentage. The threat of this 'death spiral' of customer drop-off because of energy

prices is a very real concern for the Cape program, and a large obstacle to moving towards 100% renewable energy to reduce greenhouse gas emissions on a large scale.

Table 3: Key characteristics of the Lowell and Cape programs

Characteristic	**Lowell Community Choice Power Supply Plan**	**Cape Light Compact**
Start date	October 2019	2001
Structure	External contract between Lowell City Council and Colonial Power for brokering and other energy services; external power supplier	Joint Powers Entity with most managerial and administrative functions done in-house; external power supplier
1.0, 2.0 or 3.0 conceptual model?	Closer to 1.0, but with additional renewable energy aims	1.5? Price a key driver, but additional in-house administrative functions are characteristic of 2.0 model.
Governance	Governed by Council, administered by Mayor through the role of Energy Manager	Governing Board made up of 21 member towns and one member county
Service area and approx. population	City of Lowell, approx. 110,000 customers	21 member towns and one member county, approx. 142,000 customers
Main duties	Deliver power supply program	1) Administer energy efficiency program 2) Deliver power supply program 3) Advocate for Cape and Vineyard customers at State level
Additional RECs above Renewable Portfolio Standard	45% Class 1 MA RECs	1% Class 1 New England RECs; 99% non-Class 1 RECs
Duration of fixed kWh price	26 months	6 months for residential and small commercial; 3 months for industrial
Staff size	No additional in-house staff	15 full time in-house staff
Adoption process	Stakeholder process as outlined in Massachusetts Municipal Aggregation legislation including 6 month stakeholder process culminating in unanimous City Council vote	Stakeholder process as outlined in Massachusetts Municipal Aggregation legislation. Approved through votes of all 21 towns (20 town meetings and 1 town council)

6. Discussion

This chapter will provide a more detailed comparison of the two cases as they relate to the scholarship on energy justice, energy democracy and CCA. The five themes of the research agenda - community control, community ownership, local jobs, low income assistance and the tension between 100% renewable energy and energy justice - will be highlighted in turn noting the key findings from each case study and how they interact with the three tenets of energy justice: distribution, procedural and recognition justice (Jenkins et al., 2016; McCauley et al., 2013). Finally, implications for practice and further research will be discussed.

Energy justice themes

Community control

The concept of community control is strongly related to procedural justice within the energy justice literature, that highlights the importance of process in delivering outcomes that are deemed satisfactory, legitimate and just (Jenkins et al., 2016). It also highlights the need for ongoing procedural issues for an organisation currently in operation, including what procedures are in place to widen participation and increase community control in decision-making.

The Lowell program case study particularly highlights how important the concept of procedural justice is for communities and individuals interacting with the energy system. A key finding from the research was the overarching, strong dissatisfaction with the decision-making process leading up to the establishment of the Lowell program. A number of perceived limitations were highlighted by interviewees, including: a lack of information from the City on timeline and options; a rushed timetable; a lack of outreach to a broad constituency of Lowell residents including insufficient language inclusion; and the overall decision being taken without the participation of the majority of Lowell residents. Based on the accounts of the process from nearly all the interviewees who had engaged with the process, the Council lacked a meaningful commitment to procedural justice that was felt to be detrimental to wider education and community control of the eventual CCA decision. It is clear that Lowell City Council has a huge amount of work to do to first build trust among participants in its processes, and second, commit to more inclusive, participatory and transparent processes for residents going forward.

It is worth acknowledging the limitations of the data gathered on the topic of procedural justice specifically. Because none of the Councillors or Council staff were willing to participate in the research directly, it is difficult to know for sure the true shortcomings of the Council-led process. It's possible, for example, that Councillors and Council staff were being sensitive to the needs of their low income residents who were not represented in the coalition of advocates pushing CCA. Another additional bit of context is that Lowell City Council has recently being sued for discrimination, prompting

an overhaul of their at-large voting system. It could be equally possible that the Council was spending considerable resource into reforming its ways of working to be more inclusive and participatory.

Both case studies nevertheless highlight the practical application of an important set of tensions within the energy justice and energy democracy literature around community control and procedural justice. These tensions highlight the different models of CCAs - 1.0, 2.0 or 3.0 - and the corresponding tools available to each. On the one hand, literature on both energy justice and energy democracy suggests that a key aim of procedural justice is in its ability to create citizens who are actively engaged on energy decisions (Szulecki, 2018) both because better decisions will be made (Fischer, 2000), and because interaction with a transitioning energy system provides opportunity for changing existing power inequalities (Szulecki, 2018). On the other hand, the research findings raise the real question as to the extent that an engaged citizenry on energy decisions is either possible or desirable. The different structures of the Lowell program and the Cape program highlight this tension; while the Lowell program works through an external private contract between the City and energy consultant with limited opportunity for input from the community, the Cape program's large staff team dedicated to the needs of their communities arguably provides more accountability and oversight for community participation.

And yet, the fact that the Lowell model does not require constant input and participation from customers about its overall aims - aside from the stakeholder

decision-making process, or when there is an issue with service delivery - was seen as a real strength by one proponent of the Lowell program model of CCA. To her, participation in energy decisions necessitated a high level of time, capacity and self-efficacy, and thus had class and race dimensions. She held real concern for residents who could not afford to participate in decisions, whether through lengthy stakeholder processes or providing feedback to the organisation delivering the CCA, because of their more important priorities like financial and family commitments. This is compounded by the fact that for most people, knowledge of the energy system (including important issues around RECs etc.) is low, creating a significant barrier for even those who want to be involved. The 'set it and forget it' character of the Lowell program model thus provides - in an ideal world - a participatory stakeholder decision-making process for any new contract, followed by ongoing service delivery without the need for a high level of community participation over the long term that could prove draining and exclusive for different communities.

Community ownership

Proponents of both energy justice and energy democracy suggest that different forms of ownership can play a role in reshaping power inequalities within the energy system, particularly through community-owned models that create alternatives to private, investor-owned companies that dominate the energy sector. In a broad sense, CCAs are a step away from individual private contracts towards a more collective model of owning

an aggregated energy contract as a community or municipality, similar to a consumers union. Thus alternative models of ownership can be linked to questions around distributive justice, where communities make decisions together around how to manage an important co-owned resource.

One key research finding was how little community ownership as a concept seemed important to either the Lowell or Cape program interviewees. Besides comments from two interviewees about their personal support for more public or community ownership at a general level, there was a general lack of motivation about the issue in relation to CCA. This may stem from the fact that the CCA does not offer actual, physical ownership of the 'poles and wires' of the energy system, and is only concerned with the procurement of energy and counterpart Renewable Energy Credits. However, when physical ownership was discussed as a possibility for the future, several interviewees expressed scepticism based on their experiences with Municipal Light Plants that do own infrastructure but seemingly refuse to make environmentally-conscious decisions. It must be highlighted that this perception on behalf of the interviewees that public power is less green than CCAs is not necessarily confirmed in the literature. Nationally, large public power organizations - for example Seattle City Light (Hess & Gottlieb, 2009) - do procure electricity that is greener than other entities, but the overall picture is that renewable energy procurement is very dependent on local politics - something that is changing rapidly given the Renewable Energy 100 movement currently happening across the US (Hess & Gentry, 2019).

In any case, interviewees from both cases highlighted that community buy-in through meaningful and authentic participation was key to the success of a CCA, regardless of whether actual ownership was involved. This again highlights the importance of procedural justice for communities interacting and seeking to transform the energy system, and also raises the difficult questions embedded in energy democracy literature about whether just processes necessarily create just outcomes.

Local green jobs

Creating local jobs in the renewable sector is closely tied to questions of distributive justice and wider calls from energy justice and energy democracy scholars and practitioners for society to transition towards renewable energy in a way that creates meaningful local employment with decent wages and conditions. One key research finding is that proponents of both the Lowell and Cape programs were passionate about creating New England jobs by purchasing additional Renewable Energy Credits to spur on development. In fact, talking up the jobs argument was a large focus of the advocacy efforts to get Councilors to support the Lowell program's new higher Renewable Energy Credit percentage. For the Cape program, the non-Class 1 Renewable Energy Credits were also being used to encourage renewable energy development in New England.

However, a second finding is that the two different CCA models were able to offer slightly different answers to the question about local renewable energy job creation. The Lowell program model is arguably less able to claim direct job creation beyond a more

general offer of investment into New England renewable energy developers through the Renewable Energy Credit market. The Cape program, on the other hand, can highlight its organisational staff that work on its three workstreams, and its close relationships with local renewable energy and retrofit construction companies through its administration of the Mass Save program.

Low income assistance

Low income assistance links closely with both concepts of distributive and recognition justice in energy justice scholarship. While distributive justice refers to the call for an equal allocation and distribution of energy costs and benefits (Sovacool & Dworkin, 2015; Walker, 2009), recognition justice refers to the ways in which specific communities interacting with the energy system unevenly experience burdens and are marginalized by society. A key aspect of energy justice relates to the affordability of energy for low income communities and individuals (Sovacool et al., 2017), with calls for energy costs to never be above 10% of a households' income, for example (Sovacool et al., 2017). Beyond that, however, is a call to specifically support low income households through targeted state or regional programs to offer further support at scale (Sovacool, 2015).

One key research finding relating to this discussion was the capability for different models of CCAs to offer different levels of support to their low income customers. The Cape program's structure as an organization with three distinct aims - an aggregation program, an energy efficiency program, and a state advocacy workstream - mean that it

has more tools than Lowell to deliver low income support to its residents, and more thinking in general about who should be targeted for specific programs. As documented in detail, its various projects, including its targeted energy efficiency program in partnership with housing associations and non-profits like Habitat for Humanity, represent a comprehensive commitment to low income residents throughout the state, regardless of whether they are in the aggregation or not. For the Lowell program, interviews with CCA advocates highlighted how little thinking there had been done on how to serve specifically low income communities, outside of questions of outreach, education, and participation in the initial decision-making process.

Table 4: Key differences between programs on energy justice themes

Energy justice theme	Lowell program	Cape program
Community control	*Process*: 6-month decision-making process with key stakeholders in 2019. Perceived by CCA advocates as lacking in communication, inclusion and accountability. *Structure*: Limited. Residents can contact Lowell Council or energy supplier with enquiries. No built in process for feedback.	*Process*: Decision-making process started in 1997 pushed by town representatives. *Structure*: Community can contact Governing Board of towns and county representatives with enquiries, or direct feedback to staff team.
Community ownership	Was not a primary motivation for advocates. Some scepticism of community ownership.	Was not a primary motivation for staff.
Local green jobs	General emphasis on Massachusetts / New England Class 1 Renewable Energy Credits (RECs) from 45% additional, that could spur on new local renewable energy development. Yet difficult to claim direct job creation from CCA itself.	Emphasis on Massachusetts Class 1 RECs from 1% additional, as well as 99% non-Class 1 that go towards New England energy supply via NextEra project funds. Energy efficiency program works with local contractors on various retrofit and renewable projects. Seeded sister organization Cape and Vineyard Electric Coop that has staff and large contracts. 15 full-time program staff.
Low income assistance	Nothing additional to the lower priced contract.	In-house Mass Save energy efficiency program that targets low income households.
100% renewable energy vs energy justice	Emphasis on higher renewable energy content highlighted in 45% additional Renewable Energy Credits. However, lower price than past aggregation a key component to CCA getting approved.	Emphasis on price, that tracks the utility base rate. However, renewable energy is becoming an increasingly important component offering; customers can choose to go 100% or 50% above the additional 1% default.

100% renewable energy vs energy justice

Scholarship on energy justice highlights that there are difficult trade-offs to be worked out during energy transitions, particularly between mitigating carbon emissions through renewable energy development and making sure low income households are not disadvantaged through rises in energy prices (Heffron et al., 2015; Sovacool et al., 2017). A key research finding confirms this very real challenge of making trade-offs around price and renewable energy support; in both Lowell and the Cape, working class, low income and disadvantaged communities would face significant challenges in paying highly-priced energy bills, even if they are supportive of climate action in principle. Thus both CCAs focus heavily on price and the ways in which customers can save money while still supporting renewable energy development.

Arguably, however, the research findings suggest that both cases represent slightly different answers to the dilemma. While the Lowell program was primarily about achieving a high percentage of Renewable Energy Credits in an effort to act on climate change, the Cape program was set up to achieve the lowest price for its customer base and to administer the state-wide energy efficiency program. Moreover, the Lowell program could only offer a significantly lower price for the aggregation because of the 'lucky' circumstances of its previous CCA contact being so highly priced. There is therefore an open question - playing out in live discussions within both cases - as to the extent to which the Cape program will increase its Renewable Energy Credit percentages in an effort to mitigate greenhouse gas emissions, as well as how the Lowell program will

seek to more fully serve its low income population, for example through taking the Mass Save energy efficiency program in-house where it can be more targeted for specific Lowell demographics and challenges.

Implications for practice

This research suggests several implications for individuals, communities and municipalities wanting to set up a CCA in their locality that adequately serves the needs of low income communities and moves towards energy justice.

First, the twin aims of energy justice and higher renewable energy need to be built into the design and structure of any new CCA from the outset, because of the challenge of integrating either concept once the CCA contract is already set up and running. This was particularly true in the case of the Cape program, where there is now a continuous debate between offering the cheapest price to customers and buying a higher percentage of Renewable Energy Credits - made all the more difficult because a commitment to help tackle climate change was never part of the initial design or community buy-in.

Second and related, how the initial decision-making process is executed by the Council or relevant municipality is important in encouraging community buy-in and positivity toward the CCA. The (perceived) significant limitations of the Lowell program decision-making process run by Lowell City Council were a clear and ongoing frustration

to interviewees, particularly in relation to the exclusion of marginalized groups in Lowell. Though dependent on factors that may be largely out of their control, future advocates pushing for CCA should call for clear and detailed timetables, as well as specific ways that they can provide input into and shape the decision-making process. The process of creating a CCA is broadly outlined by Massachusetts State law, and does include a general stipulation to "allow an opportunity for citizen review of the municipal aggregation plan" (Mass.gov, 2020). However, how authentic participation is is clearly dependent on the political will of Council leaders and engaged stakeholder groups. A good example might include the (ongoing at time of writing) stakeholder process for the City of Boston's new CCA. A specific webpage has been set up communicating clear information, process, timetables and how communities and individuals can input into the decision, and links with Boston's overall vision for climate action. Specific working groups have been created made up of experts, advocates and community leaders to provide input at various points along the process (City of Boston, 2020). Interestingly, the public hearing as part of the process saw dozens of community, faith, environmental, union, people of color and youth advocacy groups come together to input their evidence and ideas to decision-makers - a remarkable effort for such an obscure policy, according to one of my research participants who works on grassroots activism. More research is clearly needed to ascertain how effective and inclusive this process actually was and how much it aligns to principles of procedural justice (Jenkins et al., 2016) and creates authentic community control over decisions (Arnstein, 1969), but it does seem to

represent a much more comprehensive effort than many CCA processes in Massachusetts. Outwith Massachusetts, activist literature from California on energy democracy highlights some key strategies to create authentic community engagement in order to create CCAs that help bolster the local economy and bring benefits to marginalized customers (Weinrub, 2017).

Third, CCAs can be structured in different ways that offer different tools for different priorities. This again highlights the different CCA models available - 1.0, 2.0, and 3.0 - that represent the various functions and aims of CCAs. It must be highlighted that the differences between three models are not completely clear cut, and better described as a conceptual continuum. However, it can be argued that the Lowell program fits more under the CCA 1.0 model that offers municipalities the opportunity to create a CCA without needing to set up a whole new organization or entity to run it. On the other hand, the Cape program could be described as being somewhere between 1.0 and 2.0 - 1.5? - because it provides an in-house aggregation service administered and brokered by a dedicated staff alongside the Mass Save energy efficiency program and advocacy efforts on behalf of its customer base, while still contracting energy supply to an external energy generator. This model arguably creates a more tailored service for its different communities and allows the program a significant amount of freedom in how it spends its Mass Save grant funding, among other benefits. For practitioners, particular attention must be given to which model will deliver energy justice that is right for the particular community; for communities who don't have time or capacity for ongoing direct

democracy decision-making, a 'set it and forget it' model like the Lowell program might be the best option, but only if a clear and participative decision-making process engages a range of stakeholders from the outset. Overall, with the majority of CCAs in Massachusetts being set up under the 1.0 model, there is clearly a lot of learning to be done by studying the particular strengths of the Cape program model and seeing how its in-house functions can be extended and developed further towards a public power model.

Fourth and related, practitioners pushing CCA in Massachusetts must be cognizant of the experiences of Illinois CCA programs that, set up under the 1.0 model, proved vulnerable to changing market conditions. As discussed throughout the cases, price remains a key factor for both Lowell and the Cape programs. Advocates for the Lowell program highlighted that they pushed both the renewable energy arguments and the lower energy price argument to the general public. Yet they were honest about the fact that without the price incentive, the new contract may have struggled in getting passed. It may be that when the time comes to renegotiate the next contract, market dynamics will have changed to make the CCA less competitive. Again, with little added value to the CCA - unlike the Cape program with its other programs besides aggregation - the Lowell program may be as vulnerable as the Illinois examples. This has real consequences for other CCAs in development, particularly in working class areas where energy prices are such a key factor.

Implications for further research

A variety of implications arise from this comparative case study for scholars researching into energy justice, energy democracy and CCA.

First, more research is needed to understand customer engagement in CCA. A key research limitation already highlighted was the failure to recruit low income customers enrolled in the CCA program who could talk about their "lived experience". However, for the Lowell program, the opportunities for customer engagement were actually very limited compared to the Cape program. Low income customers would potentially only ever be interacting with CCAs through the Low Income Heat Assistance Program or Mass Save energy efficiency program, if these elements are built into the CCA at all. If a CCA lacks these programs, then it is reasonable to assume that customer engagement is likely to be low. Thus, the challenge of future research would be to understand the causal conditions that lead to greater customer engagement, particularly ongoing engagement outwith the CCA decision-making process itself.

Second, further research on how the concepts of energy justice and energy democracy relate to each other would be an interesting avenue for future scholarship. This thesis focused predominantly on energy justice, in particular the three tenets of energy justice as outlined in Jenkins et al. (2016) and McCauley et al. (2013). Yet scholarship on energy democracy was also brought in to highlight various aspects of the two case studies, not least because the energy democracy lens has been used by

advocates to push CCA in California. There are a number of different issues that arise from the energy democracy agenda as it relates to CCA, including around the issue of public ownership. While there have been wide calls within the activist community to move towards community and/or public ownership of energy infrastructure, it remains an open question as to how feasible or desirable this is for the general public given that this research found a mixture of ambivalence and scepticism towards alternative forms of physical ownership - though again, it must be highlighted that more research needs to be done on whether public power models are more or less green than CCAs. A deeper analysis of public and community ownership campaigns would clearly be beneficial, particularly given recent movements to adopt Green New Deal policies that envision a large role for federal, state and local governance.

Finally, more in-depth research is clearly required to understand the detailed legal and financial limitations of CCA legislation as regards to low income support. These issues again relate to the possibilities of the different 1.0, 2.0 or 3.0 models, and the differing tools available to use within each state's regulatory context. One question relates to a CCA's capacity to raise revenue, which would help it develop into a fully-fledged CCA 2.0 akin to the programs in California. For example, the Lowell and Cape programs help fund themselves through adders on individual customers' bills that go towards the program costs (via the broker or program administrator), but one question is whether an adder could legally be added onto a CCA program that could be funnelled into some sort of support for low income customers that is different to taking

the Mass Save program in-house as the Cape program does. It could also be the case that taking the Mass Save energy efficiency program in house creates opportunities for CCAs to move from a 1.0 to 2.0 structure. Another different question is around the possibility for a CCA to be made up of different environmental justice communities that may or may not be geographically located next to each other, but could work to administer their CCAs jointly like the Cape program with the benefit of being specifically inclusive to the needs of low income and environmental justice issues - again an issue related to the next stage of development for CCAs, the so-called CCA 3.0s that represent structured coordination and support mechanisms between CCA municipalities and communities.

8. Conclusion

This thesis has attempted to understand how the concept of energy justice is built into Community Choice Aggregation in Massachusetts by researching and comparing two cases: the Lowell Community Choice Power Supply Program and the Cape Light Compact. Through an investigation into how both cases related to distributional, procedural and recognition justice, this comparative case study adds to the limited scholarship on Community Choice Aggregation and energy justice, providing a variety of avenues for future research.

Both cases represent different ways that a CCA can be structured around energy justice, providing two useful models that other communities can learn from and build off when embarking on a new community aggregation project. The Lowell program's achievement of 59% renewable energy in its new aggregation project - the second highest percentage in the Commonwealth of Massachusetts - is remarkable, particularly given the city's working class nature connected with its history of environmental and social injustice. Yet the research uncovered some clear tensions between pushing for high percentages of renewable energy and serving the needs of low income households - a tension that was somewhat masked in Lowell's case by a set of unique circumstances that meant the new, greener aggregation contract was actually much cheaper than what residents were already paying. A second key research finding highlighted the importance of community participation and control, particularly in the crucial decision-making

process that was led by Lowell City Council and that for many interviewees, suffered from severe limitations in addressing issues of equity, justice and inclusion. The Lowell program case confirms the central underpinning of energy justice that argues that the energy system is built on both a fair distribution of resources and also provides opportunity for authentic community engagement through fair and inclusive processes.

The Cape program provides a somewhat different model wherein a whole organisation is established to administer both the power supply and energy efficiency programs. A key research finding was understanding the broad set of tools available to serve low income households and customers possible under this type of structure, including for example targeted energy efficiency projects that work with local installers to deliver cost savings for low income customers on the Cape. The Cape program's structure also allows a significant level of customer input and accountability, arguably strengthening community buy-in and creating opportunities for broad participation.

Overall, both cases exemplify the very real tension between moving towards 100% renewable energy and delivering energy justice for low income communities. Yet arguably, the two different models profiled in this comparative case study highlight the different creative solutions to these tensions. Notwithstanding the drawbacks of the decision-making processes, the Lowell program's achievement of securing the second highest renewable energy content in the state is significant. It shows decisively what can be achieved through a small-group advocacy campaign even in a city with significant economic challenges, and sets the stage for other working class, environmental justice

communities in the state to follow their ambition. The Cape program's enduring success after over two decades of operation highlights what can be achieved when municipalities work together to deliver services tailored to the needs of the local communities, particularly low income. Moreover, the Cape program is working to offer even more greener products for its customers, fully aware of how the climate crisis is escalating. A clear next step for both CCA practitioners and scholars of energy justice is to more fully understand how the key benefits of both models can be combined in future aggregations, offering steady, low priced electricity for working class communities that nevertheless has significant renewable energy content, spurring new renewable energy and significantly decreasing a community's greenhouse gas emissions in the process.

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APPENDIX

Permission for Figure 1

From: **Alison Elliott**<a*******@leanenergyus.org>
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To: <fmonk@antioch.edu>

To whom it may concern,

I grant Felicity Monk, Antioch University New England, limited permission to reproduce my graphic showing a map of community choice aggregation policy across the US, in the thesis titled "How is energy justice built into Community Choice Aggregation? A comparative case study of the Lowell Community Choice Power Supply Program and Cape Light Compact, Massachusetts", which will be deposited in Antioch University's open access AURA database, be submitted as articles to academic journals for publication, and be part of related resources for communities pursuing CCA in Massachusetts. I / my organization retain the rights to said graphic otherwise.

Alison Elliott
LEAN Energy US

Permission for Figure 2

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Hello Felicity,

Thanks for reaching out! We are absolutely fine with you reproducing our image -- I've just added some language to your text about citing us (below). Best of luck with your thesis!

I grant Felicity Monk, Antioch University New England, limited permission to reproduce and adapt my graphic showing a map of community choice aggregation across Massachusetts, in the thesis titled "How is energy justice built into Community Choice Aggregation? A comparative case study of the Lowell Community Choice Power Supply Program and Cape Light Compact, Massachusetts", with a citation to the Applied Economics Clinic. The thesis will be deposited in Antioch University's open access AURA database, be submitted as articles to academic journals for publication, and be part of related resources for communities pursuing CCA in Massachusetts. The adapted image will be changed to exclude specific information on Chelsea and color the communities of Lowell and the Cape Light Compact in dark green to reflect their NE Green default status. I / my organization retain the rights to said graphic otherwise.

Bryndis Woods, Researcher at Applied Economics Clinic
July 23, 2020