



# Bringing Power Home

*Exploring Community-Owned Energy Possibilities in Salem, Massachusetts*

Field Projects 2025, Tufts University Urban and Environmental Policy and Planning

INSIDE OF THE REPORT COVER

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Salem, Massachusetts

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May 8<sup>th</sup>, 2025

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GRADUATE SCHOOL OF ARTS AND SCIENCES  
Urban and Environmental  
Policy and Planning

# ACKNOWLEDGEMENTS

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**Salem Alliance for Environment (SAFE):**

Bonnie Bain, Executive Director  
Lucy Corchado, Embajadora (Ambassador)

**Tufts UEP Teaching Team:**

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Diana Eddowes, Northeast Policy Director, Solar United Neighbors  
Jean-Jacques Yarmoff, Board Member, Marblehead Municipal Light Plant  
Jeff Cohen, Ward 5 Councilor, City of Salem  
Lucy Corchado, Latino Leadership Coalition, Point Neighborhood Association  
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# EXECUTIVE SUMMARY

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The City of Salem, Massachusetts is widely recognized for its haunted witch trial legacy and present-day Halloween festivities. For Salem’s residents, however, this vibrant community is also home to the realities of climate change, energy injustice, and economic inequality. In diverse and resilient neighborhoods like El Punto, families often face the hard choice between paying their utility bills and meeting other basic needs. In response, this Field Projects Team partnered with the Salem Alliance for the Environment (SAFE), to conduct a comprehensive analysis of how community-owned energy (COE) can reduce energy burden, enhance resilience, and empower local residents—especially those in environmental justice communities—to shape a more equitable and sustainable energy future for Salem.

To understand what community-owned energy solutions exist as opportunities for Salem, this Field Project Team analyzed an extensive set of literature, gathered a collection of case studies, and conducted a plethora of interviews with energy experts and frontline implementers to guide SAFE and Salem towards achieving the energy future they are looking for. We developed two discrete deliverables for SAFE (which are in the Appendices of this report): *Bringing Power Home: Case Study Report* and the *Guidebook to Community-Owned Energy Possibilities in Salem*. This Final Report also provides a full description of our project process, methods, literature review, and reflections

# PROJECT PARTNER OVERVIEW

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Salem Alliance for the Environment (SAFE) is a community-based organization that has acknowledged the need to further climate resilience in Salem and has collaborated with residents to advocate for a just and equitable energy transition. They are dedicated to uplifting marginalized communities and ensuring those who have suffered the brunt of the effects of climate change and other environmental issues are centered and benefit from a clean energy future. In the past, they have advocated for workforce development around wind power, regulations at the state and local levels that decrease reliance on gas, and networked geothermal as a path towards a just transition and community-owned energy. SAFE recognizes that Salem's designation as an environmental justice geography puts it at risk, and they continue to envision ways for marginalized residents to be protected and imagine a future rooted in environmental justice and energy justice.



**Bonnie Bain** is the Executive Director of SAFE. She joined the organization in 2022 as the Offshore Wind Program Manager and has an extensive background in renewable energy development. She grew up in the Central Valley of CA and has an MBA from the University of San Francisco. A proud Salem transplant, Bonnie enjoys all this funky city by the sea has to offer with her family.



**Lucy Corchado** is SAFE's Embajadora (Ambassador) and a Staff Assistant at Salem State University's Center for Justice and Liberation. She is a former City Councilor for Salem Ward 1, currently serves as President of the Point Neighborhood Association, and is a founding member of the Latino Leadership Coalition in Salem.

# SAFE FIELD PROJECT TEAM

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**Cole Murthy Lepler**, *Master's of Environmental Policy & Planning, he/him*: Cole received his Bachelor of Arts in Political Science and Leadership Studies at Christopher Newport University. He now attends Tufts University where he is focused on land conservation, land use planning and energy justice issues.



**Deanna Kenyon**, *Master's of Environmental Policy & Planning, she/her*: Deanna earned her Bachelor of Science in Environmental Science from the University of Massachusetts, Amherst in 2019, graduating with honors and completing an integrated concentration in renewable energy. Deanna has six years of experience in the climatetech sector across North America and the United Kingdom, with a background spanning both public and private sectors. She currently serves as Senior Manager of Partnerships at Greentown Labs. Her academic interests center on the role of public policy in accelerating the deployment of renewable energy in a just and equitable manner for current and future generations.



**Denisse Manzo Gonzalez**, *Master's of Urban & Environmental Policy & Planning, she/her*: Denisse received her Bachelor of Arts in Environmental Science & Policy from Smith College in May of 2022. Since graduating, she has been working as a research associate for an energy consulting firm, where she does program evaluation of energy efficiency programs and market research. At Tufts, Denisse is interested in the intersections of housing and energy justice, climate and community resilience in cities, and models of environmental and systems management that are in direct opposition to private ownership.

# SAFE FIELD PROJECT TEAM

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**Eliza Jobin-Davis**, *Master's of Sustainability, she/her*: Eliza received her Bachelor of Science in Environmental Engineering at the University of Vermont. She then spent four years as a Climate Resiliency Engineer in the Greater Boston area. At Tufts, Eliza is focused on the intersection of sustainable development, a just transition to net-zero, and energy resilience.



**Marina Garrido**, *Master's of Environmental Policy & Planning, she/her*: Marina will receive her Bachelor's degree in Environmental Studies and Engineering Psychology from Tufts University in May 2025, where she is also pursuing her Master's in Environmental Policy and Planning through Tufts's Fifth-Year Master's program. At Tufts, Marina is interested in the intersection of environmental justice, energy democracy, just transition, and equitable access to renewable energy.



**Will Arent**, *Master's of Urban & Environmental Policy & Planning, he/him*: Will received his Bachelor of Science in Geography and GIS at the University of Minnesota. He now attends Tufts University where his research interests lie in energy geographies, energy affordability, and alternative models of energy ownership. He is currently serving as a Solar Equity Fellow with the Massachusetts Clean Energy Center.

# GLOSSARY

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## List of Acronyms:

COE: Community-owned energy  
CCA: Community choice aggregation  
CBA: Community benefits agreement  
MLP: Municipal light plant  
OSW: Offshore wind  
SAFE: Salem Alliance for the Environment

## Key Terms:

**Climate resilience:** The ability or capacity of a population or geography to be resistant to impacts of climate change.

**Climate technologies:** Refers to the technologies and processes designed to address climate change, encompassing both mitigation (reducing emissions) and adaptation (adjusting to climate impacts). It includes a wide range of solutions, from renewable energy and carbon capture to resilient infrastructure and climate risk data analytics.

**Community agency:** The ability or capacity of a community (those within a specific geography or with a shared identity) to control decision making over their future.

**Community benefits agreement:** A legally binding agreement between a developer and community (those within a specific geography) that ensures the community will receive monetary and/or non-monetary benefits from a development.

**Community choice aggregation:** Municipalities purchase bulk electricity on behalf of residents, filling a role typically occupied by a third-party procurer.

**Community energy farm:** Energy is generated at an offsite location adjacent to the community it serves. The benefits of the system, both monetary (e.g. renewable certificates and credits) and non-monetary (e.g. consumable energy) are distributed directly to the community.

**Community-owned energy:** A section of the energy system that is jointly owned by a community (i.e. a non-market, non-state entity).

**Energy burden:** A percent of a household's income allocated towards energy needs (e.g. heating or cooling).

**Energy committee:** A governmental body (typically within a municipal government) that discusses and deliberates on energy issues, opportunities, and their potential impacts.

**Energy burden:** The percentage of a household's income spent on energy-related expenses such as electricity, heating, and cooling. A high energy burden indicates that a household is disproportionately impacted by energy costs, which can affect low-income and marginalized communities the most.

# GLOSSARY

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**Energy cooperative:** Multiple stakeholders join together to form one singular mission-driven entity, typically for the purpose of pooling resources and representing their respective communities.

**Energy democracy:** Public participation and ownership over (and within) the energy sector.

**Energy expert:** A person with an expansive knowledge of the energy system, including but not limited to, the physical system, energy ownership structures, and financing.

**Energy justice - distributive:** The equitable distribution of the benefits and burdens of the energy system.

**Energy justice - procedural:** The equitable inclusion and transparency of decision-making and regulatory processes in regards to the energy system.

**Energy resilience:** The ability or capacity of a population, geography, or physical portion of the energy system to be resistant to adverse energy events (e.g. outages).

**Frontline implementer:** A stakeholder specific to Salem, Massachusetts that works for a community-based organization and has firsthand experience interacting with members of the Salem community.

**Geothermal:** Energy that is generated from the Earth's heat underground.

**Just transition:** An equity-focused shift from a fossil fuel-based economy to one that is regenerative, community-led, and centered on worker and environmental justice.

**Microgrid:** A type of local energy array that is disconnected from the main grid. It can generate, store, and distribute energy independently.

**Municipal light plant:** Municipal ownership over the distribution and delivery of energy to residents, filling a role typically occupied by a distribution utility.

**Municipality:** An incorporated town or a city.

**Renewable energy / Clean energy:** Energy that is generated from a natural, replenishable source (e.g. sun, wind, ground heat).

**Resilience hub:** Community facilities that offer points for resilience; offering resources and support before, during, and after emergency events, designed to enhance social cohesion and be a third place for in-person interactions(s).

**Solar photovoltaic:** A system that generates electricity from sunlight.

**Transmission:** The section of the energy system that delivers energy across the grid to homes and businesses.

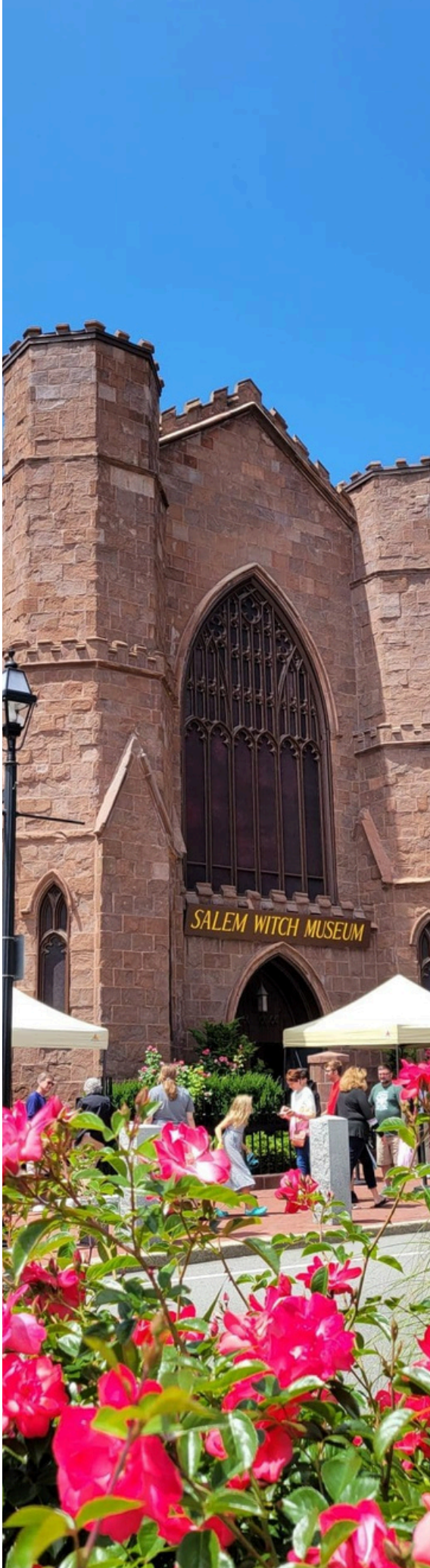
**Workforce development:** A set of strategies to support the creation of jobs (for both individuals and businesses).



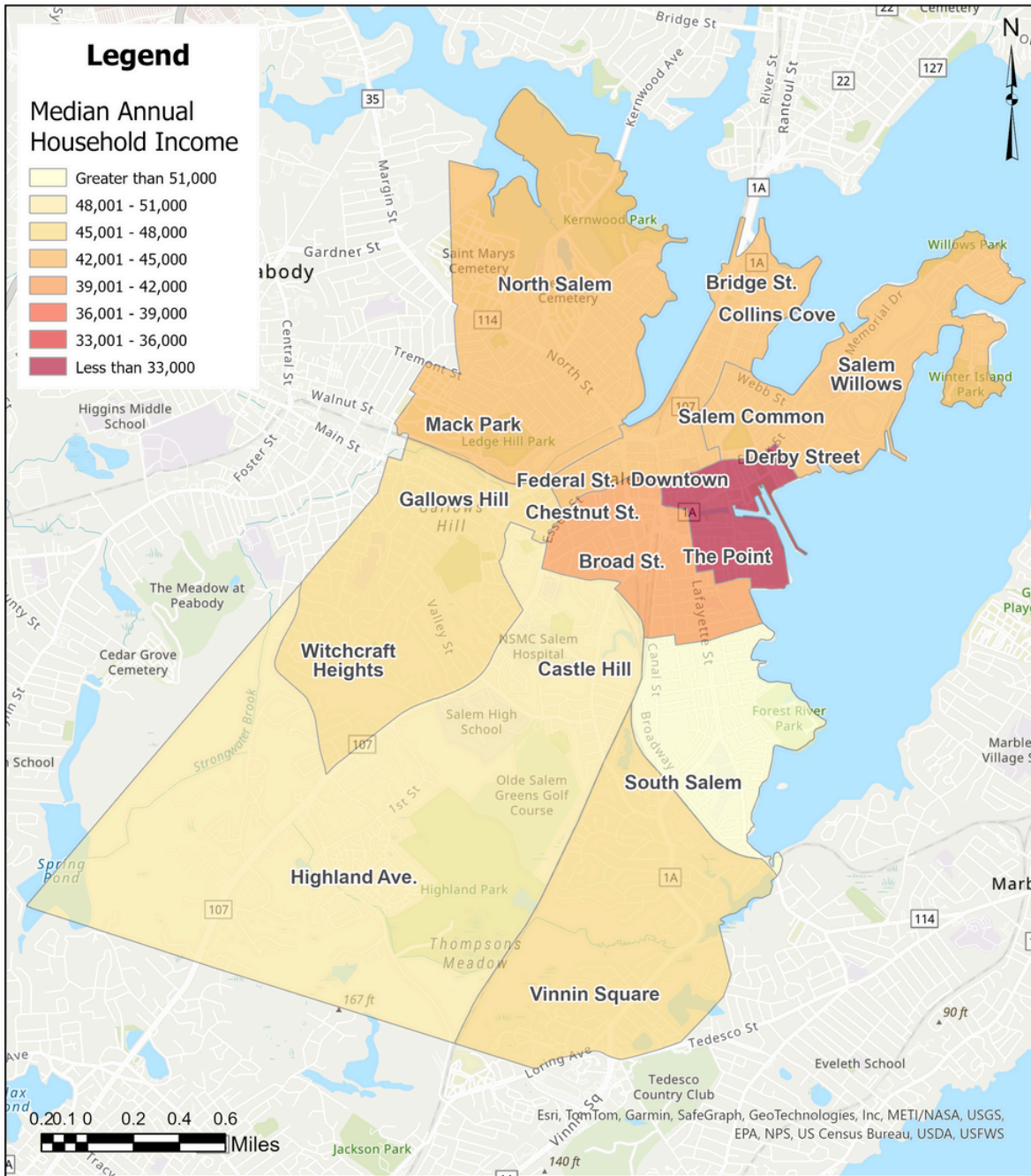
# INTRODUCTION

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Salem is a diverse port city that has played a key role in the history of Massachusetts and has undergone many changes and shifts throughout the years. It is the 28th largest city in the state (Warren 2020). Currently, 20% of its residents are Hispanic/Latino, close to 23% speak a language other than English at home, and 15% are foreign-born (Census Bureau QuickFacts 2024). Salem is one of 108 communities in the state with a designated Environmental Justice (EJ) community. The Point neighborhood in Salem, referred to as “El Punto”, has EJ designation with a 53% minority population, and 45% of the households experience language isolation (MassGIS 2024). This neighborhood is also the densest in the city with 33 people per acre, while the average in Salem is 8 people per acre (Warren 2020). These aspects make Salem’s transition to a more resilient, affordable, accessible energy system crucial, so that residents, especially in EJ communities and areas with lower median household incomes, have reliable and equitable access to energy (see Map 1).



Map 1: Median Annual Household Income in Salem



**Median Annual Household Income**  
by Neighborhood for the City of Salem, MA

March, 2025

Developed for the Salem Alliance for the Environment (SAFE)  
Dept. of Urban & Environmental Policy & Planning (UEP)



The majority of Massachusetts' in-state electricity generation comes from natural gas, with one of the state's natural gas-burning plants located in Salem, known as the Salem Power Development LP. Despite being among the five states with the lowest total electricity consumption per capita, Massachusetts consumes significantly more electricity than it generates. In 2023, MA produced less than half of the energy it required, relying on the regional grid to supply the additional electricity. That same year, MA had the third-highest residential electricity price in the nation, driven by several factors including its heavy reliance on imported energy, limited in-state generation capacity, and dependence on natural gas, which can experience price volatility (U.S. Energy Information Administration [EIA], 2024).

The City of Salem has a municipal electricity aggregation program known as Salem PowerChoice, which aims to provide residents and businesses with enhanced access to renewable energy sources while promoting price stability (City of Salem 2024). This program functions under the Massachusetts Public Aggregation Program, which enables municipalities to procure electricity supply collectively on behalf of their residents and businesses. Salem PowerChoice is an alternative to the National Grid's Basic Service, offering participants more consistent rates and expanded renewable energy options (Mass PowerChoice 2024a). Under this program, Salem has secured annual contracts with First Point Power as the electricity supplier, at fixed rates. The primary objective of the aggregation is to mitigate the volatility of electricity rates, which National Grid adjusts semiannually or more frequently. The fixed rates seek to ensure budget predictability for consumers but don't guarantee consistently lower rates than if purchased directly through National Grid. Participants in Salem PowerChoice are automatically enrolled in the Standard option (14.281 ¢/kWh), which incorporates an additional 20% renewable energy beyond the state's minimum requirements. There are also two other options: Plus (16.351 ¢/kWh), which sources 100% of the electricity from renewable resources, and Basic (13.481 ¢/kWh), which meets only the Massachusetts Renewable Portfolio Standard without additional renewable content (Mass PowerChoice 2024b).

National Grid still handles electricity delivery, maintenance of power lines, billing, and outage response, to ensure that existing services and customer benefits remain unaffected by participation in the aggregation program. Importantly, Salem PowerChoice incorporates consumer protection measures, enabling participants to opt-out or change their selected option at any time without incurring penalties or fees.

Salem PowerChoice seeks to meet the dual goals of environmental sustainability and economic stability by advancing Salem's renewable energy goals, while still providing residents with transparent and flexible electricity supply alternatives.

Salem PowerChoice helps stabilize electricity rates and expand renewable energy, but the city's broader goal of reaching 100% renewables, as outlined in the Beverly-Salem Climate Action and Resilience Plan, still lacks a clear roadmap (City of Beverly and City of Salem 2021). While the plan sets ambitious targets, it does not fully explain how Salem and Beverly will meet them, and more importantly, how they will impact short-term costs for residents. It remains unclear how these commitments will be funded, whether they will require rate increases, or how they will impact low-income residents. Since 2021, both cities have made some progress by investing in solar projects for their municipal schools. In Salem, two schools (Saltonstall K-8 School and Collins Middle School) have received rooftop solar installations, which generate 551,000 kWh annually, save the city approximately \$673,000, and prevent more than 5,000 metric tons of CO<sub>2</sub> emissions (City of Salem 2022). While these efforts show progress, they have not even begun to address the challenge of transitioning the entire energy supply to 100% renewables.

In light of these conditions, the Salem Alliance for the Environment (SAFE), a grassroots organization dedicated to creating a sustainable and resilient community in Salem, has been expanding its role in shaping Salem's energy future. Formerly a fully volunteer-led group, SAFE took a major step in 2024 and hired its first full-time employee, Executive Director Bonnie Bain. Under Bonnie's leadership, SAFE has been able to strengthen relationships with other community organizations in Salem, city officials, and residents. This shift in capacity is particularly important at this moment, while Salem is pursuing clean energy initiatives, possibly large-scale developments, and more community control over energy systems.

In this context, this Field Project was developed in collaboration with SAFE to explore a more just and participatory approach to the energy transition, recognizing the injustices and concerns about over-reliance on large-scale, top-down energy projects. Unlike traditional energy models, dominated by utilities or corporate developers, community-owned energy (COE) frameworks emphasize local control, shared ownership, and equitable distribution of monetary and non-monetary benefits.

At the start of this Field Project, in January 2025, Salem was positioning itself as a key player in Massachusetts' offshore wind future. The city had committed to developing the Salem Offshore Wind Terminal – a 42-acre site along the Salem Harbor to serve the offshore wind industry. SAFE helped to advocate for a \$9 million Community Benefits Agreement between the City of Salem and developer Crowley Wind Services. This project marked a powerful shift in Salem's energy history. The site was once home to one of the state's most polluting coal plants until 2014, and is now occupied by a natural gas-burning power plant. The CBA included funding for workforce development, sustainability and resiliency projects, housing and infrastructure, Salem public schools, and other city services (City of Salem 2024). While Crowley committed to hiring local residents and marginalized communities, including people from environmental justice communities, veterans, and those living with disabilities, the CBA still did not identify how many long-term jobs would be created for local residents beyond the initial construction phase.

However, as of April 2025, the momentum for offshore wind development has slowed down across the country and in Massachusetts. The current federal administration has halted all federal permitting for offshore wind projects and has even issued stop-work orders for developments already underway (WBUR 2025). These decisions have sent a wave of uncertainty through the sector, and in Salem, the impact was immediate.



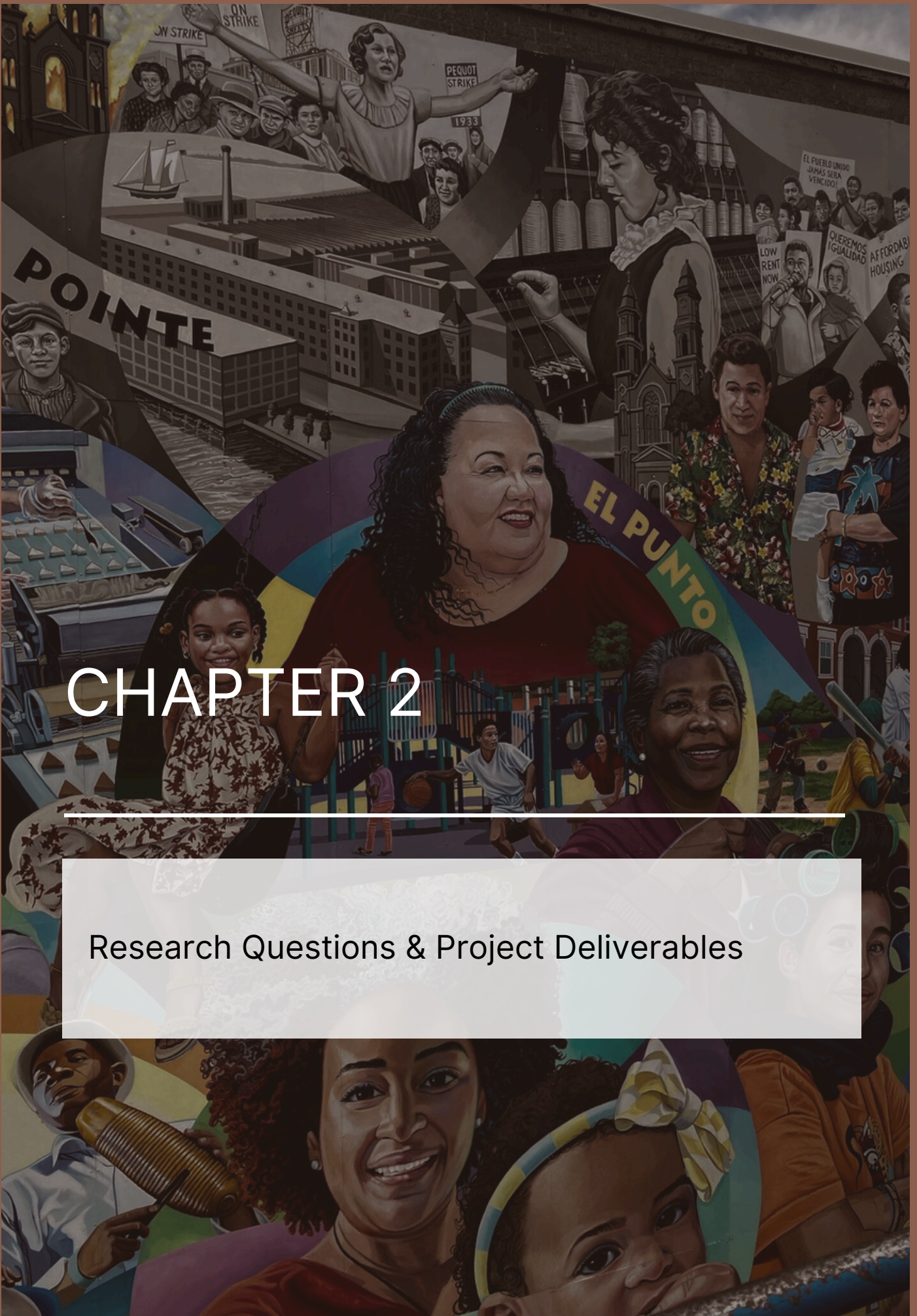
Image: Crowley Wind, Salem Offshore Wind Terminal

This moment presents both a challenge and an opportunity for the city of Salem and community organizations like SAFE. As federal support for large-scale renewable energy becomes unstable, local solutions that put the community at the center of the decision-making process are becoming increasingly important. Salem has already taken initial steps, such as investing in municipal solar and having the Salem PowerChoice aggregation program, but residents still have limited control over where their energy comes from, how it is priced, and how benefits are distributed. Community-owned energy (COE) models, the focus of this Field Project, have emerged as a potential path forward that allows communities to govern their own energy systems. COE refers to energy systems that are owned, operated, or governed by the community itself and are designed to prioritize local needs, reinvest economic benefits, and foster energy democracy. This includes microgrids, community solar, energy cooperatives, and resilience hubs that have the potential to reduce energy costs, promote energy resilience, and give residents a tangible role in shaping their energy future.

Thus, this project was developed to explore how community-owned energy could be implemented in Salem. In collaboration with the SAFE, our Tufts UEP Field Project Team set out to investigate how COE models, rooted in local ownership and participation, might help reduce energy burdens, strengthen resilience, and shift power to the communities most affected by energy and climate injustices. Over the course of the Spring 2025 semester, our team conducted research, reviewed case studies, and conducted interviews with stakeholders to understand what COE could look like in Salem, what barriers exist, and what steps could be taken to move the city closer to a more equitable energy future. The chapters that follow in this report are the culmination of our research questions, methodology, and findings and recommendations for SAFE.



From left to right: Deanna, Marina, Cole and Denisse at Salem Harbor Power Station



# CHAPTER 2

Research Questions & Project Deliverables

# RESEARCH QUESTIONS & PROJECT DELIVERABLES

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The research questions were developed out of conversations with SAFE team members. The team wanted to ensure these questions spoke to direct challenges faced by Salem residents and how COE systems could alleviate them.

## *Guiding project research question:*

How can the City of Salem implement community-owned energy systems in a way that reduces the energy burden, creates impactful economic and environmental resilience, and promotes community agency over its energy future?

With specific regard to the following sub-questions:

- What communities have attempted this, and what lessons can be learned from them?
- What challenges are associated with implementation, and which stakeholders, funding sources, future developments, and additional tools could help address these obstacles?

What issues exist in Salem that could be alleviated by community-owned energy?

## *Project Deliverables*

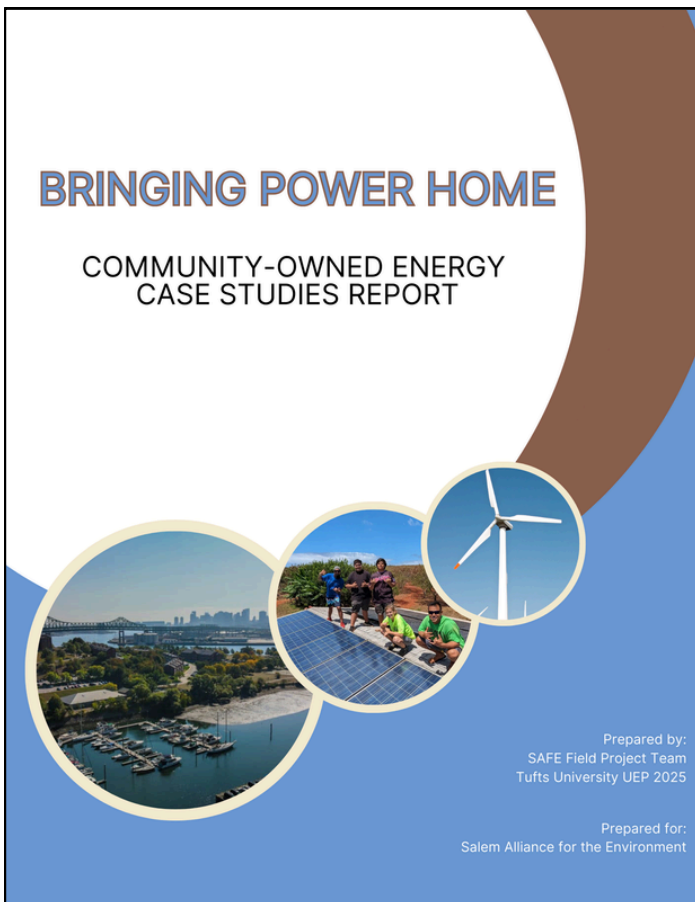
Alongside this report, our final project deliverables include (i) a Case Study Report, and (ii) a Guidebook for Community-Owned Energy Possibilities in Salem. These deliverables emerged through collaborative conversations with our Project Partner, grounded in the understanding that SAFE is in an early, foundational phase of growth. With Bonnie stepping into her role as SAFE's first Executive Director, the organization is beginning to explore and imagine what a future rooted in community-owned energy could look like.



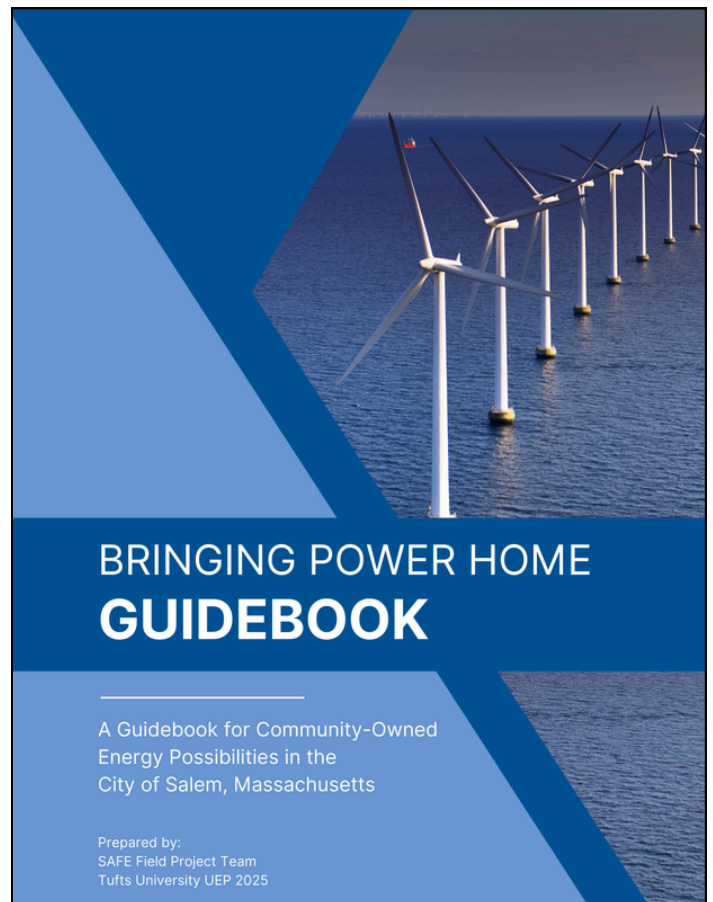
We recognized that before proposing any specific path forward, it was essential to first look outward, toward real-world examples of community energy initiatives that have taken root elsewhere. The Case Study Report became our way of capturing and synthesizing these stories, drawing out best practices and lessons learned that might inform SAFE’s own journey.

From there, the Guidebook emerged as a natural next step: a space to translate these insights into something practical, hopeful, and rooted in Salem’s unique context. Drawing on the literature review, our case study findings, and interviews with key stakeholders, we aimed to offer not just a vision but a grounded and adaptable framework for what community-owned energy could mean here.

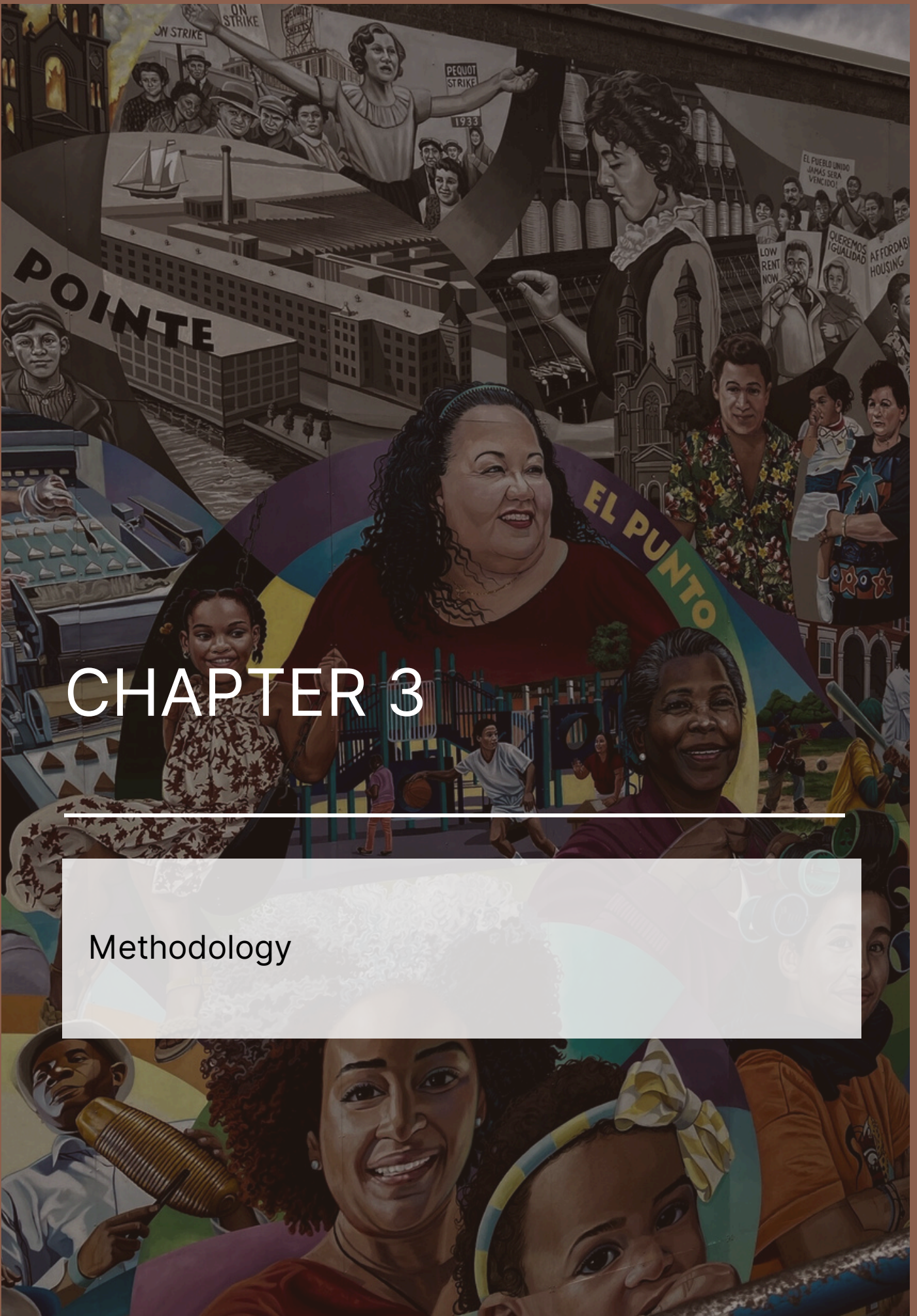
Throughout, we’ve been guided by the need to stay closely aligned with SAFE’s values and goals. Central to this work are themes of community-building, energy democracy, and environmental justice—principles we believe should not just inform the work, but be embedded in its foundation.



*Click on the Case Study Report Cover to navigate to it*



*Click on the Guidebook Cover to navigate to it*



# CHAPTER 3

## Methodology

# METHODOLOGY

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## Overview

To address the research questions guiding this project, the Project Team employed an exclusively qualitative research design. This approach prioritized the collection and synthesis of narrative, experiential and place-based knowledge to develop a comprehensive understanding of the energy landscape in Salem, Massachusetts. This allowed our team to dive deeper into community perspectives, learn first-hand from technical expertise across many energy systems and domains, and critically examine the socio-political context surrounding community-owned energy possibilities in Salem.

## *Data Sources*

Throughout this project, SAFE served as a partner, facilitating community access and providing local context that informed all phases of research. Data was collected from a variety of sources, including:

- Journal articles, white papers, and institutional research;
- Local news articles and media; neighborhood communication platforms;
- Municipal-level and state-level websites, reports, and data sets;
- SAFE team members, Tufts faculty and students;
- Interviews with key stakeholders across two groups: (i) “Frontline” Community Members, and (ii) “Energy Experts” or technical expertise in relevant energy systems to Salem.

This multi-source strategy allowed the Project Team to triangulate findings and capture a range of perspectives from both community-based and technical domains.



## Methods

### *Literature Review*

A comprehensive literature review served as the foundation for this project's conceptual framework. Drawing from interdisciplinary sources in urban planning, environmental studies, public policy, and energy justice, the team examined a range of themes, including:

- The relationship between energy and community development;
- Energy democracy and survey of community energy ownership models/frameworks;
- Energy justice and the just transition;
- Energy burden and insecurity;
- Energy policy across local, state, and federal levels;
- Research terms: *community energy*; *energy democracy*; *energy justice*; *energy burden*; *energy justice communities*; *resilience*; *adaptation*; and more.

The literature review acted as the bedrock of this project, bringing all Project Team members and SAFE up to speed on the academic landscape of community-owned energy. The review also provided key context for answering research questions outlined in Chapter 2. We then used this platform to design case selection criteria for our first deliverable, the Case Study Report (Appendix, Section 3), and inform whom we selected for subsequent interviews across both the Frontline and Energy Expert groups.

### *Stakeholder Interviews*

Semi-structured interviews represented the core empirical component of the study. These interviews were designed to elicit qualitative insights into the social, technical, and political dimensions of community energy. Participants were organized into two primary groups:

1. Frontline Stakeholders: This included Salem-based community leaders, residents, planners, and representatives from non-profit organizations engaged in housing, energy, and environmental justice work.
2. Energy Experts: This group consisted of individuals with specialized knowledge in energy systems, policy, and implementation. Participants were drawn from academic institutions, advocacy organizations, and the private sector.

All interviews were conducted using a consistent guide of open-ended questions (Appendix, Section 2) designed to allow flexibility and accommodate participant expertise. These dialogues revealed nuanced understandings of the opportunities and limitations of community-owned energy models and provided essential context for the recommendations presented in the project's final deliverables.

## Case Example & Case Study Down Selection Criteria

<i>Criteria</i>	<i>Description</i>	<i>Weighting</i>
Location	Cases must be based broadly in the United States, and ideally within the region of New England.	Low
Community Parallel	Cases must clearly exemplify who they are serving and why. Given the City of Salem is home to many EJ, ESL and BIPOC groups, preference is given to those that align most with Salem's profile.	High
Benefits	Are the benefits clearly demonstrated? Are they monetary or non-monetary? How are they being delivered? Is there evidence of this being a sustainable (long-term) solution?	High
Feasibility to Salem	How feasible is this model to replicate or adapt for Salem's context, infrastructure, and community needs?	High
Community Involvement & Participation	Cases must exemplify how the community achieves energy democracy. Is the community directly involved in the process and if so, to what extent?	Medium
Energy System Operational Stage	What phase is the project in? Additionally, is the energy system operational, or currently being developed? Ideally, we are searching for cases that are fully operational, with clear benefits being generated for the community.	Medium
Materials and Resources	Is there strong supporting evidence for this case study in gray literature, such as newspapers, articles, and more?	Medium

**Low** = Limited consideration. Limitations in transferring learnings to SAFE.

**Medium** = Moderate consideration. Some, but not all, information is relevant for SAFE and the City of Salem.

**High** = High value and impact for SAFE and relevant to the City of Salem.



# LITERATURE REVIEW

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## Problem Framing

### *Large-Scale Energy Issues*

Recent literature has put increasing focus on concepts of energy cost affordability, highlighting this as a key energy issue (Brown et al. 2020). This most notably includes energy burden, which refers to a household's total energy expenditures (such as heating and cooling needs) as a proportion of total household income (Colton, 2011; Drehobl and Ross, 2016). While energy burden severity thresholds are not widely agreed upon (Brown et al. 2020), numerous sources have attempted to classify this (Liddell et al. 2012; Fisher, Sheehan, and Colton, 2013; Drehobl and Ross, 2016; Cook and Shah, 2018; Drehobl, Ross, and Stickles 2020). A commonly accepted threshold for high and severe burdens are defined by Drehobl, Ross, and Stickles as 6% and 10%, respectively (Drehobl, Ross, and Stickles 2020; Brown et al. 2020).

Previous research has examined high energy burdens as a key energy issue and an important facet of energy injustice with specific regard to socioeconomic status, race, and geography (Drehobl and Ross 2016; Drehobl Ross and Stickles 2020; Memmott et al. 2021; Moore and Webb 2022; Chen et al. 2022). An empirical study by Drehobl and Ross highlights the socioeconomic disparity, demonstrating that low-income residents carry twice as much energy burden as stable-income households (Drehobl and Ross, 2016). Other studies have modeled the relationship between race and energy burden, finding significant evidence of disparities among Black and Hispanic households (Graff et al. 2021; Memmott, Graff, and Konisky 2021; Chen et al. 2022; Konisky et al. 2022). Finally, past research has found that energy burden varies across geographic scales such as cities (Moore and Webb 2022).

Beyond the cost perspective, scholarly literature has also highlighted the increasing need for community voices in local energy affairs (Jenkins et al. 2016). Among this literature, specific emphasis has been placed on socially and environmentally disadvantaged communities, who have historically been excluded from this decision-making process (Lennon, Dunphy, and Sanvicente 2019). Cranmer et al. argue that this lack of community agency results in environmental injustices, most notably the existence of polluting energy facilities (Cranmer et al. 2023). Carley and Koninsky build off of this argument, also highlighting the loss of jobs that can arise from this issue (Carley and Koninsky 2020). It is further compounded by other energy actors, such as utilities, who often do not incorporate the community into key, early-stage decision-making (Tapio et al. 2024).

## Solutions Framing

### *Defining Community-Owned Energy*

Community-owned energy refers to energy systems owned and operated at the community scale, in which residents own these projects outright, or in partnership with their municipality or a community action organization (Snaith 2024). Certain research has attempted to further define the community aspect of community-owned energy. Bauwens et al. describe the “community” as an entity separate from the state and market (Bauwens 2022). Given this, the authors claim that community benefits are those that are specifically directed to local residents, outside the control of the state or market. The article also discusses community as a collection of people and things within a finite geographic area. Huang et al. build off of this holistic approach, defining community benefit as the aggregate benefits and considerations of community-owned energy within a specific geographic area (Huang et al. 2017).

Previous literature has also explored different types of self-governance and ownership. Walker and Simcock discuss that who technically controls the physical energy infrastructure is not as important, and the disbursement of resources to the community is a key benchmark of community-owned energy (Walker and Simcock 2012). Dincer and Abu-Rayash discuss this physical dimension, touching on the importance of infrastructure proximity to the communities that they serve (Dincer and Abu-Rayash 2020). The authors list this as a key benchmark of community-owned energy and claim that it fills a gap left by traditional generation.

### *Community-Owned Energy as a Solution*

The case for community-owned energy is extensive as its far-reaching benefits address various issues related to equity, environmental resilience, and economic vitality. As mentioned above, energy affordability is an issue for many households, but especially for BIPOC, low-income households (Chen et. al 2022). Community-owned energy structures can provide socio-economic benefits to alleviate these issues of energy burden; a study out of the U.K found that members of a community that adopted local energy generation saw a reduction in energy costs as a result (Kiamba et al. 2022). This energy system also aims to mitigate environmental harm and improve climate resiliency. Research into existing literature highlights direct participation in renewable energy building, financing of renewable energy, and the mental connection between energy consumption and climate change as a few of the many benefits that can be reaped from community-owned energy (Brummer 2018). Kienbaum points out how local solar ownership can address energy grid issues, as households may be less likely to experience blackouts or other energy issues due to extreme weather events (Kienbaum 2024).

Many community-owned energy projects throughout the United States offer the above benefits. One example can be seen in Newton, MA. The City of Newton installed a solar canopy at its Department of Public Works parking lot to allow low-income residents to participate in the clean energy transition. A purchasing power agreement reallocated the net metering credits to participating low-income ratepayers, which provided valuable relief to energy costs (Harmon 2017). This case of Newton demonstrates a potential cost reduction strategy through local energy projects that could be scaled to other municipalities.

Another example of community-owned energy offering benefits can be seen in Greensburg, KS. Greensburg was hit by a catastrophic tornado that destroyed the community. With the help of local leaders and state officials, the city was rebuilt entirely around sustainable principles, which included a local wind farm. "DOE and NREL assisted with planning for 50-kilowatt wind turbines at the local hospital and school; several small turbines at a local business; solar photovoltaic systems on the town's business incubator; and light-emitting diode street lights in major portions of the community" (National Renewable Energy Laboratory [NREL] 2012). This project helped illustrate ways to introduce green energy to communities lagging behind the green transition.

The Red Lake Solar Project in Red Lake, MN, introduced an energy sovereignty project that allows for extensive community involvement in transitioning to a solar and storage project. The project's "goal is to achieve energy sovereignty for the Tribe while creating jobs and a more sustainable way of life for future generations" (Clean Energy Economy MN 2024). This project uses the energy system to increase involvement and engagement amongst its residents throughout the community while also adding employment possibilities.

### Barriers to Community-Owned Energy

Common barriers that exist when trying to begin a community-owned energy project include financial constraints and regulatory barriers. Community-owned energy projects often have large upfront costs, especially in low-income communities, that require investments either by third parties or by local community members, either party then bearing the costs and risks (Li and Okur 2023). This support via investment must also be consistent throughout the entirety of the project, not solely at the beginning (Energy Saving Trust 2024). Energy projects tend to take longer in the United States due to other regulatory barriers, making consistent and sustained investment very important to any community-owned energy projects (Arent et al. 2023).

Significant regulatory barriers exist locally, in the states, and federally. "Local ordinances restricting renewable energy deployment are growing. For example, 1,853 local wind ordinances in effect during 2022 compared to 286 in 2018" (Arent et al. 2023). While necessary, permitting slows down all aspects of the process of constructing a community-owned energy project. Many states have policies in effect that do not allow for subscriptions or offering credits. This has forced many localities to become creative with their solutions to provide collective benefit to their communities (Kienbaum 2024). Federal policy, at least in the next four years, will not have renewable energy at the forefront of priorities. Even when it was, fast tracked efforts in Arizona and New Mexico still took 17 years to get past the permitting process (Arent et al. 2023). Regardless of the level of federalism, there is still no streamlined way to get community-owned energy off the ground.

## Frameworks

### *Overview*

Energy justice and energy democracy are interrelated concepts that aim to address the inequities in the production, distribution, and consumption of energy. These frameworks focus on ensuring fairness in energy systems—emphasizing participation, representation, and equitable access to clean and affordable energy (Fuller 2016; Sovacool 2017). The concepts of energy justice and energy democracy are increasingly relevant in addressing historical injustices in the United States. Many low-income and disadvantaged communities in the United States not only face the challenges of climate change, such as access to clean drinking water, air, and more, but also face the socio-economic challenges of rising energy costs that contribute to energy poverty (Wahlund 2022; Mayhorn 2025). These issues are further exacerbated by inflation and the aftermath of the COVID-19 pandemic, making energy justice, democracy, and sovereignty increasingly relevant. Many scholars suggest that the present marks a unique window of opportunity to empower and uplift these communities, as near-term 2030, and long-term 2050 (and beyond) net-zero goals and pledges have been set internationally and cascaded to nations like the United States. Energy democracy and energy justice, therefore, are tools for creating a more equitable and just society in which everyone has the ability to participate and benefit from the clean-energy economy and transition (Fuller 2016; Szulecki 2020; Mayhorn 2025).

### *Dimensions of Energy Justice*

The literature suggests that energy justice may be understood through two lenses: energy production and energy consumption (Sovacool 2017; Wahlund 2022; Mayhorn 2025). Many point to understanding first how the energy is produced and where. Then, who consumes the energy, at what rate, and how much? Energy production in the United States has historically been unevenly distributed, where many energy production facilities are often located in ‘undesirable’ communities, where property values are low and many low-income households reside. This trend has led to disproportionately higher environmental health challenges for these communities, given their close proximity to energy production sites. This is an externalized cost to both the local communities and local ecosystems—exacerbating health issues, environmental pollution and degradation, and more (Burke 2017; Wahlund 2022).

This is where the concept of distributive justice arises— this concept focuses on how the costs and benefits of energy systems are distributed, with regard to both production and consumption. In comparison, procedural justice emphasizes bringing the community into the decision-making process when energy systems are being built, modified, and removed. Procedural justice, applies a normative approach that focuses more on “what will be” vs. “what is” in the planning process— and brings local communities in to ensure their voices are heard. Failure to incorporate both distributive justice and procedural justice often results in policies that do not address community needs and further entrench inequalities. Researchers also suggest that energy injustice is further compounded by a lack of citizen education, engagement, and participation (Veelen 2018; Bauwens 2024; Fiander 2024; Wyse 2024).

### *A Just Transition*

Energy justice is a key component of a just transition. The concept of a just transition has been around since the late 1900s and came about from the U.S labor movement (Wang & Lo, 2021). It arose from workers demanding better conditions and support when transitioning out of jobs that exposed them to pollutants and other environmental harms. At the same time, BIPOC communities were also fighting for their right to a clean and healthy environment, which later led to collaboration between these groups centered on a just transition (Nguyen, 2022). While the definition for a just transition may vary amongst organizations, the Climate Justice Alliance defines it as a shift away from an extractivist, fossil-fueled economy, towards a regenerative economy focused on repairing past harms and shifting power in an equitable manner. They have also identified a core set of principles: buen vivir, meaningful work, self-determination, equitable redistribution of power and resources, solidarity, regenerative ecological economics, build what we need now, and culture and tradition (Climate Justice Network, n.d.). At the heart of a just transition is a community-based approach where decision-making power is placed directly in the hands of the people. A core tenet of this principle is energy democracy.



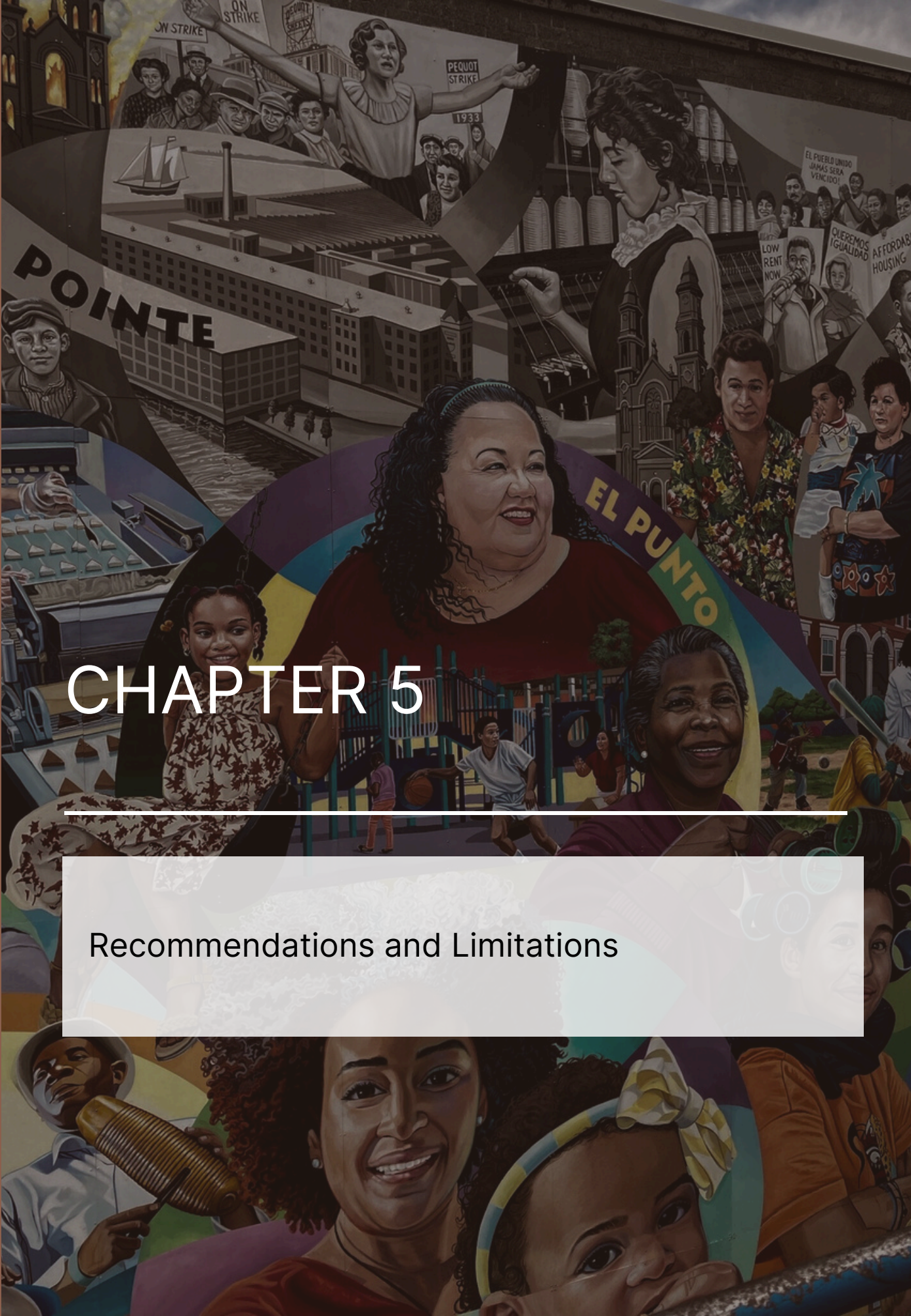
#### **Key Concept**

Just transition: An equity-focused shift from a fossil fuel-based economy to one that is regenerative, community-led, and centered on worker and environmental justice.

### *Energy Democracy & Energy Sovereignty*

The definition of energy democracy is highly contested in the literature (Burke 2017; Szulecki 2020). However, many scholars agree that at its core, energy democracy aims to decentralize decision-making power in energy systems and redistribute this to local communities to increase participation and citizen engagement in their energy economy. Many point to how energy democracy is perceived as both being process-based- i.e., how are communities achieving increasing energy democracy, and outcome-based- i.e., did a community achieve partial or full community energy ownership? This suggests that energy democracy is the catalyst for achieving energy justice- by focusing on how energy systems are designed, energy democracy seeks to increase accessibility, affordability, and equity for all who partake (Wyse 2024; Palm 2025). Sample frameworks that have appeared throughout space and time include energy cooperatives, community ownership, community choice aggregation, and more (Goedkoop 2016; O'Shaughnessy 2019; Hogan 2022). All frameworks for energy democracy lean on participatory governance to achieve energy sovereignty.

For the purposes of this Field Project, we define energy sovereignty as the right and ability of communities to control and manage their own energy resources and systems. This definition highlights the freedom to determine how energy is produced, distributed, and consumed, as well as how the benefits of the community-owned energy are shared within the community. Community participation and trust, however, require time and commitment from all stakeholders involved. Many scholars point to how energy democracy is, at times, too idealistic, and that additional barriers to energy projects, such as high upfront capital, permitting, siting, and more, can prevent energy projects from even being realized. It becomes increasingly clear that there is no 'one size fits all' approach to energy democracy, and that to achieve a just energy transition through energy democracy frameworks requires patience, cooperation, and mutual investment from all parties involved. If this is achieved, the benefits of energy democracy may be realized (Burke 2017; Wyse 2024; Palm 2025).



# CHAPTER 5

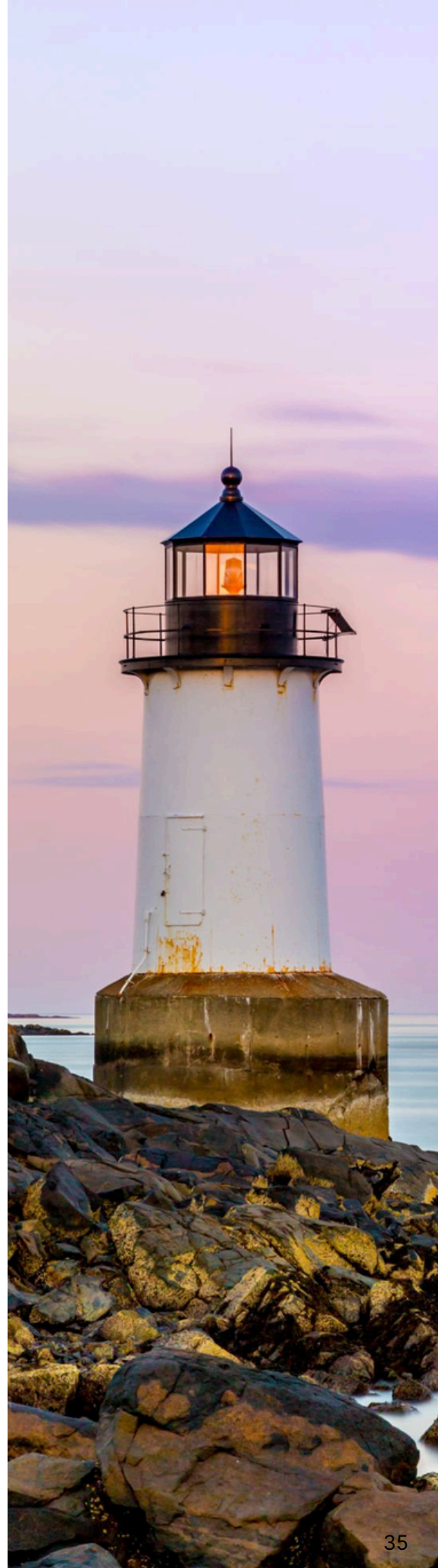
Recommendations and Limitations

# RECOMMENDATIONS & LIMITATIONS

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As we reflected on the interviews, case studies, and planning tools explored throughout this project, a clear pattern emerged: energy democracy, coalition building, and transparency throughout the process, with an emphasis on direct benefits to residents, is fundamental to achieving COE. What began as a survey of COE tools evolved into a roadmap—one that can guide SAFE and its partners toward meaningful, actionable progress in Salem.

Microgrids consistently surfaced as the most promising and scalable tools for achieving COE in urban environments. Their modular nature, ability to integrate clean energy sources, and potential for community governance make them uniquely well-suited for communities like Salem. However, microgrids projects cannot take off if they are not supported or championed by the community. These projects must be with, not just for a community. It must be embedded within a broader strategy grounded in community engagement, partnership building, and diversified funding.



With that in mind, we propose the following roadmap as a set of sequential and actionable steps that SAFE can take to initiate its COE journey and establish Salem as a statewide leader in energy justice and democracy:

- **Step 1 - Drive Community Engagement:** Start by building trust, gathering input, and involving residents, especially those from historically marginalized communities, in visioning and planning processes. Community buy-in is essential for both legitimacy and long-term success.
- **Step 2 - Cultivate and Strengthen Strategic Partnerships:** Work with local organizations, educational institutions, municipalities, and technical experts to build a robust coalition with the capacity to plan and implement COE projects.
- **Step 3 - Leverage CBAs to Diversify Funding:** Pursue funding tools such as Community Benefits Agreements, state and federal grants (e.g., MassCEC and Mass Solar for All), and philanthropic partnerships to ensure long-term financial viability.
- **Step 4 - Lead Microgrids & Resilience Hub Initiatives:** Create a community-focused resilience hub that functions as both a workforce development center and a pilot-scale innovation hub. This facility could house a microgrid pilot project, offering immediate benefits to the community and laying the foundation for a scalable COE model throughout the Commonwealth.

For more in-depth recommendations, please visit our Guidebook in the Appendix.



## Limitations

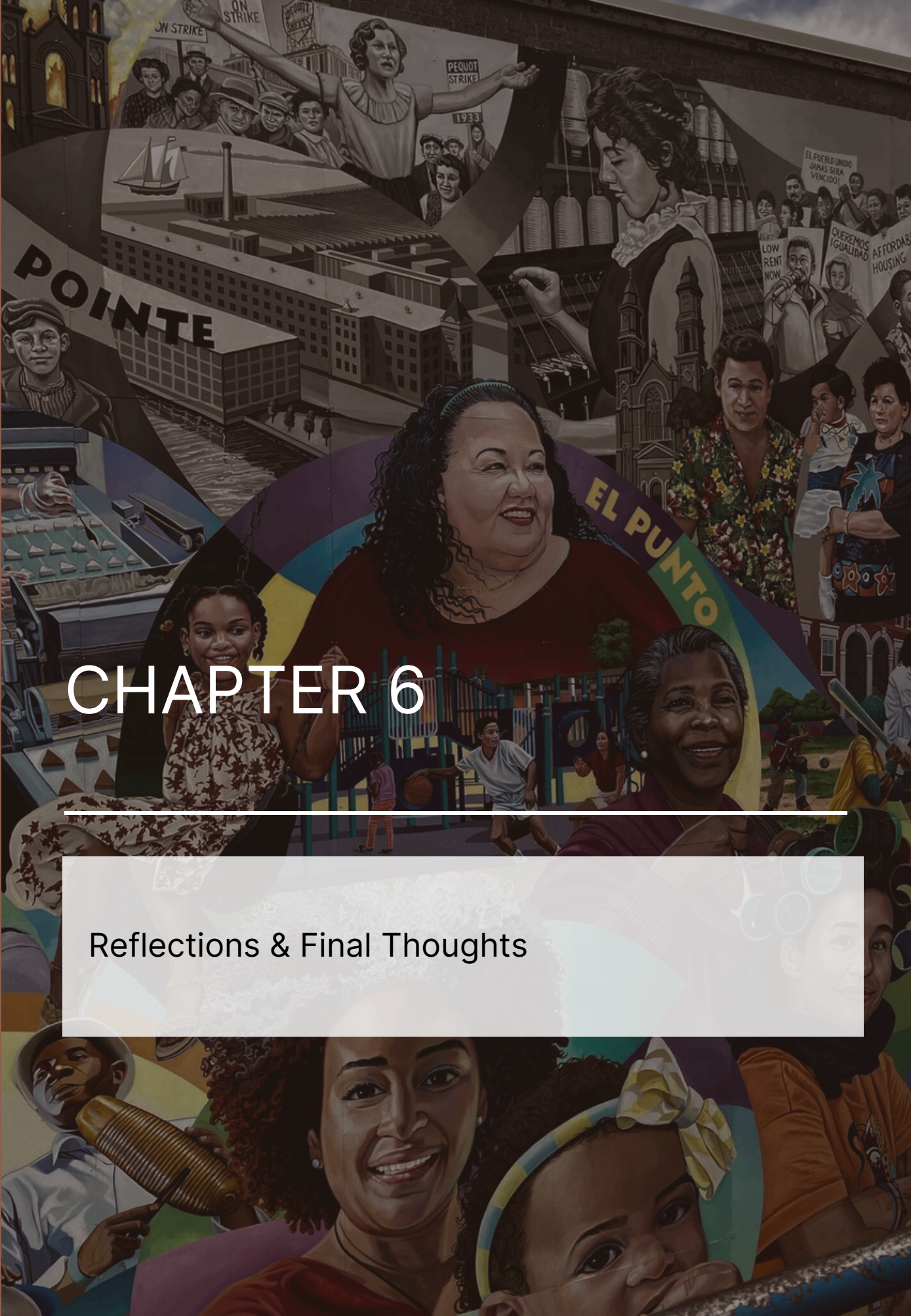
The following section highlights some of the main challenges to achieving COE both in Salem and in other similar communities. These takeaways are based on what we learned through our case study research and conversations with local stakeholders.

- **Initial Capital Investment:** Community-owned and controlled projects, particularly geothermal and offshore wind, require substantial initial investment. These costs can hinder local residents and businesses from collectively funding large-scale projects, especially without significant funding or incentives.
- **Regulatory & Policy Challenges:** The energy sector is heavily regulated, and navigating these challenges can be particularly difficult for community groups. Policies regarding grid integration, energy storage, etc. may require complicated legal and regulatory approvals that may delay or hinder the deployment of a renewable energy system.
- **Lack of Expertise:** Running a COE project requires specialized knowledge in areas of energy production, grid integration, distribution, consumption, and overall maintenance of complex systems. The City of Salem will likely need to invest in training programs and hire experts to manage operations, which may initially limit the degree of community control.
- **Permitting & Land Use:** Securing the necessary permits and addressing land use concerns may be another hurdle to COE. Many community-controlled projects may face opposition from local residents and/or developers regarding property values, views, or the local built and marine environment.
- **Limited Grid Integration Options:** COE projects of larger scale, such as offshore wind, may need to be integrated into the energy grid. This requires significant upgrades to existing infrastructure, especially with regard to solar and offshore wind energy generation, where energy is initially generated as direct current and must be transformed into alternating current for downstream distribution and consumption in homes and businesses.

- **Federal Funding Freezes:** Under the current administration, previous sources of funding that were available under the IRA or DOE are being slashed or put on pause. Federal funding is no longer as reliable as it was even a year ago, and it is especially hard to secure funding for projects aimed at benefiting environmental justice communities. Having to rely on state grants and private funding may present a big challenge to implementation.

As highlighted above, there are ample community-owned energy possibilities for SAFE to explore. With climate change continuing to ramp up we recognize the necessity for these projects to take shape to ensure a just transition in Salem. These projects will present challenges, especially under the current political climate, but the team remains hopeful for the possibilities that lay ahead and understand this is just the beginning of a long journey. We are excited for what is about to transpire in Salem and are grateful to have played a small role in this larger movement for just transition and community control.





# CHAPTER 6

Reflections & Final Thoughts

# REFLECTIONS & FINAL THOUGHTS

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COE offers an exciting opportunity for residents to have more say in what happens within their communities. Our team hopes that the recommendations in this report will paint a clearer picture of what community ownership of energy systems looks like for Salem residents and a way forward for SAFE.

This semester-long project has involved countless hours of research and collaboration. We aimed to conclude by highlighting the elements of this process that we believe we executed well, as well as those that, with more time, we would have liked to include. Additionally, we would like to acknowledge the qualities of our group that enabled us to reach this milestone.

For a project this long, amid a busy schedule, it is imperative that we maintain flexibility. Whether when reaching out for interviews or navigating around our schedules, things may not end up fitting our prescribed schedules. Developing a plan and a specific meeting time helped us check in with each other, not only about the project, but also about our lives outside of the project, allowing us to plan around busy times in our lives.

As a group, we were highly productive throughout the semester and could quickly adapt to changing paths. This approach allowed us to complete our lofty objectives and deliverables while incorporating the helpful guidance from our project partners and teaching team. We were able to achieve depth in our literature review, which helped us reach past the low-hanging fruit and tackle more difficult questions. We also had to adjust to changing conditions in Salem and federally, while still offering actionable solutions.



Our team also has a drive and deep desire to help make a change in the energy sphere. It was hard for us to adjust the project scope to be attainable within our time frame. We now have a connection to the Salem community and are excited that SAFE will continue to stay involved with the Tufts community. We would have liked to continue searching for more case studies that match our criteria, such as the Chelsea case. Nevertheless, we are delighted with the product we produced.

Lastly, we would like to thank Bonnie and Lucy from Salem Alliance for the Environment, as well as Penn Loh and Paulina Casasola Mena, for their guidance and support throughout the process. Our collective experiences and lessons learned through the project are invaluable.



From left to right: Paulina, Will, Denisse, Deanna, Cole, Marina, Eliza and Penn at our final presentation

# WORK CITED

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Arent, Doug, Irene Varoli, Kristen Panerali, Cy McGeady, and Joseph Majkut. 2023. "Energy Projects Tend to Move Slowly in the US — Here's What to Do about It." World Economic Forum. <https://www.weforum.org/stories/2023/12/energy-projects-move-slowly-in-the-us/>.

Bauwens, Thomas, Taneli Vaskelainen, and Koen Frenken. 2022. "Conceptualising Institutional Complexity in the Upscaling of Community Enterprises: Lessons from Renewable Energy and Carsharing." *Environmental Innovation and Societal Transitions* 42 (March 2022): 138–151. <https://doi.org/10.1016/j.eist.2021.12.007>.

Bauwens, Thomas, Robert Wade, and Matthew Burke. 2024. "The Energy Commons: A Systematic Review, Paradoxes, and Ways Forward." *Energy Research and Social Science*. Elsevier Ltd. <https://doi.org/10.1016/j.erss.2024.103776>.

Brown, Marilyn A., Melissa V. Lapsa, and Katie Southworth. 2020. *Low-Income Energy Affordability: Conclusions from a Literature Review*. Oak Ridge National Laboratory. <https://info.ornl.gov/sites/publications/Files/Pub124723.pdf>.

Brummer, Vasco. 2018. "Community Energy – Benefits and Barriers: A Comparative Literature Review of Community Energy in the UK, Germany, and the USA, the Benefits It Provides for Society and the Barriers It Faces." *Renewable and Sustainable Energy Reviews* 94: 187–196. <https://doi.org/10.1016/j.rser.2018.06.013>.

Burke, Matthew J., and Jennie C. Stephens. 2017. "Energy Democracy: Goals and Policy Instruments for Sociotechnical Transitions." *Energy Research and Social Science* 33 (November): 35–48. <https://doi.org/10.1016/j.erss.2017.09.024>.

Carley, Sanya, and David M. Konisky. 2020. "The Justice and Equity Implications of the Clean Energy Transition." *Nature Energy* 5 (8): 569–77. <https://doi.org/10.1038/s41560-020-0641-6>.

Clean Energy Economy MN. 2024. "Red Lake Solar Project." Clean Energy Economy Minnesota. Accessed 2024. <https://www.cleanenergyeconomymn.org/success-stories/red-lake-solar-project>.

City of Beverly & City of Salem. 2021. *Resilient Together: Climate Action & Resilience Plan*. Beverly and Salem, MA. [https://www.beverlyma.gov/DocumentCenter/View/5353/BevSalem\\_CAP\\_Report\\_508\\_C\\_Single\\_LowRes?bidId=](https://www.beverlyma.gov/DocumentCenter/View/5353/BevSalem_CAP_Report_508_C_Single_LowRes?bidId=).

City of Salem. 2022. City of Salem Celebrates Upcoming Solar Projects at Two Schools. Salem, MA. <https://www.salemma.gov/mayors-office/news/city-salem-celebrates-upcoming-solar-projects-two-schools>.

City of Salem. 2024. City of Salem and Crowley Wind Services Announce Historic Community Benefits. Salem, MA. <https://www.salemma.gov/mayors-office/news/city-salem-and-crowley-wind-services-announce-historic-community-benefits>.

Chen, Chien-fei, Jimmy Feng, Nikki Luke, Cheng-Pin Kuo, and Joshua S. Fu. 2022. "Localized Energy Burden, Concentrated Disadvantage, and the Feminization of Energy Poverty." *iScience* 25 (4): 104139.

Colton R D. 2011. Home energy affordability in New York: the affordability gap (2008–2010) Prepared for New York State Energy Research Development Authority (NYSERDA) Albany, New York  
<http://www.accessiblelaw.org/Documents/EnergyAffordabilityGap.pdf>

Cook, Jeffrey J., and Monisha Shah. 2018. "Reducing Energy Burden with Solar: Colorado's Strategy and Roadmap for States." NREL/TP--6A20-70965, 1431421.  
<https://doi.org/10.2172/1431421>.

Cranmer, Zana, Laurel Steinfield, Javier Miranda, and Taryn Stohler. 2023. "Energy Distributive Injustices: Assessing the Demographics of Communities Surrounding Renewable and Fossil Fuel Power Plants in the United States." *Energy Research & Social Science* 100 (June):103050. <https://doi.org/10.1016/j.erss.2023.103050>.

Drehobl, Ariel, and Lauren Ross. 2016. Lifting the high energy burden in America's largest cities: how energy efficiency can improve low income and underserved communities American Council for an Energy-Efficient Economy (ACEEE)  
<https://www.aceee.org/sites/default/files/publications/researchreports/u1602.pdf>

Energy Saving Trust. 2024. "Our Response to Barriers to Community Energy Projects Call for Evidence," <https://energysavingtrust.org.uk/report/barriers-to-community-energy-projects-response/>.

Fiander, Joseph, Chad Walker, Ian H. Rowlands, Patrick Devine-Wright, Charlie Wilson, Iain Soutar, and Rajat Gupta. 2024. "Energy Democracy, Public Participation, and Support for Local Energy System Change in Canada." *Energy Research and Social Science* 113 (July). <https://doi.org/10.1016/j.erss.2024.103526>.

Fisher, Sheehan and Colton. 2013. "Home energy affordability gap" Public Finance and General Economics. <http://www.homeenergyaffordabilitygap.com/>

Fuller, Sara, and Darren McCauley. 2016. "Framing Energy Justice: Perspectives from Activism and Advocacy." *Energy Research and Social Science* 11 (January): 1–8. <https://doi.org/10.1016/j.erss.2015.08.004>.

Goedkoop, Fleur, and Patrick Devine-Wright. 2016. "Partnership or Placation? The Role of Trust and Justice in the Shared Ownership of Renewable Energy Projects." *Energy Research and Social Science* 17 (July): 135–46. <https://doi.org/10.1016/j.erss.2016.04.021>.

Graff, Michelle, Sanya Carley, David M. Konisky, and Trevor Memmott. 2021. "Which Households Are Energy Insecure? An Empirical Analysis of Race, Housing Conditions, and Energy Burdens in the United States." *Energy Research & Social Science* 79 (September):102144. <https://doi.org/10.1016/j.erss.2021.102144>.

Graff, Michelle, David M. Konisky, Sanya Carley, and Trevor Memmott. 2022. "Climate Change and Energy Insecurity: A Growing Need for Policy Intervention." *Environmental Justice* 15 (2): 76–82. <https://doi.org/10.1089/env.2021.0032>.

Harmon, Elise. 2017. "Newton's Community Solar Share Initiative: Sometimes, the Answer is Hidden in Plain Sight." Metropolitan Area Planning Council (MAPC), January 26, 2017. <https://www.mapc.org/planning101/newtons-community-solar-share-initiative-sometimes-the-answer-is-hidden-in-plain-sight/>

Hogan, Jessica L., Charles R. Warren, Michael Simpson, and Darren McCauley. 2022. "What Makes Local Energy Projects Acceptable? Probing the Connection between Ownership Structures and Community Acceptance." *Energy Policy* 171 (December). <https://doi.org/10.1016/j.enpol.2022.113257>.

Huang, Zishuo, Hang Yu, Zhenwei Peng, and Yifu Feng. 2017. "Planning Community Energy System in the Industry 4.0 Era: Achievements, Challenges and a Potential Solution." *Renewable and Sustainable Energy Reviews* 78 (October 2017): 710–721. <https://doi.org/10.1016/j.rser.2017.04.004>.

Jenkins, Kirsten, Darren McCauley, Raphael Heffron, Hannes Stephan, and Robert Rehner. 2016. "Energy Justice: A Conceptual Review." *Energy Research & Social Science* 11 (January):174–82. <https://doi.org/10.1016/j.erss.2015.10.004>.

Kiamba, Orna, Lucelia Rodrigues, Julian Marsh, Eldar Naghiyev, Mark Sumner, Lee Empringham, Liliana De Lillo, and Mark Gillott. 2022. "Socio-Economic Benefits in Community Energy Structures." *Sustainability* 14 (3): 1890. <https://doi.org/10.3390/su14031890>.

Kienbaum, Katie. 2024. "Community Leaders on the Benefits of Locally Owned Clean Energy." Institute for Local Self-Reliance (ILSR), June 6, 2024. <https://ilsr.org/articles/community-leaders-benefits-of-locally-owned-clean-energy/>

Konisky, David M, Sanya Carley, Michelle Graff, and Trevor Memmott. 2022. "The Persistence of Household Energy Insecurity during the COVID-19 Pandemic." *Environmental Research Letters* 17 (10): 104017. <https://doi.org/10.1088/1748-9326/ac90d7>.

Liddell, Christine, Chris Morris, S.J.P. McKenzie, and Gordon Rae. 2012. "Measuring and Monitoring Fuel Poverty in the UK: National and Regional Perspectives." *Special Section: Fuel Poverty Comes of Age: Commemorating 21 Years of Research and Policy* 49 (October):27–32. <https://doi.org/10.1016/j.enpol.2012.02.029>.

Lennon, Breffní, Niall P. Dunphy, and Estibaliz Sanvicente. 2019. "Community Acceptability and the Energy Transition: A Citizens' Perspective." *Energy, Sustainability and Society* 9 (1): 35. <https://doi.org/10.1186/s13705-019-0218-z>.

Li, Na, and Özge Okur. 2023. "Economic Analysis of Energy Communities: Investment Options and Cost Allocation." *Applied Energy* 336 (April):120706. <https://doi.org/10.1016/j.apenergy.2023.120706>.

Mass PowerChoice. 2024a. Salem PowerChoice: Municipal Electricity Aggregation Program. <https://www.masspowerchoice.com/salem>.

Mass PowerChoice. 2024b. Salem PowerChoice: Participating Benefits and Rates. <https://www.masspowerchoice.com/salem/participating/benefits>.

Mayhorn, Ebony, Tabitha Artuso, Andrew White, and Cheryn Metzger. 2025. "Exploring Benefits and Affordability of Clean Energy Technologies in Urban Disadvantaged Communities – A Case Study." *Energy Policy* 199 (April). <https://doi.org/10.1016/j.enpol.2025.114533>.

Memmott, Trevor, Sanya Carley, Michelle Graff, and David M. Konisky. 2021. "Sociodemographic Disparities in Energy Insecurity among Low-Income Households before and during the COVID-19 Pandemic." *Nature Energy* 6 (2): 186–93. <https://doi.org/10.1038/s41560-020-00763-9>.

Moore, David, and Amanda L. Webb. 2022. "Evaluating Energy Burden at the Urban Scale: A Spatial Regression Approach in Cincinnati, Ohio." *Energy Policy* 160:112651.

National Renewable Energy Laboratory (NREL). 2012. A Tale of Two Cities: Greensburg Rebuilds as a National Model for Green Communities (Fact Sheet). U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. <https://www.energy.gov/eere/articles/tale-two-cities-greensburg-rebuilds-national-model-green-communities-fact-sheet>

O'Shaughnessy, Eric, Jenny Heeter, Julien Gattaciecce, Jenny Sauer, Kelly Trumbull, and Emily Chen. 2019. "Empowered Communities: The Rise of Community Choice Aggregation in the United States." *Energy Policy* 132 (September): 1110–19. <https://doi.org/10.1016/j.enpol.2019.07.001>.

Palm, Jenny, Anna Riikka Kojonsaari, and Dick Magnusson. 2025. "Toward Energy Democracy: Municipal Energy Actions in Local Renewable Energy Projects." *Energy Research and Social Science* 120 (February). <https://doi.org/10.1016/j.erss.2025.103921>.

Ross, Lauren, Ariel Drehobl, and Brian Stickles. 2020. "The High Cost of Energy in Rural America:" American Council for an Energy Efficient Economy <https://www.aceee.org/sites/default/files/publications/researchreports/u1806.pdf>

Snaith, M. (2024). Power to the people: An overview of community energy. Earth.Org. <https://earth.org/power-to-the-people-an-overview-of-community-energy/>

Sovacool, Benjamin K., Matthew Burke, Lucy Baker, Chaitanya Kumar Kotikalapudi, and Holle Wlokas. 2017. "New Frontiers and Conceptual Frameworks for Energy Justice." *Energy Policy* 105: 677–91. <https://doi.org/10.1016/j.enpol.2017.03.005>.

Szulecki, Kacper, and Indra Overland. 2020. "Energy Democracy as a Process, an Outcome and a Goal: A Conceptual Review." *Energy Research and Social Science*. Elsevier Ltd. <https://doi.org/10.1016/j.erss.2020.101768>.

Tapio, Rebecca, Juliet Homer, Kendall Mongird, and Jason Eisdorfer. 2024. "Folding Community Engagement into Decision Making: A Continuous Process to Increase Equity in the Energy System." *The Electricity Journal* 37 (7): 107442. <https://doi.org/10.1016/j.tej.2024.107442>

U.S. Census Bureau. 2023. "Quick Facts-City of Salem, Massachusetts -population estimates." Accessed February 14, 2025. <https://www.census.gov/quickfacts/providencacityrhodeisland>

U.S. Energy Information Administration (EIA). 2024. Massachusetts: State Energy Profile and Energy Estimates. Washington, DC. <https://www.eia.gov/state/print.php?sid=MA#tabs-4>.

Veelen, Bregje van, and Dan van der Horst. 2018. "What Is Energy Democracy? Connecting Social Science Energy Research and Political Theory." *Energy Research and Social Science*. Elsevier Ltd. <https://doi.org/10.1016/j.erss.2018.06.010>.

Wahlund, Madeleine, and Jenny Palm. 2022. "The Role of Energy Democracy and Energy Citizenship for Participatory Energy Transitions: A Comprehensive Review." Energy Research and Social Science. Elsevier Ltd. <https://doi.org/10.1016/j.erss.2021.102482>.

Walker, Gordon, and Nick Simcock. 2012. "Community Energy Systems." Energy Policy 50: 1–5. <https://eprints.lancs.ac.uk/id/eprint/128654/>.

Warren, Barbara. 2020. "Community Resilience Building Workshop: Summary of Findings." City of Salem. March 18th. [https://www.salem.com/sites/g/files/vyhlf12836/f/news/mvp\\_summary\\_of\\_findings\\_-\\_community\\_resilience\\_building\\_report.pdf](https://www.salem.com/sites/g/files/vyhlf12836/f/news/mvp_summary_of_findings_-_community_resilience_building_report.pdf)

Wyse, Susan Morrissey, and Runa R. Das. 2024. "Energy Democracy: Reclaiming a Unique Agenda in Energy Transitions Research." Energy Research and Social Science. Elsevier Ltd. <https://doi.org/10.1016/j.erss.2024.103774>.



# APPENDICES

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# APPENDICES

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## **Appendices**

- Section 1: Survey of COE Tools
- Section 2: Interview Questions
- Section 3: Bringing Power Home: Case Study Report
- Section 4: Guidebook for Community-Owned Energy Possibilities in Salem, Massachusetts

## Section 1: Survey of COE Tools

COE Model	Description	Ownership & Governance Structure	Level of Control	Benefits	Limitations
<i>Community Benefits Agreements (CBA)</i>	Legally binding agreement between a developer and a community.	Often created by local community members and organizations.	High	Ensures the community receives both monetary and non-monetary benefits. May be upheld in court.	Requires technical expertise, legal counsel, and clean vision of near-term and long-term community goals.
<i>Community Choice Aggregation (CCA)</i>	Municipalities purchase bulk electricity on behalf of residents, filling a role typically held by a third-party procedure.	Municipal governments oversee bargaining. Community members have the option to enroll in the program	Low	Diversifies local community energy options	Limited community input. May or may not offer lower rates for members enrolled.
<i>Community Energy Farms</i>	Energy is generated at an offsite location, often adjacent to the community it serves.	May be owned and maintained by community organizations and/or municipal governments.	Med	Benefits of the energy system are often distributed to the community.	Requires high capital upfront for partial and/or full ownership.
<i>Committees</i>	A governmental body (typically within a municipal government) that discusses and deliberates on energy issues, opportunities, and their potential impacts.	Subject to the decisions and/or agendas of elected municipal officials.	Low	Ability to directly influence and support local energy initiatives with key stakeholder(s).	Subject to the decision making and/or agendas of municipal government.
<i>Cooperatives</i>	Multiple stakeholders join together to form a mission driven organization, typically for the purpose of pooling resources and representing their respective communities.	Shared ownership model; often owned and operated by members who share its monetary and non-monetary benefits.	Med/High	Ability to directly advocate for and implement energy initiatives often independent of local government.	Requires significant stakeholder collaboration and access to capital.

Section 1: Survey of COE Tools continued

COE Model	Description	Ownership & Governance Structure	Level of Control	Benefits	Limitations
<i>Microgrids</i>	A local type of energy array that is disconnected from the main grid (i.e., solar panels, battery storage, etc.). It can generate, store, and distribute energy independently.	May be owned and maintained by community organizations, municipal governments, and more.	High	Monetary benefits can be directed to residents, often reducing the rate. Provides an additional layer of resilience, and is easy to integrate into complex, urban settings.	Requires moderate capital upfront to finance. Benefits are directly proportional to the degree of control/ownership of the system.
<i>Municipal Light Plants</i>	A municipality and its community maintain full agency over the distribution and delivery of energy to residents of that municipality, filling a role typically occupied by a distribution utility.	Ownership, costs, and maintenance falls on municipal government.	Low/ Med	No profit motive; residents can communicate directly with MLP officials.	Requires high upfront capital to deploy. Often many bureaucratic hurdles to face to get these projects approved.
<i>Resilience Hubs</i>	Community facilities that offer points for resilience; offering resources and support before, during, and after emergency events. Designed to enhance social cohesion and be a third place for in-person interactions(s).	Designed to be flexible and adaptable; often require at least one organization (such as a Co-op) to spearhead and bring in additional stakeholders to form.	Med/ High	High degree of resilience and adaptation possible- a place for education, workforce development, and piloting of microgrid projects, and more. Community centered and tailored for the unique needs of the community it serves.	Requires moderate upfront capital and strategic partnership(s) to initiate. Likely a high-degree of planning as well. Outcomes of a resilience hub vary widely depending on their purpose/goal.

## Section 2: Interview Guide & Questions

*Note each interview started with the following introduction and set of opening questions. Depending on the type of interviewee, energy expert or frontline implementer, we tailored questions unique to their background and context.*

<b>Energy Experts</b>	<b>Frontline Implementers</b>
<ul style="list-style-type: none"><li>• Bridget Monihan<ul style="list-style-type: none"><li>◦ Tufts PhD Candidate</li></ul></li><li>• Diana Eddows<ul style="list-style-type: none"><li>◦ Solar United Neighbors, Northeast Policy Director</li></ul></li><li>• Jean-Jacques Yarmoff<ul style="list-style-type: none"><li>◦ Marblehead Municipal Light Plant, Board Member</li></ul></li><li>• Moneer Azzam<ul style="list-style-type: none"><li>◦ Beacon Climate Innovations, CEO &amp; Founder, Faculty at Tufts</li></ul></li><li>• Victoria Pisini<ul style="list-style-type: none"><li>◦ Climate Salon, CEO &amp; Founder, Faculty at MIT</li></ul></li><li>• Sarah Saydun<ul style="list-style-type: none"><li>◦ Tufts Masters Candidate</li></ul></li><li>• Sari Kayyali<ul style="list-style-type: none"><li>◦ Microgrid Manager, Green Roots Inc.</li></ul></li></ul>	<ul style="list-style-type: none"><li>• Jeff Cohen<ul style="list-style-type: none"><li>◦ City of Salem</li></ul></li><li>• Julio Mota<ul style="list-style-type: none"><li>◦ City of Salem, LLC Chair</li></ul></li><li>• Lucy Corchado<ul style="list-style-type: none"><li>◦ Point Neighborhood Association, President</li></ul></li><li>• Richard Andre<ul style="list-style-type: none"><li>◦ Vineyard Power, President</li></ul></li></ul>

## Section 2: Interview Guide & Questions

### Interview Guide

*Intro Memo:* Thank you for taking the time to speak with us today. We are all students from Tufts University's Urban and Environmental Policy and Planning Graduate School. We are working with SAFE (Salem Alliance for the Environment) to develop a roadmap for community-owned energy in Salem. We are exploring pathways for Salem to expand community-led energy projects, ensuring long-term sustainability for the Salem residents.

We are very excited to be speaking with you today. This conversation will be in an interview format but also an open conversation. We would like to ask you for your consent to record this meeting/take notes with your permission.

*Opening Questions:* What is your professional affiliation and the goals of that organization and how long have you been working in this position? What does community-owned energy mean to you?

#### *Energy Expert Questions*

- Could you talk about your experience researching, interacting with, or implementing COE projects?
- What types of COE projects have you seen, and what models tend to be most effective?.
- Who are the key stakeholders typically involved in COE projects?
- What are the biggest barriers to COE implementation that you've encountered in research or practice?
- What funding mechanisms are commonly used to launch and sustain COE projects?
- How do you see COE contributing to justice and sustainability? Why is it a good model?
- How have energy rates or affordability changed after implementing COE in places you've studied or worked in?
- What stakeholders need to be included in the process of developing COE projects?

#### *Frontline Implementor Questions*

- What is your connection to Salem? How long have you lived or worked here, and what keeps you involved in the community?
- How have you seen energy affordability and access affecting Salem residents?
- What are some past or ongoing community initiatives in Salem that have been successful? What did they look like?
- Who holds the power and decision-making authority on energy issues in Salem?
- What do you see as the key levers for change in Salem's energy landscape? If you could make one major change, what would it be?

# BRINGING POWER HOME

## COMMUNITY-OWNED ENERGY CASE STUDIES REPORT



Prepared by:  
SAFE Field Project Team  
Tufts University UEP 2025

Prepared for:  
Salem Alliance for the Environment

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We are especially thankful for Bonnie Bain and Lucy Corchado for their guidance and commitment to environmental justice in Salem. We hope this case study report supports SAFE with their ongoing efforts towards a community-led energy future in Salem. We also appreciate the time and insights of our interviews, whose experiences informed our work.

Finally, we thank our teaching team, Penn Loh, Paulina Casasola Mena, in the Urban and Environmental Policy and Planning Department at Tufts University for their ongoing support throughout the semester.



Image: [SAFE website](#)

# 1. Introduction

This report examines real-world examples of community-owned energy (COE). We first pose a definition of COE based on a brief literature review. We examine the broad benefits of COE as well as considerations. We then present a suite of cases, chosen based on a down-selection criterion and impact analysis of select COE models. Using our criteria, we also chose two cases to explore in further detail. Finally, we examine shared best practices and takeaways from our cases, as well as potential applicability to Salem.

This case study report is part of a semester-long partnership and project between the Tufts University Department of Urban Environmental Policy and Planning (UEP) and the non-profit organization, Salem Alliance for the Environment (SAFE). The project examines pathways towards COE implementation for the City of Salem, and includes a tailored guidebook in addition to this report.

To determine pathways for COE in Salem, it is important to examine similar projects and the steps they took to become successful. As such, this report will aim to answer the following:

- 1. What is community-owned energy?**
- 2. What are examples of successful and unsuccessful community-owned energy?**
- 3. What processes contribute to a project's success?**



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Urban and Environmental  
Policy and Planning

# 2. Methodology

## 2.1 Case Search

To develop a wide database of cases, we conducted a traditional search combined with information derived from interviews. We first browsed databases such as Google Scholar and Web of Science. We additionally searched the websites of municipal governments, nonprofit organizations, and news databases for existing community-owned energy projects. Finally, we relied heavily on the expertise and knowledge of our project’s interviewees. For both our frontline implementer and energy experts categories, we asked our interviewees for information on any new and existing community-owned energy projects. We sourced a number of cases through this strategy, and it helped us fill in gaps in current cases that could not be found online.

## 2.2 Down Selection

To evaluate and select case studies that illustrate relevant community-owned energy projects, we established a structured set of criteria. These criteria ensure that selected examples are aligned with the goals of energy justice and democracy, and transferable to the City of Salem’s specific context. Criteria (below) were developed in conjunction with SAFE staff to determine maximum applicability and impact and are described in Table 1.

## 2.3 Case Examples vs. Case Studies

While all of the cases we reviewed offer insights into community-owned energy, not all are equally relevant to the City of Salem. To help organize our findings, we use the terms case examples and case studies to reflect their varying degrees of alignment with our project goals.

Case examples provide a general overview of community-owned energy efforts, including ownership models and outcomes. Case studies refer to cases that more closely align with our evaluation criteria, particularly in terms of stakeholder roles, funding mechanisms, implementation strategies, and municipal involvement. The final two case studies were the most relevant to Salem’s context and to shape our recommendations.

Case Examples	Case Studies
Not perfectly applicable to Salem, fall short in a few of the criteria.	Applicable and relevant to Salem in most criteria.
Berkshire Co-Op, Marblehead MLP, Vineyard Wind CBA, Adjuntas Solar, Together NOLA Lighthouses	Chelsea Microgrids, Ho’āhu Cooperative

**TABLE 1: DOWN SELECTION CRITERIA FOR CASE STUDIES**

<b>Criteria</b>	<b>Description</b>	<b>Weighting</b>
Location	Cases must be based broadly in the United States, and ideally within the region of New England.	Low
Community Parallel	Cases must clearly exemplify who they are serving and why. Given the City of Salem is home to many EJ, ESL and BIPOC groups, preference is given to those that align most with Salem’s profile.	High
Benefits	Are the benefits clearly demonstrated? Are they monetary or non-monetary? How are they being delivered? Is there evidence of this being a sustainable (long-term) solution?	High
Feasibility to Salem	How feasible is this model to replicate or adapt for Salem’s context, infrastructure, and community needs?	High
Community Involvement & Participation	Cases must exemplify how the community achieves energy democracy. Is the community directly involved in the process and if so, to what extent?	Medium
Energy System Operational Stage	What phase is the project in? Additionally, is the energy system operational, or currently being developed? Ideally, we are searching for cases that are fully operational, with clear benefits being generated for the community.	Medium
Materials and Resources	Is there strong supporting evidence for this case study in gray literature, such as newspapers, articles, and more?	Medium

**Low** = Limited consideration. Limitations in transferring learnings to SAFE.

**Medium** = Moderate consideration. Some, but not all, information is relevant for SAFE and the City of Salem.

**High** = High value and impact for SAFE and relevant to the City of Salem.

# 3. Exploring Community-Owned Energy

## 3.1 Defining Community-Owned Energy

Before exploring successful case studies of community-owned energy, we first aimed to define what exactly community-owned energy is. To accomplish this, we conducted a short literature review on foundational research of community-owned energy. We used the Web of Science and Google Scholar platforms, using keywords such as ‘community energy,’ ‘energy democracy,’ ‘community-owned energy,’ ‘community solar,’ and ‘community energy systems.’ This heeded several community energy-focused articles, which are discussed below.

Certain articles attempt to define the ‘community’ aspect of community-owned energy. Bauwens et al. describe the “community” as an entity separate from the state and market (Bauwens et al. 2022). The authors claim that community benefits are those that are specifically directed to local residents, outside the control of the state or market. The article also discusses community as both a collection of people and things within a finite geographic area. Huang et al. build off of this holistic approach, defining community benefit as the aggregate benefits and considerations of community-owned energy within a specific geographic area (Huang et al. 2017). Previous literature has also explored different types of self-governance and ownership. Walker and Simcock discuss that who technically controls the physical energy infrastructure is not as important, and the disbursement of resources to the community is a key benchmark of community-owned energy (Walker and Simcock 2012). Dincer and Abu-Rayash discuss this physical dimension, touching on the importance of infrastructure proximity to the communities that they serve (Dincer and Abu-Rayash 2020). The authors list this as a key benchmark of community-owned energy and claim that it fills a gap left by traditional generation.

We have found two common aspects of the definition of COE in the literature: 1. Provide direct benefit to non-market, non-state populations, and 2. Exist within a finite geographic area in (or in close proximity to) the populations it serves. For the needs of this case study report, our group will adopt a definition of community-owned energy modeled after these two principles:

*Community-Owned Energy (COE) refers to energy systems that are collectively owned, governed, and operated by a community or group of stakeholders. It encompasses both the physical infrastructure of energy production and distribution, as well as the political and organizational structures that enable decision-making and governance. Under community-owned energy models, the social, environmental, and monetary benefits of the system are directly distributed to the community (i.e. non-market, non-state entities with a shared identity or within a finite geographic area).*

### **3.2 Successful Community-Owned Energy**

The case for community-owned energy is extensive as its far-reaching benefits address various issues related to equity, environmental resilience, and economic vitality. Energy affordability is an issue for many households, but especially for BIPOC, low-income, and other disadvantaged households (Memmott et al. 2021; Koninsky et al. 2022; Chen et. al 2022). Community-owned energy structures can provide socio-economic benefits to alleviate these issues of energy burden; a study out of the U.K found that members of a community that adopted local energy generation saw a reduction in energy costs as a result (Kiamba et al. 2022). Other examples of cost reduction can be seen in the United States (Harmon, 2017; Heeter et al. 2024).

This energy system also aims to mitigate environmental harm and improve climate resiliency. Existing literature highlights direct participation in renewable energy building, financing of renewable energy, and the mental connection between energy consumption and climate change as a few of the many benefits that can be reaped from community-owned energy (Brummer 2018). Kienbaum points out how local solar ownership can address energy grid issues, as households may be less likely to experience blackouts or other energy issues due to extreme weather events (Kienbaum 2024). Community-owned energy systems can also be used to introduce renewable energy into a municipality's energy mix (National Renewable Energy Laboratory 2012). Finally, existing literature has placed heavy emphasis onto the energy democracy aspect, noting community decision-making in energy affairs as a benchmark issue in political ecology and energy justice (Jenkins et al. 2016; Cranmer et al. 2023; Tapio et al. 2024).

We can infer that community-owned energy aims to achieve a few key goals. It aims to decrease costs, increase community agency, sustainability, and build resilience. Given this, our group will adopt four main success metrics to consider while examining our cases:

**1**

Reduces energy costs, particularly for energy burdened households.

**2**

Increases community agency over their energy future.

**3**

Introduces clean energy into the consumption mix of a community.

**4**

Builds resilience in regards to energy, generation, distribution, and consumption.

### 3.3 Community-Owned Energy Models

In our literature review process and search, we found that there are a number of different strategies that can be used to achieve community-owned energy. This includes a mix of distributive and procedural strategies, as well as both political and physical systems. Table 2 shows common strategies to achieve community ownership of energy, while Table 3 demonstrates the pros and cons of various community-owned energy strategies.

These community-owned energy models are quite different in terms of structure, governance, and implementation strategy. They also come with their own set of benefits and considerations, listed in the Table 3 below.

**TABLE 2: Common strategies to achieve community ownership of energy**

<b>Community-Owned Energy Model</b>	<b>Description</b>	<b>Ownership &amp; Governance Structure</b>
Community Energy Farm	Energy is generated at an offsite location adjacent to the community it serves. The benefits of the system, both monetary (e.g. renewable certificates and credits) and non-monetary (e.g. consumable energy) are distributed directly to the community.	Can be owned and maintained by community organizations or municipal governments.
Microgrid	A type of local energy array that can operate separately or together from the main grid. It can generate, store, and distribute energy independently.	Can be owned and maintained by community organizations or municipal governments.
Municipal Light Plant	A municipality and its community maintain full agency over the distribution and delivery of energy to residents of that municipality, filling a role typically occupied by a distribution utility.	Ownership, costs, and maintenance falls on municipal government.
Energy Cooperative	Multiple stakeholders join together to form one singular mission-driven entity, typically for the purpose of pooling resources and representing their respective communities.	Cooperative involves a shared ownership model where it is owned and operated by its members who share in its profits and benefits.
Energy Committee	A governmental body (typically within a municipal government) that discusses and deliberates on energy issues, opportunities, and their potential impacts.	Sits within and beholden to a municipal government.
Community Energy Benefits Agreement	A legally binding agreement between a developer and community (geographic) that ensures the community will receive monetary or non-monetary benefits from a development.	Created by community members and organizations.
Community Choice Aggregation	Municipalities purchase bulk electricity on behalf of residents, filling a role typically occupied by a third-party procurer.	Municipal governments oversee bargaining and there seems to be little to no community input in the process. Community members have the option of enrolling in the program. 64

**TABLE 3: Pros and cons of various community-owned energy strategies.**

<b>Community-Owned Energy Model</b>	<b>Benefits</b>	<b>Considerations</b>
Community Energy Farm	Monetary benefits can be directed to residents, the system exists in close proximity to the community, and produces monetary benefits.	Requires upfront financing and access to capital for full ownership, partial ownership can bar access to certain benefits of the system.
Microgrid	Monetary benefits can be directed to residents, provides an extra layer of resilience, and can be integrated into complex built environments such as urban areas.	Requires upfront financing and access to capital for full ownership, partial ownership can bar access to certain benefits of the system.
Municipal Light Plant	No profit motive, residents within the municipality can directly communicate with MLP officials.	Highly expensive, requires a very large administrative apparatus, and has a long implementation timeline.
Energy Cooperative	Serves as an entity that can directly advocate for and implement energy initiatives independent of government.	Requires significant stakeholder collaboration and access to funding.
Energy Committee	Serves as an entity that can directly influence and support energy initiatives, interact with a wide range of stakeholders, and control the energy agenda of a community.	Beholden to the decisions and agendas of municipal officials.
Community Energy Benefits Agreement*	Community organizations and members can directly advocate for their needs, communities can capitalize on new development.	Requires an independent project to be in the development stage, requires significant stakeholder deliberation and negotiation. May not lead to any real benefits or changes to the community and is a time intensive process.
Community Choice Aggregation	Provides rate stability and the option to integrate renewable energy into a municipality's consumption mix.	Does not significantly reduce costs. Requires existing state legislation that would provide cities and towns the opportunity to implement this. Local governments need community buy-in to proceed. <sup>65</sup>

\*Note: While community benefits agreements (CBAs) can result in community needs being met, it is especially important to consider that CBAs often serve as a box-ticking mechanism for developers, and do not effectively engage the community. CBAs also have uneven relational dynamics, in which developers hold a position of power over the community. When considering the creation and implementation of a CBA, it is important to consider these dynamics and make developer accountability a priority in negotiations.

Different COE strategies offer varying levels of impact and control. Some strategies provide communities with greater control over their energy systems but may have a more localized impact, while others can drive broader change with less direct control. The mapping exercise below helps assess the trade-offs between local autonomy and the scale of transformation (Figure 1).

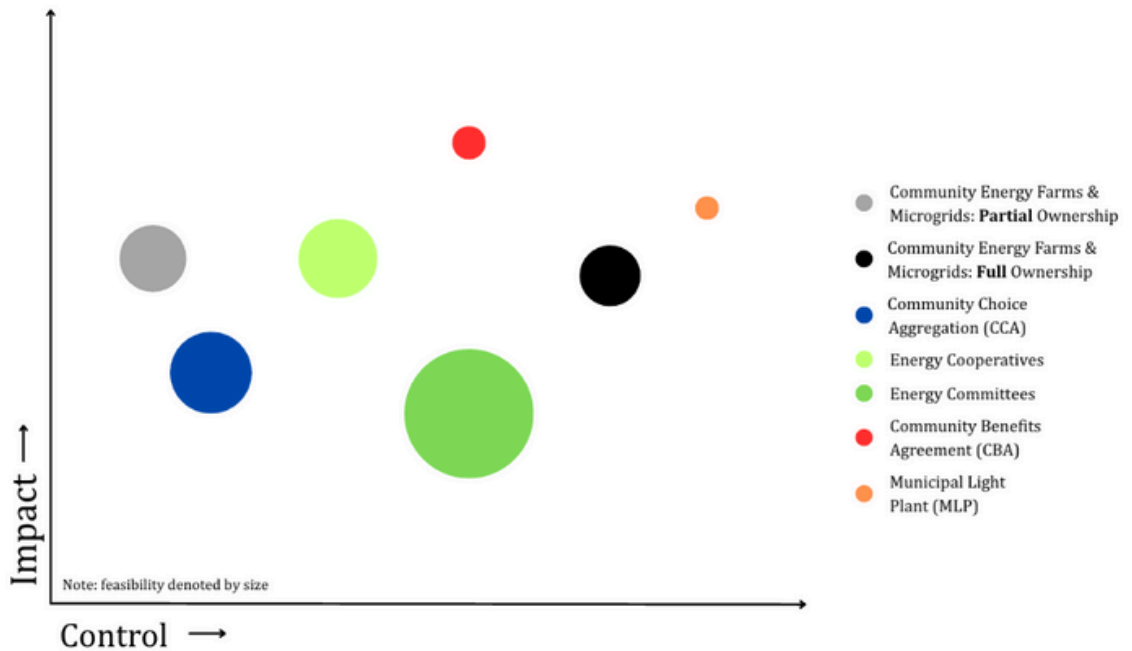


Figure 1: Impact and control mapping exercise for community ownership strategies.

In figure 1, the size of each dot corresponds to perceived implementability of each COE strategy (with larger dots being easier to implement). This was done to properly standardize each strategy in terms of applicability to this project (denoted by our target opportunity area). While a municipal light plant (MLP) may have the greatest impact and level of control, it requires massive capital investment and coordination. A community choice aggregation (CCA) program has less impact and control, but does not require as many resources to implement. Our full justification of each placement is discussed below:

- **Microgrids and Farms (Partial):** Partial ownership of solar microgrids and farms can have impact in the community through bill reduction (as a result of credits and other financial benefits). However, third party ownership through a lease provider or installer nullifies any community control over the system. Third party ownership reduces financial and technical barriers to installation, making it more feasible than full ownership.
- **Microgrids and Farms (Full):** Full ownership provides the community with the full financial benefits of a system, as well as full control over the system itself. Full ownership requires greater upfront capital and technical expertise, making it less feasible than partial ownership.
- **Community Choice Aggregation (CCA):** CCA programs can have some impact through reduced bulk rates, and provide communities some say in what type of energy is purchased. However, they can have limited overall impact (such as in the case of Salem), and have numerous guidelines and requirements.
- **Energy Cooperatives:** Energy cooperatives are often made up of large private entities (such as distribution utilities) and therefore have greater access to capital, giving them the ability to invest in large-scale energy projects. However, they do not always integrate community decision-making into their agendas given their size.
- **Energy Committees:** Committees sit within municipal governments and often act as an advising entity as opposed to decision-making one (e.g. city council or mayor), which limits their power. They can act as a vessel for community needs, as their meetings are available for public comment and input. Different municipalities have different local regulations on forming committees, so their feasibility depends on the scope, power, and purpose of the committee.
- **Community Benefits Agreement (CBA):** CBAs can provide significant benefits to communities when executed properly, as they allow communities to negotiate on behalf of their own needs. However, numerous aspects of the project must come together concurrently (e.g. existing development, collaborative developer, community organizing power), limiting their feasibility.
- **Municipal Light Plant (MLP):** MLPs have the power to provide communities with nearly full autonomy from distribution utilities and can provide energy at lower rates than distributional utilities. However, their massive capital investment and coordination requirements make MLPs unfeasible for most municipalities.

# 4. Case Examples

As stated in our methods section, case examples refer to cases that are not perfectly applicable to Salem, but are still worth exploring to extract best practices. This will be a high-level overview, and unlike the case study, will not go into significant detail on stakeholders, funding, and barriers. Each of the case examples did not become case studies for different reasons, mostly because they did not have concrete monetary or non-monetary benefits to the community, or lacked evidence of community-led decision-making.



## 4.1 Berkshire Wind Cooperative



## 4.2 Marblehead Municipal Light Plant



## 4.3 Vineyard Wind Community Benefits Agreement



## 4.4 Adjuntas Solar Microgrid



## 4.5 Together New Orleans Community Lighthouse

## 4.1 Berkshire Wind Cooperative



Image: [Berkshire Wind Cooperative](#) and local students at Ridgeline of Brodie Mountain.

### Main Takeaway

Collaboration & resource sharing among powerful stakeholders can reduce barriers to large capital energy projects (e.g. costs and implementation).

### Salem Applicability

SAFE can potentially collaborate with other stakeholders (such as utilities and state non-profit organizations) to form a cooperative, which will allow them to access more capital, decision making power, and represent Salem residents in a greater organization.

## Executive Summary

The Commonwealth of Massachusetts is home to many existing and emerging community-owned energy projects. One example that stood out to our Project Team is the Berkshire Wind Power Project, owned and operated by the Berkshire Wind Cooperative (BWC). The BWC is a non-profit entity that consists of 14 municipalities and their joint action agency, the Massachusetts Municipal Wholesale Electric Company (MMWEC). Berkshire Wind is a unique initiative that embodies many of the selection criteria for this field project; it is fully commissioned, and has clear, tangible benefits. Wind is one of many forms of renewable energy in New England that is relevant to both SAFE, and the City and Port of Salem, Massachusetts.

### Overview of the Berkshire Wind Cooperative & Berkshire Wind Project

What is the Berkshire Wind Project?

The Berkshire Wind Power Project is owned and operated by the non-profit organization Berkshire Wind Cooperative (BWC). The cooperative consists of 14 municipal, publicly-owned utilities as well as MMWEC. It was formed to allow municipal utilities to collectively develop and own a large-scale renewable energy resource.

This project is located in Western Massachusetts, which includes a number of EJ communities in areas like Pittsfield, Springfield, Holyoke, and more. Unlike other inland and offshore wind projects in the Northeast, this particular example stood out due to its distinction of community ownership. Not only did this project create 50 unique jobs for local residents, but it actively creates and delivers monetary benefits to the local community for active land use in the form of annual payments to the Town of Hancock, but also delivers clean energy to active participants in the co-op. We selected this particular project given its operational status, dedication to serving and putting community benefits at the forefront of the planning process, and equitable use of the land.

### *What Did it Entail?*

According to a 2008 press release by MMWEC, the projected cost of the Berkshire Wind Power Project was originally projected to be \$45 million. That year, the Berkshire Wind Cooperative entered into a short-term loan of \$8 million with the Holyoke, MA PeoplesBank. Assets of the project (such as easements, permits, and developed property) were purchased for \$4 million. In 2010, the Cooperative followed this by issuing \$64.7 million in bonds to complete project financing. According to FitchRatings, \$31.3 million in bonds were issued in 2024, suggesting that incurred costs were halfway paid off.

### *Community Benefits of the Berkshire Wind Project*

The Berkshire Wind Project is able to provide benefits directly to communities by way of resource sharing. The BWC created it in part to allow community members of participating municipalities to directly benefit from clean energy produced by the wind project. Residents and businesses can become members of the co-op, effectively allowing them to share in the ownership and revenue generated by the wind farm. It also provides communities with the choice to advocate for and introduce clean energy into their consumption mix. Finally, the BWC is also made up of municipal utilities. This means that they primarily serve and receive feedback from their residents, as opposed to a traditional distribution utility that is influenced by private investors.

The Berkshire Wind Project also provides significant monetary benefit to communities. First, members of the co-op can bulk purchase energy generated by the wind project at rates that are at-or-below market rate for electricity. The addition of state incentives such as net metering and renewable energy credits helps to further reduce costs. Finally, energy prices become more stable as there is no exposure to fossil fuel price volatility. Locally, the project supports economic growth. As part of a land use agreement, the Berkshire Wind Cooperative pays between \$100,000-\$110,000 annually to the towns of Hancock and Lanesborough. It has also created approximately 50 full-time union and non-union jobs.

**Barriers: Limited Information**

Due to limited secondary sources, our group can only provide a limited picture of barriers at this time. Much of this case study relies on information gathered from the BWC's website and town articles and reports.

**Takeaways: Best Practices, Considerations, and Limitations**

This case study demonstrates that establishing a cooperative can be an effective method for distributing the benefits of a community-owned energy system. In this case, electricity generated by the wind farm is sold at a price that is either comparable to or lower than the market rate for large-scale electricity generation, allowing Co-op members to access clean energy for their communities. One aspect of energy justice and democracy is distributional justice, which is achieved in this case by providing the opportunity to purchase clean energy at a fair or discounted price, along with direct financial benefits to the local community hosting the wind farm. However, the study has some limitations, including uncertainty about the proportion of clean energy consumed by each municipality (i.e., is one municipality consuming more than another), and whether there is a measurable impact on low-income and EJ communities. Additionally, it is clear that substantial capital was required to launch this community-owned energy project. Further research is needed to investigate the implementation process of this case study and to analyze the actual market price of electricity for MMWEC participants, particularly in lower-income and marginalized communities.

## 4.2 Marblehead Municipal Light Plant



Image: Marblehead Municipal Light Plant

### Main Takeaway

Community-owned utilities like MLPs can lead the way in decarbonization when empowered by local governance and strong community engagement, however no MLP has been formed in MA since 1926.

### Salem Applicability

Staying in touch with Jean-Jacques and the Marblehead MLP could be important for future collaboration on projects, because Marblehead has ties to a land parcel in Salem.

This case study is based on a summary of the interview with Jean-Jacques Yarmouff of the Marblehead Municipal Light Plant (MLP).

### **Yarmouff's Background**

Jean-Jacques Yarmouff currently serves as a member of the board overseeing the Marblehead Municipal Light Department (MMLD), which owns and operates the Marblehead Municipal Light Plant (MLP). With a background as a mechanical engineer and having lived in Marblehead since 2013, Yarmouff ran for local election in 2022 to join the commission and advance decarbonization efforts through local energy governance. Yarmouff's involvement in Marblehead's sustainability efforts was shaped during the first Trump administration, following the U.S.'s withdrawal from the Paris Agreement. In response, Marblehead formed Sustainable Marblehead, aiming to push for local climate action and carbon neutrality goals (Sustainable Marblehead, n.d.). This involvement ultimately propelled Yarmouff to seek a position on the board to influence Marblehead's energy transition.

### **General and Marblehead-specific MLP Background**

Municipal Light Plants (MLPs) in Massachusetts are unique entities, in that they are owned and operated by the town, governed under Chapter 164 of Massachusetts General Laws. Unlike privately owned or investor-owned utilities (IOUs), MLPs are publicly owned and non-profit structured such that they are accountable to the local community rather than shareholders. This governance structure allows towns to control their energy decisions, prioritize community needs, and pursue decarbonization goals. It also protects MLP operations from short-term political pressures by ensuring that long-term investment decisions are not swayed by elected officials focused on short-term gains (Peterson et al. 2017).

In Marblehead, the board (also called the Light Commission) acts as the governing body for the MLP. It consists of elected officials (like Yarmouff) who have the authority to hire and fire the General Manager (GM), set high-level policy related to electrification and decarbonization goals, and approve the budget. Operational control — such as infrastructure management, daily decision-making, and procurement — falls under the GM's jurisdiction. This division can lead to tension when long-term strategic goals (such as decarbonization) conflict with the operational priorities of the GM.

The Light Commission's primary responsibility is ensuring the financial sustainability of the MLP, which requires maintaining a balanced budget (net zero profit or slight surplus). Revenue generated through electricity sales primarily goes toward purchasing power (60%), paying staff (30%), and maintaining infrastructure (remaining funds).

Marblehead is only one of 41 communities in MA that have established an MLP. Important to note that no new MLP has been established for a new town in Massachusetts since 1926.

### **Decarbonization and Renewable Energy Goals**

Yarmouff emphasized that achieving decarbonization has been a key priority since he joined the Light Commission. Marblehead has already made significant commitments toward achieving net zero emissions. In Yarmouff's first year, the town passed a resolution committing to reach net zero "as quickly as possible."

Subsequently, a goal was established to achieve net zero emissions by 2040—ahead of the Massachusetts statewide goal.

One of the main challenges Yarmouff has encountered is shifting the MLP's approach to prioritize decarbonized energy. Initially, the Commission faced resistance from the General Manager, who viewed decarbonization as a secondary concern to providing affordable and reliable electricity. However, through sustained efforts and community support, the Commission gradually built momentum toward increasing the carbon-free share of Marblehead's electricity portfolio.

Currently, Marblehead sources around 60% of its electricity from carbon-free sources (up from 44% two years ago) and has set a target of reaching 70% carbon-free electricity by 2028, 85% by 2033, and ultimately net zero by 2040. The Light Commission has also expressed strong interest in expanding hydroelectric power sourced from Hydro-Québec and exploring future investments in nuclear energy, despite the challenges associated with nuclear waste management. Yarmouff is confident Marblehead will meet 2028 goals, but states it is “unclear” how they would achieve greater decarbonization, especially without increased hydroelectric or nuclear sources.

### **MLP and Community-Ownership**

One of the defining features of MLPs is their close relationship with the community. Because MLPs are owned by the town they serve, they are directly accountable to residents rather than external shareholders. This is reflected in the rate-setting process, where the Commission and General Manager work together to determine electricity rates with the goal of breaking even — ensuring minimal to no profits are generated.

Currently the rates from the Marblehead MLP are higher than Salem Power Choice or National Grid averages, set at \$0.1895 per kilowatt-hour. However, basic monthly charges, which seem to be inclusive of all delivery and other fees, are set at only \$18.50 per month (Marblehead Municipal Light Department, 2023). This is likely where potential cost savings take place, compared to traditional IOUs. In Marblehead, they’ve also coupled with a North Shore nonprofit organization which assists in determining low-income eligibility and facilitating access to financial support for energy bills. This social infrastructure is part of the MLP’s commitment to equitable service provision.

A limitation with Marblehead’s MLP, like many others, is that they are facing staffing shortages. Out of a team of 20 staff members (including line workers, managers, and administrative staff), they are currently short six employees. This staffing gap limits the MLP’s capacity to advance large-scale infrastructure projects or administer complex energy programs without external support.

## Regulatory Framework and Challenges

The regulatory landscape for MLPs is shaped by Chapter 164 of Massachusetts General Law, which outlines the legal and operational framework for MLPs. This law protects MLPs from political interference but also imposes certain limitations. Notably, no new MLP has been established for a new town in Massachusetts since 1926. This is primarily because transitioning a community from an IOU to an MLP requires a two-thirds majority town vote and most importantly, the financial capacity to buy out existing utility infrastructure — a costly and complex process.

Another major regulatory hurdle is the lack of dedicated decarbonization guidance for MLPs. Unlike IOUs regulated by the Department of Public Utilities (DPU), MLPs operate independently, meaning decarbonization efforts are entirely driven by community and Commission priorities. This creates variability in clean energy adoption across the 41 towns in Massachusetts with MLPs — some aggressively pursuing decarbonization, while others lag behind. MLPs are exempt from many of the clean energy mandates required of IOUs, such as the state renewable portfolio standard (Peterson et al. 2017).

## 4.3 Vineyard Wind Community Benefits Agreement



Image: [Iberdrola](#)

### Main Takeaway

Communities can fight for (and win) a slice of benefits from incoming development through CBAs, given the right conditions and strategic decision making.

### Salem Applicability

Salem stakeholders (including the city, SAFE, and other local NGOs) can collaborate to create a comprehensive community benefits agreement in case of future development.

## Executive Summary

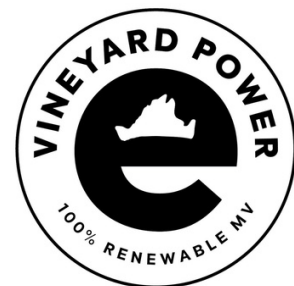
Vineyard Power Cooperative or ‘Vineyard Power’ is a non-profit organization dedicated to community-owned energy in Martha’s Vineyard. This organization is strategically located, and has access to a variety of renewable energy sources, from wind, solar, and more. The Vineyard Wind Community Benefits Agreement (CBA) was the first federally recognized offshore wind (OSW) energy CBA in the United States, signed in 2015. This case example is relevant to SAFE and Salem because of its location, and the city’s possible OSW development with Crowley Wind, which also includes a CBA. Vineyard Wind’s partnership with Vineyard Power offers SAFE with an example of a collaborative model between an energy developer and a community-based organization, and how the community can secure benefits from renewable energy projects.

## Project and Community Background

Martha’s Vineyard is a coastal island located south of Cape Cod. It is a popular vacation spot during the summer, which means it has mostly a seasonal economy. Due to its geographic location, the energy costs for residents are very high, as most islands. In 2009, Vineyard Power Cooperative was formed as a non-profit, member-owned organization, with the goal to keep the benefits and control of local renewable energy sources on the island and its community. As of 2025, the cooperative has over 1,400 members. Their vision and mission prioritize fostering the production of electricity from local, renewable sources while enhancing the resiliency at the community’s facilities and ensuring equitable access to all residents, while trying to become 100% renewable in electricity, transportation, and heating by 2040.



Developer



COE organization

## Early Stages and Funding

In January 2015, Vineyard Wind and Vineyard Power signed the United State's first federally recognized offshore wind community benefits agreement. The CBA aims to bring specific value from the offshore wind farms from Vineyard Wind 1 and Vineyard Wind 2 projects to the islands. Since signing the CBA, Vineyard Power has been involved in day-to-day operations and playing a lead role in community outreach and permitting. As part of the agreement, Vineyard Wind had to provide reimbursement for operation costs in 2015 up to USD 100,000. The agreement also included obligations for Vineyard Power to advocate and support OSW legislation in Massachusetts, support relevant OSW project(s) through educational programs and outreach, and provide advice and guidance to Offshore MW through the permitting and financing.

Most importantly, the CBA investigate opportunities for Vineyard Power to finance, purchase, own, or take an equity position in up to 100 MW of offshore wind capacity (roughly 12.5% of the capacity of Vineyard Wind 1) in the Lease Area to secure long-term benefits to its members and residents of the Cape and Islands Region. The CBA also agreed that both parties would investigate the opportunities for power purchase agreements (PPAs) that would support the financing of OSW development within the leasing area. Vineyard Wind also committed to regular consultations with Vineyard Power for the continuity of community benefits, community relations, and stakeholder engagement.

## Community Focus and Benefits

The Vineyard Wind CBA was designed to ensure that the community would be the focus of this large-scale energy development. Vineyard Power took the lead in community engagement and participation, which was important for the whole community to understand the benefits of the CBA and the project scope and goals. The agreement committed that the projects would explore workforce development and create thousands of opportunities. As of now, the offshore wind projects are estimated to generate up to 800 MW of clean energy, enough to power 400,000 homes, and create around 3,600 full-time equivalent jobs (MassGOV 2024).

## Limitations

During the research for this case study, we could not find the full text of the CBA online, which limits its transparency. Probably because Cape Cod's county's population is overwhelmingly white (over 90%) and English-speaking (nearly 90%), the language in the CBA does not explicitly center on environmental justice communities, which we found to be something important in our criteria. The CBA, however, does include a commitment to serving "income-eligible residents" and exploring community participation pathways through ownership or power purchase agreements (PPAs). Finally, while the CBA outlines co-investment possibilities, it is unclear to what extent Vineyard Power has been able to secure ownership stakes or financing for long-term community-owned energy assets, or even when this is going to happen.

## Applicability to SAFE

This case offers many takeaways and possibilities for SAFE, especially given that the city of Salem also has a CBA in place with Crowley Wind. SAFE can look to the Vineyard Wind CBA as a model for how to represent the community in future energy projects. One recommendation is for SAFE to take an active role when new energy systems are being planned, like geothermal or rooftop solar, and use Community Benefits Agreements (CBAs) as a tool to push for partial or full community ownership. SAFE could also continue building its role as a resource for education and community engagement, similar to what Vineyard Power has done on Martha's Vineyard. Education played a key role in building community trust in Vineyard Power, and similar outreach in Salem could help create support for new projects while opening up pathways for local workforce development.

## 4.4 Adjuntas Solar Microgrid



Image: [Honnold Foundation](#)

### Main Takeaway

Solar Microgrids are easier to integrate into the built environment and are vital in providing energy resilience during disasters.

### Salem Applicability

The City of Salem can explore the possibility of a solar microgrid on public buildings or offsites, which will provide energy resilience and sustainability to Salem residents.

## Executive Summary

This case study highlights Casa Pueblo’s pioneering role in building community energy resilience in Adjuntas, Puerto Rico. In the wake of Hurricane Maria in 2017—a Category 5 storm that destroyed over 80% of Puerto Rico’s centralized electrical grid—Casa Pueblo’s foresight in installing rooftop solar panels enabled the community center to remain powered while most of the island suffered prolonged blackouts. Their locally controlled solar system ensured continued access to lighting, refrigeration, and medical device support, proving essential for community survival.

## Organization Background and Historical Context

In September 2017, the Category 5 Hurricane Maria brought devastating flooding and widespread destruction to Puerto Rico. With up to 155 mph winds, Hurricane Maria wiped out much of the existing power grid, with over 80% of the transmission and distribution systems owned and operated by the Puerto Rico Electric Power Authority (PREPA) designated damaged or destroyed. This led to one of the longest blackouts in U.S. history, with some areas not restored until almost a year later. Due to the centralized grid structure in Puerto Rico, the loss of an individual but critical area cascaded power loss across the entire island. Hurricane Maria demonstrated just how fragile this centralized energy system could be, and highlighted the need for resilient modernization and distributed generation systems to mitigate electricity losses.

While all customers connected to PREPA were without power, one community center in a small mountainous town known as Adjuntas, served as a glimmer of hope. Casa Pueblo, a local advocacy group established in the 1990s, had understood years prior the dangers associated with the centralized national electricity grid. To gain agency and ownership over their energy future, Casa Pueblo established their own rooftop solar generation capacity, which proved to be vital during Hurricane Maria. As the rest of the island lost power, Casa Pueblo was able to store and generate enough electricity for local residents to keep lights on, medical devices running, food and medicine refrigerated, and neighbors connected. The success story of Casa Pueblo's rooftop solar powering local electricity generation in the aftermath of Hurricane Maria emphasizes a different type of solution compared to grid modernization: community-owned energy as a resilient tool for life-saving support when centralized systems fail.

Since then, Casa Pueblo's solar-powered facilities have remained operational, and continue to provide critical services and a refuge for residents. With the help of the Honnold Foundation, Casa Pueblo distributed over 14,000 solar lamps and installed more than 350 solar systems on homes and essential service buildings, to ensure that vital services continued uninterrupted. This initiative not only offered immediate relief but also demonstrated the potential of decentralized renewable energy in enhancing community resilience. This model of localized, renewable energy generation has inspired other communities across Puerto Rico to pursue similar initiatives, fostering a grassroots movement towards energy ownership and independence.

## 4.4 Together New Orleans Lighthouse



Image: [Together New Orleans](#)

### Main Takeaway

Resilience hubs are a useful tool for building local community agency and organization around key issues in energy and the environment.

### Salem Applicability

Alongside other local organizations, SAFE can consider the development of a resilience hub around energy and environmental issues, possibly in collaboration with St. Peter's Church.

## Executive Summary

The Community Lighthouse Project, led by Together New Orleans, “Together NOLA”, is a climate resilience initiative that equips churches and community centers across New Orleans with commercial-scale solar panels and backup battery systems. In New Orleans, these Lighthouses serve as emergency hubs during power outages caused by hurricanes and extreme weather events and provide residents with access to charging stations, medical equipment support, food storage, and heating or cooling.

Each Lighthouse is owned and operated by the host institution rather than by a community trust or cooperative. While the energy is generated and used on-site, and management is localized, monetary benefits from solar savings accrue only to the institution, not to the broader community. This model does not fit all of our criteria for community-owned energy, as the benefits from the energy system are not widely shared among community members, but it still serves as an example of using clean energy to provide equitable resilience.

## Project and Community Background

New Orleans, Louisiana, has long stood at the intersection of climate vulnerability and environmental injustices. Rising sea levels, increasing hurricanes, and sensitive infrastructure have exposed the city’s most vulnerable residents, particularly Black and low-income communities, to heightened risk. According to the U.S Census Bureau, as of 2023, New Orleans has a population of approximately 384,000 residents, of whom 59.2% identify as Black or African American, 5.5% as Hispanic or Latino, and 2.9% as Asian. Nearly one in four residents lives below the poverty line, and the city continues to face persistent racial and economic inequities (U.S. Census Bureau 2023).

In response to these challenges, Together New Orleans, “Together NOLA,” has emerged as a leading organization to build local resilience. Together NOLA is a broad-based coalition of congregations and community-based organizations and is focused on organizing across lines of race, religion, neighborhood, and political affiliation. One of the coalition's most ambitious and recent initiatives is the Community Lighthouse Project. The Community Lighthouse Project is a network of solar and battery resilience hubs dedicated to providing electricity during power outages and natural disasters. With New Orleans’ long history of hurricanes and power outages, the systems are designed to provide continuous power and serve as safe havens for residents during emergencies, all while running on clean energy sources.

### **Early History and Funding**

The idea for the Community Lighthouse Project emerged after the failures of the electrical grid during Hurricane Ida in 2021, which left thousands without power for weeks (City of New Orleans, 2024). Together NOLA, in the wake of this crisis, started organizing around the need for community-controlled energy infrastructure that would be resilient and equitable. In the planning phases, Together NOLA identified key congregations and community institutions across the city that could serve as pilot sites and resilience hubs.

Since the project took off, funding has been assembled through a mix of public, philanthropic, and federal support. In 2021, the passage of the American Rescue Plan Act (ARPA) helped the City of New Orleans allocate \$2 million to the construction of eight Community Lighthouses (City of New Orleans 2024). More recently, in FY 2023, Rep. Troy A. Carter Sr. secured \$3.8 million in congressional funding to support the expansion of the Community Lighthouse Network, which was the largest federal funding to ever go to a solar community project (Troy Carter House 2024). This was followed by an additional \$806,000 from the Department of Energy’s Energy Storage for Social Equity (ES4SE) program to expand even further.

## Overall Mechanics

The Community Lighthouse project functions as a decentralized network of solar-powered resiliency hubs, located at churches and community centers. Following any disaster, these lighthouses can immediately assess needs and provide assistance to their surrounding communities in the form of charging stations, food distribution, cooling and heating stations, oxygen exchange, light medical equipment, and more. Each Lighthouse site is strategically identified based on its location, accessibility, and willingness to serve as a hub. The project was very intentional about serving across all neighborhoods, so that no resident lives more than one mile away from a Community Light House (Together NOLA 2021).

Each Lighthouse is equipped with commercial-scale solar panels and backup battery storage, which allows them to operate even when the citywide power grid is down. Solar panels generate direct current (DC) electricity, which is converted to alternating current (AC) through inverters so it can power buildings and be sent to the grid. Essentially, in normal times, the solar array helps defray electricity costs, with lifetime savings estimated between \$168,000 and \$178,080 for host institutions (Solar Alternative 2024). Any excess energy produced can be stored in the onsite battery systems or exported to the grid, which reduces electricity bills for the centers. If the grid goes down, battery storage helps restore power quickly at community lighthouses. These systems can deliver up to 20 kW of continuous power for up to 17 hours—enough to support critical services like medical equipment, lighting, and cooling. In addition to resilience, the system has climate benefits, offsetting carbon emissions equivalent to 33 acres of mature forest annually (Solar Alternative 2024). Facilities are designed with three tiers of capacity that tailor energy capacity to site needs (Together NOLA 2021):

- Large-scale systems (~\$470,000): Support HVAC 24/7, full lighting, charging, and medical equipment
- Medium systems (~\$140,000): Support partial HVAC, electronics, and lighting for 12–18 hours/day
- Small systems (~\$47,000): Support essential functions for 8–10 hours/day

### **Community Focus and Benefits**

It is clear that the Community Lighthouse Project is rooted in community needs. From the start, Together NOLA intentionally designed these resilience hubs to not only provide clean energy but to serve as a direct response to climate-driven disasters. Beyond emergency energy access, the solar panels help reduce electricity costs for the host institutions, but unfortunately, not for the broader community. However, the community still has numerous non-monetary benefits provided by the Community Lighthouses such as increased climate resilience, access to emergency services and the creation of third spaces that offer safety and trust in case

The selection locations of each Lighthouse were based on a strong equity framework, ensuring that environmental justice communities, who are most impacted by outages, would still have equitable access to emergency services (Together NOLA 2021). Additionally, the Community Lighthouse Project created benefits through local workforce development for high-wage jobs in the renewable energy sector (Dryfoos 2024). The exact number of jobs created could not be found online.

### **Does This Project Qualify as COE?**

The Community Lighthouse Project is a community-serving energy initiative, but it does not fully meet our criteria of community-owned energy (COE). In our definition, “community-owned energy refers to energy produced by a decentralized, locally managed system, with the social, environmental, and monetary benefits of the system being directly distributed to the community (i.e., non-market, non-state entities). The energy generated must be produced and distributed in or near the community it serves.”

While the Community Lighthouses are decentralized and locally managed by community members, and the solar energy is generated on-site and directly powers the buildings it serves, the project does not distribute monetary benefits directly to the broader community as the host institutions are the ones receiving the cost-saving benefits, not the residents.

# 5. Case Studies

Out of our case examples, we have selected two cases to be case studies given their impact and relevance to Salem. The Chelsea Microgrid was chosen especially because of its location, and demographic similarities to Salem, as both are considered environmental justice communities. The Chelsea Microgrid is recent and relevant because it models municipal ownership and a governance structure that reflects and serves the community. The Ho'āhu Cooperative was chosen to be a case study because of the depth of insights it was able to provide in terms of COE implementation and community governance aspects of energy democracy.



## 5.1 Chelsea Microgrids



## 5.2 Ho'āhu Energy Cooperative

## 5.1 Chelsea Microgrids



Image: [WBUR](#)

### Main Takeaway

While solar microgrids can prove useful in building energy resilience, agency, and sustainability, certain conditions (e.g. funding) must fall into place.

### Salem Applicability

Chelsea's microgrid serves as a relevant blueprint for a Salem energy system at a time of significant top-down funding for local solar PV projects.

## Project and Community Background

Chelsea is a city with an industrial history not too dissimilar from many of the cities in New England, that has served as a home to many different immigrant communities throughout the years. During the height of its industrial period in the 20th century, it was home to many Irish, Italian, and Eastern European immigrants. Throughout the years, those demographics have shifted, and now, many immigrants residing in Chelsea are predominantly from Central and South America and the Caribbean (Johnson n.d.). This small but dense city located in Massachusetts has a population that is predominately Latinx and foreign-born (U.S Census Bureau 2024). The Commonwealth recognizes many of the neighborhoods that make up this city as environmental justice communities (MassGIS 2024).

GreenRoots, an environmental justice non-profit located in Chelsea, has been working alongside community members in Chelsea, East Boston, and the Greater Boston area for 30 years to elevate concerns of environmental injustices and organize for the right of their residents to “live in a healthy and safe environment” (GreenRoots n.d.). One of the core tenets of this organization is energy democracy and how best to move their communities away from fossil-fuel-based energy systems towards more resilient, renewable energy systems. One way to achieve this is through community-owned microgrids (GreenRoots n.d.). The idea of a local microgrid and energy democracy emerged as a priority for GreenRoots around the time Hurricane Maria, in 2017, devastated the island of Puerto Rico. Many of the residents who had ties to Puerto Rico acknowledged the need for resiliency in the energy infrastructure in Chelsea. Chelsea, a coastal community, is particularly vulnerable to the effects of severe weather events, which will increase in frequency over the years due to climate change (Power n.d.).

## Early Stages and Funding

This project was launched in 2016 through their partnership with Resilient Urban Neighborhoods and Green Justice Coalition (RUN-GJC). RUN-GJC comprises organizations such as the Chinese Progressive Association and Clean Water Action as well as clean energy engineering and consulting firms like Climbable, Clean Energy Solutions and others (GJC n.d.). After 2017, this project became a priority, and RUN-GJC launched a feasibility study. This first step was possible through seed funding from the Massachusetts Clean Energy Center. Funding for this project was mainly procured from two of the state's resiliency programs: the Municipal Vulnerability Preparedness Program, from which they received \$650,000, and the Green Communities Program, which provided \$200,000 (Kavanaugh 2022). The funding gap that remained after these grants was covered by the city, as the city council approved a \$3.6 million loan with Bank of America to fund this project (Cohn 2024). While funding often presents hurdles to implementation, this project saw great success with the decision to have the microgrids be municipally owned. Working in collaboration with the city on this project was described as crucial to getting the project approved for financing by the City Council (GJC 2024).

## Community Focus

One important key focus of this project for GreenRoots was the community focus and making sure members felt the benefits of this project. A community survey was conducted to gauge energy usage, resiliency, and other important factors that would help ground this project in the community (Power n.d.). For GreenRoots, an organization that has deep ties to the community, it was important that the buildings powered by the microgrid were chosen by community members and informed by vulnerability assessments. The successes of the project are largely attributed to the bottom-up approach and emphasis placed on community buy-in throughout the process (GJC 2024).

The creation of a governance structure for this project that is by and for the community is an important part, so currently, the city oversees the project and will transition to be a local resident-run board. This board is intended to give local residents a voice in the project and the ability to have power over decisions made regarding it. They are currently still in the process of deciding what that will look like (Kayyali 2025).

### **Overall Mechanics**

The project's first phase began in early December of last year with the installation of hundreds of solar panels at the Department of Public Works City Yard. The buildings identified as most important through the community engagement process were City Hall, Public Works City Yard building, and the police station. The intention is to expand to eventually be able to power affordable housing complexes, senior centers, public schools, and others (Chelsea Record 2024). Each of the buildings selected will have its own form of energy generation and storage, where solar energy will be captured via solar panels and stored for future energy demands via battery storage. In the event of a power outage each building will be able to “island” off the main grid and continue with its operations. These buildings are intended to serve as resilience hubs for residents (Chelsea Record 2024). These specific microgrids are able to use cloud-based software as a workaround to utility restrictions around wiring. This creates an opportunity for the project's scalability (Parshley 2023). The cloud-based controller can direct batteries to absorb power during off-peak hours and sell excess electricity back to the grid for a profit (Cohn 2024).

## **Community Benefits**

This microgrid project has the potential to offer many benefits for the community of Chelsea. One of those benefits being a reduction in energy bills as solar fed back into the grid will provide bill credits that can be used by low-income residents. This project has already been accepted into the Massachusetts Community Solar Program, which is how bill credits will be made possible. The project is also eligible to receive incentives under the Connected Solutions Program and the state's SMART (Solar Massachusetts Renewable Target) program which are funds the city and community members will be able to directly benefit from (Cohn 2024). One major benefit the project will offer is resiliency to severe weather events as this has the potential to continue protecting vulnerable communities during power outages.

## **Why is this Energy Democracy?**

GreenRoots saw this microgrids project as a part of their broader vision of a just transition that aims to give people more power over their energy systems. It was important for them that this project not be privately owned but rather municipally owned and that the governance structure reflect the community that exists (Power n.d.). This is a project that will allow the city to have more control over their energy systems and create resiliency with a shift towards renewable energies that do not pollute the neighborhood. This project was prioritized due to a direct need that was echoed throughout the community to increase energy and climate resiliency for the City of Chelsea, after having witnessed the disastrous effects Hurricane Maria had on Puerto Rico's energy systems (Power n.d.).

## Limitations

One of the limitations that the microgrids team in Chelsea is running into as they have started breaking ground on implementation has been the bureaucratic hurdles presented by private utilities. Currently, Chelsea has an agreement with Eversource regarding the interconnection of the system. They have been unable to get this started because Eversource has claimed they need to upgrade a transformer first but have not alerted them of when this work will be done (Cohn 2024). In general, the bureaucratic inertia presented by utilities can present big hurdles to getting these types of projects up and running (Kayyali 2025). Other potential issues they anticipate are the impacts tariffs will have on sourcing the materials for the project and supply chain issues, which they also encountered a lot during the COVID-19 pandemic (Kayyali 2025).

## 5.2 Ho'āhu Energy Cooperative



Image: [Ulupono Initiative](#)

### Main Takeaway

Local solar PV systems serve a purpose beyond cost and sustainability, and serve as a catalyst for community communication, organizing, and empowerment.

### Salem Applicability

If a solar PV system is considered, the City of Salem can integrate a similar model of community engagement and involvement in project design.

## Project and Community Background

Moloka'i is the most rural of Hawai'i's five major islands with a small population of around 7,400 people. The vast majority of the population is Native Hawaiian as they make up 65% of the island's total population (Office of Hawaiian Affairs 2024). Moloka'i is the least developed of the islands and the groups of residents have organized to keep it that way by opposing and blocking plans for hotels, golf courses, condominiums and other large scale development plans (Graham 2019). Many of the residents on the island depend on subsistence fishing, farming, and hunting and it has the lowest energy consumption rates of the islands (Nitta 2024). Moloka'i, currently pays the highest price per watt in the country at 50.60 cents/kWh for residential users (Hawaiian Electric n.d.). The high energy prices and lack of control over their energy system is what led to establishment of Moloka'i Community Energy Resilience Action Plan and alongside that community energy planning process emerged the Ho'āhu cooperative. Residents did not want renewable energy projects pushed by the Hawaiian Electric Company that did not align with community values and interests (Nitta 2024).

The Ho'āhu cooperative was developed in 2020 as a result of community advocates in Moloka'i pushing for the ability to own and develop renewable energy projects. Their mission is to produce "community-owned, affordable, renewable energy" that is not only beneficial to the community but also the natural and cultural environment. Their work is grounded in the belief that energy resources should benefit the communities who care and steward them (Ho'āhu Energy Cooperative n.d.). The Ho'āhu cooperative is community-led and is made up of local Moloka'i volunteers who are passionate about energy justice and it follows a democratic governance model. The cooperative structure ensures that profits are distributed back to its members.

## Community Focus

At the heart of these renewable energy projects is community empowerment and resilience. Over 40 public workshops took place from the span of March 2020 to March 2022 to get community input as their goal was to have these projects be fully designed by community members. Ho'āhu also identified groups who may be directly impacted by these projects and had various meetings with them to discuss their participation in the cooperative. Topics discussed in these public workshops covered site selection, dual land use options, technology selection, project financing options, subscription program design, and workforce development (Ho'āhu Energy Cooperative n.d.). For the members that developed Ho'āhu it was integral to their mission to incorporate as a cooperative as democratic decision-making was inherent to the projects and their goals of energy democracy. Ho'āhu was also committed to ensuring that the values of the project aligned with community values and they enlisted the services of two cultural practitioners rooted in Moloka'i culture. Once the sites of the project were decided on, Pālā'au and Kualapu'u, the practitioners collaborated with the Proposer Team to host a community workshop and develop a cultural report (Ho'āhu Energy Cooperative n.d.).

## Overall Mechanics

The project is set to break ground in 2025 and it will be able to meet 20% of Moloka'i energy needs (Solutions Project n.d.). One of the proposed projects will be located at Kualapu'u Recreation Center and will include a 250 kW AC (325 kW AC) PV array that will go above a carport structure and will be paired with a 250 kW AC (1MWh) battery energy storage system. The second proposed project will be located adjacent to the Pālā'au Power Plant and will include a 2.2 MW AC (3.3 MW DC) ground-mounted PV array with a 2.2 MW battery energy storage system (Ho'āhu Energy Cooperative n.d.). The intent behind locating one of the projects in the Kualapu'u Recreation Center is so it may be considered a potential resilience hub location and can eventually provide energy to Kualapu'u area residents during severe weather events.

These will be subscription based community solar projects that residents can opt into and will provide enough energy for about 1,500 households. Their goals are to begin building out this infrastructure so that eventually the other 80% of the island's energy needs are met by these types of projects (Solutions Project n.d.).

### **Community Benefits**

The community benefits of these projects was a big factor in their design. Subscribing to these projects is estimated to have savings of up to 20% on residential energy bills. One of the main benefits for residents is stable rates that will no longer be subject to oil market spikes (Nitta 2024). The cooperative also wants to ensure that work related to these projects goes to local residents and that they serve as opportunities for workforce development. Ho'āhu received funding to run two workforce training programs in 2022 which includes training on equipment installation, as well as microgrid design and maintenance. They were able to provide courses through the Department of Energy at Arizona State University that were free of charge. As a result of offering these training courses, 30 technicians have been certified in the past two years. Workforce development is especially important for an island like Moloka'i with an unemployment rate of nearly 14% (Nitta 2024).

### **Why is this Energy Democracy?**

The residents of Moloka'i saw an opportunity to control their energy future through Hawaiian Electric's CBRE Request for Proposal. They have for various years experienced exploitation at the hands of the U.S government and corporate interests and have been successful in their efforts to stave off large-scale development on the island. The people of Moloka'i, who are predominantly Native, recognize the direct link energy sovereignty has to self-determination and the benefits it will bring to their community. The Ho'āhu cooperative was established with the intent of giving the community direct control over the energy projects proposed not only in its final stage but through every step of the design process. Democratic decision making has been a core component of the projects and cooperative as a whole.

## Limitations

It is unclear what barriers to implementation exist with these projects. The projects are supposed to break ground this year but there is little to no information regarding if that work has started and if not what is stalling it. One potential hurdle they may be encountering is issues with accessing federal funding. A portion of their funding came from the Department of Energy and given the current administration's dismantling of different departments and programs focused on equity and energy justice, it is plausible funding for these projects may be inaccessible and stalling this project. One limitation of other cities, towns, or states wanting to adopt this model is the lack of CBRE legislation and collaboration with the utility company that facilitated these projects. In 2015 Governor David Ige of Hawai'i signed a law that required electric utilities to create a tariff that would incentivize customers to join community renewable energy projects. This law established the CBRE program under which subscribers could participate in renewable energy projects in exchange for bill credits. The Public Utility Commission would oversee the approval of projects but it further incentivized the emergence of these projects throughout the Hawaiian islands (Hawai'i's Department of Commerce and Consumer Affairs n.d). This is legislation that does not exist in other states which may complicate the process of replicating such projects elsewhere.

# Work Cited

## **Case Example 4.1 - Berkshire Wind Cooperative**

Berkshire Wind Power Cooperative Corporation. n.d. "Who We Are." Accessed March 6, 2025. <https://www.berkshirewindcoop.org/who-we-are/>.

Berkshire Wind Power Cooperative Corporation. 2024. "Fitch Affirms 'A' Rating on Berkshire Wind Bonds." February 29, 2024. <https://www.berkshirewindcoop.org/wp-content/uploads/2024/03/Fitch-Berkshire-Wind-bond-rating-release-2-29-003.pdf>.

Berkshire Wind Power Cooperative Corporation. 2019. "Berkshire Wind Phase II Online." November 20, 2019. <https://www.berkshirewindcoop.org/wp-content/uploads/2019/11/Phase-II-news-release-11-20.pdf>.

Berkshire Wind Power Cooperative Corporation. 2017. "Advance Refunding Saves Members \$2.5 Million." December 17, 2017. [https://www.berkshirewindcoop.org/wp-content/uploads/Advance\\_Refunding\\_Closing\\_Release\\_12-17\\_final.pdf](https://www.berkshirewindcoop.org/wp-content/uploads/Advance_Refunding_Closing_Release_12-17_final.pdf).

Massachusetts Municipal Wholesale Electric Company (MMWEC). n.d. "Wind." Accessed March 6, 2025. <https://www.mmwec.org/how-we-are-green/wind-2/>.

## **Case Example 4.2 - Marblehead Light Plant**

Sustainable Marblehead. n.d. Our Story. Accessed April 17, 2025. <https://www.sustainablemarblehead.org/our-story>.

Peterson, Cammy, Neal Duffy, Alison Henry, and Kate Ito. 2016. Municipal Light Plants in Massachusetts: Spotlight on Clean Energy Initiatives. Boston, MA: Metropolitan Area Planning Council. [https://www.mapc.org/wp-content/uploads/2017/10/MAPC\\_MLPWhitePaper\\_Jul2016-1.pdf](https://www.mapc.org/wp-content/uploads/2017/10/MAPC_MLPWhitePaper_Jul2016-1.pdf)

Yarmouff, Jean-Jacques. 2025. Interview by the SAFE Field Project Team. March 5, 2025. Zoom.

## **Case Example 4.3 - Vineyard Wind CBA/Vineyard Power Co-op**

Dwyer, Joseph, and David Bidwell. 2019. "Chains of Trust: Energy Justice, Public Engagement, and the First Offshore Wind Farm in the United States." *Energy Research & Social Science* 47: 166–176. <https://doi.org/10.1016/j.erss.2018.08.019>.

Hartman, Liz. 2021. "Top 10 Things You Didn't Know about Offshore Wind Energy." *Energy.gov*, August 30, 2021. <https://www.energy.gov/eere/wind/articles/top-10-things-you-didnt-know-about-offshore-wind-energy>.

Massachusetts Government. 2024. "Vineyard Wind, America's First Large-Scale Offshore Wind Farm, Delivers Full Power from 5 Turbines to the New England Grid." Accessed April 17, 2025. <https://www.mass.gov/news/vineyard-wind-americas-first-large-scale-offshore-wind-farm-delivers-full-power-from-5-turbines-to-the-new-england-grid>.

McCoy, Angel, Walter Musial, Rob Hammond, Daniel Mulas Hernando, Patrick Duffy, Philipp Beiter, Paula Pérez, Ruth Baranowski, Gage Reber, and Paul Spitsen. 2024. Offshore Wind Market Report: 2024 Edition. Golden, CO: National Renewable Energy Laboratory. <https://www.nrel.gov/docs/fy24osti/90525.pdf>.

Office of Energy Efficiency & Renewable Energy. 2019. "History of U.S. Wind Energy." Energy.gov. <https://www.energy.gov/eere/wind/history-us-wind-energy>.

Pfeifenberger, Johannes P., Joe DeLosa III, Linqun Bai, Cornelis Plet, Carson Peacock, and Ryan Nelson. 2023. "The Benefit and Urgency of Planned Offshore Transmission: Reducing the Costs of and Barriers to Achieving U.S. Clean Energy Goals." <https://www.catf.us/resource/the-benefit-and-urgency-of-planned-offshore-transmission-reducing-the-costs-of-and-barriers-to-achieving-u-s-clean-energy-goals/>

Powers, Thomas, Amirhossein Sajadi, and Bri Mathias Hodge. 2022. "The Current Opportunities and Challenges for Offshore Wind in the United States." *The Electricity Journal* 35 (7). <https://doi.org/10.1016/j.tej.2021.107061>.

Schumacher, Kim, and Zhuoxiang Yang. 2018. "The Determinants of Wind Energy Growth in the United States: Drivers and Barriers to State-Level Development." *Renewable and Sustainable Energy Reviews* 94: 281–291. <https://doi.org/10.1016/j.rser.2018.08.017>.

Vineyard Offshore. 2023. *Vineyard Offshore: Case Study – Martha’s Vineyard*. October 30, 2023. [https://cdn.prod.website-files.com/6453f12a83b4a3bb1a7071a7/65fde8d55e32ed2d74a458b9\\_VO%20Case%20Study\\_MV%2010.30.23.pdf](https://cdn.prod.website-files.com/6453f12a83b4a3bb1a7071a7/65fde8d55e32ed2d74a458b9_VO%20Case%20Study_MV%2010.30.23.pdf).

Vineyard Power Cooperative. n.d. *Community Benefits Agreement Summary*. Accessed April 17, 2025. <https://static1.squarespace.com/static/57797a98414fb50acf42515d/t/579b845229687f6efd779504/1469809746655/Community+Benefits+Agreement+Summary.pdf>.

#### **Case Example 4.4 - Adjuntas Solar Microgrids**

Casa Pueblo (n.d) Supporting Community Energy Independence after Hurricane Maria | American Academy of Arts and Sciences . Accessed April 4, 2025. <https://www.amacad.org/climate/case-study/casa-pueblo-community-energy>.

Casa Pueblo (2019) "Casa Pueblo Collaborates with Google’s Project Sunroof." 2019. Casa Pueblo, Puerto Rico. February 1, 2019. <https://casapueblo.org/casa-pueblo-collaborates-with-googles-project-sunroof/>.

Geopolitics Unplugged. 2025. "Puerto Rico in the Dark: Unraveling the Island’s Energy Crisis." Substack newsletter. *GeopoliticsUnplugged Substack* (blog). January 1, 2025. <https://geopoliticsunplugged.substack.com/p/puerto-rico-in-the-dark-unraveling>.

"Press Release: Casa Pueblo and ACESA Are Transforming Adjuntas into the First ‘Pueblo Solar.’" 2020. Honnold Foundation. October 20, 2020. <https://www.honnoldfoundation.org/news/press-release-casa-pueblo-and-small-business-owners-advance-their-vision-of-transforming-the-town-of-adjuntas-into-the-first-pueblo-solar>.

Department of Energy (n.d) "Success Story—New Tool Connects Multiple Microgrids to Increase Community Resilience." Accessed April 4, 2025. <https://www.energy.gov/eere/articles/success-story-new-tool-connects-multiple-microgrids-increase-community-resilience>.

**Case Example 4.5 - Together New Orleans Community Lighthouse**

City of New Orleans. (2024). *Together New Orleans Community Lighthouse Initiative*. Retrieved from <https://nola.gov/next/mayors-office/news/articles/june-2024/2024-06-10-together-new-orleans-community-lighthouse/>

Reyna, L. (2020). *Environmental Racism Is Killing Black Communities in Louisiana*. Talk Poverty. <https://talkpoverty.org/2020/01/09/environmental-racism-black-communities-louisiana/>

Dryfoos, D. (2024, June 30). *Nuns harnessing the sun*. The Lens. <https://thelensnola.org/2024/06/30/nuns-harnessing-the-sun/>

Solar Alternative. (2024, September 24). *Community Lighthouse serves as a solar-powered beacon of hope during natural disasters*. <https://www.solalt.com/community-lighthouse-ensures-solar-power-during-disasters/>

Troy Carter House. (2024). *Rep. Carter Announces \$800K for Together New Orleans to Build Community Lighthouses*. Retrieved from <https://troycarter.house.gov/media/press-releases/rep-carter-announces-800k-together-new-orleans-build-community-lighthouses>

U.S. Census Bureau. (2023). *QuickFacts: New Orleans city, Louisiana*. Retrieved from <https://www.census.gov/quickfacts/fact/table/neworleanscitylouisiana>

Together New Orleans. (2021). *Community Lighthouse Strategy Presentation*. [Google Slides] [https://docs.google.com/presentation/d/1Euo\\_qohb05lq0XQPsTy1gQvGFF0hq2W-4IWSleqBpQl/edit?slide=id.g10d3888177f\\_0\\_13#slide=id.g10d3888177f\\_0\\_13](https://docs.google.com/presentation/d/1Euo_qohb05lq0XQPsTy1gQvGFF0hq2W-4IWSleqBpQl/edit?slide=id.g10d3888177f_0_13#slide=id.g10d3888177f_0_13)

U.S. Census Bureau. (2023). *Louisiana Census*. <https://www.census.gov/library/stories/state-by-state/louisiana.html?utm>

**Case Study 5.1 - Chelsea Microgrids**

Chelsea Record. 2024. "City Launches Solar-Powered Microgrid Project to Strengthen Energy Resilience and Sustainability." November 28, 2024. <https://chelsearecord.com/2024/11/28/city-launches-solar-powered-microgrid-project-to-strengthen-energy-resilience-and-sustainability/>.

Cohn, Lisa. 2024. "Launched in Chelsea, Mass., Virtual Microgrid Concept Could Expand to Other Cities." Microgrid Knowledge. December 9, 2024. <https://www.microgridknowledge.com/distributed-energy/virtual-power-plant/article/55248333/launched-in-chelsea-mass-virtual-microgrid-concept-could-expand-to-other-cities>.

"Gaining the People's Trust Helped Move This Virtual Microgrid Forward." 2024. Green Justice Coalition. April 18, 2024. <https://greenjusticecoalition.org/2024/04/18/gaining-the-peoples-trust-helped-move-this-virtual-microgrid-forward/>.

Johnson, Marilyn. n.d. "Chelsea." Global Boston. Accessed March 13, 2025. <https://globalboston.bc.edu/index.php/home/immigrant-places/chelsea/>.

Kavanaugh, Jennifer. 2022. "Chelsea Develops Microgrid for Public Buildings." Massachusetts Municipal Association (MMA). January 12, 2022. <https://www.mma.org/chelsea-develops-microgrid-for-public-buildings/>.

MassGIS. 2024. "MassGIS Data: 2020 Environmental Justice Populations." *Commonwealth of Massachusetts*. <https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations>

Parshley, Lois. 2023. "The Little City That Could." *Mother Jones*, 2023. <https://www.motherjones.com/environment/2023/04/microgrids-chelsea-massachusetts-environmental-justice-climate-resilience/>.

Power, Maria Belen. n.d. The Chelsea Project. Accessed March 13, 2025. <https://www.massclu.org/the-chelsea-project/>.

"Resilient Urban Neighborhoods + Green Justice Coalition (RUN-GJC)." 2021. Green Justice Coalition. January 15, 2021. [https://greenjusticecoalition.org/news/community\\_microgrids-2/](https://greenjusticecoalition.org/news/community_microgrids-2/).

U.S. Census Bureau. 2024. "Quick Facts-City of Chelsea, Massachusetts -population estimates." Accessed March 9, 2025. <https://www.census.gov/quickfacts/fact/table/chelseacitymassachusetts/PST045224>

Kayyali, Sari. 2025. "Microgrids Manager of GreenRoots and Chinatown CLT Interview." Interview by Denisse Manzo Gonzalez, Marina Garrido, and Will Arent. Tufts University, March 10. Video Conference.

### **Case Study 5.2- Ho'āhu Cooperative**

Graham, Wade. 2019. "Why Molokai Is the Least Developed of Hawai'i's Islands | Essay." Zócalo Public Square. August 28, 2019. <http://www.zocalopublicsquare.org/why-molokai-is-the-least-developed-of-hawaiis-islands/>.

Hawai'i's Department of Commerce and Consumer Affairs. n.d. "Community-Based Renewable Energy (CBRE)." Accessed April 4, 2025. <https://cca.hawaii.gov/dca/community-based-renewable-energy/>.

Hawaiian Electric. n.d. "Average Price of Electricity." Accessed April 4, 2025. <http://www.hawaiianelectric.com/billing-and-payment/rates-and-regulations/average-price-of-electricity>.

Hawaiian Electric. 2023. "Hawaii's First Two Community-Owned and -Designed Solar Projects Coming to Molokai." <http://www.hawaiianelectric.com/hawaiis-first-two-community-owned-and--designed-solar-projects-coming-to-molokai>.

Ho'āhu's Energy Cooperative. n.d. "Ho'āhu's Community-Based Renewable Energy Projects." Accessed April 4, 2025. <https://hoahuenergy.coop/cbre/>.

Nitta, Naoki. 2024. "On a Rural Hawaiian Island, Solar Provides a Path to Energy Sovereignty." *Grist*. August 9, 2024. <https://grist.org/energy/molokai-rural-hawaiian-island-community-solar-energy/>.

Office of Hawaiian Affairs. 2024. "Island Community Report: Moloka'i." <https://www.oha.org/wp-content/uploads/2024-Molokai-Island-Community-Report.pdf>.

The Solutions Project. 2024. "Community-Driven Solar Grids Revolutionize Island Energy." October 9, 2024. <https://thesolutionsproject.org/stories/community-driven-solar-grids-revolutionize-island-energy/>.



# BRINGING POWER HOME GUIDEBOOK

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A Guidebook for Community-Owned  
Energy Possibilities in the  
City of Salem, Massachusetts

Prepared by:  
SAFE Field Project Team  
Tufts University UEP 2025



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# PURPOSE OF THE GUIDEBOOK

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This guidebook was created as a resource for SAFE and its partners to explore practical, community-centered strategies for advancing community-owned energy (COE) in Salem. It is meant to be both a starting point and a toolkit—offering a survey of existing COE models, examples from across the country, and tailored recommendations that reflect the unique energy landscape and needs of Salem.

We hope this guide supports SAFE in taking the next steps: identifying coalition partners, pursuing funding opportunities, and deepening engagement with residents and city leadership. It is not intended to be prescriptive, but rather to spark ongoing conversation and action around energy democracy in Salem.



Image source: [SAFE](https://www.salemsafe.org)

# 1. INTRODUCTION

Community-owned energy (COE) refers to energy systems that are owned, managed, or directly benefit local residents (Snaith 2024). At its core, COE seeks to shift control of energy production and distribution into the hands of communities, ensuring that the social, economic, and environmental benefits—such as lower electricity costs, local job creation, and workforce development—are felt close to home.

Beyond practical advantages, COE serves as a powerful tool for promoting energy justice. It can help elevate the voices of historically marginalized communities, ensuring their needs are prioritized in the energy transition. By fostering inclusive participation and shared decision-making, COE supports more equitable outcomes and strengthens community resilience in the face of climate change (Huang et al. 2017). This model also enhances public support for renewable energy projects by involving people at every stage—from generation to distribution to consumption (Bauwens 2022)

Energy touches every aspect of our lives—from homes and businesses to schools and recreational spaces. As such, the decisions about how energy is produced and who benefits from it are deeply impactful.

This Guidebook provides a high-level overview of COE models and explores how they might be applied in the City of Salem. It is intended as a resource for stakeholders, including groups like the Salem Alliance for the Environment (SAFE), and aims to inspire further dialogue and collaboration. The Tufts Project Team views this work as a starting point—a spark—for ongoing conversations about community engagement and equitable energy solutions in Salem’s clean energy future.



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# 2. SURVEY OF COE TOOLS

The table below provides an overview of different COE models, outlining their structures, levels of community control, and potential benefits and limitations. Each tool offers a unique pathway for advancing energy justice in Salem—from microgrids and cooperatives to resilience hubs and CBAs. The survey was put together based on all of our explorations and findings of COE throughout the semester.

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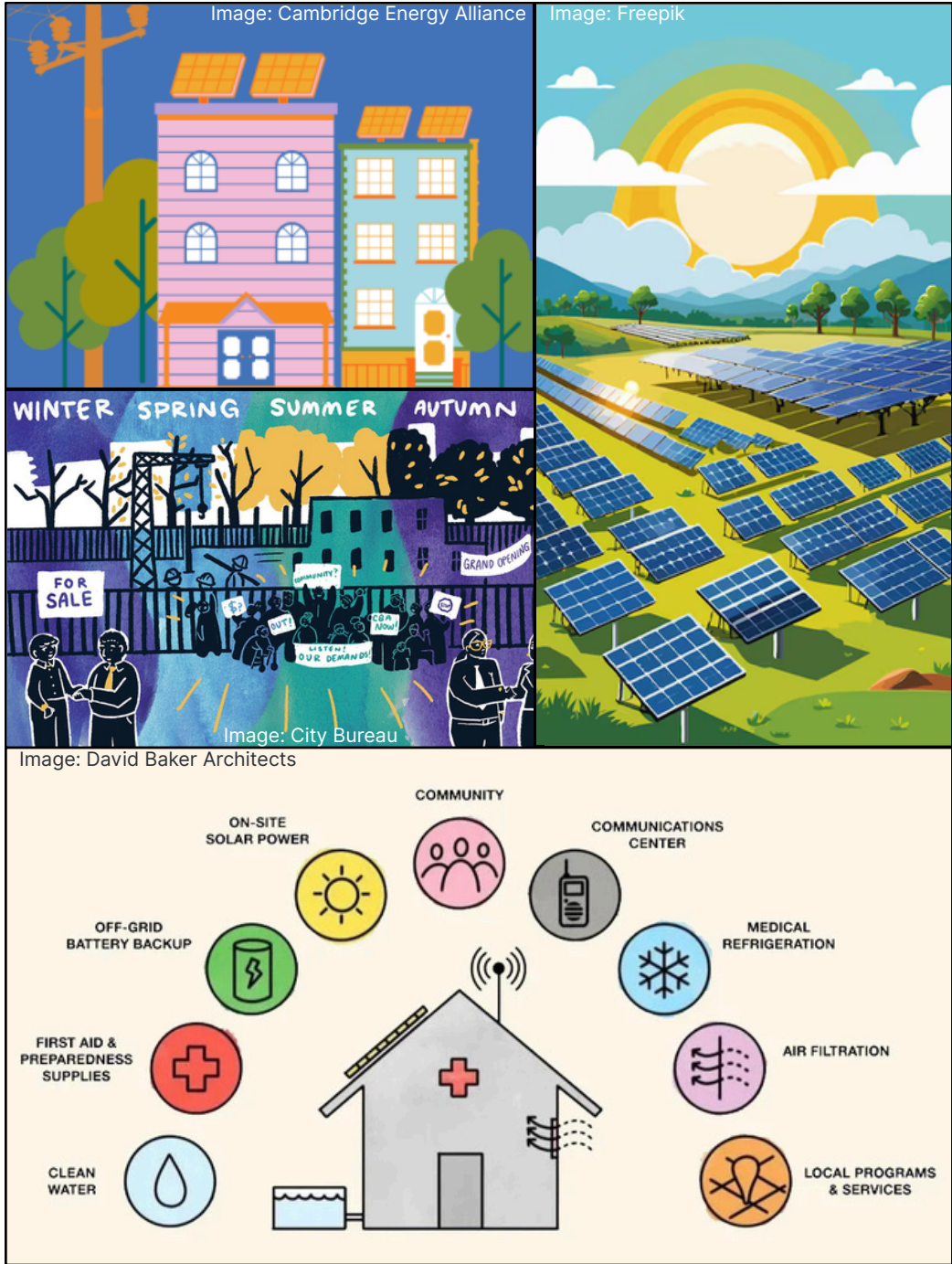


Table of COE tools

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COE Model	Description	Ownership & Governance Structure	Level of Control	Benefits	Limitations
<i>Community Benefits Agreements (CBA)</i>	Legally binding agreement between a developer and a community.	Often created by local community members and organizations.	High	Ensures the community receives both monetary and non-monetary benefits. May be upheld in court.	Requires technical expertise, legal counsel, and clear vision of near-term and long-term community goals.
<i>Community Choice Aggregation (CCA)</i>	Municipalities purchase bulk electricity on behalf of residents, filling a role typically held by a third-party procedure.	Municipal governments oversee bargaining. Community members have the option to enroll in the program	Low	Diversifies local community energy options	Limited community input. May or may not offer lower rates for members enrolled.
<i>Community Energy Farms</i>	Energy is generated at an offsite location, often adjacent to the community it serves.	May be owned and maintained by community organizations and/or municipal governments.	Med	Benefits of the energy system are often distributed to the community.	Requires high capital upfront for partial and/or full ownership.
<i>Committees</i>	A governmental body (typically within a municipal government) that discusses and deliberates on energy issues, opportunities, and their potential impacts.	Subject to the decisions and/or agendas of elected municipal officials.	Low	Ability to directly influence and support local energy initiatives with key stakeholder(s).	Subject to the decision making and/or agendas of municipal government.
<i>Cooperatives</i>	Multiple stakeholders join together to form a mission driven organization, typically for the purpose of pooling resources and representing their respective communities.	Shared ownership model; often owned and operated by members who share its monetary and non-monetary benefits.	Med/High	Ability to directly advocate for and implement energy initiatives often independent of local government.	Requires significant stakeholder collaboration and access to capital.

COE Model	Description	Ownership & Governance Structure	Level of Control	Benefits	Limitations
<i>Microgrids</i>	A local type of energy array that is disconnected from the main grid (i.e., solar panels, battery storage, etc.). It can generate, store, and distribute energy independently.	May be owned and maintained by community organizations, municipal governments, and more.	High	Monetary benefits can be directed to residents, often reducing the rate. Provides an additional layer of resilience, and is easy to integrate into complex, urban settings.	Requires moderate capital upfront to finance. Benefits are directly proportional to the degree of control/ownership of the system.
<i>Municipal Light Plants</i>	A municipality and its community maintain full agency over the distribution and delivery of energy to residents of that municipality, filling a role typically occupied by a distribution utility.	Ownership, costs, and maintenance falls on municipal government.	Low/ Med	No profit motive; residents can communicate directly with MLP officials.	Requires high upfront capital to deploy. Often many bureaucratic hurdles to face to get these projects approved.
<i>Resilience Hubs</i>	Community facilities that offer points for resilience; offering resources and support before, during, and after emergency events. Designed to enhance social cohesion and be a third place for in-person interactions(s).	Designed to be flexible and adaptable; often require at least one organization (such as a Co-op) to spearhead and bring in additional stakeholders to form.	Med/ High	High degree of resilience and adaptation possible- a place for education, workforce development, and piloting of microgrid projects, and more. Community centered and tailored for the unique needs of the community it serves.	Requires moderate upfront capital and strategic partnership(s) to initiate. Likely a high-degree of planning as well.  Outcomes of a resilience hub vary widely depending on their purpose/goal.

# 3. RECOMMENDATIONS FOR COMMUNITY-OWNED ENERGY IN SALEM, MA

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While there exists an extensive list of opportunities for the residents and City of Salem, MA to pursue community-owned energy (COE) systems, there are four strategic steps that this team is recommending SAFE pursue, to lead Salem down the road towards COE.

The recommended roadmap to COE includes the following:

1. Foster Community Engagement
2. Cultivate & Strengthen Strategic Partnerships
3. Leverage Community Benefits Agreements (CBAs)
4. Lead Microgrids & Resilience Hub Initiatives



## ***Recommendation #1: Foster Community Engagement***

Community-owned energy projects must ultimately be grounded in a communal vision of the future. What has become evident throughout our research is the need to center energy democracy throughout the process. Community members are more likely to buy into a project if they feel like they have been involved from start to end.

The Ho'āhu Cooperative in Moloka'i is a shining example of energy democracy with its two microgrid projects. They committed to holding over 40 workshops throughout the span of two years to discuss every step of the project. They also established a cooperative model for these projects so residents could have a stake and experience direct benefits. While we recognize this model may not be directly transferable to other cities, it illustrates the importance of centering community collaboration. In the case of Chelsea, they have credited the success of their project to the ability to get the city and the community on board with it.

The case studies point to various approaches that organizations have taken to ownership, location, design, and implementation, and we can not recommend one approach over another. We believe those are decisions that should be left up to the Salem community. We recommend that the process of developing this project centers on a deep democracy.



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## ***Recommendation #2: Cultivate & Strengthen Strategic Partnerships***

Developing and maintaining strong partnerships is key to ensuring the sustainability of a COE project. Our interviews with key stakeholders revealed a consistent theme: collaborative efforts among public, private, and nonprofit actors can help mitigate the risks associated with large-scale renewable energy projects. By sharing responsibility, these partnerships ensure that no single organization bears the full burden.

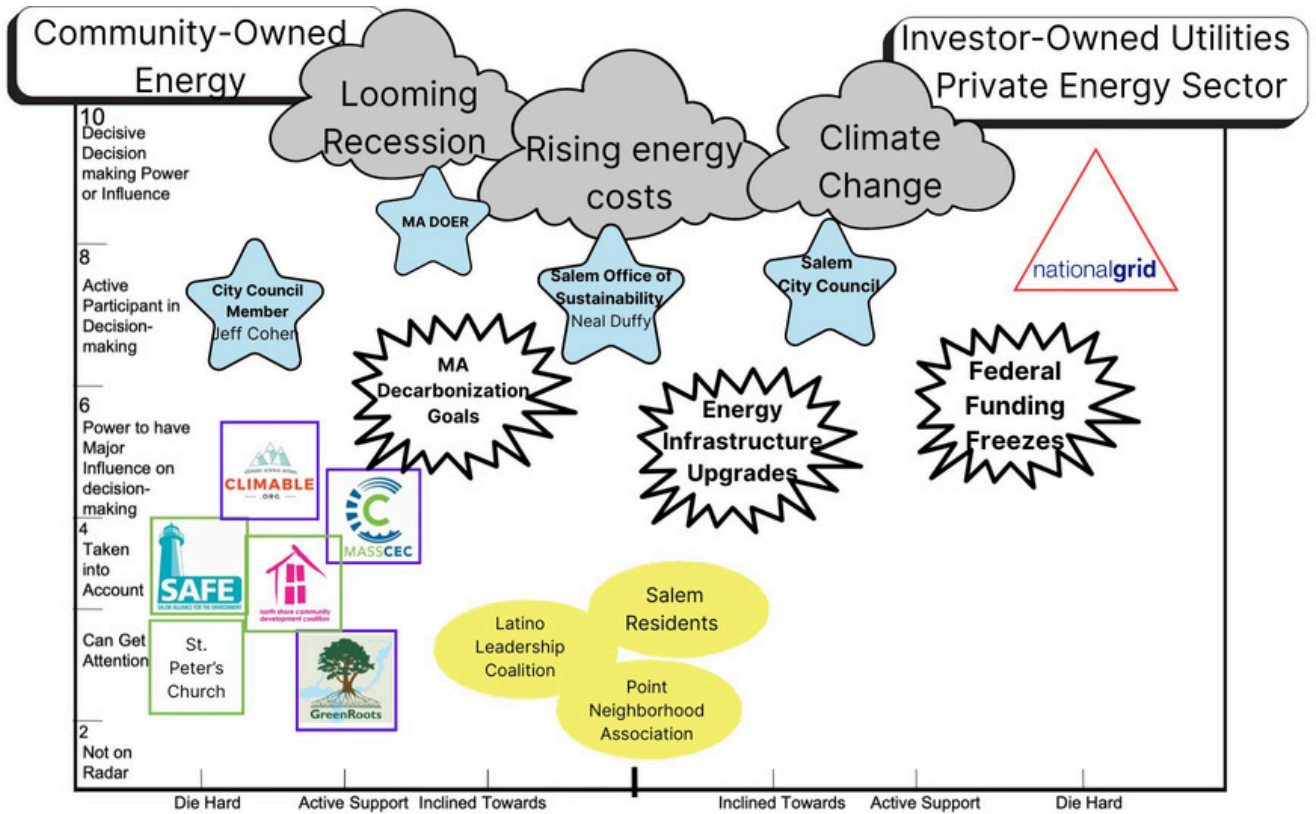
The team developed a power map that can serve as a starting point for identifying key allies, as well as targeted opponents that will need to be won over. It is included on the following page. In the case of Chelsea, GreenRoots' participation with Green Justice Coalition (GJC) and Resilient Urban Neighborhood (RUN), was key to making significant progress and achieving their goals. This partnership gave them access to technical expertise from organizations like Climable, Peregrine Energy Group, Clean Energy Solutions, and others. GreenRoots has also stated the importance of winning the city council over to secure funding and establish a municipal ownership structure for their project.



# Power Analysis Grid

Power mapping is a tool used by organizers trying to advance a campaign or political project. This tool is helpful in understanding power relationships in the socio-political climate one is working in. It identifies who has power, how they are using it, what unequal power relationships present issues, and how grassroots organizations can leverage their own power to see change. This power mapping exercise is an attempt to analyze power in the City of Salem and what opportunities and hurdles exist for community-owned energy. The team wants to emphasize that this map is merely a tool for SAFE to expand upon and further utilize in their fight for a just transition in Salem.

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## Legend

- Decision-makers
- Socio-Political & Environmental Context
- Opportunities/Threats
- Direct Opposition
- Social Groups
- Technical and Community Organizations
- Community Organizations in Salem

## ***Recommendation #3: Leverage Community Benefits Agreements (CBAs)***

Community Benefits Agreements (CBAs) are legally binding contracts between developers and host municipalities or community groups, of which SAFE has experience in developing. The goal of these agreements is to mitigate the local impacts of large energy infrastructure projects and ensure that the community itself benefits directly from the project. CBAs allow communities to link energy development to their specific priorities, addressing needs that might otherwise be unmet. For developers, CBAs can increase community support and reduce uncertainty in the permitting process. For Salem, CBAs offer a compelling opportunity to ensure that Salem residents gain access to the socio-economic benefits of the new energy development projects.

As part of the Crowley Wind Services Offshore Wind development, the City of Salem and Crowley established a \$9 million Community Benefits Agreement (CBA) to ensure that local residents and businesses share the economic benefits of the offshore wind industry. The CBA included funding for workforce development, sustainability and resiliency projects, housing and infrastructure, Salem public schools, and other city services (City of Salem 2024). While Crowley committed to hiring local residents and marginalized communities, including people from environmental justice communities, veterans, and those living with disabilities, this has yet to materialize and it is still unclear as to how many long-term jobs will be created for local residents beyond the initial construction phase.

As of 2025, uncertainty around the future of offshore wind projects has grown. The current federal administration has halted all permitting for new offshore wind projects and issued stop-work orders for those already underway (Barnes, Berke, and Wasser 2025). As a result, the Crowley development and its associated CBA remain in limbo. Thus, the following recommendations are proposed to support SAFE/Salem in advancing CBA arrangements to better fit their needs.



Image: Crowley Wind, Salem Offshore Wind Terminal

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## Strategic Actions:

### Propose a Draft and Start the Conversation on SAFE/Salem's

**Terms:** Our main recommendation to SAFE, with regard to CBAs and opportunities for enhancing community benefits from developers, is to propose a draft CBA of your own, early and publicly, on your terms. Time is often constrained and eaten up with developing the informed proposals, leaving terms that are shaped late in the process, or entirely by developers. But one of the most effective ways for SAFE to take the lead could be to propose a draft CBA of their own. Through spearheading a working group or team, SAFE can establish a draft agreement that highlights more of the ideal vision for Salem. It doesn't have to be perfect or final form, but it would be to create a starting point that reflects Salem's values, needs, and vision—and to signal clearly what matters most. Instead of waiting to see what a developer might offer, starting with a proposal from SAFE would outline what Salem expects. This can reframe the negotiation from “what are you willing to give us?” to “how will you respond to our priorities?” A draft CBA can be created through open community gatherings, listening sessions, or surveys. That process alone helps deepen resident alignment and shared goals. This builds collective transparency and trust.



**Reframe CBAs as Transformative Opportunities:** Often, CBA discussions become stuck on monetary compensation—and when that happens, they can start to feel transactional, or even extractive. As Richard Andre, Vineyard Power, states, simply asking for money, “comes across as a bribe.” But when tied to shared, long-term goals, and defining what matters most to Salem can make the ask more powerful—and more transformative. A shift in the conversation from “how much money” to “what kind of future do we want to build together?” Communities may already have strong visions—local jobs, clean energy access, resilience hubs—and CBAs can be tools to realize those visions.



“  
What kind of future  
do we want to  
build together?  
”

CBAs also serve as an excellent opportunity for Salem to establish funds that promote long-term investments in community-owned energy structures. These funding streams can work in harmony with the remaining recommendations (microgrids and resilience hubs) to diversify sources of financial support and need for new COE systems.

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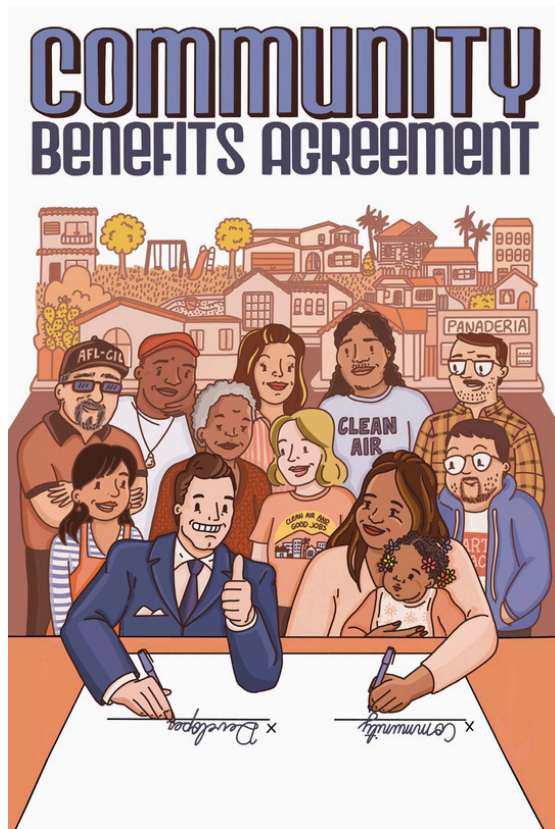
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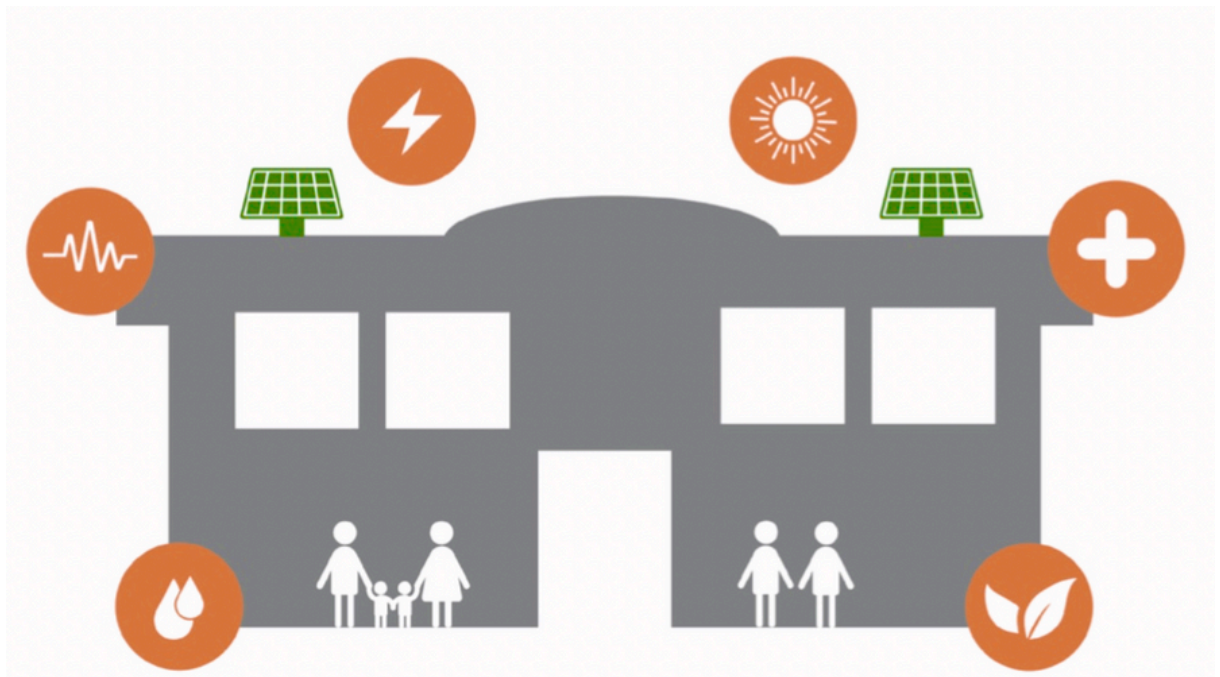
**Strengthen and Center a Trusted Community Voice:** Using the coalition-building, resilience hub establishment, and resident engagement practices previously described, it is recommended that SAFE consider ways to build collective structure and accountability, like a cooperative model or coalition. This doesn't mean starting from scratch—instead, clarifying roles, sharing leadership, or expanding participation. Vineyard Power's membership cooperative model of the coming together of six different municipalities allowed them to establish consensus, governance strategy, and support community agency, in a way that traditional 'informing' types of engagement doesn't grant. Building trust is a challenging but powerful tool. Richard Andre, Vineyard Power, shared, "you have to be very cognizant of who the messenger is" and whether they're perceived as reflecting the whole community. Strengthening that trust and clarity can unlock more productive relationships with developers. Vineyard Power's success was rooted in trust-building over time—"Once guardrails were negotiated, there was an iterative process of trust-building." Even when outcomes weren't certain, showing up consistently strengthened their voice and credibility. Vineyard Power also wrote legislation, worked with Mass Save, and organized island-wide votes for clean energy targets. Richard was clear: "Partnerships played a critical role—we couldn't have done it without them." Sometimes the biggest breakthroughs come from looking beyond the immediate circle.



## ***Recommendation #4: Lead Microgrids & Resilience Hub Initiatives***

Microgrid case studies displayed the highest degree of community control and energy democracy over an energy system. In the city of Chelsea, GreenRoots is in the process of implementing a microgrids project, which has the potential to lower energy bills and increase resilience during severe weather events. On the islands of Puerto Rico and Moloka'i, residents have looked towards microgrids to address issues around energy insecurity and lack of autonomy over their energy futures. Many microgrid projects are used to power resilience hubs.

Resilience hubs are also vital tools for advancing energy democracy. They act as community anchors that reimagine how people engage with and benefit from energy systems. Drawing inspiration from successful examples, such as the Taunton, MA, resilience hub championed by Beacon Climate Innovation, these hubs can take the form of churches, schools, community centers, or other trusted institutions. They often provide essential services like food, shelter, battery storage, and also serve as sites for workforce development and educational training. The team has developed a series of strategic action steps SAFE can take to champion a microgrids project in conjunction with a resilience hub.



## Strategic Actions:



**Explore Workforce Development Opportunities:** It is of utmost importance that residents learn how to implement and maintain these projects so that work can stay in the community. One of the greatest benefits of resilience hubs is their multi-purpose use of space. Resilience hubs, as seen throughout our case studies, can serve as places for workshops, learning, and workforce development. It can also serve as a meeting place for cultivating and strengthening strategic partnerships with key stakeholders, such as community-based and educational institutions.

In the case of the Ho'āhu Cooperative example, they were able to partner with Arizona State University to provide courses and training for certifications free of charge to residents. Arizona State University's (ASU) Laboratory for Energy and Power Solutions (LEAPS) offers 300+ hours of training courses in microgrid design, implementation, and maintenance, and many of these courses are also offered online.

As a first step, we strongly encourage SAFE to pursue a partnership with ASU to learn about best practices for launching this type of program. At the same time, SAFE should begin exploring funding opportunities to support early-stage planning for a resilience hub under its management. The Massachusetts Clean Energy Center offers up to \$12 million annually for workforce development programs that align with environmental justice and clean energy education in the Commonwealth. Once funding is secured, SAFE could also identify and engage workforce development partners—such as ASU—that provide training in microgrid management, battery technology, and other relevant fields.

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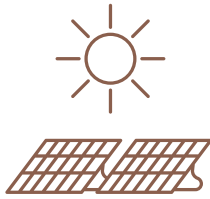
## Strategic Actions:

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**Conduct a Microgrids Feasibility Assessment:** As briefly mentioned above, RUN or Resilient Urban Neighborhoods is a collaboration between technical organizations Climable, Clean Energy Solutions, Inc., Peregrine Energy Group, and Synapse Energy Economics. This partnership is dedicated to aiding grassroots organizations, like SAFE, with clean energy implementation in their communities. This process allows for community members and organizations to be involved in the decision-making throughout the design and operation processes. They have to date conducted two of these feasibility assessments for Chelsea and Chinatown. We recommend developing a relationship with this organization, which can kickstart the process through a feasibility assessment.



**Pilot Scalable Technologies:** We also recommend that SAFE position a resilience hub as a pilot site for community-scale microgrid technologies, providing a real-world environment to test and refine clean energy solutions such as modular battery storage and solar integration. SAFE is well-suited to lead this effort and should actively pursue funding from programs like MassCEC and Mass Solar for All to support the development of a microgrid-powered resilience hub in Salem. This initiative would not only showcase the potential of resilient, low-carbon infrastructure in urban areas but also serve as a replicable model for advancing community-driven energy solutions across the region.



**Ensure Equitable Governance:** Building on the development of the resilience hub, we recommend exploring a shared governance model that includes meaningful representation from residents, local organizations, and energy stakeholders. Such a structure can foster trust, transparency, and sustained community engagement over the long term. SAFE could look to models like Vineyard Power, where community members democratically elect representatives to serve on an Energy Board or Committee with decision-making authority tied to their specific function or working group.

## Strategic Actions:

**Utilize MASFA Funding:** The Massachusetts Solar for All (MASFA) program presents a valuable opportunity for Salem to secure funding for a solar microgrid project at a resilience hub. In April 2024, Massachusetts received a \$156 million award to support community-based solar initiatives, with funds available for application and distribution over the next five years.



According to MASFA guidelines, grants will be awarded to community shared solar projects that demonstrate strong potential to maximize resident benefits—such as reducing energy bills, serving a large number of households, creating workforce opportunities, and enhancing community resilience. The program also prioritizes projects that explore alternative ownership models, including community-owned systems (MASFA, n.d.).

This funding stream offers a unique win-win scenario: state support for a solar project that delivers tangible benefits to marginalized residents while promoting community ownership. We strongly encourage SAFE to pursue this opportunity and consider engaging interns or volunteers to assist with the grant application process and the identification of additional funding sources.

*Organizations mentioned, click logos to explore:*



CLEAN ENERGY  
**SOLUTIONS**

**RESILIENT URBAN  
NEIGHBORHOODS (RUN)**



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## 4. CONCLUSION

Community-owned energy represents a transformative approach to energy systems—one that prioritizes local ownership, inclusive participation, and equitable distribution of benefits. By shifting control of energy production and distribution into the hands of communities, COE can help lower costs, create local jobs, and promote workforce development, all while advancing energy justice. It ensures that historically marginalized voices are heard and that decisions about energy are made with the well-being of the entire community in mind. As energy continues to shape every facet of daily life, the importance of who controls it—and who benefits—cannot be overstated. This Guidebook offers a foundational overview of COE models and their potential in Salem, serving as a resource and catalyst for stakeholders like SAFE to engage in meaningful dialogue and actions—across both the near-term and long-term. The Tufts Project Team hopes this work sparks continued collaboration toward a just, resilient, and community-centered clean energy future. **It's time to bring power home!**



Image: [Climate Resiliency Project](#)

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# APPENDIX

## *Overview of Energy Systems relevant to the City of Salem*

### **Solar Energy: Microgrids vs. Farms**

#### *Solar Microgrids:*

A solar PV (photovoltaic) microgrid generates, stores, and distributes electricity locally using solar power. Solar panels capture sunlight and convert it into electricity, which inverters transform into usable alternating current (AC) power. Excess energy is stored in batteries, allowing the system to provide electricity at night or during cloudy conditions. Picture it as a smaller version of the electricity grid designed only to use solar energy, allowing communities to achieve energy independence.

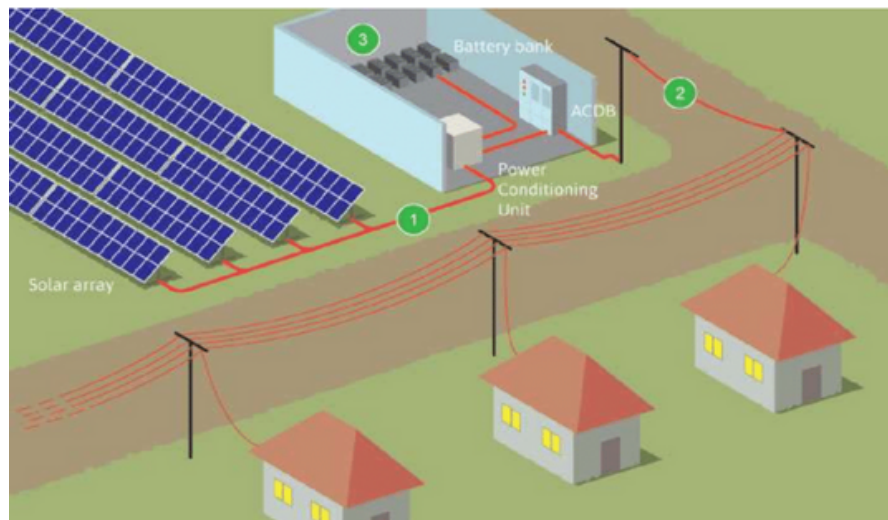


Image: Saur Energy International

#### *Benefits of Microgrids*

Solar microgrids offer numerous benefits, including reliable and resilient power, especially in areas prone to grid outages or lacking traditional infrastructure. By generating electricity locally, they reduce dependence on centralized power grids, lowering transmission losses and increasing energy security. They also provide long-term cost savings by utilizing free solar energy and minimizing reliance on expensive fossil fuels. Environmentally, solar microgrids contribute to sustainability by reducing carbon emissions and promoting clean, renewable energy use. Additionally, they empower communities by enabling local ownership and control over energy resources, fostering economic development and energy independence.

## Overview of Energy Systems relevant to the City of Salem

### Solar Farms

A solar farm is a large-scale installation of solar panels that captures sunlight and converts it into electricity for widespread distribution. The panels absorb solar energy and generate direct current (DC) electricity, which is converted into alternating current (AC) by inverters to match the power used in homes and businesses. This electricity is fed directly into the power grid or stored in battery systems for later use. Solar farms can vary in size, from small community projects to massive utility-scale facilities that power entire cities. By harnessing renewable energy from the sun, solar farms provide a sustainable and cost-effective alternative to fossil fuels, reducing carbon emissions and supporting a cleaner energy future.

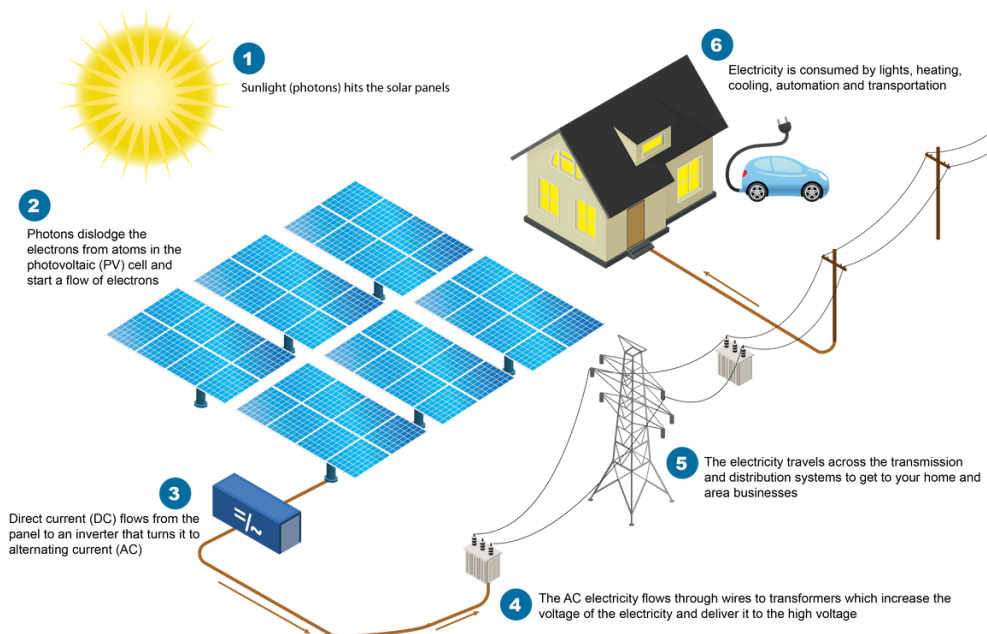


Image: Cider Solar Farm

### Solar Farms versus Microgrids

While similar in terms of generation, these two systems serve different purposes and operate on various scales. A solar microgrid is a localized energy system that produces and stores energy. It distributes electricity within a specific area, such as a community, business, or remote location, often functioning independently from the primary grid. In contrast, a solar farm is a large-scale installation designed to produce electricity for the broader power grid, supplying energy to multiple regions rather than a single, self-contained system. While solar microgrids prioritize energy resilience, local control, and independence, solar farms focus on large-scale energy production and grid integration.

## *Overview of Energy Systems relevant to the City of Salem*

Additionally, microgrids typically include battery storage and energy management systems to ensure continuous power supply, whereas solar farms rely on direct grid connection, sometimes supplemented by large-scale battery storage solutions.

### *Financial Benefits of Solar*

Solar PV systems produce tangible benefits to the owner of the system by way of financial incentives. The primary solar financial incentive is the Solar Massachusetts Renewable Target (SMART) Program, which compensates solar PV systems based on generation amounts. Solar PV systems are also eligible for net metering, which pays the system owner for power injected back into the grid.

## Wind Energy

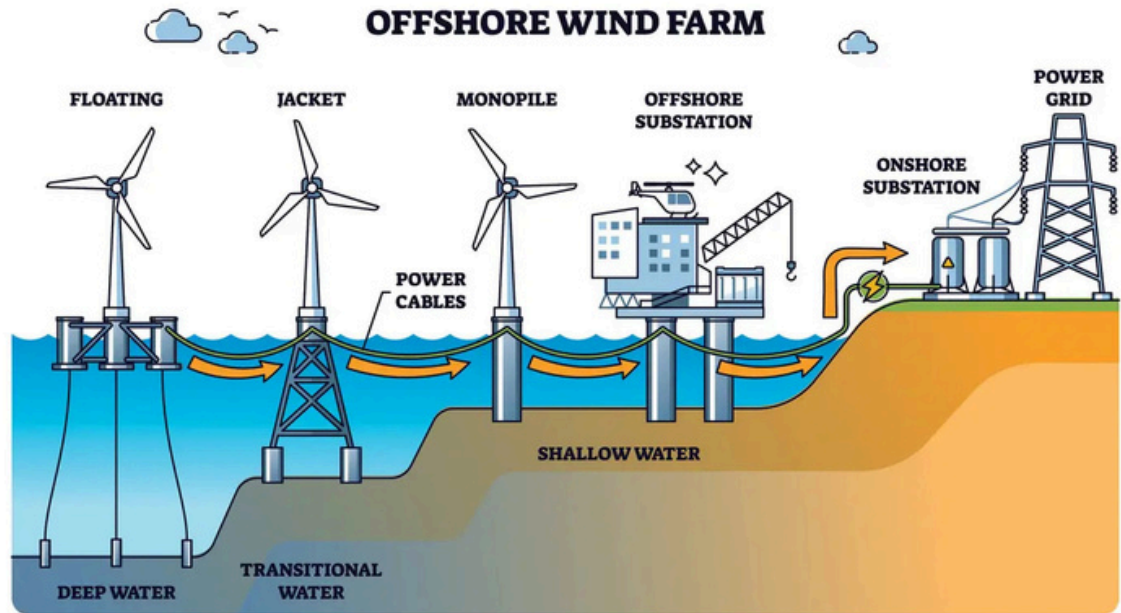
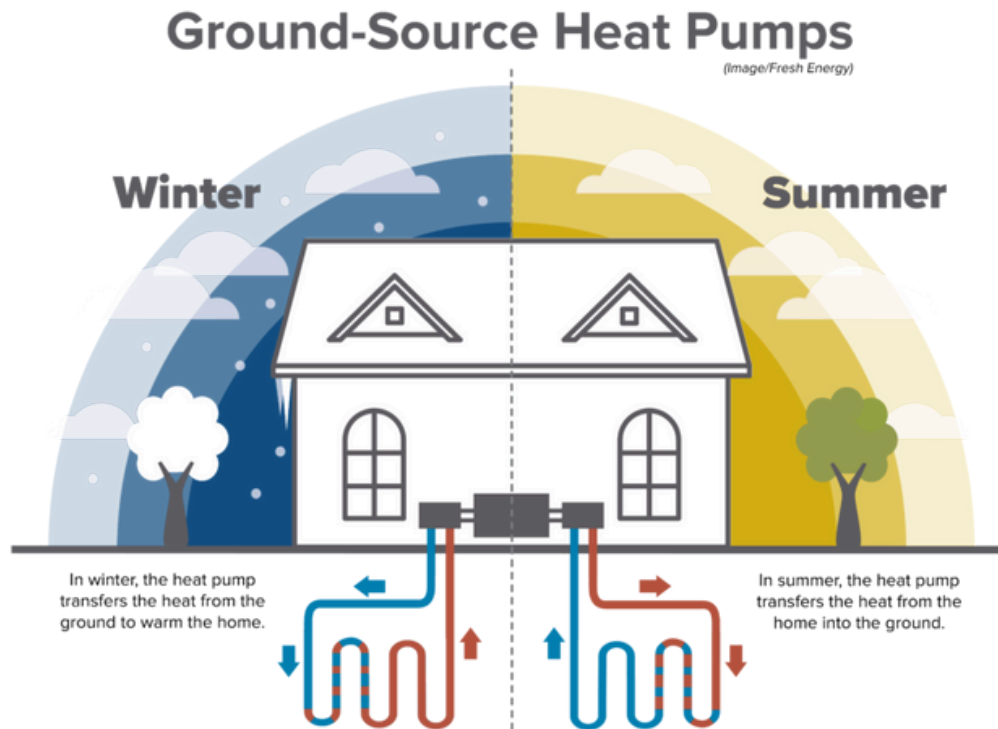


Image: New Zealand Wind Energy Association

Wind is the largest source of renewable electricity in the United States, providing clean power to homes, businesses, and communities of all sizes. As one of the oldest forms of renewable energy, wind has been harnessed for centuries, from ancient civilizations to modern-day wind turbines. As wind passes over the turbine blades, it creates a spinning motion that powers a generator housed at the top of the turbine. Inside the generator, the kinetic energy from the rotation is converted into electrical energy. In modern turbine systems, the electricity produced is initially direct current (DC). However, as most onshore grids operate on alternating current (AC), the DC must be converted into AC before grid integration and distribution.

Additionally, the efficiency of wind energy depends on many factors, such as the local wind environment, blade design, turbine height, and more. Advances in wind turbines and design have allowed turbines to grow taller and larger for both onshore and offshore applications, making wind energy increasingly viable and scalable.

## Geothermal



Underground, the Earth's core produces heat and stays at a consistent temperature year-round. Networked geothermal, also known as geothermal district heating and cooling, is a centralized energy system that uses underground thermal energy to provide heating and cooling to multiple buildings through a shared loop system. The Earth acts as a heat storage system, absorbing and transferring heat from the ground to warm buildings in winter and releasing excess heat into the ground to cool them in summer. A network of pipes carries the thermal energy to and from buildings. Each building's heat pump adjusts the temperature for heating or cooling as needed.

The stability of the subsurface environment offers many benefits that can be realized through networked geothermal. At a high level, geothermal energy provides consistent, reliable energy year round. This consistency translates into direct energy savings. (US DOE n.d.). Homeowners can experience significant energy savings, with reductions of 30% to 70% in heating costs and 20% to 50% in cooling costs compared to conventional systems (Government of Manitoba n.d.). Additionally, networked geothermal requires less land area than other renewable energy installations, preserving natural habitats (Kirchoff n.d.). By adopting geothermal energy, communities can decrease their dependence on fossil fuels, enhance air quality, and promote a cleaner, more sustainable future.

# WORK CITED

Barnes, Jennette, Ben Berke, and Miriam Wasser. 2025. "Massachusetts Communities That Bet Big on Offshore Wind Face Uncertainty." WBUR News, April 18, 2025. <https://www.wbur.org/news/2025/04/18/offshore-wind-businesses-massachusetts-new-england-trump>.

Bauwens, Thomas, Taneli Vaskelainen, and Koen Frenken. 2022. "Conceptualising Institutional Complexity in the Upscaling of Community Enterprises: Lessons from Renewable Energy and Carsharing." *Environmental Innovation and Societal Transitions* 42 (March): 138–151. <https://doi.org/10.1016/j.eist.2021.12.007>.

City of Salem. 2024. City of Salem and Crowley Wind Services Announce Historic Community Benefits. Salem, MA. <https://www.salemma.gov/mayors-office/news/city-salem-and-crowley-wind-services-announce-historic-community-benefits>.

Government of Manitoba. n.d. Why Geothermal?. Manitoba Sustainable Development. [https://www.gov.mb.ca/sd/environment\\_and\\_biodiversity/energy/geothermal/why\\_geo.html](https://www.gov.mb.ca/sd/environment_and_biodiversity/energy/geothermal/why_geo.html).

Kirchoff, Savanna. n.d. Basics of Geothermal Energy. Colorado Clean Energy Fund. <https://cocleanenergyfund.com/basics-of-geothermal-energy/>.

"Massachusetts Solar for All Program." n.d. Mass.Gov. Accessed April 10, 2025. <https://www.mass.gov/info-details/about-solar-for-all>.

Snaith, M. 2024. Power to the People: An Overview of Community Energy. Earth.Org. <https://earth.org/power-to-the-people-an-overview-of-community-energy/>.

U.S. Department of Energy. n.d. Geothermal Basics. Office of Energy Efficiency & Renewable Energy. <https://www.energy.gov/eere/geothermal/geothermal-basics>.