



Comparative Analysis of U.S. Community Solar Initiatives: Recommendations for the City of Detroit

By Sanya Bery, Warren Gunn, Andrea Mahieu, Megan McLaughlin, Margerie Snider, and Daniel Vargas-Weil

Project Advisor: Kerry Duggan

April 2024

A project submitted in partial fulfillment of the requirements for the degree of Master of Science (Environment and Sustainability) at the University of Michigan.

Abstract

Like many cities across the United States, Detroit, Michigan, is facing compounding challenges due to global climate change. Detroit is highly vulnerable to the impacts of climate change and is already experiencing the effects, including flooding and rising temperatures. The City of Detroit Office of Sustainability seeks tools and strategies for the accelerated development of solar energy to meet greenhouse gas reduction goals set forth in the Detroit Climate Strategy and mitigate the effects of climate change for Detroit residents. This report informs and contributes to Detroit's clean energy transition by highlighting existing community solar programs in Michigan, California, New York, and Illinois, and providing focused recommendations from these case studies that can be applied to the Detroit context. Additionally, local community stakeholder perspectives are shared to inform on an equitable and just energy transition. Through extensive online research, interviews, and stakeholder engagement, we compiled case studies and recommendations for the successful, expedient, and just implementation of solar energy in Detroit. Finally, we conducted a cost-benefit analysis of the Detroit Solar Neighborhood Initiative, a city-owned solar development project that is expected to generate 55 MW of renewable energy, to offset all 127 municipally owned buildings, and improve air quality and health outcomes for residents. This report finds that solar-specific policy initiatives, extensive community engagement paired with benefits, and a focus on energy affordability for low-income communities are key indicators for effective and equitable solar energy projects.

Contents

Abstract	2
Executive Summary	5
Part 1: Review of U.S. Community Solar Initiatives	
1. Introduction	10
1.1 Current Landscape of Detroit.....	10
1.2 Michigan and Detroit’s Climate Goals.....	11
1.3 Community Solar.....	12
1.4 Types of Electric Utilities.....	14
1.5 Community Solar in Michigan	15
1.6 Community Solar in Detroit.....	17
1.7 Community Engagement.....	17
1.8 Report Overview	18
2. Michigan Community Solar Landscape	18
2.1 Clean Energy for Low Income Communities Accelerator (CELICA)	19
2.2 L’Anse Community Solar	19
2.3 Consumers Energy Solar Garden and Solar Sunrise	20
2.4 Lansing Board of Water and Light	22
2.5 SpartanSolar	23
2.6 MIGreenPower Community Impact Pilot Project.....	24
3. Case Studies	25
3.1. Case Study: Los Angeles, CA	25
3.2. Case Study: New York, NY	36
3.3. Case Study: Chicago, IL	44
Part 2: Expert Conversations	
4. Expert Engagement	51
4.1 Background	51
4.1 Engagement Approach.....	51

4.2 Results..... 52

Part 3: Discussion and Recommendations

5. Discussion..... 56

5.1 Community Solar Barriers in Michigan 56

5.2 Examining Energy Justice, Climate Change Mitigation and Energy Resiliency 57

6. Recommendations..... 64

7. Conclusion..... 66

Executive Summary

Published in 2022, Michigan's MI Healthy Climate Plan sets ambitious targets for combating climate change, aiming for a 28% reduction in greenhouse gas emissions by 2025, followed by a 52% reduction by 2030, and ultimately achieving carbon neutrality by 2050. In alignment with these statewide objectives, the City of Detroit has established its own targets through the Detroit Climate Strategy, pledging to reduce emissions by 75% by 2034 and to achieve zero emissions by 2050¹. A key component of the Detroit Climate Strategy involves the promotion and support of community solar initiatives.

Community solar projects are seen as essential not only for contributing to greenhouse gas reduction efforts but also for democratizing access to solar energy. These initiatives aim to ensure that all households and businesses, regardless of their ability to install rooftop solar panels, can benefit from solar energy. This report has been developed to provide guidance and best practices to support the City of Detroit in advancing its community solar initiatives, thereby contributing to its broader climate goals and fostering equitable access to renewable energy resources.

Part 1 of this report provides a comprehensive analysis of community solar initiatives throughout Michigan, California, Illinois, and New York and provides recommendations on best practices to improve the development of community solar in Detroit.

Part 2 of this report analyzes and consolidates feedback from multiple experts in renewable energy and/or community solar on how the City of Detroit can enhance the community solar landscape and accelerate its progress towards the goals outlined in the Detroit Climate Strategy.

Part 3 offers a discussion and synthesis of lessons learned from Parts 1 and 2 and offers recommendations to improve the implementation of community solar in Detroit.

Background

Utilities in the state of Michigan include Investor-Owned Utilities (IOUs) like DTE Energy and Consumers Energy, regulated by the Michigan Public Service Commission (MPSC); Municipal Utilities, managed by local governments, such as the 42 in Michigan that set their own rates; and Cooperative Utilities, member-owned entities like the 10 electric co-ops in the state with rates set by a governing board.

Michigan's legislative environment does not actively support community solar development, and there is no legislation mandating virtual net metering or allowing third-party ownership of community solar, presenting considerable barriers to broad adoption and access.

The Detroit Climate Strategy outlines measures to harness renewable energy and champion sustainable transportation. Despite these goals, community-led solar efforts, like the Hope Village initiative, face challenges due to state restrictions on energy transfer and the current lack of supportive policy frameworks.

1. https://library.municode.com/mi/detroit/codes/code_of_ordinances?nodeId=PAIVCOCH1--20_CH20HE_ARTXGRGAIN_S20-10-3MUGRGAEMBE

Michigan Community Solar Landscape

Overview of Community Solar Projects in Michigan

Clean Energy for Low Income Communities Accelerator (CELICA) partnerships have driven the development of inclusive community solar projects, such as the L'Anse Community Solar, focusing on aiding low-income households with energy costs and fostering ownership through active community engagement.

Financial models vary across projects, with up-front fees or monthly payments for subscriptions, resulting in long-term savings (e.g., L'Anse subscribers can save approximately \$528 over 25 years per panel). Subsidies from organizations like EGLE are crucial for enabling low-income participation.

Funding challenges persist, as highlighted by the stalled MIGreenPower Community Impact Pilot Project by DTE, which requires additional funding to move forward. However, federal initiatives like the Inflation Reduction Act may offer new avenues for funding and expansion of community solar projects in underserved areas.

Case Studies

Insights gained from case studies in Los Angeles, Chicago, and New York highlight best practices in policy frameworks and community engagement strategies that include policies at the local and state levels that incentivize renewable energy development and access, specifically for low-income residents.

Los Angeles, California

California's electricity sector is regulated by the CPUC and includes various utility models like IOUs, publicly owned utilities, cooperatives, and community choice aggregators. While the state generates most of its power internally, it also imports energy, primarily using natural gas, followed by solar and wind power. California has robust climate policies, with plans to reach net-zero emissions by 2045 and to transition to a 100% clean electric grid by the same year.

Los Angeles leads in solar PV capacity but has room to grow in community solar. State legislation has evolved over time to foster renewable energy and reduce greenhouse gas emissions, with significant laws such as the Global Warming Solutions Act, Clean Energy and Pollution Reduction Act, and the 100 Percent Clean Energy Act.

More recently, policies have been passed to enhance clean energy accessibility and jobs, promote property tax incentives for active solar energy systems, provide financial incentives for self-generation systems, and aim for one million solar installations, which was achieved by 2019.

Community solar in California has seen various iterations, with programs aimed at furthering access to renewable energy, specifically among disadvantaged and low-income communities. New policies in 2022 include the customer renewable energy subscription programs and community renewable energy program, which focus on ensuring that over half of the capacity serves low-income customers.

The NEM 3.0 tariff introduced significant changes to compensation for new solar customers and incentivized solar-plus-storage installations, while local initiatives like LADWP Solar Rooftops aim to promote rooftop solar adoption. Community solar programs by organizations like Clean Power Alliance and SCE have been implemented to offer renewable energy options and bill discounts to customers.

Chicago, Illinois

Illinois has implemented several laws to regulate utilities and promote clean energy, such as the Public Utilities Act, Electric Service Customer Choice and Rate Relief Law, Illinois Power Agency Act, Energy Infrastructure Modernization Act, Future Energy Jobs Act, and Climate and Equitable Jobs Act. These laws foster innovation, support renewable projects, and set clean energy targets.

State and local policies support solar energy adoption, like Illinois Solar Power For All and Illinois Shines programs, encouraging equitable access and providing financial incentives. Community solar projects are supported through these programs and local initiatives like the Cook County Community Solar Project and Chicago Solar Express.

Illinois is actively developing community solar, with 26 operational and 69 in development, particularly in the ComEd area. Two notable Illinois Solar Power For All projects in Chicago Heights underline the role of community solar in providing clean energy access to low-income homes, reducing GHG emissions, and benefiting from financial incentives without upfront subscriber costs.

New York City, New York

The New York Climate Leadership and Community Protection Act sets ambitious goals for reducing greenhouse gas emissions, aiming for significant reductions by 2030 and 2050, and increasing renewable electricity to 100% by 2040. New York City has also committed to clean electricity and energy storage benchmarks, in addition to upgrading aging in-city power plants.

NYSERDA plays a critical role in enhancing energy efficiency and advancing the state's clean energy goals, strengthened by state and local solar policy instruments such as the Clean Energy Standard and the introduction of NY-Sun, which supports solar industry growth. Programs like Community Solar NY, SEGs tax abatement, and PlaNYC foster renewable energy adoption and provide financial incentives to encourage solar installations, particularly in underserved communities.

The state has also established innovative community solar models such as automatic enrollment programs and inclusive policies to enable low- to moderate-income households to benefit from clean energy savings. Notable projects like Sunset Park Solar illustrate community-led renewable energy efforts, while opt-out community solar programs like the one in Brockport and Lima demonstrate public-private collaborations providing shared solar benefits to residents.

Additionally, we spoke with numerous experts in the community solar space in Michigan to learn about their vision for the clean energy transition. Several common themes emerged for how Detroit can implement solar in a way that best serves residents and helps the city achieve its equity and sustainability goals. We report ideas from the experts below.

Community Empowerment and Revitalization: Community solar projects can offer opportunities to revitalize economically distressed areas by providing access to affordable clean energy and reducing energy burden.

Environmental Sustainability and Renewable Energy Transition: Community solar projects can contribute to environmental sustainability by reducing reliance on fossil fuels, educating the community about renewable energy, and integrating ecological benefits into project design.

Equity and Social Justice: Solar projects can address disparities in access to clean energy by ensuring renters and local businesses can benefit from affordable clean energy.

Resilience and Emergency Preparedness: Solar can enhance community resilience by providing reliable energy access during emergencies, improving infrastructure to mitigate power outages, and facilitating support services during crises.

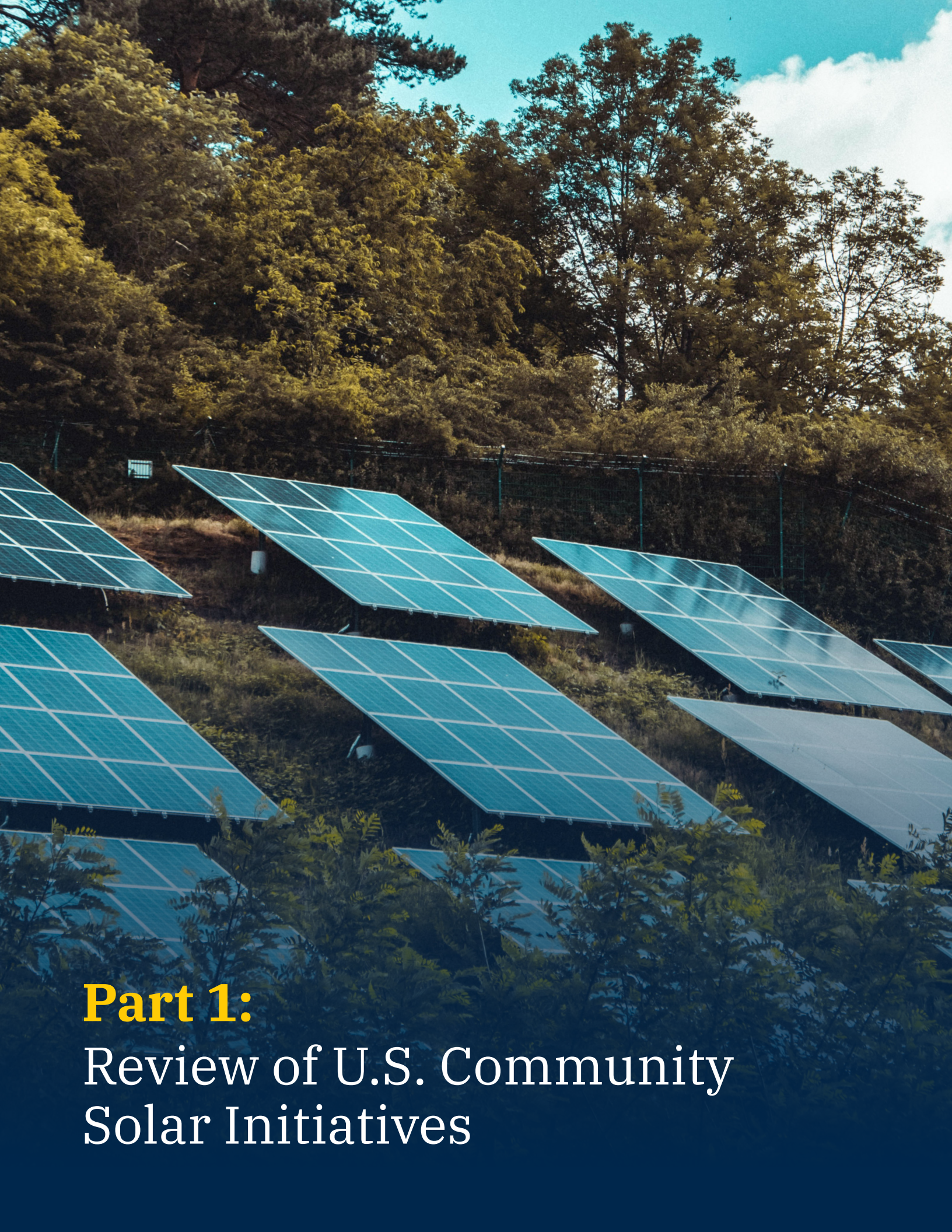
Economic Development and Job Creation: Community solar projects can stimulate economic development by creating jobs in project development, installations, and maintenance, and fostering the growth of local businesses involved in the solar supply chain.

Recommendations for Advancing Community Solar in Detroit

To facilitate the growth of community solar initiatives and achieve its Climate Strategy goals, the City of Detroit is encouraged to:

- 1. Advocate for state-level legal reforms** that diminish IOU power to set barriers to community solar, encourage distributed energy interconnection, and incentivize community solar projects, particularly for low-income households.
- 2. Explore the feasibility of establishing a Municipal Utility** or Sustainable Energy Utility to gain autonomy over energy provision. Policies should be developed at the municipal level to integrate robust community engagement, prioritize energy justice, and streamline processes for increased solar adoption.
- 3. Develop battery storage solutions** to enhance energy resilience and reliability. Specifically, Detroit should consider strategically placing storage systems on or near critical facilities.
- 4. Facilitate collaboration among stakeholders** including community members, local leaders, and solar developers to ensure effective community engagement and procedural justice in solar projects.
- 5. Implement municipal-level policies** that support the equitable development of community solar in Detroit assuming current barriers to community solar are eventually mitigated through state-level legislation, including streamlining the enrollment processes for residents and permitting for developers.

These strategic initiatives collectively underscore the City of Detroit's commitment to a sustainable energy future that is inclusive, equitable, and aligned with broader climate objectives.



Part 1:

Review of U.S. Community Solar Initiatives

1. Introduction

1.1 Current Landscape of Detroit

Detroit, located in Wayne County, Michigan, is home to a population of 636,787. The city has a notably young demographic profile, with the median age of Detroit residents being 35, which is 5 to 6 years younger than the median age of Michigan residents overall. Moreover, Detroit has a substantially higher concentration of Black residents compared to both the state and the country, with representations 64.2% and 65.1% higher, respectively.²

Detroit faces significant challenges stemming from its history of economic downturns and population decline. Between 2010 and 2020 alone, the city experienced a population decline of 10.5%, equivalent to almost 75,000 residents. This trend of population loss has persisted since the 1950s, indicating a long-standing issue.

As of January 2024, Detroit residents grapple with some of the highest electricity rates in the nation, surpassing the nationwide average by 20.2%³ and exceeding the statewide average by approximately 25% compared to 2022 rates.⁴ This is partly attributable to Detroit's extensive aging housing stock, with 62% of homes built before 1950⁵. The financial strain imposed by these high rates is compounded by elevated energy burdens, affecting 46% of households in varying degrees. These burdens disproportionately impact minority communities, with 43% of Black households and 38% of Hispanic households in the Detroit metropolitan area experiencing the most significant energy burdens⁶. This intersects with various other pressing issues, including inefficient or unsafe housing, elevated eviction rates, and adverse health outcomes, challenges often linked to historical redlining practices, which have compounded burdens on communities of color, exacerbating existing disparities in access to resources and opportunities.⁷

In Detroit, housing arrangements correlate closely with income levels. The vast majority of individuals earning \$75,000 or more per year own their homes, whereas the majority of those earning \$35,000 or less per year rent. Despite renters typically having lower incomes, rental housing tends to be less affordable. Comparing affordability between renters and homeowners, only 39% of rental housing is deemed affordable, contrasting with 72% of owner-occupied housing. Consequently, most rental properties available are either unaffordable or severely unaffordable.

Despite these challenges, Detroit is a city in transition, characterized by vibrant cultural scenes, innovative urban agriculture projects, and a growing focus on sustainability and equitable development. Ongoing efforts aim to revitalize neighborhoods through initiatives focused on rehabilitating older homes and repurposing vacant lots for community use. Moving forward, addressing

2. U.S. Bureau of Labor Statistics, 2024

3. U.S. Bureau of Labor Statistics, 2024

4. U.S. Energy Information Administration, 2022

5. <https://www.secondwavemedia.com/metromode/features/WAP.aspx#:~:text=The%20median%20metro%20Detroit%20household,which%20was%20built%20before%201950>

6. https://www.aceee.org/sites/default/files/pdfs/aceee-01_energy_burden_-_detroit.pdf

7. <https://www.sierraclub.org/press-releases/2021/08/town-hall-calls-attention-detroit-s-severe-energy-burden-inequities>

social and economic disparities and promoting inclusive growth will remain vital priorities for Detroit's continued evolution.

Given Detroit's distinctive municipal landscape, community solar emerges as a compelling opportunity with the potential to alleviate extreme energy burdens for lower-income renters.⁸ Unlike rooftop solar, community solar presents no specific barriers for renters or individuals residing in multifamily housing units. Consequently, community solar initiatives broaden solar accessibility to demographic groups traditionally underserved by conventional on-site solar models. Moreover, the role of community solar in enhancing solar access is reinforced by a growing array of federal and state policies aimed at promoting community solar adoption among low- to moderate-income (LMI) households.

1.2 Michigan and Detroit's Climate Goals

1.2.1 The MI Healthy Climate Plan 2022

Developed by the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE), the MI Healthy Climate Plan serves as the state's comprehensive action plan to reduce GHG emissions and transition toward economy-wide carbon neutrality, with a strong focus on solutions that support communities.⁹

Setting ambitious targets for mitigating greenhouse gas (GHG) emissions in the state, it positions Michigan as one of only 14 states with comprehensive economy-wide climate goals. Specifically, the plan aims to reduce GHG emissions by 28% by 2025 and 52% by 2030 (measured against 2005 levels), with the ultimate objective of achieving statewide carbon neutrality by 2050, followed by efforts to maintain net negative GHG emissions.

The Plan primarily targets sectors where the greatest and quickest reductions in greenhouse gas emissions can be achieved, namely energy, transportation, and building. It delineates seven key objectives, including mitigating climate change impacts, stimulating economic development, safeguarding public health, positioning Michigan as a climate action leader, preserving natural resources and wildlife, achieving energy independence, and addressing environmental injustices.

To attain the interim target of reducing GHG emissions by 52% by 2030, the Plan provides the Roadmap to 2030, laying out essential recommendations for equitable implementation such as pursuing a just transition, cleaning the electric grid, electrifying vehicles and increasing public transit, home and building decarbonization, clean innovation incentives, and an effort to protect the states land and water.

1.2.2 The Detroit Climate Strategy 2023

The Detroit Climate Strategy serves as an actionable guide for the City in achieving climate objectives and ensuring a thriving and healthy urban environment for all inhabitants.¹⁰ Spearheaded by the Office of Sustainability, in close collaboration with 14 City departments and offices tasked with various

8. <https://www.nrel.gov/docs/fy24osti/87524.pdf>

9. Michigan Department of Environment, Great Lakes, and Energy. MI Healthy Climate Plan: Making Michigan Carbon-Neutral and Climate Resilient. State of Michigan, 2022. https://www.michigan.gov/documents/egle/MI_Healthy_Climate_Plan_FINAL_740095_7.pdf

10. Detroit Climate Strategy. Building a Sustainable Future Together: The Detroit Climate Strategy. City of Detroit, 2020. https://detroitmi.gov/sites/detroitmi.localhost/files/2020-08/Detroit%20Climate%20Strategy%20-%20Final%20%28002%29_0.pdf

aspects of implementation, the strategy is designed to focus on tangible, short-term actions that benefit Detroiters immediately, while setting the city on a trajectory to meet its climate targets. The strategy, developed during the COVID-19 pandemic, received extensive community input over two years, involving six focus group sessions and three town hall meetings.

With a focus on practical, immediate measures, the strategy outlines specific actions to be taken by the City and its partners to intensify efforts to curb climate change, improve quality of life for Detroit residents, and pave the way for reducing municipal greenhouse gas emissions by 75% by 2034 and achieving complete decarbonization by 2050. Organized around four key strategies, each with three-year targets, the Detroit Climate Strategy strives to transition Detroit's energy sources to renewables, increase access to sustainable transportation, expedite energy efficiency initiatives, and support communities, particularly the most vulnerable residents, in adapting to a changing climate.

1.3 Community Solar

The City of Detroit views clean energy, including renewables generated from solar and wind, as critical to meeting the City's greenhouse gas reduction goals, improving air quality, and lowering energy costs for residents and businesses in Detroit. In the Detroit Climate Strategy, the City describes its goal of sourcing 50% of Detroit's electricity from clean energy. To achieve this goal, the City has a three-year target to "support community solar efforts".¹¹ Community solar is becoming an increasingly popular strategy to allow all households and businesses to access the benefits of solar energy, regardless of whether they are able to install solar panels on their rooftops. NREL estimates that nearly 50% of all households and businesses are unable to host rooftop solar systems, primarily due to lack of building ownership (i.e. renting) or not having appropriate rooftop conditions, including size, tilt, and shading.¹²With this in mind, community solar can connect these households and businesses to renewable energy that they otherwise would not be able to access.¹³

According to the U.S. Department of Energy, community solar can offer numerous benefits to surrounding communities. In addition to helping cities achieve greenhouse gas reduction goals, community solar initiatives can reduce household energy expenditures, increase renewable energy access for those who would otherwise not have access, improve community resilience during blackouts or other weather events, and create local jobs.¹⁴ Community solar also has the potential to offer significant benefits to LMI residents who face substantial financial barriers to installing rooftop panels.¹⁵

Community solar has significant momentum across the country, as cities and states are excited by the potential benefits community solar initiatives can offer their residents. Currently, 43 states and the District of Columbia have at least one community solar project, and 22 states and DC have passed enabling legislation for community solar. While the state of Michigan does have several active community solar projects, it does not have enabling legislation to encourage or mandate community solar initiatives in the state.¹⁶

11. <https://detroitclimatestrategy.com/1transitioning/>

12. <https://maps.nrel.gov/slope/stories/nm#:~:text=As%20nearly%2050%25%20of%20households,energy%20for%20the%20first%20time>

13. <https://www.energy.gov/eere/solar/community-solar-basics>

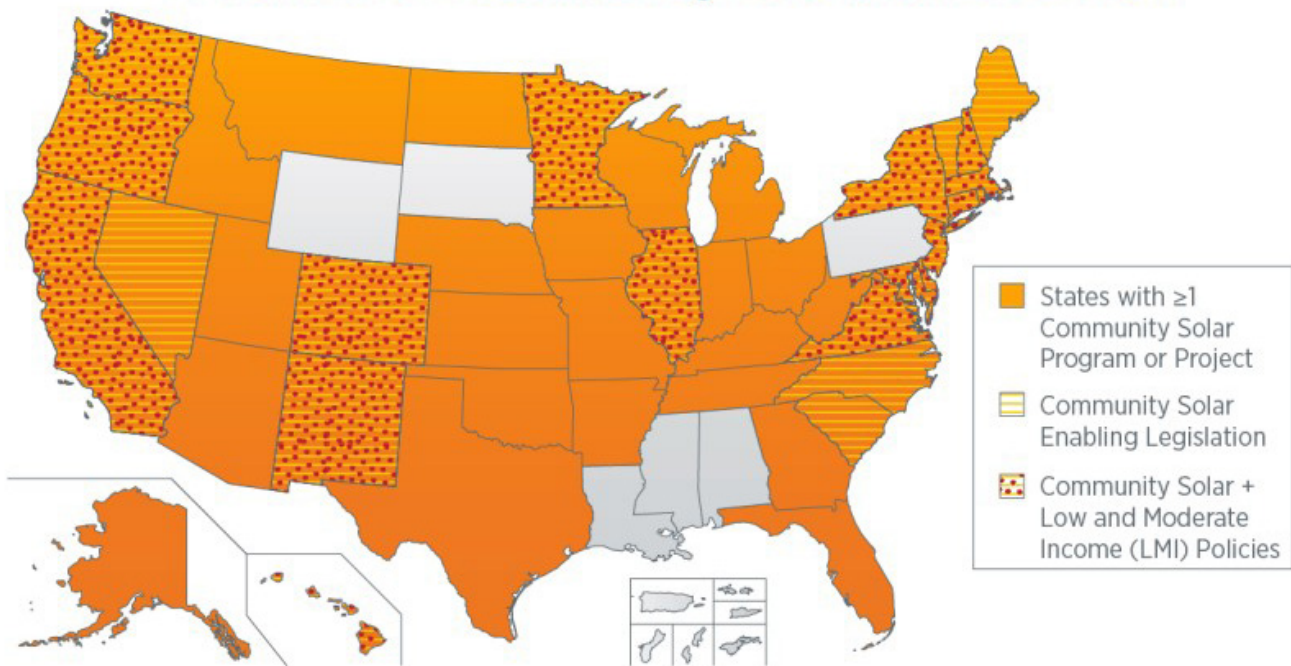
14. <https://www.energy.gov/eere/solar/community-solar-basics>

15. <https://www.epa.gov/statelocalenergy/community-shared-solar>

16. <https://www.energy.gov/eere/solar/community-solar-basics>

Figure 1. Community solar across the country. Source: <https://www.energy.gov/eere/solar/community-solar-basics>

Where is community solar available?



For the purposes of this report, we employ the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE) definition of community solar:

“Community Shared Solar refers to a solar-electric system which provides power and/or financial benefits to subscribing members of a community. Subscribers receive credits on their electric bills for their portion of the energy generated by their allotted panels. These panels are located in an array off-site, meaning they are not physically on the subscriber's home or business. In this case, 'community' is flexibly defined. It can be defined by location or merely a group of people who are connected via their electric utility.”¹⁷

EGLE’s definition of community solar was chosen in alignment with the recipients of this report, the City of Detroit Office of Sustainability. While the U.S. Department of Energy (DOE)¹⁸ and National Renewable Energy Laboratory (NREL)¹⁹ issue similar definitions, EGLE’s definition was chosen due to the specificity of this report to Michigan.

As indicated in EGLE’s statement, this definition of community solar is highly flexible, as is the definition of “community”. Under this definition, a group of subscribers is enough to label a solar project as community solar. Although microgrids are commonly considered a necessary aspect of

17. MI Solar Communities. <https://www.michigan.gov/egle/about/organization/materials-management/energy/renewable-energy/mi-solar-communities>. Accessed 21 Feb. 2024.

18. “Community Solar.” Energy.Gov, <https://www.energy.gov/communitysolar/community-solar>. Accessed 24 Mar. 2024.

19. Community Solar. <https://www.nrel.gov/state-local-tribal/community-solar.html>. Accessed 24 Mar. 2024.

community solar, this is a popular misconception. Community solar in practice more commonly refers to subscriptions to large solar arrays owned and managed the utility. Furthermore, this loose definition of community solar, and its wide-scale use by energy utilities has been considered “community washing” by some authors.²⁰ Community washing is defined as a “feel-good wrapper, employed inconsistently, largely for PR,” when a company promotes its sense of community, but the relationship between the energy provider and its customers is disempowering, exploitative, and unbeneficial to the community.²¹ Moreover, the determination whether a subscription-based solar project is truly community solar if the utility rather than the community owns the infrastructure is up for debate. Critics argue that this loose version of community solar denies communities the financial advantages of owning solar and instead solely benefits the energy utility.²² While acknowledging this debate, we have found no examples of community-owned solar in Michigan; rather, in each example explained in the report, the electric utility owns the solar array for which customers (the community) can subscribe to.

Therefore, we utilize EGLE’s definition of community solar, but also introduce the concept of community-driven community solar (CDCS). These are community solar projects that are “intended to provide a more direct and tangible connection and benefits to the communities in which they operate. These benefits can include community ownership or wealth-building, meaningful project involvement and engagement from community members, nonprofit organizations, or public entities, and more.”²³

1.4 Types of Electric Utilities

Three types of electric utility companies are prevalent in this report. The definitions below provide necessary context for understanding the community solar landscape in Michigan.

1.4.1 Investor-Owned Utility:

An energy utility that provides energy to customers for a profit, in service ultimately to its shareholders.²⁴ IOUs issue stock owned by shareholders.²⁵ As stipulated, by Act 3 of 1939 Section 406.6, rates and service are regulated by the Michigan Public Service Commission (MPSC).²⁶ The two largest IOUs in Michigan are DTE, the main service provider for southeast Michigan and Detroit, and Consumer’s Energy, the main service provider for northwest Michigan.²⁷

20. Ptak, Thomas, et al. “Rethinking Community: Analyzing the Landscape of Community Solar through the Community-Place Nexus.” *The Electricity Journal*, vol. 31, no. 10, Dec. 2018, pp. 46–51. *ScienceDirect*, <https://doi.org/10.1016/j.tej.2018.11.006>.

21. Adjovu, Charles. “Thoughts on ‘Is “Community-Washing” the New Greenwashing?’” *Ledgerback Digital Commons Research Cooperative Blog*, 29 Mar. 2021, <https://medium.com/ledgerback-blog/thoughts-on-is-community-washing-the-new-greenwashing-5c7a9b5cb773>.

22. Perkins, Tom. “Is It Community Solar If the Utility — Not Community — Owns the Panels?” *Energy News Network*, 29 June 2021, <http://energynews.us/2021/06/29/is-it-community-solar-if-the-utility-not-community-owns-the-panels/>

23. *Exploring Solar – Illinois Shines*. <https://illinoisshines.com/exploring-solar/>. Accessed 26 Mar. 2024.

24. *A People’s History of Utilities*. The Energy Democracy Project, <https://emeraldcities.org/wp-content/uploads/2021/11/FINAL-Peoples-History-of-Utilities-1.pdf>.

25. *Investor-Owned Utilities Served 72% of U.S. Electricity Customers in 2017 - U.S. Energy Information Administration (EIA)*. <https://www.eia.gov/todayinenergy/detail.php?id=40913>. Accessed 24 Mar. 2024.

26. *Michigan Public Service Commission Act 3 of 1939*. Michigan Public Service Commission.

27. Michigan Electric and Gas Association. *Basic Energy Regulation in Michigan*. Michigan House of Representatives, <https://www.house.mi.gov/SessionDocs/2011-2012/Testimony/Committee6-1-25-2011-3.pdf>.

1.4.2 Municipal Utility:

An energy utility that is managed by the local government. Municipal utilities bill customers for electricity similarly to IOUs and use customer revenues to pay for power lines and power plants, purchase electricity from other utilities, and operate and maintain utility systems. However, unlike IOUs, municipal utilities do not generate profit for private investors. Instead, net revenue is either reinvested in the municipal utility or in other public services at the local level. There are 42 municipal utilities in Michigan. Their rates are regulated by the local government and not the MPSC.²⁸

1.4.3 Cooperative Utility:

An electric utility that is owned by its customers and members as opposed to an IOU owned by shareholders.²⁹ Cooperatives (co-ops) originated in the 1930s when “grassroots networks of rural people formed the co-ops with financing from the federal government.”³⁰ IOUs did not have the incentive to build infrastructure over vast rural areas due to the high upfront costs and low population density; therefore, localities were left to finance and build electricity infrastructure themselves through co-ops.³¹ Co-ops “were first formed by residents of rural communities where power companies refused to provide service. Most cooperatives remain highly localized, though the board determines the actual service area.”³² Revenues are “returned to members in the form of capital credits in years when the co-op has profit above the actual cost of providing service and maintenance of the system for future reliability.”³³ There are 10 electric distribution cooperatives in Michigan. Cooperatives are owned by their members who elect rate regulation through a governing board instead of the MPSC.³⁴

1.5 Community Solar in Michigan

Michigan legislation does not prohibit community solar; rather, it does not encourage or enable it. Michigan “lacks a policy framework that makes community solar broadly feasible, especially for customers of investor-owned utilities. Therefore, many customers in Michigan, including those of utilities like DTE and Consumers Energy, don’t have access to locally driven, locally sited community solar projects.”³⁵ It is each energy utility’s decision to allow community solar in its service area. There are three main barriers to community solar in Michigan: bill credits, virtual net metering, and third-party ownership of community solar:

28. n(8), Michigan Electric and Gas Association

29. “Electric Co-Op and Utility: What’s the Difference?” *CNET*, <https://www.cnet.com/home/energy-and-utilities/whats-the-difference-between-an-electric-co-op-and-a-utility/>. Accessed 24 Mar. 2024.

30. n(7), A People’s History of Utilities

31. Hayes, Jason. “Electricity Cooperatives.” *Mackinac Center*, <https://www.mackinac.org/28583>. Accessed 21 Feb. 2024.

32. “Key Facts About Utility Cooperatives.” *NCBA CLUSA*, <https://ncbaclusa.coop/resources/co-op-sectors/utility-co-ops/>. Accessed 24 Mar. 2024.

33. Lines, Country. “Co-Ops Are Different.” *Michigan Country Lines Magazine*, 1 Apr. 2013, <https://www.countrylines.com/comment/co-ops-are-different/>.

34. n(8), Michigan Electric and Gas Association

35. Sherman, Laura. “Michigan Bill May Unlock Community Solar and Your State Should Follow Suit.” *POWERGRID International*, 12 May 2021, <https://www.power-grid.com/executive-insight/michigan-bill-may-unlock-community-solar-and-your-state-should-follow-suit/>.

*“Currently, Michigan lacks any legislation allowing for the creation and financing of community solar, which has severely hindered its adoption in the state. Community solar legislation usually establishes virtual net metering and interconnection requirements to provide a community solar market. Virtual net metering is the same as net metering but applies to energy generation that is not on-site, such as community solar arrays. Utilities in Michigan are not currently required to approve community solar projects and are not obligated to provide virtual net metering agreements.”*³⁶

1.5.1 Bill Credits

Under Michigan law, energy utilities are not required to provide bill credits to customers who subscribe to community solar arrays.³⁷ In fact, some utilities charge more per kilowatt-hour (kwh) for a renewable energy subscription, a concept called “green power pricing.”³⁸

1.5.2 Virtual Net Metering

Virtual net metering is a “solar incentive system that allows community solar subscribers to benefit from net metering” and “awards credits for energy produced by solar panels, and those credits translate to discounts on electricity costs.” Virtual net metering differs from net metering by allowing “community solar customers to reap the benefits of net metering even though they do not own a solar system” by offering “weighted credits determined by portion of the solar array.”³⁹ Energy utilities in Michigan are not required to provide virtual net metering.⁴⁰

1.5.3 Third Party Ownership

Only utilities can start community solar projects in Michigan.⁴¹ Unless the utility agrees to develop a community solar project, there is no way for customers to receive credits from solar energy unless they install solar panels on their privately-owned property. Few utilities have voluntarily agreed to “community leadership, the option of third-party ownership and local siting.”⁴²

While many new energy laws were passed in Fall 2023, the bills on community solar (Senate Bills 152 and 153 and House Bills 4464 and 4465) failed to become law and remains a point of tension in the Michigan legislature.⁴³

36. Gonzalez, John. *Renewable Energy Policy in Michigan*. University of Michigan, July 2021, https://erb.umich.edu/wp-content/uploads/2021/08/ERB-155-MBSR-Policy-Memo_v2.pdf

37. Ignaczak, Nina. “Michigan Legislators Introduce Bipartisan Bill Package to Enable Community Solar.” *Planet Detroit*, 9 Mar. 2023, <https://planetdetroit.org/2023/03/michigan-legislators-launch-bipartisan-bill-package-to-enable-community-solar/>.

38. *Voluntary Green Pricing Programs*. <https://www.michigan.gov/mpsc/consumer/electricity/voluntary-green-pricing-programs>. Accessed 21 Feb. 2024.

39. “Virtual Net Metering: What Is It? How Does It Work?” *EnergySage*, 27 Oct. 2022, <https://www.energysage.com/community-solar/virtual-net-metering-what-is-it-how-does-it-work/>.

40. *Michigan’s Distributed Generation Program*. Michigan Public Service Commission, Jan. 2020, https://www.michigan.gov/-/media/Project/Websites/mpsc/consumer/info/tips/Net_Metering.pdf?rev=178e8e0e69ab4bc19cc3d359c3b540e1.

41. Abraham, Aurora. “Communities or Utilities: Michigan Bills Delve into Who Should Be Able to Start a Solar Project.” *Midland Daily News*, 9 July 2021, <https://www.ourmidland.com/insider/article/Communities-or-utilities-Michigan-bills-delve-16302096.php>

42. n (18), Sherman

43. Roberts, David. *Michigan Targets Clean Electricity and Faster Permitting*. 15 Mar. 2024, <https://www.volts.wtf/p/michigan-targets-clean-electricity>.

1.6 Community Solar in Detroit

It is clear from the Detroit Climate Strategy that the City of Detroit has committed to transitioning to clean energy and powering Detroit with solar, yet city-backed community solar projects have yet to take off. The Detroit Climate Strategy incorporates a goal to work with utility providers and private property owners to source 50% of Detroit’s electricity from clean energy, while supporting community solar efforts.⁴⁴ This goal reflects the established interest in driving community solar developments by local groups in Detroit, some currently being implemented.

Hope Village, a neighborhood in Detroit, is embracing community-owned solar initiatives led by HOPE Village Revitalization, aiming to combat rising energy costs and frequent power outages. Despite challenges, such as state restrictions on energy transfer and feasibility concerns, the organization is persisting, collaborating with local nonprofits and legal firms to devise a path to overcoming these barriers. A potential approach is to develop a community land trust structure, financing solar arrays on low-income apartment buildings through a limited liability company (LLC). Once installed, the power is intended to be sold at a fixed price to residents, reducing reliance on the grid and enhancing community resilience.⁴⁵

Projects like HOPE Village Revitalization can inspire similar efforts city-wide, recognizing the broader need for regulatory and legislative reforms and support of non-utility-owned community solar initiatives. Many other groups exist throughout Detroit who have made substantial efforts towards the prioritization of community solar development through pilot projects and solar innovation.

1.7 Community Engagement

Inclusive and authentic community engagement includes practices in which community members define and drive the outcomes of the decision-making process to ensure that project benefits accrue to the community.⁴⁶ Community engagement is crucial for community solar projects for several reasons including the obtainment of local support and buy-in, addressing community needs, and building investment in the success of the project.

Although not a community solar project, O’Shea Solar Park demonstrates the importance of early and intentional community engagement. The decommissioned O’Shea Park Community Center represented one of the last institutional establishments in the area and had been a community hub for generations. With hopes that it could be restored, residents of the area were displeased when it was developed by DTE in partnership with the City to install a 2.44 MW solar array that would not distribute energy or financial benefits directly to the neighborhood.

Community notification occurred only after the project proposal and agreements were already in motion, leading to discontent among residents.⁴⁷ Community members expressed that the project fell

44. Office of Sustainability. *Addressing Climate Change in Detroit*. 2023, chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/<https://detroitmi.gov/sites/detroitmi.localhost/files/2023-11/Detroit%20Climate%20Strategy.pdf>

45. DOE. *Moment in the Sun: HOPE Village Revitalization*. October 1, 2021, <https://www.energy.gov/communitysolar/articles/moment-sun-hope-village-revitalization>

46. DOE. *Community Solar Best Practices Guide: Developing Projects with Meaningful Benefits*. <https://www.energy.gov/communitysolar/community-solar-best-practices-guide-developing-projects-meaningful-benefits>

47. Blankenship, Dana. “Detroit Re-opening of O’Shea Park and Solar Park.” DTE Energy, 2019.

short in addressing their specific needs and priorities for revitalizing the O'Shea site. They perceived the project as lacking genuine intentions, as they believed that installing solar panels did not align with their community needs had they been consulted on the site's revitalization.⁴⁸ Therefore, engaging residents meaningfully at the onset of discussions about the site would have better served their interests and significantly enhanced the project's success in achieving its stated goals. In response to the affected Grandale neighborhood not being responsive to this plan, the City and DTE held public meetings to identify community priorities for the solar project.⁴⁹

1.8 Report Overview

This report is tailored for the City of Detroit, offering guidance for community solar development. By leveraging the lessons gleaned from other urban centers and receiving insights with local experts, it charts a course for successful implementation and enduring sustainability.

This report provides an in-depth examination of the Michigan community solar landscape, highlighting existing projects and their associated benefits. Likewise, drawing on case studies from cities leading in community solar, Los Angeles, Chicago, and New York, this report explores the legal frameworks and policy instruments that have facilitated successful community solar initiatives in these cities. Individual highlighted projects offer insights into best practices and lessons learned, providing valuable guidance for Detroit's own community solar development efforts.

In addition, this report presents findings from an expert survey conducted with community solar advocates, facilitating the exchange of ideas, desired benefits, and concerns related to potential future projects. By incorporating diverse perspectives and input from stakeholders, this report aims to ensure that community solar initiatives in Detroit are inclusive, equitable, and responsive to the needs of the community.

Based on these insights, the report concludes with recommendations for advancing community solar projects in Detroit, encompassing policy measures, stakeholder engagement strategies, and implementation guidelines. By leveraging lessons learned from other regions and engaging with local stakeholders, Detroit can harness the full potential of community solar to drive sustainable development and enhance the quality of life for its residents.

2. Michigan Community Solar Landscape

The following section provides an overview of five community solar projects in Michigan. Each project is described with examples from each of the three types of utilities: investor-owned utilities (IOUs), municipal utilities, and co-op utilities. Benefits and community engagement for each project are highlighted.

48. Guillen, Joe. "DTE plans 10-acre Solar Array in Detroit". *Detroit Free Press*, 2016. <https://www.freep.com/story/news/local/michigan/detroit/2016/03/27/dte-plans-10-acre-solar-array-detroit/82251592/>

49. Guillen, Joe. "DTE plans 10-acre Solar Array in Detroit". *Detroit Free Press*, 2016. <https://www.freep.com/story/news/local/michigan/detroit/2016/03/27/dte-plans-10-acre-solar-array-detroit/82251592/>

2.1 Clean Energy for Low Income Communities Accelerator (CELICA)

Several of the community solar programs in Michigan originated from or were expanded by the United States Department of Energy (DOE) Clean Energy for Low Income Communities Accelerator (CELICA). CELICA is a “voluntary partnership between the U.S. Department of Energy (DOE) and state and local governments to lower energy bills for low-income communities.”⁵⁰ Through CELICA, household weatherization efforts, such as installation of weatherstripping, new windows, or insulation, were combined with community solar projects to lower energy costs for low-income communities.⁵¹ CELICA was a major financial contributor to both the L’Anse and Consumer Energy Solar Garden projects described below. For both projects, CELICA partnered with Michigan’s Department of Environment, Great Lakes, and Energy (EGLE), a local community action agency (CAA), and the electric utility.⁵²

2.2 L’Anse Community Solar

In this section, we highlight two solar projects in L’Anse, a village of 1900 people, located in the upper peninsula of the state.⁵³ The first project is not an example of community solar but provides context for the community desire for a second solar project on community solar. L’Anse has its own municipal energy utility run by the city government.⁵⁴

The first solar project in L’Anse started with an economic development study developed by the Western Upper Peninsula Planning and Development Region. Based on that study, L’Anse decided it would be “advantageous to have a renewable energy component as part of its industrial park.”⁵⁵ As a pilot project, WPPI Energy, a member-owned, not-for-profit energy wholesale power provider, funded a grant for a 11.4 kW solar array completed in 2016.⁵⁶ All of the solar energy generated from the array is used to power the energy intensive water treatment plant.⁵⁷

2.2.1 Community Engagement

With the success of the first solar project at the Industrial Park, L’Anse began exploring a community solar-specific option in 2018 and partnered with Michigan Tech University to conduct social and technical feasibility studies for a new solar array. A team of Michigan Tech students conducted door-to-door canvassing efforts to gather input from community members on the proposed community

50. Adamsson, Anna. *Partnering to Reduce Energy Burden: A Michigan Community Solar and Weatherization Pilot*. Clean Energy States Alliance, June 2023, <https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/MMD/Energy/presentation/Michigan-Case-Study.pdf?rev=46dabd5d2be54a65832c6f43d87d5330&hash=BF4945C8FF7BDBF96155E00C350EBD70>.

51. Davidson, Kyle. “Here’s How Pilot Programs Aimed at Cutting Energy Costs in Low-Income Mich. Households Are Faring Michigan Advance.” *Michigan Advance*, 15 July 2023, <https://michiganadvance.com/2023/07/15/heres-how-pilot-programs-aimed-at-cutting-energy-costs-in-low-income-mich-households-are-faring/>.

52. Adamsson n(1)

53. *Explore Census Data*. https://data.census.gov/profile/L'Anse_village_Michigan?g=160XX00US2645540. Accessed 6 Apr. 2024.

54. *Lansemi*. <https://www.villageoflanse.org/services/utilities.php>. Accessed 21 Feb. 2024

55. Christensen, Kelley. “Solar for the People.” *Michigan Technological University*, 3 Mar. 2020, <https://www.mtu.edu/news/2020/03/solar-for-the-people.html>

56. “About Us.” *WPPI Energy*, <https://wppienergy.org/about-us/>. Accessed 21 Feb. 2024.

57. Christensen n(5)

solar project. Surveys and community meetings were used as supplementary methods to facilitate meaningful community engagement. Overall, public input shaped key aspects of the community solar project including bill financing, price points, and the size of the solar array.⁵⁸ The model community engagement efforts resulted in a grassroots program where residents felt “real ownership of the process.”⁵⁹ In 2019, the community decided on a 450-panel, 110.5-kilowatt community solar array built at the Lambert Road Industrial Park.⁶⁰

Due to the robust community engagement program and partnership with Michigan Tech, EGLE reached out with interest in supporting the project. To carry the work forward, EGLE partnered with Baraga-Houghton-Keweenaw Community Action Agency. Prior to partnering with EGLE, L’Anse decided to include a low-income program based on results from their community engagement efforts. To meet CELICA requirements, only households with recently completed weatherization efforts were eligible for the community solar project specific to LMI households. Subscribers could buy shares of panels from the solar array, a key difference from the first solar array at the water treatment plant built in 2016. Of the 450 panels, 250 (55%) were reserved for LMI subscribers, while other organizations and individuals could purchase shares of the community solar array to receive credits on their electricity bills over the next 25 years. EGLE subsidized the subscription fee to make the program affordable for LMI customers. Thus, instead of paying an upfront cost, LMI subscribers committed to a low monthly fee for half the life of the subscription. Without subsidies from EGLE, the LMI model for community solar would not have been successful at substantially lowering costs for LMI households.⁶¹

2.2.2 Benefits

For non-low-income households, subscribers pay an upfront, \$385 fee per panel and receive an average credit of \$2.80-\$3.30 on their electricity bills per month.⁶² This model of “on-bill financing” is a key practice aligned with energy justice principles.⁶³ On-bill financing refers to both costs and credits present on the same bill. Overall, the net long-term savings of a subscription to the community solar array is appropriately \$528 per panel over 25 years.⁶⁴ For LMI households, subscribers receive about \$275 in bill credits each year. LMI subscribers do not experience any costs associated with subscription to the program, as the bill credits exceed the monthly subscription costs. This community solar program has allowed LMI customers to keep up with their electricity bills and avoid delinquency and shutoffs by providing significant savings.⁶⁵

2.3 Consumers Energy Solar Garden and Solar Sunrise

Consumers Energy, the largest Investor-Owned Utility (IOU) in Michigan, also has a community solar subscription program, Solar Garden, with a separate LMI household subscription incentive program

58. Christensen n(5)

59. Foley, Liz. “Village of L’Anse: Making Solar Accessible to All.” *WPPI Energy*, 5 Oct. 2022, <https://wppienergy.org/village-of-lanse-making-solar-accessible-to-all/>

60. Christensen n(5)

61. Adamsson n(1)

62. Foley n(9)

63. DenHerder-Thomas, Timothy, and Jonathan Welle. *Equitable Community Solar: Policy and Program Guidance for Community Solar Programs That Promote Racial and Economic Equity*. Institute for Local Self-Reliance, Feb. 2020, <https://ilsr.org/wp-content/uploads/2020/02/Equitable-Community-Solar-Report.pdf>.

64. Foley n(9)

65. Adamsson n(1)

named Solar Sunrise. Like the L’Anse example, Consumers Energy had already developed a community solar program, the Solar Gardens-Sunrise program, before partnering with EGLE.⁶⁶ In partnership with EGLE, Consumers Energy established an LMI subscription program, the Sunrise Program, as an offshoot of the original program.⁶⁷ Consumers Energy owns community solar garden sites at Grand Valley State University, a 17-acre site containing 11,200 solar panels, Cadillac, a 2.77-acre site containing 1,752 solar panels, and Western Michigan University, an 8.5-acre site containing 3,900 solar panels.⁶⁸

2.3.1 Community Engagement

Compared to the L’Anse project, very little community engagement was facilitated for the Consumers Energy Solar Garden/Solar Sunrise project. In this case, Capital Area Community Services (CACS), a non-profit organization working towards eliminating poverty in the Lansing area, was chosen as the project’s CAA per CELICA requirements.⁶⁹ CACS served as the first point of contact for potential participants in the program and conducted outreach to every household who applied and qualified for weatherization services. CACS explained the program, gave potential participants an informational sheet, and shared any additional information that Consumers Energy developed for their Sunrise Program.⁷⁰

2.3.2 Benefits

Both residents and businesses are invited to participate in the Solar Garden program. Interested customers can buy a subscription to Consumers Energy’s Solar Garden for \$9 a month for half of a kilowatt of solar generation.⁷¹ However, this \$9 a month fee for solar energy costs more than Consumers Energy’s typical energy mix, which is primarily a combination of natural gas and coal,⁷² as each half a kilowatt block costs the subscriber \$9 a month but provides only a \$4 rebate (07.5 cents per kwh). 10 to 12 blocks are estimated as necessary to offset household energy usage according to Consumers Energy.⁷³ Paying a premium on renewable energy is called a “green power pricing program,” a concept offered by many IOUs nationally.⁷⁴

The Solar Sunrise program is only open to low-moderate income households. Non-profit organizations that serve low-income residential customers or schools are also eligible but must

66. *Solar Gardens | Consumers Energy*. <https://www.consumersenergy.com/residential/renewable-energy/solar-gardens>. Accessed 21 Feb. 2024.

67. Adamsson n(1)

68. *Solar Gardens Project Locations | Consumers Energy*. <https://www.consumersenergy.com/residential/renewable-energy/solar-gardens/locations#gvsu-solar-garden>. Accessed 21 Feb. 2024.

69. “About Us.” Capital Area Community Services - CACS, <https://cacs-inc.org/about-us/>. Accessed 21 Feb. 2024.

70. Adamsson n(1)

71. *Solar Gardens | Consumers Energy*. https://www.consumersenergy.com/residential/renewable-energy/solar-gardens?utm_source=solargardens&utm_medium=redirect&utm_campaign=solargardens&utm_content=solargardens. Accessed 21 Feb. 2024.

72. *Electric Generation | Consumers Energy*. <https://www.consumersenergy.com/company/electric-generation>. Accessed 21 Feb. 2024.

73. “I Bought a Half-Kilowatt of Solar Energy for \$9 in under 10 Minutes. And You Can Too.” *CNET*, <https://www.cnet.com/home/energy-and-utilities/i-bought-a-half-kilowatt-of-solar-energy-for-9-in-under-10-minutes/>. Accessed 21 Feb. 2024.

74. *Voluntary Green Pricing Programs*. <https://www.michigan.gov/mpsc/consumer/electricity/voluntary-green-pricing-programs>. Accessed 21 Feb. 2024.

secure funding through fundraising efforts or grants.⁷⁵ Under this program, customers are eligible for a three-year subscription with no subscription fee. LMI subscribers are expected to save up to \$200 per year on electricity bills.⁷⁶ The program also requires extensive and lengthy new weatherization to maximize electricity bill savings. EGLE completely covers the subscription costs for all participants in the Solar Sunrise Program.⁷⁷ This program would not have been economically possible without the \$200,000 contribution by EGLE provided to CACS to cover subscription costs from Consumers Energy Solar Garden.

2.4 Lansing Board of Water and Light

Electricity customers in Lansing are served by a municipal electric utility, the Lansing Board of Water and Light. The East Lansing Solar Park project, a 1-acre, 1,000 solar panel array producing 430,000 kWh of energy annually, was primarily driven by a local non-profit organization, Michigan Energy Options (MEO), which partnered with the Lansing Board of Water and Light, the City of Lansing, and Pivot Energy, a national solar provider, to facilitate the project.⁷⁸ MEO is the first non-profit organization in Michigan to build, own, and manage a large solar array.⁷⁹ In this particular site, the solar array was built on top of a retired landfill at Burcham Park and finished in 2019.⁸⁰

The Lansing Board of Water and Light owns two additional solar arrays, the 824-panel Cedar Street Solar Array and 50 panels on REO Town Headquarters rooftops. The municipal utility also contracts to purchase solar energy from Delta Solar, the largest solar array in Michigan and Assembly Solar, an array in Shiawassee County.⁸¹

2.4.1 Community Engagement

Like L'Anse, the East Lansing Solar Park project engaged in significant community outreach efforts. A key similarity between the two projects is the establishment of partnerships with neighboring universities to help facilitate community engagement efforts. For the East Lansing Solar Park project, Michigan State University's extension program partnered with MEO to conduct community outreach and engagement. Like L'Anse, community engagement was facilitated before the start of the project to give community members a voice throughout the process.⁸²

2.4.2 Benefits

Interested customers could buy a 25-year subscription to the East Lansing Solar Park's solar panels

75. *Solar Gardens Sunrise* | Consumers Energy. <https://www.consumersenergy.com/business/renewable-energy/solar-gardens/sunrise>. Accessed 21 Feb. 2024.

76. Clinkscales, Sarah. "Community Solar Program Funded by EGLE Will Lower Energy Bills for 25 Families." *Capital Area Community Services - CACS*, 28 June 2021, <https://cacs-inc.org/2021/06/28/community-solar-program-funded-by-egle-will-lower-energy-bills-for-25-lansing-area-families/>.

77. Adamsson n(1)

78. Schapp, Brian. *Brownfield Developments: East Lansing Community Solar*. University of Michigan, Apr. 2020, <https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/MMD/Energy/communities/Case-Study/brownfield-solar-ELansing.pdf?rev=87bd388b1ee54e719e367a1b6a1f9077>.

79. Bandyk, Matt. "Michigan Energy Innovators Gala - Awards and Solar Bills Signed Into Law » MIEIBC." *MIEIBC*, 18 Nov. 2019, <https://mieibc.org/michigan-energy-innovators-gala-awards-and-solar-bills-signed-into-law/>.

80. Schaap, Brian, et al. *Accelerating Solar Development on Michigan Brownfields: Challenges and Pathways Forward*. University of Michigan, 2019, <https://graham.umich.edu/media/files/dow/Dow-Masters-2019-Brownfields.pdf>

81. "Renewable Energy." Lbwl.Com, <https://www.lbwl.com/about-bwl/renewable-energy>. Accessed 21 Feb. 2024.

82. Schaap n(30)

for \$400 per panel. Subscribers are expected to receive approximately \$650 in electricity bill savings over the 25-year subscription.⁸³ All panels are currently accounted for by 144 customers.⁸⁴ Unlike previous examples, the Lansing Board of Water and Light does not offer an LMI household specific program, and no subsidies are involved in this project.

2.5 SpartanSolar

SpartanSolar is a community solar partnership with several of Michigan’s cooperative utilities including Cherryland Electric, Great Lakes Energy, Tri-County Electric Cooperative, Midwest Energy and Communications, and Presque Isle Electric & Gas.⁸⁵ Wolverine Power Supply Cooperative supplies wholesale electricity to all five of the cooperative utilities participating in SpartanSolar.⁸⁶ Therefore, these coop utilities share a grid which allows for the community solar partnership and energy distribution under SpartanSolar. The organization of several co-op utilities managed by one membership-based community solar organization, SpartanSolar, eliminates common barriers to community solar for small, rural coop utilities such as high upfront costs and insufficient numbers of subscribers. Electricity customers under the partnering co-ops can subscribe to solar energy generated by utility-scale community solar panel arrays through SpartanSolar. Each member co-op advertises this community solar subscription program on their website.^{87 88 89 90 91} SpartanSolar community solar arrays are in Cadillac and Cassopolis, Michigan.⁹²

2.5.1 Community Engagement

Community engagement efforts are not relevant to this case study due to the structure of the membership-based organization, SpartanSolar. SpartanSolar provides community solar to many communities in northwest Michigan.

2.5.2 Benefits

Customers of the member co-op utilities can subscribe to SpartanSolar’s solar arrays for a \$600, one-time payment or a \$10 monthly payment per panel over 5 years. Electricity credits can be expected for 15 years with savings of \$40 per panel per year. There are no LMI specific programs offered by SpartanSolar.⁹³

83. Schaap n(30)

84. “East Lansing Solar Park Becomes Operational.” *Lbwl.Com*, <https://www.lbwl.com/community/newsroom/2019-01-25-east-lansing-solar-park-becomes-operational>. Accessed 21 Feb. 2024.

85. Spartan_Solar. “Home.” *SpartanSolar*, <https://www.spartansolar.com/>. Accessed 21 Feb. 2024.

86. Hayes, Jason. “Electricity Cooperatives.” *Mackinac Center*, <https://www.mackinac.org/28583>. Accessed 21 Feb. 2024.

87. Cherryland. “Renewable Energy Programs.” *Cherryland Electric Co-Op*, <https://cherrylandelectric.coop/renewable-energy-programs/>. Accessed 21 Feb. 2024.

88. “Renewable Energy and Great Lakes Energy Electric Cooperative.” *Great Lakes Energy*, <https://www.gtlakes.com/renewable-energy/>. Accessed 21 Feb. 2024.

89. “Renewable Energy Programs.” HomeWorks Tri-County Electric Cooperative, 2 Apr. 2020, <https://www.homeworks.org/210-2/electric-home/member-services/renewable-energy-programs/>.

90. Price, Taed. “Our Power - Presque Isle Electric & Gas Co-Op & Wolverine Power Co-Op.” *Presque Isle Electric & Gas Co-Op*, <https://pieg.com/our-power/>. Accessed 21 Feb. 2024.

91. *SpartanSolar-MEC Community Solar - MEC - Midwest Energy & Communications*. <https://www.teammidwest.com/electric/electric-programs/renewable-energy/community-solar/>. Accessed 21 Feb. 2024.

92. Spartan_Solar n(35)

93. Spartan_Solar n(35)

2.6 MIGreenPower Community Impact Pilot Project

DTE initiated a community solar program, MIGreenPower Community Impact Pilot in 2021, but the project has stalled due to insufficient funding. The initiative plans to build community solar projects in underserved neighborhoods in Detroit, Highland Park, and River Rouge, with a stated goal to “help income-qualified customers and communities participate in the benefits of renewable energy.”⁹⁴

The lack of funding results from DTE’s commitment to funding only 30% (\$300,000) of the costs of the initiative. DTE hopes “individual and philanthropic contributors from across the United States” will cover the remaining 70% (\$700,000) of funding necessary to complete the projects.⁹⁵ The initiative was recently revitalized due to new grant opportunities allocated by the Inflation Reduction Act.

2.6.1 Community Engagement

The project idea resulted from community engagement efforts with community stakeholder groups. DTE is partnering with the Low-Income Solar Council (Solar Council) to facilitate the MIGreenPower Community Impact Project. Members of the Solar Council include one representative from DTE, Vote Solar, a non-profit organization, Guidehouse, a subject matter expert, a staff member from the Michigan Public Service Commission, and one income-qualified community representative from each of the three communities. The responsibilities of the Solar Council are to oversee the success of the pilot, recommend potential project sites, community outreach, fundraising, and project prioritization.⁹⁶

2.6.2 Benefits

Bill credits for selected subscribers are predicted to be \$35 each month. The maximum number of subscribers is dependent on the funds raised for the project.⁹⁷

94. *MIGreenPower Community Impact | Products | DTE Energy*. <https://solutions.dteenergy.com/dte/en/Products/MIGreenPower-Community-Impact/p/MIGPSOLAR>. Accessed 21 Feb. 2024.

95. Owings, Lauren. “MIGreenPower Community Impact Pilot.” *Empowering Michigan*, 9 June 2021, <https://empoweringmichigan.com/migreenpower-community-impact-pilot/>.

96. Owings n(45)

97. Owings n(45)

2.7 Summary of community solar initiatives in Michigan

Project Name	Type of Utility	Kilowatts Generated	Number of Solar Panels	LMI-Specific Program?	Community Engagement Efforts?
L'Anse	Municipal	110.5 kWh	450	Yes	Yes
Consumers Energy	IOU	4,500 kWh <i>(combined across 3 sites)</i>	16,852 <i>(combined across 3 sites)</i>	Yes	Some
East Lansing Community Solar	Municipal	430,000 kWh	1,000	No	Yes
SpartanSolar	Co-op	2,000 kWh <i>(combined across 2 sites)</i>	6,836 <i>(combined across 2 sites)</i>	No	N/A
MIGreen Power Community Impact Pilot Project	IOU	TBD	TBD	Yes	Yes

Table 1. Summary of Michigan Community Solar Projects

3. Case Studies

In this section, we present case studies for the cities of Los Angeles, New York, and Chicago, which are each leading the nation in community solar developments. In each case study, we examine each city’s climate goals, describe the legal framework regulating each city’s energy sector, discuss the specific policies that play a role in the development of community solar projects within those cities, and highlight several key community solar initiatives to identify how community solar is taking shape on the ground. The information provided in this section provides useful background to guide Detroit in its future community solar initiatives. At the end of the report, we conduct a comparative analysis to leverage these case studies and provide recommendations to the City.

3.1. Case Study: Los Angeles, CA

3.1.1. Highlights

- Los Angeles leads the country in installed solar PV capacity, with over 41,000 MW of solar energy installed, though it lags in community solar initiatives.
- California expanded its community solar legal framework in 2022, prompting an evaluation of all current community solar legislation and requiring at least 51% of all community solar program capacity to serve low-income customers.

- California offers various financial incentives for rooftop solar installation and community renewable energy subscription, many of which target low-income and vulnerable communities.
- Several community solar options are available to electricity customers in LA, including programs specifically geared towards low-income communities.

3.1.2. Background Information

The most populous US state, California (CA) is home to nearly 40 million people. CA is also the third largest US state in terms of land area and has a population density of about 250 people per square mile.⁹⁸ The state's largest city, Los Angeles, is the second most populated city in the US after New York City, with a population of nearly 4 million people.⁹⁹ CA is also the nation's largest economy, boasting a GDP of \$3.5 trillion total, or \$89,540 per capita.¹⁰⁰

Utility companies in CA are regulated by the California Public Utilities Commission (CPUC). There are numerous electric utilities in the state, including IOUs Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas and Electric (SDG&E). In addition to IOUs, publicly owned utilities, rural electric cooperatives, and community choice aggregators play a substantial role in electricity service provision.¹⁰¹

CA's electricity is generated primarily within the state, though a substantial portion is imported from the Southwest and Northwest. In 2022, 203,257 GWh of the 287,220 GWh of total electricity was generated within the state. CA's electricity also comes from a wide variety of renewable and nonrenewable sources. In 2022, the majority of the state's electricity mix came from natural gas (36.38%), followed by solar (17.04%) and wind (10.83%). Overall, 45.77% of the electricity mix came from thermal and unspecified sources, and the remaining 54.23% came from non-GHG and renewable resources.¹⁰²

CA has taken on some of the strongest climate policies and action plans in the United States. In September 2022, Democratic Governor Gavin Newsom signed an aggressive climate measure, Assembly Bill (AB) 1279, requiring CA to achieve net zero carbon emissions by 2045 and reduce direct anthropogenic greenhouse gas (GHG) emissions to 85% below 1990 levels by 2045.¹⁰³ This comes as part of California's Climate Commitment, a \$53.9 billion climate action investment to combat climate change. The plan sets ambitious targets including a 100% clean electric grid by 2045, cutting air pollution by 71%, and creating 4 million new jobs.¹⁰⁴

The City of Los Angeles (LA) developed its first Sustainability Plan in 2015 calling for major action to fight climate change. In 2019, the city released a revised plan, updated with new and more aggressive targets. The revised plan, the Los Angeles Sustainability City pLAn 2.0 or LA's "Green New Deal," aims

98. <https://worldpopulationreview.com/states/california-population>

99. <https://www.usapopulation.org/los-angeles-population/>

100. <https://wisevoter.com/state-rankings/gdp-by-state/>

101. <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/electric-load-serving-entities-lses>

102. <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation>

103. <https://www.gov.ca.gov/2022/09/16/governor-newsom-signs-sweeping-climate-measures-ushering-in-new-era-of-world-leading-climate-action/>

104. <https://www.gov.ca.gov/wp-content/uploads/2022/09/Fact-Sheet-California-Climate-Commitment.pdf>

to move LA towards a cleaner environment and stronger economy. The Green New Deal updates LA's climate plans with bold targets including supplying 100% renewable energy by 2045, achieving carbon neutral municipal GHG emissions by 2045, and creating 400,000 green jobs by 2050.¹⁰⁵

CA leads the country in solar installations, with over 1.8 million solar projects and over 41,000 megawatts (MW) of installed capacity, enough to power 11.5 million homes.¹⁰⁶ Deemed a "solar superstar," LA ranks #1 in the US for installed solar photovoltaic (PV) capacity, reporting a total installed capacity of 649.9 MW in 2021. LA also ranks among the top US cities for per capita solar, in which it ranks 14th.¹⁰⁷ In 2018, 32% of electricity provided by the Los Angeles Department of Water and Power (LADWP), LA's municipal utility, came from renewables, including 13% from solar and 11% from wind.¹⁰⁸ LA's Green New Deal details plans for a nearly \$1 billion investment in renewable energy and storage over five years. It also includes targets for LADWP to supply 100% renewable energy by 2045 and to increase the city's cumulative installed solar capacity to 1,950 MW by 2050.¹⁰⁹

While LA leads the nation in solar PV capacity, the city lags behind in community solar efforts. Nevertheless, CA introduced the state's first community solar program in 2013 and updated the policy in 2022 with more targeted support to low-income communities.¹¹⁰ We will explore these recent changes in the next section.

3.1.3. Legal Framework

Public Utilities Act (1912)

The Public Utilities Act expanded the authority of the Railroad Commission, the commission assigned with regulating California's railroad industry, to regulate gas, electric, and telephone utilities. In 1946, the Railroad Commission was renamed the California Public Utilities Commission (CPUC). As such, the CPUC has the authority to establish rates charged by IOUs and currently implements numerous state energy programs.¹¹¹

Electric Utility Industry Restructuring Act (AB 1890) (1996)

The Electric Utility Industry Restructuring Act altered the electricity utility industry to create an open and competitive electricity market. This legislation revised prior regulations to allow electricity customers in most existing electric utility service areas to choose their electric generation supplier. The Act applies to customers in the service territories of IOU Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, PacifiCorp, Sierra Pacific Power, or Bear Valley Electric. The Act also established a statewide transmission system operator, the Independent System Operator (ISO), to oversee electricity transmission.¹¹²

Global Warming Solutions Act (AB 32) (2006)

105. https://plan.lamayor.org/sites/default/files/pLAn_2019_final.pdf

106. <https://www.seia.org/state-solar-policy/california-solar>

107. https://environmentamerica.org/california/wp-content/uploads/2022/04/CA_Shining_Cities_2022-scrn-3.pdf

108. https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-renewableenergy/a-p-re-renewableenergypolicy?_adf.ctrl-state=kwem6y1dh_4&_afLoop=908897132765382

109. https://plan.lamayor.org/targets/targets_plan.html

110. <https://legiscan.com/CA/text/AB2316/id/2606963#:~:text=This%20bill%20would%20require%20the.and%20to%20determine%20whether%20it>

111. <https://ad75.asmrc.org/understanding-public-utilities-commission>

112. <https://www.eia.gov/electricity/policies/legislation/california/assemblybill.html>

A groundbreaking piece of legislation, the Global Warming Solutions Act was the nation's first program to take a comprehensive, long-term approach to address climate change. The Act declared global warming as a serious threat to economic wellbeing, public health, natural resources, and the environment. As such, the Act established mitigation targets, including reducing CA state greenhouse gas emissions to 1990 levels by 2020. The Act also designated the State Air Resources Board as the agency responsible for monitoring and regulating greenhouse gas emissions.¹¹³

Clean Energy and Pollution Reduction Act (SB 350) (2015)

The Clean Energy and Pollution Reduction Act built off of the Global Warming Solutions Act of 2006 to set California's renewable electricity procurement goal to 50% by 2030. In addition, the Act required the state to double energy efficiency savings in electricity and natural gas end uses by 2030. The Clean Energy and Pollution Act also transformed the state's ISO into a regional organization.¹¹⁴

Global Warming Solutions Act (SB 32) (2016)

In 2016, SB 32 was signed as a follow-on to the Global Warming Solutions Act of 2006. CA achieved the Act's initial target of reducing greenhouse gas emission to 1990 levels by 2020 ahead of schedule. In fact, CA achieved the goal in 2016. As such, SB 32 was established to build on the Act's targets to add more ambitious, long-term targets. SB 32 set a new target for the state to reduce greenhouse gas emissions to 40% below the 1990 level by 2030.^{115 116}

100 Percent Clean Energy Act (SB 100) (2018)

California's 100 Percent Clean Energy Act was signed into law in September 2018 with the goal of expediting the state's transition to renewable energies. The policy requires that 100% of all retail sales of electricity come from renewable energy and zero-carbon sources by 2045. The Act also increased CA's Renewable Portfolio Standard (RPS) to require that at least 60% of CA's electricity comes from renewable sources by 2030. The Act further mandates that the Energy Commission, Public Utilities Commission and Air Resources Board use programs under existing laws to achieve 100% clean electricity and issue a joint policy report on SB 100 by 2021 and then every four years.¹¹⁷ In 2022, 35.81% of CA's total energy mix came from the following renewable resources: biomass, geothermal, small hydro, solar, and wind.¹¹⁸

California Climate Crisis Act (AB 1279) (2022)

The California Climate Crisis Act built off of the Global Warming Solutions Act of 2006 to set additional and more ambitious targets. The Act directs the state to achieve net zero greenhouse gas emissions by 2045 and reduce statewide greenhouse gas emissions by at least 85% below 1990 levels by 2045.¹¹⁹

113. <https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006>

114. <https://www.energy.ca.gov/rules-and-regulations/energy-suppliers-reporting/clean-energy-and-pollution-reduction-act-sb-350>

115. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB32

116. <https://clear.ucdavis.edu/explainers/how-california-working-reduce-greenhouse-gas-emissions#:~:text=What%20is%20California%20SB%2032,the%201990%20levels%20by%202030>.

117. [https://www.energy.ca.gov/sb100#:~:text=Senate%20Bill%20\(SB\)%20100%20established,end%2Duse%20customers%20by%202045](https://www.energy.ca.gov/sb100#:~:text=Senate%20Bill%20(SB)%20100%20established,end%2Duse%20customers%20by%202045).

118. <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2022-total-system-electric-generation>

119. <https://legiscan.com/CA/text/AB1279/id/2606946#:~:text=This%20bill%2C%20the%20California%20Climate,2045%2C%20statewide%20anthropogenic%20greenhouse%20gas>

Clean Energy, Jobs, and Affordability Act (SB 1020) (2022)

The Clean Energy, Jobs, and Affordability Act was introduced to build on the state’s existing climate and clean energy targets. The Act established interim targets to ensure the state achieves its 100% clean energy goal by 2045, including having 90% of all retail sales of electricity from renewable energy and zero-carbon sources by 2035, 95% by 2040, and 100% by 2045. The Act also established a state Affordable Decarbonization Authority to administer a fund to support efforts towards these goals.^{120 121}

3.1.4. Policy Instruments

3.1.4.1. State Level Policy Instruments

Active Solar Energy Exclusion (1980)

In place since 1980, the Active Solar Energy System Exclusion is a property tax break for the installation of an active solar energy system in the form of a new construction exclusion. Active solar energy systems are systems that use solar devices, which are thermally isolated from living space or any other area where the energy is used, to provide for the collection, storage, or distribution of solar energy. Active solar energy systems include solar panels. With the exclusion, any qualifying active solar energy systems will not be assessed and will therefore not result in any changes to the existing assessment of the real property value. The statute was amended in 2022 to extend until January 1, 2027. After the exclusion sunsets, any solar energy system previously excluded as new construction will remain excluded from property tax until the property changes ownership.^{122 123}

Self-Generation Incentive (2001)

The Self-Generation Incentive is a financial rebate program, established under AB 970, for customers installing qualifying distributed energy systems on the customer’s side of the utility meter. Qualifying technologies include wind turbines, waste heat to power technologies, pressure reduction turbines, internal combustion engines, microturbines, gas turbines, fuel cells, and advanced energy storage systems such as home solar batteries. Rebates are offered to customers installing technology at either residential or non-residential facilities. Recently, the CPUC has allocated funding of over \$1 billion through 2024 to prioritize communities living in high fire-threat areas, communities that have experienced two or more utility Public Safety Power Shut-Off events, and communities who are low-income and/or medically vulnerable. New, higher rebates for “equity” and “equity resilience” have been introduced for low-income, medically vulnerable, and at-risk for fire communities. Such rebates can range from \$850 per kWh to \$1,000 per kWh. Customers of PG&E, SCE, SoCalGas, and SDG&E are eligible for the program.^{124 125}

A Million Solar Roofs Initiative (2006)

In 2006, Republican Governor Arnold Schwarzenegger launched the Million Solar Roofs Initiative, through Senate Bill (SB) 1, to dramatically expand solar energy across the state. The Initiative set the

120. <https://trackbill.com/s3/bills/CA/2021/SB/1020/analyses/assembly-natural-resources.pdf>

121. <https://legiscan.com/CA/text/SB1020/id/2606962>

122. <https://www.boe.ca.gov/proptaxes/active-solar-energy-system.htm#FAQs>

123. <https://www.boe.ca.gov/proptaxes/pdf/lta22054.pdf>

124. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/self-generation-incentive-program/participating-in-self-generation-incentive-program-sgip>

125. <https://sgipd.org/background>

ambitious goal of building one million solar energy systems on homes, schools, farms, and businesses throughout the state by 2019. Overall, CA invested \$3.3 billion in solar rebates to reduce costs of solar installation and support efficient scale-up. The state successfully achieved its target of one million solar installations in 2019, generating over 10 billion kWh of electricity per year from solar. The Initiative also saw success in expanding solar to lower-income neighborhoods. By 2019, nearly 50% of the state’s rooftop solar market was in neighborhoods at or below CA’s median household income.¹²⁶

California Solar Initiative (2007)

The California Solar Initiative (CSI) began in 2007 under the state-wide “Go Solar California” effort and was implemented for ten years until 2016. The initiative aimed to support the transition to clean, renewable resources by providing financial incentives to customers in the service territories of PG&E, SCE, and SDG&E. The CSI program included several subprograms targeted towards low-income homeowners, including the Single-family Solar Affordable Solar Housing (SASH) program, the Disadvantaged Communities – Single-family Solar Homes (DAC-SASH) program, the Multifamily Affordable Solar Housing (MASH) program, the CSI-Thermal program, and the CSI-Thermal Low-Income program.¹²⁷

Single-family Affordable Solar Homes (2008)

The CSI’s Single-family Affordable Solar Homes (SASH) subprogram was implemented to provide low-income homeowners support to install solar. Over \$100 million of the CSI budget was allocated towards SASH, to provide financial incentives for solar installations on affordable, single-family housing. SASH provided qualified homeowners fixed, upfront, capacity-based incentives to offset the upfront cost of installing solar energy partially or fully. SASH provided an incentive of \$3/W. Eligible applicants were homeowners who receive electricity services from PG&E, SCE, or SDG&E, had a household income 80% or below the area median income, and lived in “affordable housing.” The SASH program also provided job training and employment opportunities in the areas of solar energy and energy efficiency for low-income communities. The SASH program was extended in 2015 and officially ended in December 2022. SASH successfully installed and connected over 10,000 PV systems, generating over 30 MW of solar energy capacity.^{128 129 130 131}

Multifamily Affordable Solar Housing (2008)

Along with SASH, the CPUC launched the Multifamily Affordable Solar Housing (MASH) program in 2008 to provide focused solar support to low-income multifamily households, as part of the CSI. The program established a \$108 million solar incentive to qualifying affordable housing developments to encourage solar installation. The program applies to customers within the PG&E, SCE, and SDG&E service territories. MASH officially ended in December 2021. Over its implementation period, MASH

126. <https://static1.squarespace.com/static/54c1a3f9e4b04884b35cfef6/t/5ee1265fd63c89368203f23e/1591813729735/MSR+white+paper.pdf>

127. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/california-solar-initiative>

128. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/california-solar-initiative/csi-single-family-affordable-solar-homes-program>

129. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/california-solar-initiative/sash/sash-program-2022-q3-q4_semi-annual-report_01302023.pdf

130. https://docs.cpuc.ca.gov/published/Final_decision/99026.htm

131. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/california-solar-initiative/csi-single-family-affordable-solar-homes-program/>

supported 604 multifamily affordable household projects and achieved 53.5 MW of interconnected solar capacity.^{132 133}

Green Tariff Shared Renewables Program (2013)

CA released its first piece of legislation related to community solar in 2013, with the enactment of the Green Tariff Shared Renewables Program. Under this program, CA set up a Green Tariff (GT) component and an Enhanced Community Renewables (ECR) component to promote the transition to renewable resources across the state. Under the GT component, customers can purchase energy from renewable sources rather than the traditional local IOU electricity mix. As such, the customer pays the difference between their current generation charge and a charge that reflects the cost of procuring 50-100% solar generation for their electric needs. Under the ECR component, customers can purchase a share of a local solar project directly from a solar developer. In exchange, customers receive a credit from their utility for the avoided generation procurement and for their share of the benefit of the solar development. The size of ECR projects is limited to between 500 kW and 20 MW. Overall, the ECR program has been found unsuccessful, largely due to its low and variable bill credits for community solar programs. Additional challenges include the large upfront requirement for solar developers to demonstrate community interest before beginning a community solar project.¹³⁴

Disadvantaged Communities Green Tariff (2018)

CA established the state Disadvantaged Communities Green Tariff (DAC-GT) program in 2018, under AB 327, which sought to expand the adoption of renewable energy generation in disadvantaged communities. The program aims to allow customers who are unable to take advantage of onsite solar to access renewable energy and receive benefits. Eligible residents can sign up through their existing electricity providers. DAC-GT is eligible for customers who are income-eligible for CARE or FERA and reside in disadvantaged communities (DACs). Eligible customers are able to benefit from utility scale clean energy by receiving 100% renewable energy and a 20% discount on their electricity bill. The three large investor-owned utilities, PG&E, SCE, and SDG&E, currently operate or plan to implement DAC-GT programs at 70 MW, 70 MW, and 18 MW, respectively.¹³⁵

DAC-Single-Family Affordable Solar Homes (2018)

The CSI's Disadvantaged Communities – Single-family Solar Homes (DAC-SASH) program was also established under AB 327 in 2018. DAC-SASH was initiated to increase the adoption of solar by residential customers in DACs. The program was modeled after the SASH program and provides qualified low-income homeowners fixed, up front, capacity-based incentives to help offset the upfront cost of a solar electric system. Program features are largely the same between DAC-SASH and SASH, although DAC-SASH differs from SASH in income eligibility requirements and whether homeowners are required to live in a DAC. Unlike SASH, DAC-SASH requires households to live in a DAC and meet the IOU's low-income rate assistance programs' eligibility. In 2020, eligibility requirements were

132. https://docs.cpuc.ca.gov/published/FINAL_DECISION/92455.htm

133. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/california-solar-initiative/csi-multifamily-affordable-solar-housing-program>

134. <https://www.renewableenergyworld.com/solar/community-solar-california-s-shared-renewables-at-a-crossroads/>

135. <https://www.cpuc.ca.gov/consumer-support/consumer-programs-and-services/electrical-energy-and-energy-efficiency/csgt>

expanded to include homeowners living on tribal lands.¹³⁶ The DAC-SASH program provides a \$3/W incentive to install onsite solar energy systems. Project sizes may range from 1 kW to 5 kW. The program also includes job training in solar energy and energy efficiency for low-income communities into every project. Eligible customers include customers of PG&E, SCE, or SDG&E that reside in DACs (see CA’s definition of DAC.)¹³⁷ Customers must also qualify for CARE and FERA.^{138 139}

Community Solar Green Tariff (2018)

The Community Solar Green Tariff (CSGT) was also established through AB 327 in 2018. CSGT is structured like the DAC-GT program, although the CSGT program requires solar projects to be located near the customers it serves. Specifically, the CSGT program requires projects to be sited within 5 miles of subscribing customers and encourages greater community participation by requiring a community sponsor. The communities work with a local non-profit or government “sponsor” to organize community interest and present siting locations to the utility or CCA. Community sponsors are engaged to ensure interest from the local community and promote community participation in project siting. Customers receive 100% renewable energy and 20% off their otherwise applicable electric bill rate. The program further incentivizes community sponsors by offering eligible community sponsors a 20% bill discount on up to 25% of a CSGT project’s energy output. Eligible customers include those residing in DACs or in selected San Joaquin Valley pilot communities. 50% of the project’s output must be subscribed to by customers eligible for CARE or FERA. PG&E, SCE, and SDG&E plan to implement CSGT programs at 18 MW, 18 MW, and 5 MW, respectively.¹⁴⁰

CA Solar Mandate (2020)

The CA Solar Mandate went into effect in January 2020, requiring that new single-family homes and multi-family dwellings up to three stories high must install solar panels.

The mandate is now part of the state’s building codes. With approval from the California Clean Energy Commission (CEC) and the local utility company, building developers can build a community solar project as opposed to a rooftop solar panel system for each property. In these cases, any off-location community solar project must offer similar benefits to the new homeowner that a rooftop or ground-mounted system on their property would provide. The installation of solar batteries alongside solar panels is optional under this mandate.¹⁴¹

Customer renewable energy subscription programs and the community renewable energy program (2022)

In 2022, CA expanded its existing community solar framework to further incentivize community solar development and accessibility. One such policy is the customer renewable energy subscription programs and the community renewable energy program, which was passed in September 2022. This policy requires utility regulators to increase the accessibility of community solar programs for

136. <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/sash-dac-sash-final-research-plan.pdf>

137. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/disadvantaged-communities>

138. <https://gridalternatives.org/what-we-do/program-administration/dac-sash>

139. <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/california-solar-initiative/csi-single-family-affordable-solar-homes-program>

140. <https://www.cpuc.ca.gov/consumer-support/consumer-programs-and-services/electrical-energy-and-energy-efficiency/csgt>

141. <https://www.greenlancer.com/post/california-solar-mandate>

low-income households. Specifically, the bill requires the CPUC to evaluate each existing customer’s renewable energy subscription program, determine if the program meets specified goals, and then authorize the termination or modification of any programs that do not meet those goals. Relevant programs that will undergo review include the Disadvantaged Green Tariff (DAC-GT), Community Solar Green Tariff (CSGT) and Green Tariff Shared Renewables (GTSR) programs. The bill also requires all community solar programs to ensure at least 51% of their capacity serves low-income customers.^{142 143}

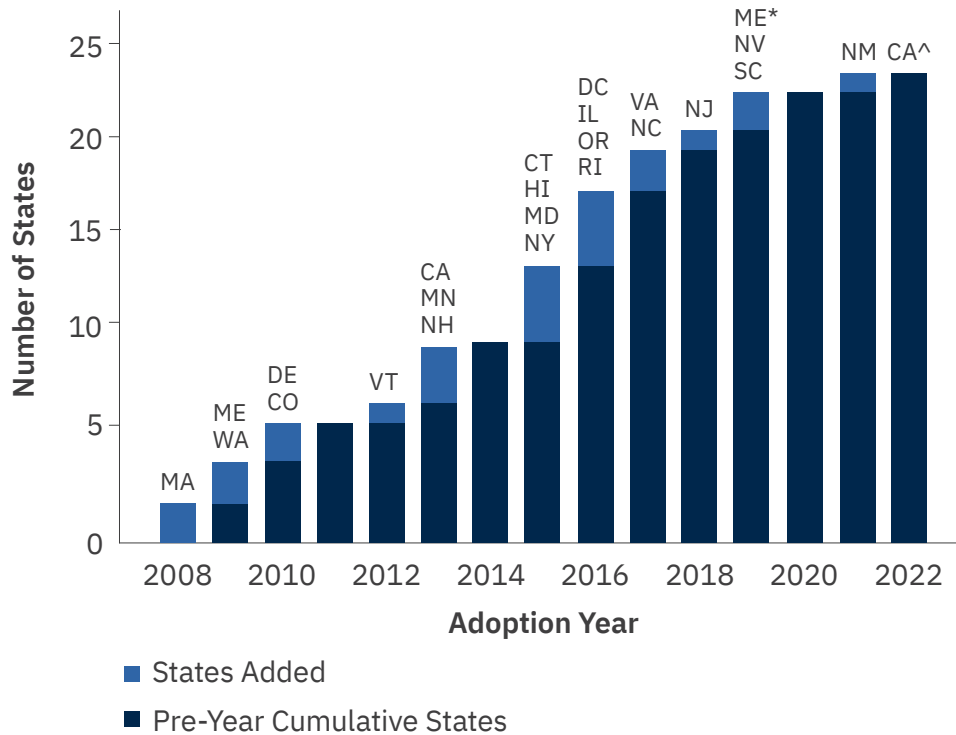


Figure. State-level community solar enabling legislation. Source: <https://www.nrel.gov/docs/fy23osti/84247.pdf>

New Energy Metering 3.0 (2022)

The third iteration of Net Energy Metering tariff, NEM 3.0, was adopted by the California Public Utilities Commission (CPUC) in December 2022. A drastic change to CA rooftop solar guidelines, NEM 3.0 reduces household solar energy credits for new customers, thereby reducing the incentive for household rooftop solar. Specifically, NEM 3.0 reduces net metering compensations rates for new PG&E, SCE, and SDG&E solar customers, meaning that customers receive less compensation for excess power they generate that is sent back into the electrical grid than they did under NEM 2.0. Under NEM 2.0, the previous net billing tariff, the average rate customers received for sending excess energy back to the grid (export rate) was 30 cents per kWh. Under NEM 3.0, the rate will decrease by about 75% to an average of 8 cents per kWh.¹⁴⁴ NEM 3.0 shifts the structure of solar crediting from net metering to net billing, with credits based on an “avoided costs” rate. The NEM 3.0 policy change also

142. <https://legiscan.com/CA/text/AB2316/id/2606963#:~:text=This%20bill%20would%20require%20the,and%20to%20determine%20whether%20it>

143. <https://eslawfirm.com/blog/californias-new-community-renewable-energy-legislation>

144. <https://www.solar.com/learn/nem-3-0-proposal-and-impacts-for-california-homeowners/>

includes incentives for solar battery installation. NEM 3.0 increases the savings potential of pairing a solar panel system with a battery by increasing the return on investment for investment into solar-plus-storage installations and dramatically reducing the payback period.^{145 146 147}

3.1.4.2. Local Level Policy Instruments

Solar Rooftops (2017)

LA's Solar Rooftops program was launched by LADWP in 2017 to promote rooftop solar and to help LADWP achieve its target of supplying 100% renewable energy by 2045. LADWP electricity customers who live in an owner-occupied home, have a single-family home with composite shingles, and have a residential rate schedule are eligible to sign up for the program. Once a homeowner has applied for the program, LADWP will inspect the home to ensure the rooftop can support a solar energy system. If the rooftop passes inspection, LADWP will install a solar energy system between 1-10 kW on the home at no cost to the homeowner. LADWP will connect the rooftop solar system to the LADWP electrical grid, and the energy produced will feed directly into the grid to support LADWP's clean energy goals. There are no upfront costs, annual fees, credit checks or maintenance costs for program participants, and participating homeowners will not receive any electrical bill credits as part of this program. However, customers receive fixed roof lease payments between \$240 and \$600 per year from the LADWP, depending on the size of the system. The agreements with LADWP are valid for up to 20 years, meaning homeowners can receive between \$4,800 and \$12,000 over the 20-year period.^{148 149} The program has a cap of 300-400 customers, or up to 1 MW of capacity.¹⁵⁰

3.1.5. Community Solar in Action

Clean Power Alliance's Power Share Program

Founded in 2017, Clean Power Alliance (CPA) is an emerging, community-driven, California-based community choice aggregator (CCA). Currently the fourth largest electricity provider in CA, CPA serves 32 cities across LA and Ventura County. CPA is a joint powers authority governed by a Board of Directors comprised of locally elected officials from each city and county they serve. A local not-for-profit government agency, CPA offers a variety of electricity source options to its customers, including 40%, 50%, and 100% renewable energy options. Rates differ across the three options. 40% and 50% clean options are comparable with local utility rates. However, customers are required to pay a small premium for 100% renewable energy.¹⁵¹

In Los Angeles, SCE partners with CPA to deliver electricity to customers. Under this arrangement, SCE continues to supply electricity from its transmission network and providing maintenance and outage response, yet CPA determines billing rates. Customers can choose their CPA clean energy option, or they can opt-out entirely.¹⁵²

145. <https://www.energysage.com/blog/net-metering-3-0/>

146. <https://www.solar.com/learn/nem-3-0-proposal-and-impacts-for-california-homeowners/>

147. <https://sandbar.com/news/net-metering-in-california/#:~:text=California%20Net%20Metering%20Explained,-During%20the%20day&text=It's%20worth%20noting%20that%20NEM,in%20bill%20credit%20per%20kWh>

148. <https://housing2.lacity.org/wp-content/uploads/2021/07/Solar-Rooftops-Program-Fact-Sheet.pdf>

149. <https://www.ladwp.com/residential-services/solar-programs/solar-rooftops>

150. https://clkrep.lacity.org/onlinedocs/2016/16-1284_misc_1_11-16-2016.pdf

151. <https://cleanpoweralliance.org/rateoptions/>

152. <https://www.sce.com/customer-service/Community-Choice-Aggregation>

In addition to supplying renewable energy to its electrical customers, CPA also offers community solar subscriptions to eligible low-income customers. Eligible CPA customers residing in low-income communities who enroll in the program receive 100% renewable energy and a 20% discount off their total electric bill each month. The Power Share discount will apply on top of any customer's existing electrical bill discounts as part of CARE or FERA, resulting in a total monthly electrical bill discount of up to 45%. Under the Power Share program, CPA purchases renewable energy from SCE's transmission network and provides it to the community. No investment is required by customers to take advantage of this service. Each customer can receive a subscription up to a maximum of 2 MW. Overall program enrollment is capped at 12.19 MW.^{153 154}

Southern California Edison's Community Renewables Program

Southern California Edison (SCE) is one of the largest investor-owned electric utilities in the United States and is a subsidiary of Edison International, one of the nation's largest electric utility holding companies. SCE has served CA for over 135 years and currently serves about 15 million people across Central, Coastal, and Southern California. Due to the 2013 SB43, SCE launched a 600 MW statewide program to increase the adoption and accessibility of renewable energy. Under this initiative, SCE rolled out a Green Rate program and the Community Renewables program.

SCE's Community Renewables program allows SCE electricity customers to work directly with developers to subscribe to a portion of a renewable energy project. Projects can range from 0.5-20 MW and must be developed within SCE's service area. Subscribers must be located within the same municipality or county or within ten miles of the project's address. Under the program, enrolled customers receive credits on their monthly electricity bills based on their portion of the project's energy generation. Residential customers receive a credit of about \$0.15 per kWh, reflecting the average cost that the customer would have paid for generation if they did not participate in the Community Renewables program.

The Community Renewables program works across three main components, including:

1. A Customer Developer Agreement, in which customers contract a developer for a renewable energy project and subscribe to a portion of the project. This agreement is negotiated bilaterally between the customer and the developer. SCE is not a part to this contract;
2. A Power Purchase Agreement, signed between the developer and SCE and then approved by the CPUC;
3. And, a Customer Energy Statement Credit, or Bill Credit, received by enrolled customers each month which applies to their SCE energy bill.

To ensure community interest and participation, SCE requires developers to market proposed projects directly to customers. Furthermore, developers must submit a substantial Community Interest package for review by SCE to demonstrate sufficient community interest before construction of any new projects.

153. <https://cleanpoweralliance.org/>

154. <https://files.cleanpoweralliance.org/uploads/2024/01/Power-Share-Tariff-for-web.pdf>

Three SCE Community Renewables programs are currently operational or pending. The 3 MW Sheep Creek Community Solar Farm became operational in June 2023. Two more projects will become operational in Kern County, CA in late 2024.^{155 156}

3.2. Case Study: New York, NY

3.2.1. Highlights

- New York State has the country's most active community solar market, with more than 2 GW of community solar installed as of November 2023.
- New York State provides an array of solar and community solar initiatives, with specific attention toward low to moderate income communities and individual.
- A community solar park, 'Sunset Park,' in New York City, that is both owned and operated entirely by a community cooperative is in the works.
- New York State has the first opt out community solar program, occurring in two villages.

3.2.2. Background Information

New York is the nation's fourth most populous state, and its largest city, New York City, has been the most populous U.S. city in every census since 1790. New York has the nation's third-largest state economy and one of the most energy-efficient economies.¹⁵⁷

In 2021, renewable sources and nuclear power, together, supplied 54% of New York's total in-state generation from utility-scale and small-scale facilities.¹⁵⁸ The state is ranked fifth in the nation in electricity generated from renewable resources.¹⁵⁹

In general, solar power contributed 3% to the total in-state net generation in 2021, with over two-thirds of it generated by small-scale systems producing less than 1 megawatt each.¹⁶⁰ In addition, New York's distributed solar pipeline is now comprised of more than 8,700 projects, which once completed will provide 3,297 MW of clean energy.¹⁶¹

The state has also become the nation's largest and most active community solar market, with more than 2 GW of community solar installed as of November 2023.¹⁶² Currently, community solar makes up 61% of total solar installations across the state and caters to over 14,000 subscribers.¹⁶³

155. <https://www.edison.com/>

156. <https://www.sce.com/business/generating-your-own-power/solar-power-for-business/Community-Green-Rates#:~:text=What%20is%20the%20Community%20Renewables,portion%20of%20the%20project's%20generation.>

157. "New York State Profile and Energy Estimates," Energy Information Administration, <https://www.eia.gov/state/analysis.php?sid=NY>.

158. U.S. Energy Information Administration, "New York State Profile Overview," <https://www.eia.gov/state/?sid=NY>.

159. New York State Department of Public Service, "Renewable Electricity in New York State," <https://www.osc.ny.gov/files/reports/pdf/renewable-electricity-in-nys.pdf>.

160. U.S. Energy Information Administration, "New York State Profile Overview," <https://www.eia.gov/state/?sid=NY>.

161. Wolfe, Sean. "New York Has Installed More Than 2 GW of Community Solar, State Says," *Renewable Energy World*, 2023.

162. Wolfe, Sean. "New York Has Installed More Than 2 GW of Community Solar, State Says," *Renewable Energy World*, 2023.

163. Hornberger, Abby & McCoy Maria. "New York's Community Solar Program," *Institute for Local Self Reliance*, 2021.

New York's Climate Leadership and Community Protection Act of 2019 set higher targets from the Plan, with a commitment toward achieving 70% renewable electricity by 2030, 100% zero-emission electricity by 2040, and complete economy-wide net-zero carbon emissions by 2050. The Act also introduced a goal to install 6 GW of distributed solar by 2025, on the path to 10 GW by 2030.¹⁶⁴

Keeping in line with the state's commitments, the City also noted its commitment to 100% clean electricity for City government operations by 2025, 500 MW energy storage citywide by 2025, 1,000 MW solar installed citywide by 2030, and 100 MW solar installed on City-owned buildings by 2025.¹⁶⁵

In 2021, NYC's local electric grid was powered approximately 85% by fossil fuels. This contrasts greatly with the upstate grid, where clean sources make up 91% of the electricity supply. There are insufficient transmission lines to bring this clean power to NYC. As a result, only about half of NYC's electricity is brought in from outside the city; the rest must be produced within the five boroughs. NYC relies on 24 in-city power plants that run on natural gas and/or fuel oil. 70% of these plants are over 50 years old. A top priority for the city is to replace these plants with renewable energy resources in a way that is reliable and affordable.¹⁶⁶

3.2.3. Legal Framework

The New York Climate Leadership and Community Protection Act

The New York Climate Leadership and Community Protection Act, often called the Climate Act, was signed into law in July 2019.¹⁶⁷ Requiring the state to reduce economy-wide greenhouse gas emissions 40 percent by 2030 and no less than 85 percent by 2050 from 1990 levels, it is among the most ambitious climate laws in the nation.

Article 8, Title 9

Under Article 8, Title 9 and Title 9A of the State Public Authorities Law, the New York State Energy Research and Development Authority (NYSERDA) was established as a public benefit corporation in 1975.¹⁶⁸ NYSERDA is committed to providing New Yorkers with objective information and analysis, innovative programs, technical expertise, and funding opportunities aimed at enhancing energy efficiency, saving money, utilizing renewable energy sources, and decreasing reliance on fossil fuels. In 2018, NYSERDA, with the Department of Public Service, set forth the statewide energy efficiency target for 2025. Presently, NYSERDA holds a crucial position in advancing the State's objectives for clean energy adoption and carbon emissions reduction.

3.2.4. Policy Instruments

3.2.4.1 State Level Solar Policy Instruments

The Clean Energy Standard

Before adopting its current Clean Energy Standard (CES), New York State operated under the Renewable Portfolio Standard (RPS). In September 2004, following extensive stakeholder

164. New York State. Climate Leadership and Community Protection Act of 2019

165. City of New York. Solar and Storage. <https://climate.cityofnewyork.us/subtopics/solar-and-storage/>

166. City of New York, Climate Portal, "Systems," <https://climate.cityofnewyork.us/subtopics/systems/>

167. New York State. Climate Leadership and Community Protection Act of 2019

168. New York State. Article 8, Title 9 and Title 9A of the State Public Authorities Law. Laws of New York. New York State, 2019. <https://www.nysenate.gov/legislation/laws/PBA>

engagement, New York implemented a Renewable Portfolio Standard aiming to raise the share of renewable energy in use by New Yorkers from 19.3 percent (based on 2004 figures) to a minimum of 25 percent by the close of 2013. In 2010, the RPS was raised from 25 percent by 2013 to 30 percent by 2015, maintaining the 2004 baseline.¹⁶⁹

Following the 2015 New York State Energy Plan, the State outlined a target of sourcing 70 percent of New York's electricity from renewable sources by 2030, which led to the formal replacement of the Renewable Portfolio Standard with the CES.¹⁷⁰

The CES is crafted to combat climate change, diminish detrimental air pollutants, and guarantee a diverse and dependable low-carbon energy supply. Officially implemented in 2016, the CES underwent expansion in 2020 to align with the mandates of the Climate Act, which outlines objectives for attaining 70% electricity sourced from renewables by 2030 and achieving a zero-emission electric grid by 2040.¹⁷¹

The CES operates through two key mechanisms—the Renewable Energy Standard and Zero-Emissions Credit requirement—mandating that all load-serving entities obtain Renewable Energy Certificates (RECs) and Zero-Emission Credit.

Reforming the Energy Vision (REV) and the 2015 State Energy Plan

In 2014, New York launched its official energy policy, Reforming the Energy Vision (REV). REV is a broad initiative to transform New York's energy sector and increase community participation in renewables.¹⁷²

2015 State Energy Plan

The State Energy Plan was produced in 2015, serving as a roadmap to achieve REV's energy goals. These included cutting greenhouse gas emissions to 40% below 1990 levels by 2030, getting at least half the state's power from renewable energy sources.¹⁷³

NY-Sun

NY-Sun, a dynamic public-private partnership, is the solar-centric division within the REV that works to create a self-sustaining solar industry without subsidies.¹⁷⁴

NY-Sun aims to drive down the cost of solar energy by streamlining administrative processes and inspections, thereby reducing installation expenses and other associated costs apart from the solar

169. NYSERDA. "Renewable Portfolio Standard." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Standard/Clean-Energy-Standard-Resources/Renewable-Portfolio-Standard>

170. NYSERDA. "Renewable Portfolio Standard." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Standard/Clean-Energy-Standard-Resources/Renewable-Portfolio-Standard>

171. NYSERDA. "Clean Energy Standard." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/Clean-Energy-Standard/Clean-Energy-Standard-Resources/Renewable-Portfolio-Standard>

172. NYSERDA. "Reforming the Energy Vision." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/Programs/Reforming-the-Energy-Vision>

173. NYSERDA. "2015 State Energy Plan." New York State Energy Research and Development Authority, 2015. <https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard>

174. NYSERDA. "NY-Sun." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/Programs/NY-Sun>

panels themselves. The initiative provides various loan options tailored to assist both residents and businesses in financing solar installations. For homeowners, small businesses, and not-for-profits, on-bill recovery loans allow for gradual payment through monthly utility bills. Small Commercial Participation Loans cover up to half of the project cost, capped at \$100,000, offering favorable interest rates for businesses. Smart Energy Loans provide up to \$25,000 in financing, while Companion Loans address additional expenses related to large-scale solar projects. Additionally, Renewable Energy Tax Credit Bridge Loans enable individuals to utilize tax credits towards financing their solar projects.¹⁷⁵

The expense of setting up solar power systems differs across various parts of New York. To ensure that solar incentives target areas with the most need, the NY-Sun incentive program is segmented across three regions across the state—Con Edison Region (which includes all of New York City and Westchester County), Upstate, and Long Island—and further divided into "blocks". The block system aims to bolster solar markets in areas requiring more support while reducing incentives in regions where they are less essential for a self-sufficient solar market across New York.¹⁷⁶

3.2.4.2 Local Level Solar Policy Instruments

The Solar Electric Generating Systems Tax Abatement program

The Solar Electric Generating Systems Tax Abatement (SEGs) program in New York City is designed to encourage property owners to install solar panels on their buildings by offering a property tax incentive.¹⁷⁷ It applies to both residential and commercial properties. The abatement is based on the cost of the solar installation, including equipment, labor, and soft costs like design and permitting, but it does not apply to financing costs or interest paid on a solar loan.¹⁷⁸ The maximum abatement is \$62,500 per year or the building's annual tax liability, whichever is less. Initially, SEGs covered 20% of the cost of solar systems, but, as of January 2024, SEGs has been extended through 2035 and expanded to offer a maximum incentive value of 30% of cost. Such serves as a rare example of a solar incentive increasing over time.¹⁷⁹

PlaNYC

In April 2023, New York City introduced the fifth installment in a series of climate plans titled *PlaNYC: Getting Sustainability Done*.¹⁸⁰ PlaNYC introduces the Public Solar initiative, a pioneering program dedicated to financing solar installations for low-income homeowners residing in disadvantaged communities. Acknowledging that these neighborhoods have borne the brunt of climate change impacts, the Public Solar Initiative aims to reduce the cost barriers associated with the upfront costs of rooftop solar. Specifically, the initiative seeks to provide solar access, full decarbonization, and explore shared ownership models for underutilized rooftops. Over the next five years, it plans to reach

175. NYSEDA. "NY-Sun." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/Programs/NY-Sun>

176. NYSEDA. "NY-Sun Contractors Dashboards and Incentives." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/NY-Sun/Contractors/Dashboards-and-incentives>

177. New York State Energy Research and Development Authority. "Solar Electric Generating Systems Tax Abatement." New York State Energy Research and Development Authority, n.d.

178. Solar.com. "Solar Loans." Solar.com, n.d., <https://www.solar.com/learn/solar-loans/>

179. Solar.com. New York City's Solar Property Tax Abatement Extended. <https://www.solar.com/learn/new-york-citys-solar-property-tax-abatement-extended/>

180. New York City Mayor's Office of Long-Term Planning and Sustainability. PlaNYC: Getting Sustainability Done. New York City Mayor's Office, 2011. https://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/planyc_2011.pdf

3,000 homes.¹⁸¹ This initiative seeks to fund itself through the federal Greenhouse Gas Reduction Fund. PlaNYC also highlighted a commitment to ongoing advocacy for and expansion of SEGs.

3.2.4.3 State Level Community Solar Policy Instruments

Community Solar NY

Community solar was first established in New York under the Shared Renewables Program in 2015.¹⁸² The Community Shared Renewables program falls under NY-Sun and is part of NY-Sun's initiative to reduce solar electric balance-of-system expenses. Community Solar NY, administered by NYSERDA, collaborates with local entities such as governments, educational institutions, and community partners to facilitate the Community Shared renewables program and to no enhance solar accessibility and affordability through collective procurement campaigns and alternative tactics.

Value of Distributed Energy Resources (VDER)

In 2017, the New York Public Service Commission introduced the Value of Distributed Energy Resources (VDER) within its Reforming the Energy Vision (REV) initiative. Unlike traditional net metering, VDER employs the Value Stack Tariff, setting the price that project developers are paid by utilities for the energy they provide to the grid.¹⁸³ Through this approach, solar system owners receive compensation that reflects not only the energy they contribute but also its environmental, geographical, and temporal advantages. Then, those project developers sign up "subscribers" ranging from corporate and government energy buyers to individual households that purchase a share of the power those projects produce, typically at a lower price than what they can get from the utility.¹⁸⁴

Energy Storage Systems

In August 2023, New York's first state-owned utility-scale battery energy storage project began operating.¹⁸⁵ The 20-megawatt facility installed and operated by the New York Power Authority connects into the state's electric grid. Unlike community solar, batteries do not generate their own clean power. Instead, they draw power from the grid during cheaper and cleaner periods and discharge it to replace costlier and dirtier grid power during peak demand or stressed grid conditions. These energy storage systems play a crucial role in enabling states and cities to incorporate more clean energy into their power systems, especially during peak demand. They are also essential for enhancing energy resilience, allowing community solar projects to contribute effectively. Additionally, various companies in New York, such as Ninedot, Summit Ridge Energy, and Convergent Energy + Power, are

181. Office of the Mayor. "Mayor Adams Releases PlaNYC: Getting Sustainability Done, New York City's Strategic Climate Plan." Mayor of New York City, 2024, <https://www.nyc.gov/office-of-the-mayor/news/274-23/mayor-adams-releases-planyc-getting-sustainability-done-new-york-city-s-strategic-climate-plan#/0>

182. New York State Energy Research and Development Authority. "Community Shared Renewables Program." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/Programs/Community-Solar>

183. NYSERDA. "Value of Distributed Energy Resources." New York State Energy Research and Development Authority, n.d., <https://www.nyserda.ny.gov/All-Programs/NY-Sun/Contractors/Value-of-Distributed-Energy-Resources>

184. New York State Energy Research and Development Authority. *New York Solar Guidebook for Local Governments*. 2023. Retrieved from <https://www.nyserda.ny.gov/All-Programs/Programs/NY-Sun/Contractors/NY-Sun-Resources>

185. American Public Power Association. "NYP&A Utility-Scale Battery Energy Storage Project Now Operating." American Public Power Association, 2024, <https://www.publicpower.org/periodical/article/nypa-utility-scale-battery-energy-storage-project-now-operating>

utilizing VDER incentives for standalone battery projects, aiming to bolster grid resilience.¹⁸⁶

Inclusive Community Solar Adder (ICSA)

The Inclusive Community Solar Adder (ICSA) constitutes a distinct branch within the Community Solar program.¹⁸⁷ It specifically caters to projects aimed at serving low-to-moderate income (LMI) subscribers, affordable housing units, and other institutions aiding disadvantaged communities.

For a project to qualify for the ICSA, it must allocate between 40% and 100% of its capacity to eligible Residential and Affordable Housing/Nonresidential subscribers.¹⁸⁸ Additionally, a minimum of 50% of the project's ICSA capacity must cater to Residential Customers. Lastly, individual household eligibility is granted if the documented household income falls below 80% of the Area Median Income or 80% of the State Median Income, whichever is higher.

Community Benefit Projects in the Upstate and Con Edison areas receive enhanced incentives. The criteria to receiving these incentives include establishing strong partnerships with local disadvantaged community organizations during project development, a dedication to workforce training and hiring from priority populations or the surrounding disadvantaged community, models emphasizing community ownership or participation, and targeting individuals in disadvantaged communities with Limited English Proficiency.¹⁸⁹

Expanded Solar for All

In May 2022, the New York government approved the first phase of the Expanded Solar for All ("E-SFA"), a program jointly run by National Grid and NYSERDA to expand on previous framework and continue to provide community solar to customers participating in the National Grid's Energy Affordability Program.¹⁹⁰

New York's Expanded Solar for All Program introduces an innovative "automatic enrollment" community solar model aimed at providing electric bill savings to households enrolled in LIHEAP and the supplemental Energy Assistance Program (EAP).¹⁹¹ Phase 1 of the initiative is set to secure up to 300 MW of community solar, benefiting over 160,000 low-income households. The program's potential statewide expansion is currently under consideration by the New York Public Service Commission. Under this model, households are automatically enrolled during their annual enrollment in the Low Income Home Energy Assistance Program and the Energy Assistance Program, with the flexibility to "opt-out" of the program or "opt-in" to a traditional community solar subscription.¹⁹²

186. Canary Media. "Long Wary of Batteries, New York's Now Poised to Go Big on Energy Storage." Canary Media, 2024, <https://www.canarymedia.com/articles/energy-storage/long-wary-of-batteries-new-yorks-now-poised-to-go-big-on-energy-storage>

187. NYSERDA. "Inclusive Community Solar Adder." New York State Energy Research and Development Authority., <https://www.nyserda.ny.gov/All-Programs/NY-Sun/Contractors/Dashboards-and-incentives/Inclusive-Community-Solar-Adder>

188. NYSERDA. *NY-Sun Inclusive Community Solar Adder Proposed Round 2 Program Design Version 2.0*. 2023. Retrieved from <https://www.nyserda.ny.gov/All-Programs/NY-Sun/Contractors/Dashboards-and-incentives/Inclusive-Community-Solar-Adder>

189. NYSERDA. Clean Energy Fund Compiled Investment Plans. 2023. Retrieved from <https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Fund>

190. NYSERDA. Clean Energy Fund Compiled Investment Plans. 2023. [PDF document]. Retrieved from NYSERDA portal. <https://portal.nyserda.ny.gov/servlet/servlet.FileDownload?file=00P8z0000017GeNEAU>

191. https://www.nclc.org/wp-content/uploads/2024/02/202402_Report_Community-Solar.pdf

192. NYSERDA. Solar Energy Equity Framework: Community Solar Strategies. Year. Retrieved from <https://portal.nyserda.ny.gov/servlet/servlet.FileDownload?file=00P8z0000017GeNEAU>

3.2.5. Community Solar in Action

Sunset Park

Sunset Park Solar will be owned and operated by a cooperative for the benefit of residents and businesses.¹⁹³ The initiative is taking shape in a 685kW solar array on the roof of the Brooklyn Army Terminal in Sunset Park, a city-owned industrial park.

Sunset Park Solar represents a collaboration between various entities. The project is spearheaded by UPROSE¹⁹⁴, Brooklyn's oldest Latino community-based organization with a deep-rooted commitment to environmental justice and community empowerment in Sunset Park. The initiative partners with Working Power¹⁹⁵, a dedicated clean energy developer prioritizing climate justice and robust community benefits. Together, they will jointly own, operate, and manage the Sunset Park Solar project. Complementing this partnership is Solar One¹⁹⁶, an NYC-based environmental nonprofit providing crucial expertise in solar project implementation, workforce training, and community engagement. Adding technical proficiency to the endeavor is 770 Electric Corp¹⁹⁷, a seasoned solar installation company with extensive experience in both residential and commercial projects in New York City and Long Island. Training courses offered by UPROSE and Solar One have resulted in local job opportunities, with six trainees hired by 770 Electric Corp for installation.¹⁹⁸

The involvement of the New York City Economic Development Corporation (NYCEDC) is pivotal in this project. NYCEDC, acting on behalf of the City of New York, has structured the project in a manner where the public sector will contribute the entire real estate value necessary for the project, contingent upon its effectiveness in achieving policy objectives of supplying below-market clean energy to local subscribers.¹⁹⁹ NYCEDC runs the Brooklyn Army Terminal (BAT) through a lease with the City of New York and solicited proposals for a community solar garden on the BAT roof in spring 2018 to facilitate solar projects that provide economic opportunity to New York residents and businesses.

Operating as a cooperative, each subscriber-member holds a vote in determining the allocation of the cooperative's resources, including any operational profits from the solar installation. These profits can be reinvested into additional solar projects, utilized to initiate complementary energy efficiency initiatives, or distributed among members as dividends. The cooperative conducts regular open meetings accessible to all members, facilitating discussions and voting on matters concerning the Sunset Park Solar project and other cooperative-developed projects.²⁰⁰

Projections suggest it could generate 19.6 million kWh of solar electricity and reduce approximately 13,056 tons of CO₂ equivalent emissions over 25 years. Operating at an average of 520 tCO₂e per year, it serves as a pilot project with a lease of 25 years.

193. Sunset Park Solar, <https://sunsetparksolar.org/>

194. UPROSE, <https://www.uprose.org/collaborative-campaigns/sunset-park-solar/>

195. Working Power, <https://www.workingpower.com/>

196. Solar One, <https://solar1.org/>

197. 770 Electric Corp, <https://770electriccorp.com/>

198. Sunset Park Solar, <https://sunsetparksolar.org/>

199. Sunset Park Solar, <https://sunsetparksolar.org/>

200. Sunset Park Solar, <https://sunsetparksolar.org/>

Approximately 200 Sunset Park households and businesses are participating, and the estimated lifetime solar production from this project amounts to 19.6 million kilowatt hours. The estimated lifetime net savings from this endeavor are projected to reach \$1.34 million, averaging \$6,700 per participant. Over its lifetime, this project is expected to offset greenhouse gas emissions equivalent to 13,056 tons.²⁰¹

Opt-Out Community Solar Program in Brockpark and Lima, NY

The towns of Brockport and Lima entered into a tri-party agreement with Joule Assets and Generate Capital to implement an opt-out community solar program.²⁰² This initiative, titled 'Finger Lakes Community Choice', is accessible to over 3,800 households and small businesses in the two upstate municipalities. The solar farms are expected to generate a combined 28 million kilowatt-hours annually and are estimated to provide 17 million kilowatt hours of solar power to residents for 25 years.²⁰³

Generate Capital, Inc. is a leading sustainable infrastructure company that builds, owns, operates, and finances solutions for clean energy. Joule, overseeing the opt-out community choice solar program, had actively supported Brockpark and Lima's community choice aggregation program, Finger Lakes Community Choice, since 2017.²⁰⁴ Joule holds the sole approval from the State to merge community solar and electricity supply in a community choice offering. Finger Lakes Community Choice works with participating towns like Brockpark, Lima, and four other upstate municipalities, to enable participants to save money on electricity by pooling local electricity demand to leverage the collective buying power of their residents and small businesses to secure more favorable terms on their electricity supply and community solar contracts, protect consumers, and support renewable generation sources. Finger Lakes Community Choice has two components: community choice electricity supply and the opt-out community choice solar offering being described within this case study.²⁰⁵

Within this opt-out community solar program, Brockpark and Lima residents are automatically enrolled, without the need for contracts, credit checks, or home solar panel installations. Those who wish to leave the program can do so anytime without penalties.²⁰⁶ This structure allow municipal leaders to extend the advantages of community solar to all constituents including LMI residents who faced barriers in traditional opt-in programs due to state regulations and socioeconomic factors. This opt-out community-level agreement ensures equal access to the benefits of community solar, including electricity bill savings. Both low- and high-income households have access to these benefits on equal terms. Participants are guaranteed 10% savings on solar credits without needing to sign an

201. C40 Cities. "NYC Sunset Park Solar." n.d. <https://www.c40.org/case-studies/nyc-sunset-park-solar/>

202. Westside News, "Brockport and Lima activate opt-out community choice solar program," September 19, 2021, <https://westsidenewsny.com/news/2021-09-19/brockport-and-lima-activate-opt-out-community-choice-solar-program/>.

203. "Opt-Out Community Choice Solar for Upstate New York," CleanTechnica, September 4, 2021, <https://cleantechnica.com/2021/09/04/opt-out-community-choice-solar-for-upstate-new-york/#:~:text=Brockport%20and%20Lima%20officially%20activated,for%20the%20next%2025%20years>

204. "Lima Community Choice Electricity Program," Village of Lima, March 2021, <https://villageoflima.us/wp-content/uploads/2021/03/Liima-Community-Choice-Electricity-Program.pdf>

205. Finger Lakes Community Choice, <https://www.fingerlakescommunitychoice.com/>

206. "Groundbreaking Opt-Out Community Solar Program in Brockport and Lima, NY, Moves Toward Launch as the Villages Select Solar Provider," PR Newswire, <https://www.prnewswire.com/news-releases/groundbreaking-opt-out-community-solar-program-in-brockport-and-lima-ny-moves-toward-launch-as-the-villages-select-solar-provider-301230268.html>

individual contract, undergo a credit check, pay a second bill for solar, or install solar panels on their home or property. As such, the program is the first community choice aggregation in NY State to serve low-income consumers. Out of the eligible customers, more than 200 are low-income households and around 300 are moderate-income. Going forward, LMI residents will have priority in receiving solar credits within their municipality.²⁰⁷

3.3. Case Study: Chicago, IL

3.3.1. Highlights

- About 16% of electricity generation in Illinois is from renewable sources and 2% from solar energy specifically.
- The Illinois Renewable Portfolio Standards is the main policy to transition to clean energy in the state, aiming to accomplish a 100% clean energy mix by 2050.
- Illinois has two main policies to support community solar projects, the Illinois Shine Program and the Illinois Solar for All Program. The first supports community solar developments in general and the second focuses on low-income households.
- There are currently at least 26 operational community solar projects within Illinois, and 69 projects in development.
- Evidence suggests that subsidies are a key factor in making community solar projects financially viable in Illinois.

3.3.2. Background Information

Illinois had a population of about 12.8 million people in 2021 and a median household income of \$72,563, which represented a 6% income increase compared to the previous year.²⁰⁸ Chicago, Illinois largest city and capital, had a population of about 2.6 million in 2022, a median household income of \$71,673 and 16.9% poverty.²⁰⁹

The main energy utilities in Illinois are ComEd and Ameren. ComEd serves most of northern Illinois, including Chicago. Ameren serves most of central and southern Illinois. Additionally, part of the northern counties is served by MidAmerican Energy.²¹⁰ The three utilities are investor owned. Utilities in Illinois operate only in the energy distribution space, as the state legislation prevents utilities from also generating electricity, as a measure to promote competition in the energy generation industry. Illinois utilities are regulated mainly by the Illinois Commerce Commission, and partially by the Illinois Power Agency.

According to data from the Electric Information Administration (EIA) for the year 2023, the energy mix in Illinois was mostly comprised of nuclear power (55%) and renewables represented a small fraction (16%).²¹¹

207. Power Engineering International. (2021). "New York launches first opt-out community solar programme." Retrieved from <https://www.powerengineeringint.com/renewables/new-york-launches-first-opt-out-community-solar-programme/>

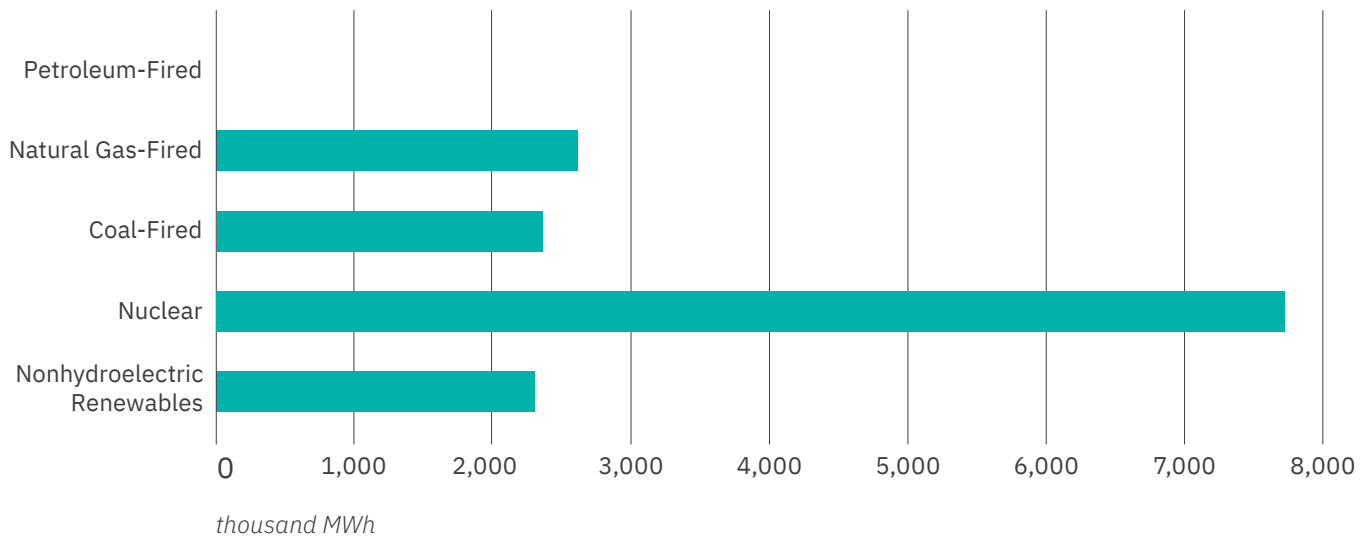
208. <https://datausa.io/profile/geo/illinois>

209. <https://www.census.gov/quickfacts/fact/table/chicagocityillinois/PST045223>

210. <https://www.ilenergyratings.com/companies#:~:text=MISO%2C%20PJM%2C%20and%20Illinois%20Commerce,are%20served%20by%20MidAmerican%20Energy>

211. <https://www.eia.gov/state/?sid=IL#tabs-4>

Illinois Net Electricity Generation by Source, Oct. 2023



Source: Energy Information Administration, *Electric Power Monthly*

According to the Solar Energy Industry Association, 1.8% of the total energy from the state comes from solar generation.²¹² However, Illinois has plans to transform its grid to a more sustainable one. The state is currently progressing towards achieving 100% clean energy by 2050, setting interim targets of 40% renewable energy by 2030 and 50% by 2040.²¹³ According to Chicago's Climate Action Plan, the city aims to reduce GHG emissions by 80% of their 1990 levels, by 2050.²¹⁴ One of the pillars of that plan is transitioning to clean energy sources, including distributed solar energy. This plan has not been updated since 2008 though.

3.3.3. Legal Framework

The Public Utilities Act (PUA) (1921)

This act²¹⁵ is a comprehensive legislation regulating public utilities. It provides the framework for regulatory oversight, rate-setting, and consumer protection in the energy sector for the State of Illinois. These regulations are overseen by the Illinois Commerce Commission.

The Electric Service Customer Choice and Rate Relief Law (1997)

Following a general trend within the United States, this law²¹⁶ introduced fundamental changes in the paradigm of how the electricity industry ought to function and organize within Illinois. This law enabled the separation of electricity generation, transmission, and distribution functions and by doing so intended to boost competition and innovation. This in turn was expected to lower electricity rates for final consumers.

212. <https://www.seia.org/state-solar-policy/illinois-solar>

213. <https://cleanchoiceenergy.com/news/renewable-energy-in-illinois>

214. <https://www.chicago.gov/city/en/progs/env/climateaction.html>

215. <https://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=1277&ChapterID=23>

216. <https://pubs.naruc.org/pub.cfm?id=E5BC7881-971A-4E55-722D-61A92B8ABFB6>

The Illinois Power Agency Act (IPAA) (2007)

This piece of legislation created the Illinois Power Agency (IPA).²¹⁷ The IPA is responsible for developing and implementing renewable energy programs and the administration of the Renewable Portfolio Standard (RPS) program. These standards mandate that a certain percentage of the total energy consumed in Illinois must come from renewable sources. The way in which utilities comply with RPS in Illinois is by procuring Renewable Energy Certificates (REC), which are documents that certify that a certain amount of energy was generated from a renewable source.²¹⁸ It is important to mention that utilities don't determine what RECs they buy; instead, their procurement is planned and regulated by the IPA.²¹⁹

The Energy Infrastructure Modernization Act (EIMA) (2011)

This law²²⁰ was enacted to modernize and upgrade the energy infrastructure in Illinois. It included provisions to facilitate the deployment of advanced metering infrastructure and other investments on the grid within the State. An important objective of the act was enhancing the reliability and efficiency of the electric grid by improving outage response and reducing energy losses.

The Future Energy Jobs Act (FEJA) (2016)

This law covers various areas of energy policy.²²¹ It provides support for the development of clean energy initiatives in general and in particular for community solar projects. It sets new targets for renewable energy, solar energy and distributed energy, along with financial incentives. It creates the Illinois Solar For All Program, which we refer to in more detail in the Policy Instruments section of this case study. The implementation of FEJA is spearheaded by the IPA.²²²

The Climate and Equitable Jobs Act (2021)

This Act is a more comprehensive legislation that addresses not only energy and clean energy matters, but climate change and environmental justice more broadly. It includes provisions to support the expansion of community solar and other renewable energy projects. These include expanding the Illinois RPS and the Illinois Solar for All Program.²²³

3.3.4. Policy Instruments

3.3.4.1 State Level Solar Policy Instruments

The state of Illinois has the following clean energy targets: having 40% of its energy come from renewable energy sources by 2030, 50% by 2040, and 100% clean energy by 2050. To help achieve these targets, the state established the Illinois Renewable Portfolio Standard (RPS) in 2007 and updated them in 2016 and 2021.²²⁴ Currently Illinois RPS corresponds to 50% by 2040 and 100% by

217. <https://www.ilga.gov/legislation/ilcs/ilcs5.asp?ActID=2934&ChapterID=5>

218. <https://www.epa.gov/green-power-markets/renewable-energy-certificates-recs>

219. <https://ipa.illinois.gov/content/dam/soi/en/web/ipa/ipa-factsheet-renewable-portfolio-standard-92722.pdf>

220. <https://www.prnewswire.com/news-releases/illinois-general-assembly-enacts-energy-infrastructure-modernization-act-132681088.html>

221. <https://www.ilga.gov/legislation/publicacts/99/099-0906.htm>

222. <https://pubs.naruc.org/pub.cfm?id=E5BC7881-971A-4E55-722D-61A92B8ABFB6>

223. <https://ipa.illinois.gov/public-act-102-0662-implementation.html>

224. <https://ipa.illinois.gov/renewable-resources.html>

2050.²²⁵ On top of the Renewable Portfolio Standard, Illinois has two programs aimed at boosting solar energy within the state: Illinois Solar Power For All and Illinois Shine.

Illinois Solar Power For All Program

This program was established in 2017 by the Future Energy Jobs Act and is administered by the IPA. The objective of this program is to promote equitable access to solar energy, mainly by providing incentives that make solar energy more affordable for low-income families.

A section of the program focuses on community solar. The program supports community solar by providing monetary incentives to pre-approved vendors²²⁶ as well as facilitating the matching between community solar project vendors and subscribers. Vendors receive monetary incentives consisting of IPA fixing the value of the REC they produce in the \$80-110 per MW range, depending on the size of the project and the utility company to which the project is connected.²²⁷ Subscribers to a project under this program need to have an income lower than 80% of the area median income, adjusted for family size.²²⁸ This corresponds to about \$50,000 for a four-member household, with some variability depending on the county.

The program guarantees that subscribers will not have to pay any upfront costs and that at least 50% of the value of the energy generated will be received by subscribers.²²⁹ According to the “2022 Long-Term Renewable Resources Procurement Plan”²³⁰, published by the IPA, the community solar section of the Illinois Solar Power For All program had a budget of \$43,200,000 for the 2018-2022 period. As of 2022 (the most recent official information we could find), 17 community solar projects have been approved under the Illinois Solar Power For All program.²³¹

Illinois Shines Program

This program was established in 2017 by the Future Energy Jobs Act and is administered by the IPA. Its main objective is to make solar energy more affordable for Illinois residents, by providing financial incentives and guidance for solar energy adoption. Unlike the Illinois Solar Power For All program, the Illinois Shines program does not have a focus on income distribution aspects.

A section of this program is dedicated to community solar. Community solar vendors receive monetary incentives from IPA including them in the REC procurement plan of Illinois utilities. The specific prices at which RECs are bought are determined by the IPA on a yearly basis. More specifically, the IPA sets a price at which RECs will be bought for projects approved during a specific year, and approved vendors are guaranteed those REC prices for 15-20 years into the future.²³²

As defined by law, community solar projects covered in this program are limited to a maximum size of

225. [https://www.ncsl.org/energy/state-renewable-portfolio-standards-and-goals#:~:text=623%20\(2015\).-,Illinois,2040%3B%20100%25%20by%202050.](https://www.ncsl.org/energy/state-renewable-portfolio-standards-and-goals#:~:text=623%20(2015).-,Illinois,2040%3B%20100%25%20by%202050.)

226. Vendors are the entities that run the community solar project. They operate as a nexus between subscribers and utilities.

227. <https://ipa.illinois.gov/renewable-resources.html>

228. <https://ipa.illinois.gov/content/dam/soi/en/web/ipa/documents/appendixfilsfaincomelevels16august2021.pdf>

229. <https://www.illinoissfa.com/programs/community-solar/>

230. <https://ipa.illinois.gov/content/dam/soi/en/web/ipa/documents/2022-long-term-plan-23-august.pdf>

231. <https://www.illinoissfa.com/app/uploads/2022/02/Selected-Project-Summaries.pdf>

232. <https://ipa.illinois.gov/content/dam/soi/en/web/ipa/documents/modified-2022-long-term-plan-upon-reopening-9-may-2022-final.pdf>

5MW. There are no income-based requirements for subscribers.

3.3.4.2 Local Level Solar Policy Instruments

The Cook County Community Solar Project

This project was launched in 2015 and funded through a grant from the Department of Energy Solar Market Pathways Program.²³³ Multiple partners were involved in this project: Cook County, The City of Chicago, Elevate Energy, the Environmental Law and Policy Center, ComEd and West Monroe Partners.²³⁴ This project generated a series of reports presenting analyses and tools aimed at supporting stakeholder kickstart community solar in the region. The deliverables of this project included an opportunity assessment report, policy analysis report, best practices report, economic impact report and 15 site-specific project evaluations.²³⁵

One important take away from this large study is that there is abundant space for community solar in Cook County. The project determined that there are roof and vacant land locations that can house at least 7,000 Megawatts of electricity generating capacity from solar installations of 100 kW or more. A second important take away is that the value of available financial incentives appears to be critical to the financial feasibility of community solar projects, at least based on the 2015 Illinois landscape (we must keep in mind that the cost of solar energy generation infrastructure has decreased substantially in the last years). According to the report, \$45 per megawatt hour (MWh) of subsidies are needed for most community solar projects to become economically attractive to both developers and subscribers. This can vary substantially with the size of the project though, since economies of scale play an important role.²³⁶

Chicago Solar Express

Chicago published its Climate Action Plan²³⁷ in 2008, in which the city set a target of reducing GHG emissions by 80% of their 1990 levels, by 2050. One of the pillars of that plan was transitioning to clean energy sources, including distributed solar energy. In 2013, the city kickstarted the Chicago Solar Express program as an effort to move towards that goal.²³⁸ This policy has streamlined permitting for solar projects, by providing guidelines, shortening permitting time, and reducing permitting fees. This in turn has also reduced solar projects' design costs.²³⁹ ²⁴⁰ While the focus of this program has been rooftop solar, non-rooftop solar has also benefited from these measures.

3.3.5. Community Solar in Action

According to data from the State of Illinois, there are currently 26 operational community solar projects within the state, and 69 projects in development. 57 of all projects are in the ComEd distribution area (ComEd is the main utility in northern Illinois and Chicago area). 19 projects within

233. <https://www.energy.gov/eere/solar/solar-market-pathways>

234. <https://www.cookcountyil.gov/service/community-solar>

235. <https://www.cookcountyil.gov/content/sun-shot>

236. https://www.cookcountyil.gov/sites/g/files/yywepo161/files/documents/2021-09/community_solar_for_cook_county.pdf

237. <https://www.chicago.gov/city/en/progs/env/climateaction.html>

238. https://www.chicago.gov/city/en/progs/env/solar_in_chicago.html

239. https://www.chicago.gov/content/dam/city/depts/bldgs/general/Solar/Overview_Permit_Process_Overview_40513.pdf

240. <https://programs.dsireusa.org/system/program/detail/5839/city-of-chicago-solar-express-permit-program>

the ComEd distribution area are operational. For more details on specific projects, refer to the Illinois Solar for All Approved Projects report²⁴¹, last updated in September 2022. We highlight two specific projects within the Chicago area.

Verduin Cottage Grove Development, Chicago Heights

According to the information published by the Illinois Solar Power For All Program, this is their larger community solar project.²⁴² It was approved during the 2021-2022 period and is currently under development. This project's capacity is 2,955 DC kW and should be able to supply electricity to about 600 households. The project will also reduce GHG emissions by approximately 3,671 CO₂e per year. The developer, owner and operator for this project is Community Power Group, LLC.²⁴³ This company has developed multiple solar and community solar projects across the US. The project is expected to receive \$5,644,204 of funding from REC value. As an Illinois Solar Power For All Program project, subscribers must meet the program's eligibility requirements, having an income lower than 80% of the area median income. Subscribers don't have to pay any upfront fee and are guaranteed that at least 50% of the value of the energy generated by the project will be credited to their energy bills.

E, 16th Street Development, Chicago Heights

This project also falls under the Illinois Solar Power For All Program umbrella. It was approved during the 2019-2020 period and is currently operational. This project's capacity is 663 DC kW and is estimated to support about 72-108 households. The reduction in GHG emissions per year is calculated to be approximately 779 CO₂e. The vendor for this project is Groundswell Inc.²⁴⁴ This organization is a non-profit that has "promoting energy justice" as its mission and has worked in several community solar projects across 5 states. A key partner of this project is Christ for Everyone Ministries, where the solar project is located.²⁴⁵ The financing of the project was done by SunLight General Capital.²⁴⁶ The project is expected to receive \$1,933,151 of funding from REC value. As an Illinois Solar Power For All Program project, subscribers must meet the program's eligibility requirements, having an income lower than 80% of the area median income. Subscribers don't have to pay any upfront fee and can expect 75% of the value of the energy generated by the project to be credited to their energy bills. The remaining 25% will be used by the hosting organization on site.²⁴⁷

Community engagement in this project seems to have been robust. Committed leaders like Bishop Kenneth and Pastor Lydena Franklin seem to not only have been involved throughout the process, but also played a key role in shaping it. The project was developed on an abandoned site and is, apparently, seen as positively impacting the neighborhood.^{248 249}

241. <https://www.illinoissfa.com/app/uploads/2022/02/Selected-Project-Summaries.pdf>

242. <https://www.illinoissfa.com/app/uploads/2022/02/Selected-Project-Summaries.pdf>

243. <http://www.communitypowergroup.com/>

244. <https://groundswell.org/programs/>

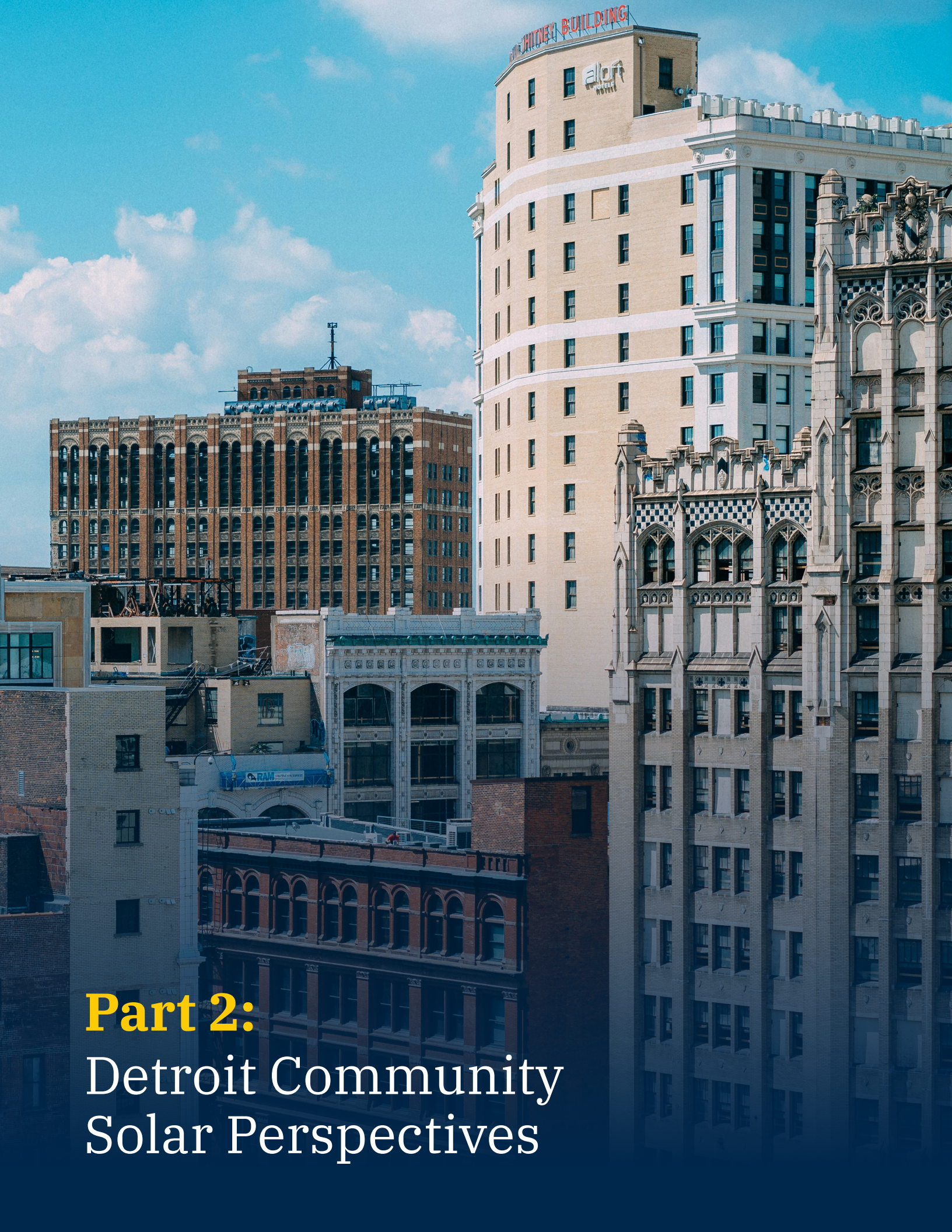
245. <https://groundswell.org/project/christ-for-everyone-ministries/>

246. <https://www.sunlightgeneral.com/>

247. <https://www.illinoissfa.com/app/uploads/2022/02/Selected-Project-Summaries.pdf>

248. <https://groundswell.org/project/christ-for-everyone-ministries/>

249. <https://www.sunlightgeneral.com/post/sunlight-develops-community-solar-project-in-chicago-heights>



Part 2:

Detroit Community Solar Perspectives

4. Expert Engagement

4.1 Background

Incorporating community voices into the development of community solar projects is important to ensure that the perspectives, needs, and concerns of those directly impacted by such initiatives are considered. Community engagement can foster a more inclusive and sustainable approach that aligns with the community's values and aspirations. While the goals of this project did not include extensive community research, we endeavored to create opportunities for community insights by reaching out to several local experts.

We define local experts as individuals who are actively involved in efforts to improve solar availability and solar energy education opportunities for communities within Detroit. With their firsthand experience and deep understanding of the local landscape, these experts are invaluable resources for informing and guiding future initiatives aimed at advancing community solar projects and achieving desired community outcomes.

4.2 Engagement Approach

Beginning in June 2023, we scheduled several informal virtual discussions with local experts to learn the history of solar projects in Detroit, identify community solar efforts to date, and hear about any unique challenges that occurred in the past related to combined municipal and community-based projects. Furthermore, we distributed an open-ended survey to the community solar advocates with whom we spoke to hear their insights regarding strategies for community solar development, desired benefits among Detroit community members, and concerns related to future community solar projects. Survey questions are presented in Table 1.

The survey was completed by representatives from eight local organizations, consulting firms, and coalitions. These contacts were initially recommended by the City of Detroit Office of Sustainability and the University of Michigan Sustainability Clinic, largely based on their previous exposure or relationships with these groups. Subsequently, these organizations provided additional contacts, and our team's research and outreach expanded the network of engagement partners. Some groups, in turn, shared the survey within their network.

Expert Survey Questions

1. What does community solar in Detroit look like to you? Please share any details of potential projects that you think are appropriate for Detroit.
2. What types of benefits do you hope to see from community solar projects in Detroit?
3. What are your top concerns regarding community solar projects in Detroit?

Table 1 - Each survey respondent was asked to voluntarily answer these three questions.

It is important to note that responses to this survey represent a small subset of community solar advocates in Detroit. Therefore, generalized conclusions about the opinions of the broader Detroit community or decision-making resulting from these opinions should not be derived from these survey results. This engagement methodology serves to amplify the ideas and efforts

of dedicated advocates who have long contributed to the expansion of solar energy projects in Detroit, predating the development of this project. We consider their insights in our Discussion and Recommendations sections.

4.2 Results

4.2.1 Potential Opportunities

Survey participants were asked: “What does community solar in Detroit look like to you? Please share any details of potential projects that you think are appropriate for Detroit.” Responses to this question are shared in Table 2. We organize respondent ideas for potential opportunities into strategy types to reflect the range of approaches in advancing community solar initiatives suggested by survey participants. Each idea presents its own set of advantages and challenges, making some ideas unapplicable to Detroit and the potential for implementing these ideas was not assessed in this report. However, highlighting such ideas touches on the importance of a multifaceted decision-making approach that aligns with the unique needs and dynamics of the City of Detroit, as well as broader Michigan legislation.

Strategy	Description
Operational Innovation	<p>Negotiating with DTE for Community Solar Microgrids: City collaborates with DTE to implement community solar and storage microgrids in neighborhoods, potentially through a pilot program that incorporates bill credits for participants</p>
Policy Advocacy	<p>City intervention at MPSC: Advocating for city intervention at the Michigan Public Service Commission to influence voluntary green pricing dockets and electric rate cases</p>
Institutional Development	<p>Establishment of Municipal Sustainable Energy Utility (SEU): Creating a municipal SEU like Ann Arbor to oversee and implement sustainable energy projects</p>
Market Mechanisms	<p>Power Purchase Agreements (PPAs) for Solar Projects: Deploying solar projects through PPA with various sites</p>
Community Empowerment and Development	<p>Encouraging Local Economic Development through Community Entities: Supporting community-based entities to develop and own solar projects</p>

Table 2 - Potential Opportunities: Survey respondents shared multiple ideas for community solar, shared under the "Description" column. These ideas were then categorized under the "Strategy" column.

4.2.2 Community Benefits

Several themes emerged throughout the responses to the survey question: “What types of benefits do you hope to see from community solar projects in Detroit?” We present these themes in Table 3 under “Desired Benefits”. These themes represent the aspirations and priorities voiced by respondents of our survey, who are invested in the success of community solar initiatives in Detroit. Through this sharing process, various opinions have been articulated that seek to harness the power of solar energy with the aim to foster resilient, inclusive, and thriving communities for generations to come.

Overall, respondents identified several areas in which community solar projects can benefit the community by initiating positive social change while promoting community resilience and well-being. Spanning from community empowerment and revitalization to economic development, each theme covers a spectrum of benefits sought after in future community solar endeavors.

Desired Benefits	Respondent Feedback
Community Empowerment and Revitalization	Several respondents highlighted the desire to transform blighted and disinvested communities and for access to financial benefits, seeking subsidies to subscriptions for low-income households. Respondents stressed the need for active participation and residential ownership.
Environmental Sustainability and Renewable Energy Transition	Respondents shared the desire to lower energy usage from non-renewable sources, solar education opportunities, and the potential for benefits from accompanying features like shaded habitats and green stormwater infrastructure.
Equity and Social Justice	Respondents highlighted benefits aimed at addressing disparities in access to clean energy, specifically based on socioeconomic status. Respondents acknowledged a need to ensure renters and local businesses can benefit from affordable clean energy.
Resilience and Emergency Preparedness	Public access to emergency information, device support during power outages, and improvements to local electric distribution are benefits respondents share that align with this theme.
Economic Development and Job Creation	Respondents expressed interest in community solar projects that enhance economic opportunity, job creation, and foster the growth of local businesses involved in the solar supply chain.

Table 3 - Desired benefits expressed by respondents are categorized into key themes.

4.2.3. Expressed Concerns

Finally, respondents were asked: “What are your top concerns regarding community solar projects in Detroit?” Respondents highlighted several concerns which were grouped into themes and summarized in Table 4. This question was asked to understand how future community solar projects may impact Detroit residents and how to best meet the needs and preferences of those directly affected.

Key Concerns	Respondent Feedback
Corporate Influence and Land Dispossession	This theme points to respondents' concern of corporate influence overshadowing community interests and the potential of the dispossession of land by the City or utility.
Lack of Community Engagement and Self-Determination	Concerns about overlooking community values and inadequate neighborhood engagement were highlighted by respondents. Several respondents shared that active decision-making by community members should be prioritized.
Equity and Fair Distribution of Benefits	Responses pointed to concerns such as residents not receiving a fair share of the benefits or profits from community solar projects.
Environmental and Social Impacts	Respondents shared a concern over the extractive nature of some renewable technologies and the potential for future land use changes that may have negative consequences on local ecosystems and communities.
Energy Affordability and Grid Improvements	Concerns about energy prices rising in areas without access to solar and the potential for unprioritized improvements to the energy grid were shared by respondents.

Table 4 - Themes summarized from the concerns expressed in respondent feedback are organized under the "Key Concerns" column.

These concerns can provide valuable insights to the broader discourse needed to address sustainable energy solutions tailored to the unique needs of Detroit. Ranging from environmental harm to social justice issues, community solar projects are subject to various challenges and can restore existing infrastructure and systems of operation.

In conclusion, the insights derived by local experts are important and provide initial insights and rationale for future community solar projects. However, it is equally important to acknowledge the necessity of more extensive community engagement to ensure that any future projects align with the needs and concerns of all stakeholders. Further exploration of community engagement practices will be delved into in the subsequent discussion and recommendations sections.

Part 3:

Discussion and Recommendations

5. Discussion

5.1 Community Solar Barriers in Michigan

Community solar projects in Detroit are limited due to Michigan legislation. While state law does not expressly prohibit such initiatives, it lacks provisions to mandate or facilitate them, leaving the decision to offer community solar projects at the discretion of each electric utility. Investor-owned utilities (IOUs) hold considerable authority in determining whether to permit the connection and net metering agreement for energy generated by third-party community solar arrays to their grid. Consequently, any entity seeking to establish a community solar project must secure approval from the local IOU. Given that IOUs primarily generate revenue from grid infrastructure and energy generation, they are hesitant to allow the integration of third-party community solar projects. This discrepancy explains why community solar projects thrive in other regions of the state but are absent in Detroit. For instance, municipal utilities like the Lansing Board of Water and Light and L'Anse Municipal Utility provide community solar subscriptions to their customers. Presently, residents of Detroit are unable to access community solar projects as they are not offered by Detroit's electric utility, DTE.

In recent years, attempts have been made to revise Michigan legislation to mandate and facilitate community solar projects for all state residents. However, these efforts faced a setback in Fall 2023. Despite the passage of several renewable energy bills, such as the Clean Energy Future Package and Clean Energy and Jobs Act, Senate Bills (SB) 152 and 153, along with House Bills (HB) 4464 and 4465, which focused on community solar initiatives, were not brought to a vote. SB 152 and HB 4464 aimed to empower communities to establish community solar projects in unused spaces and offer opportunities for energy bill subscriptions and credits.²⁵⁰ SB 153 and HB 4465 would require “not less than 30% of the electricity produced by a community solar facility to go to low-income households or low-income service providers.”²⁵¹ The community solar bills were creating tensions within the Michigan legislature, and therefore excluded from the package of renewable energy laws.²⁵²

The community solar bills failed largely due to efforts by IOUs. Because community solar allows customers to choose the source of energy used to power their homes, for-profit energy companies would lose profits from competition with alternative sources of energy generation, such as community solar arrays. Therefore, IOUs have utilized their immense influence and political spending to stop proposed legislation requiring community solar options and have spent millions in the last two years to do so.²⁵³ 80% of Michigan legislators have accepted donations from political action committees (PACs) tied to DTE and Consumers. DTE and Consumers have also directly denounced the legislation, stating

250. Davidson, Kyle. “Here’s How Pilot Programs Aimed at Cutting Energy Costs in Low-Income Mich. Households Are Faring Michigan Advance.” *Michigan Advance*, 15 July 2023, <https://michiganadvance.com/2023/07/15/heres-how-pilot-programs-aimed-at-cutting-energy-costs-in-low-income-mich-households-are-faring/>.

251. *Let’s Finish the Job: Community Solar and More* | Sierra Club. <https://www.sierraclub.org/michigan/blog/2024/01/let-s-finish-job-community-solar-and-more>. Accessed 18 Mar. 2024.

252. Roberts, David. *Michigan Targets Clean Electricity and Faster Permitting*. 15 Mar. 2024, <https://www.volts.wtf/p/michigan-targets-clean-electricity>.

253. Allnutt, Brian. “Republicans and Democrats Want Community Solar. Why Won’t Michigan Legislators Enable It?” *Planet Detroit*, 6 Dec. 2023, <https://planetdetroit.org/2023/12/republicans-and-democrats-want-community-solar-why-wont-michigan-legislators-enable-it/>.

that such proposals are unnecessary and would only add costs to customers.²⁵⁴ The future passage of laws enabling community solar will have to combat immense IOU efforts against community solar energy generation.

5.2 Examining Energy Justice, Climate Change Mitigation, and Energy Resiliency

Thus far, we have examined the status of community solar initiatives in Michigan and delved into the community solar landscapes of Los Angeles, Chicago, and New York, along with stakeholder engagement ideas and concerns specific to the City of Detroit. From our analysis, three primary objectives of community solar have emerged: advancing energy justice, meeting climate mitigation targets, and supporting energy resilience. In the upcoming sections, we will investigate the potential opportunities and obstacles for community solar adoption in Detroit by assessing our research through the lens of these three objectives.

5.2.1 Energy Justice

Energy justice is a multifaceted concept that encompasses the pursuit of fairness and the reduction of disparities across various dimensions of energy systems, markets, and operations. It revolves around three fundamental principles: distributional justice, procedural justice, and recognition justice.²⁵⁵

Distributional justice centers on the equitable allocation of benefits and burdens associated with energy resources and infrastructure among different societal groups, aiming to ensure that vulnerable and marginalized communities receive fair access to energy benefits while mitigating disproportionate burdens, such as environmental impacts and affordability challenges. Procedural justice emphasizes the inclusivity and transparency of decision-making processes related to energy policies, projects, and regulations. It focuses on democratizing participation, ensuring that all stakeholders, particularly marginalized groups, have a meaningful say in shaping energy systems that align with their needs and preferences. Recognition justice involves acknowledging historical and contemporary inequalities within energy systems, including systemic barriers faced by certain groups due to factors like race, ethnicity, socioeconomic status, and geography. By addressing these disparities and their root causes, recognition justice seeks to promote equity and inclusion in energy transitions.

While all three principles are crucial for advancing energy justice, our analysis emphasizes the significance of procedural and distributional justice within the context of community solar initiatives. By prioritizing these aspects, we aim to identify and address equity concerns associated with the development, implementation, and outcomes of community solar projects, thereby contributing to a more just and equitable energy landscape for all.

254. Allnutt, Brian. “Republicans and Democrats Want Community Solar. Why Won’t Michigan Legislators Enable It?” *Planet Detroit*, 6 Dec. 2023, <https://planetdetroit.org/2023/12/republicans-and-democrats-want-community-solar-why-wont-michigan-legislators-enable-it/>.

255. <https://www.nrel.gov/docs/fy24osti/86268.pdf>

5.2.1.1 Distributional Justice

To achieve greater equity, distributional justice brings our attention to how the benefits and burdens of energy systems are distributed across difference groups.²⁵⁶ Throughout history, environmental burdens have been disproportionately placed on marginalized groups.

The broader United States Justice40 initiative has made justice a key factor in government investment, requiring 40% of all government investments to go into disadvantaged communities. Specifically, the US Department of Energy is currently implementing Justice40 and committing to distributional energy justice through efforts to decrease the energy burden in disadvantaged communities, increase energy resiliency in disadvantaged communities, and increase access and adoption to clean energy technology in disadvantaged communities.²⁵⁷ If executed properly, community solar initiatives can improve distributional justice by giving low-income residents, renters, and those living in multifamily units the ability to access and afford renewable energy. By allowing disadvantaged communities to access and afford community solar, communities may even be able to reduce their energy bills and contribute to climate mitigation, in addition to contributing to a variety of other social, economic, and environmental co-benefits.²⁵⁸

Distributional Justice in Detroit

While the City of Detroit has demonstrated its dedication to incorporating justice into climate initiatives, notably through initiatives like the Detroit Climate Strategy, which places a strong emphasis on assisting vulnerable residents²⁵⁹, there remains room for improvement in Michigan legislation and policy frameworks to better support distributional justice, particularly in the context of community solar initiatives. As previously mentioned, the current legislative landscape in Michigan does not facilitate the development or promotion of community solar projects.

Due to existing legislation, the advancement of community solar initiatives in Michigan heavily relies on private utility companies such as DTE and Consumers Energy. While some utility companies have initiated community solar programs, the pricing structures, including premiums for renewable energy or community solar participation (green power pricing), often pose barriers for low-income residents, thereby limiting their access. Consequently, Michigan's legislative framework falls short in incentivizing the development of community solar projects and ensuring support for marginalized communities. Despite these challenges, community solar endeavors throughout the state demonstrate diverse considerations for distributional justice.

The implementation of distributional justice concerns in community solar across Michigan is mixed. Several projects around Michigan have attempted to integrate distributional justice into community solar developments.

The L'Anse Community Solar project developed a low-income-resident-specific community solar program to improve the accessibility and affordability of community solar in the community. The program reserved 55% of solar panels for low- or middle-income subscribers and subsidized the subscription fee to allow community members to afford the program. This program effectively lowered

256. <https://www.nrel.gov/docs/fy24osti/86268.pdf>

257. <https://www.energy.gov/justice/justice40-initiative>

258. https://www.nclc.org/wp-content/uploads/2024/02/202402_Report_Community-Solar.pdf

259. <https://detroitclimatestrategy.com/>

costs to make community solar more accessible and affordable for low-income residents and enabled customers to experience cost savings throughout the program. However, it is important to note that enrollment was limited to households with recently completed weatherization efforts, leaving some residents unable to access the program.

Consumers Energy's Solar Sunrise program, within Consumers Energy's broader Solar Garden program, is another example of a community solar program with a specific component focused on supporting low-income households.

Under the larger Solar Garden program, customers are charged \$9 extra each month for enrolling in the community solar program, making it more expensive to access renewable energy than the regular energy mix. However, LMI residents can enroll in the Solar Sunrise community solar program targeted to disadvantaged groups. Under the Solar Sunrise community solar program, LMI customers can enroll without any subscription fee and save up to \$200 per year on their electricity bills.

The Solar Sunrise program is a good example of targeting LMI residents to expand access. However, extensive and lengthy weatherization efforts are required for customers to maximize cost savings. In addition to these programs, the Hope Village community solar initiative exemplifies a community effort to combat rising energy costs and frequency power outages and may provide a model for enhancing community resilience. Furthermore, DTE's MIGreenPower program aims to build community solar projects in low-income communities in Detroit, which intends to help low-income customers access renewable energy.

While some community solar efforts in Michigan have integrated distributional justice considerations, many efforts have failed to support low-income residents, leaving them unable to access or afford these programs. Neither the community solar program run by the Lansing Board of Water and Light nor the Spartan Solar community solar project contain a program specific to low-or-middle-income residents. Although community solar can provide numerous benefits, including benefits to low-income residents, renters, and those residing in multifamily units, the lack of supportive legislation in Michigan has enabled community solar developments to ignore distributional justice considerations.

While distributional justice is a key tenant of energy justice, themes of distributional justice also came up in our local expert conversations, suggesting that experts also view it as a critical element of community solar.²⁶⁰ In the survey, experts discussed the importance of financial support for low-income households to access community solar through mechanisms like subsidies, addressing disparities in clean energy access across socioeconomic lines, ensuring equitable distribution of benefits, and making energy more affordable, all of which reflect aspects of distributional justice.

Distributional Justice Successes Nationally

While evidence of distributional energy justice in Michigan is mixed, examples from Los Angeles, Chicago, and New York can provide some guidance for Michigan. California, Illinois, and New York all have state policy instruments that encourage community solar and specifically support disadvantaged groups access and afford community solar.

California has a number of policies that support distributional justice in community solar. The 2007 California Solar Initiative initiated several programs to promote solar uptake among low-income

260. https://link.springer.com/chapter/10.1007/978-3-031-46282-5_10#Fn10

communities, including the Single-family Solar Affordable Solar Housing (SASH) program, the Disadvantaged Communities – Single-family Solar Homes (DAC-SASH) program, the Multifamily Affordable Solar Housing (MASH) program, the CSI-Thermal program, and the CSI-Thermal Low-Income program. Additionally, California recently expanded its community solar framework to require at least 51% of the capacity of all community solar programs to serve low-income customers. This mandate demonstrates a strong commitment from the state of California towards improving distributional justice.

Illinois and New York have also substantially integrated distributional energy justice considerations in their community solar legislation and are viewed as nationwide leaders in the community solar space. In Illinois, the Solar Power For All program was developed to promote equitable access to solar energy, including to community solar. Programs under the Solar Power For All program are required to serve customers with an income lower than 80% of the area median income, ensuring that LMI income households are supported. Moreover, this program guarantees that subscribers will not have to pay any upfront costs and that at least 50% of the value of the energy generated will be received by subscribers, further enabling low-income residents access and afford renewable energy. Between 2018-2022, 17 community solar projects were approved under this program.

Similarly, New York has also demonstrated substantial distributional justice provisions. New York has implemented a wide variety of support for low-income residents to access and afford rooftop solar and community solar. Of particular note is New York's Expanded Solar for All program which introduced an "automatic enrollment" community solar model aimed at providing financial savings to low-income households. The automatic enrollment aspect is particularly relevant since it increases the reach of the program among low-income households and decreases enrollment costs, which can be an issue among disadvantaged residents. This innovative program directly targets low-income residents and allows subscribers to opt-out entirely or opt-in to a traditional community solar project, as desired. New York legislation also supports low-income residents access community solar through the Inclusive Community Solar Adder, which specifically caters to projects aimed at serving LMI subscribers, affordable housing units, and other institutions aiding disadvantaged communities.

5.2.1.2 Procedural Justice

Built upon acknowledging historical and persistent energy disparities and involving marginalized communities, procedural justice offers the chance to develop energy systems guided and tailored by the community. Procedural energy justice aims to empower the voices of the most vulnerable members of society and distribute decision making authority equitably among all stakeholders.²⁶¹

It is believed that active public participation in the energy decision-making processes promotes better outcomes, fosters social innovation, and enhances public acceptance of energy projects. Thus, procedural justice is relevant to the planning of community solar energy infrastructure and holds potential for mitigating the negative impacts associated with energy resource development and utilization.

The practical application of the procedural justice principle involves determining who is invited and able to participate, whose voices are considered during decision-making, collaborating to

261. Rosner, N., Blanco, L., Romero-Lankao, P., & Zimny-Schmitt, D. (2023). "Chapter 2: Procedural Justice." In: LA100 Equity Strategies: Final Report. National Renewable Energy Laboratory (NREL). <https://www.nrel.gov/docs/fy24osti/85949.pdf>

develop procedures that inform this deliberative process, and ensuring access to formal mechanisms of regulation and accountability.²⁶²

Procedural Justice in Detroit

Thus far, solar energy procedural justice in the City of Detroit is mixed. O’Shea Solar Park serves as an example of weak procedural energy justice, where community members did not feel that the project was done with the right intentions; they felt that adding solar panels did not serve the needs of the community in the ways they would have outlined had they been consulted on how to revive the O’Shea site. Conversely, certain Community Solar Projects in Detroit demonstrate stronger procedural justice practices. For instance, in the Industrial Park, L’Anse partnership, and the East Lansing Solar Park, proactive measures such as surveys and community meetings were implemented, aiming to engage residents before project initiation. However, the Consumers Energy Solar Garden/Solar Sunrise project falls short in terms of procedural justice, as outreach efforts primarily focused on explaining program benefits rather than soliciting input from the community beforehand. The MIGreenPower Community Impact Pilot Project exhibits a better approach to procedural justice, as the concept arose from community engagement endeavors. Nevertheless, the composition of the project's board, which includes only one income-qualified community representative from each of the three communities involved, is a bit weak and highlights the need for more equitable and consistent engagement.

Procedural Justice Successes Nationally

An exemplary instance of procedural energy justice is exemplified by the Sunset Park Solar project in New York City. The project is a public private ownership, jointly owned by UPROSE, a Latino community-based organization, Working Power, a dedicated clean energy developer prioritizing climate justice and robust community benefits, and NYCDEC. Central to both UPROSE and Working Power is ensuring meaningful community engagement, participatory planning, sustainable economic development, and community leadership development with environmental and climate justice at the center. Likewise, each subscriber-member holds a vote in determining the allocation of the cooperative's resources, including any operational profits from the solar installation. Thus, the project not only addresses the community's energy needs but also actively engages local stakeholders in decision-making processes and fostering genuine community involvement and empowerment. This collaborative approach ensures that the project aligns with the community's goals and values while maximizing its positive impact on the neighborhood. Detroit can follow the lead of the Sunset Park Solar project in New York City by implementing a similar model to enhance procedural justice in its energy initiatives.

5.2.2 Climate Change Mitigation and Achieving Climate Goals

The City of Detroit has set ambitious goals for achieving carbon neutrality by 2050. New York City has the same objectives, while Chicago aims to reduce greenhouse gas emissions by 80% by 2050, and Los Angeles targets carbon neutrality by 2045. Community solar emerges as a key tool in addressing climate change and meeting these ambitious policy goals, driving the increasing interest and active pursuit of community solar initiatives in these cities.

262. Rosner, N., Blanco, L., Romero-Lankao, P., & Zimny-Schmitt, D. (2023). "Chapter 2: Procedural Justice." In: LA100 Equity Strategies: Final Report. National Renewable Energy Laboratory (NREL). <https://www.nrel.gov/docs/fy24osti/85949.pdf>

The Detroit Climate Strategy acts as a guiding framework detailing how the city intends to achieve its mitigation targets. One of its key priorities is to transition to clean energy, which includes sourcing 100% of municipal electricity from clean sources by 2034 and launching a solar program to generate clean energy on city-owned properties, with benefits for the community.²⁶³ Community solar initiatives can be utilized to meet Detroit's overarching goal of advancing a transition to a sustainable and resilient clean energy future. By installing shared solar systems on city-owned properties, residents gain access to clean energy while reducing the city's reliance on traditional electricity sources. Furthermore, the Strategy also emphasizes the priority of vulnerable residents when adapting to climate change. The above section underscores the importance of ensuring these programs are designed and implemented to promote equity and accessibility for marginalized groups, including low-income households, communities of color, and other underserved populations. By focusing on procedural and distributional justice, community solar projects can actively work towards narrowing the energy equity gap, empowering disadvantaged communities to access clean and affordable renewable energy resources.

Additionally, the U.S. Department of Energy has developed the "Low-Income Clean Energy Connector"²⁶⁴ software to facilitate access to community solar for low-income households. This tool simplifies the enrollment process for income-eligible individuals into low-income community solar programs, ensuring consumer protections and verified savings. The City of Detroit has the option to utilize this online tool, which aims to integrate low-income households into the clean energy sector while mitigating potential consumer risks and reducing energy bills.

5.2.3 Energy Resilience

In addition to specific priorities, The City of Detroit's Climate Strategy serves as a comprehensive framework for residents, businesses, City departments, and industry to enhance general resilience to climate change.

Michigan ranked second in the nation for the highest number of power outages affecting at least 50,000 customers between 2000 and 2021.²⁶⁵ Over the past decade, outages surged by 78%.²⁶⁶ This trend is partly attributed to the increasing frequency of severe storms in recent years, a pattern expected to exacerbate further.²⁶⁷ However, the sheer number of power outages as compared to neighboring states also highlights a regulatory failure, as state regulators have not ensured that utilities sufficiently invest in and maintain the grid to mitigate power failures.²⁶⁸ Thus, within the broad topic of 'resilience', energy resilience²⁶⁹, or the capacity of the electric grid and local communities to endure and rebound from power outages, is a crucial aspect for safeguarding public health, economic prosperity, and overall societal well-being. As climate-related challenges continue to escalate, it is crucial that both the state of Michigan and the City of Detroit prioritizes grid strengthening and

263. Detroit Climate Strategy Executive Summary <https://detroitmi.gov/sites/detroitmi.localhost/files/2023-11/Detroit%20Climate%20Strategy%20Executive%20Summary.pdf>

264. U.S. Department of Energy. "Clean Energy Connector." <https://www.energy.gov/communitysolar/clean-energy-connector>

265. <https://www.michiganpublic.org/weather/2024-01-19/michigan-ranks-no-2-for-power-outages>

266. <https://www.climatecentral.org/climate-matters/surging-weather-related-power-outages>

267. <https://www.ncei.noaa.gov/access/billions/events/MI/1980-2023?disasters%5b%5d=all-disasters>

268. <https://www.canarymedia.com/articles/solar/the-fight-over-california-community-solar-everyone-vs-the-utilities>

269. <https://www.energy.gov/eere/energy-resilience>

the maintenance of reliable energy sources becomes increasingly vital for enhancing public health, economic prosperity, and overall societal well-being.²⁷⁰

Theoretically, community solar systems, like other distributed solar systems, can enhance the grid's energy resilience by reducing its vulnerability to outages.²⁷¹ However, our investigation within the studied cities, including Detroit, has revealed a lack of tangible examples of community solar initiatives contributing to resilience. Existing literature echoes such, indicating that resilience and grid benefits have not been a primary focus in the planning of community solar projects thus far.²⁷² A key aspect limiting community solar projects' ability to contribute to energy resilience is that during outages, distributed energy generators must disconnect from the grid for technical reasons. To be able to continue to get energy from distributed energy through the grid during an outage requires having the grid partitioned into smaller sub-grids, often called microgrids. A specific microgrid could continue to provide energy from distributed energy sources, like community solar projects, in isolation from the rest of the grid, allowing for higher energy resilience. Setting microgrids would require regulatory changes and infrastructure investment though.

Likewise, the general effectiveness of community solar in enhancing resilience is somewhat limited due to the intermittent nature of solar power, particularly during extended storms. Recent research, however, has emphasized that the resilience of community solar can be enhanced through the integration of energy storage systems.²⁷³ By storing excess solar energy and shifting it to critical loads during grid outages, these systems work to enable community solar resilience. Likewise, they also enable solar energy to be stored and used during nighttime hours.

Of the cities explored, New York City is the only one that has committed to battery energy storage investment, recognizing its essential role in achieving the city's objectives, which are akin to those of Detroit. New York City's proactive measures in advancing storage and community solar initiatives underscore the significance of this integration in bolstering energy resilience.²⁷⁴ Should a large-scale grid failure occur, the city recognizes that energy storage stands ready to provide emergency power to vital services, homes, and businesses. There is no such action from Chicago or Los Angeles, however, there has been consistent action and policy across LA to approve a community solar-battery program.²⁷⁵

Note that the deployment of energy storage systems is not consistently co-located with community solar projects. This is because batteries are often more cost-effective when strategically placed on the grid rather than directly paired with renewable energy projects like solar.²⁷⁶ The recent slight increase in the deployment of combined solar and storage systems²⁷⁷ is primarily fueled by federal

270. <https://www.energy.gov/eere/energy-resilience>

271. <https://www.energy.gov/eere/solar/articles/solar-resilience-keeping-communities-connected#:~:text=Solar%20energy%20can%20play%20an,of%20the%20communities%20it%20serves>

272. <https://www.nrel.gov/docs/fy24osti/87524.pdf>

273. <https://www.nrel.gov/docs/fy24osti/87524.pdf>

274. <https://www.governor.ny.gov/news/governor-hochul-announces-160-million-federal-investment-national-science-foundation-new#:~:text=January%2029%2C%202024-,Governor%20Hochul%20Announces%20%24160%20Million%20Federal%20Investment%20From%20the%20National,in%20Battery%20Technology%20and%20Manufacturing>

275. <https://www.canarymedia.com/articles/solar/the-fight-over-california-community-solar-everyone-vs-the-utilities>

276. <https://www.sciencedirect.com/science/article/pii/S0140988322000226>

277. <https://www.nrel.gov/docs/fy24osti/87524.pdf>

tax incentives. But changes in tax credit policies, like the IRA, may impact the efficiency and value of co-location, requiring a much more in-depth case-by-case evaluation before making generalized assertions about the enhanced resilience of community solar.²⁷⁸

As climate-related challenges continue to escalate, it is crucial that both the state of Michigan and the City of Detroit prioritizes grid strengthening and the maintenance of reliable energy sources becomes increasingly vital for safeguarding public health, economic prosperity, and overall societal well-being.

6. Recommendations

The Detroit City Government should keep in mind what their objectives are when deciding whether to pursue community solar. As mentioned in the discussion section, if done correctly, community solar can contribute to energy justice, climate change mitigation goals, and energy resilience. However, other policies can also contribute to these objectives. Our analysis does not include a comparative analysis of community solar development against other alternative strategies. Therefore, the City should assess whether these are indeed the objectives they are prioritizing and if community solar is the best way to achieve them. Ultimately, in this section, we present our recommendations for community solar development to the Detroit City Government, assuming the City is committed to advancing community solar development within the city.

1. Invest political capital in pushing legislation that facilitates the development of community solar in Michigan

As discussed in our report, the successful development of community solar projects is highly dependent on how the electricity sector is regulated, which lies within state law authority. Therefore, if the City would like community solar projects to play a role in achieving the goals of the Detroit Climate Strategy within the IOU landscape, Michigan's legislature needs to introduce and pass reform into the electricity sector legal framework. We recommend the following legal modifications:

- An electricity sector regulation amendment that requires IOUs to allow the interconnection of distributed energy projects like community solar projects, assuming the projects pass clearly defined and regulated feasibility criteria.
- An electricity sector regulation amendment that introduces (i) subsidies for the development of community solar projects targeted toward low-income households (see Chicago and Los Angeles case studies for examples), (ii) subsidies for the development of community solar projects that meet predefined community engagement and involvement standards and incorporate energy justice principles (see New York's Community Benefit Projects for examples), (iii) obligation by IOUs to generate a certain amount of energy from community solar projects with benefits targeted toward low-income households (see the Chicago case study for an example), or (iv) a combination of all three.
- A bill that reforms the Michigan Public Service Commission (MPSC), to align its functioning more clearly with effective monitoring of IOUs and enforcement of the electricity sector regulation. In Fall 2023, the MPSC was granted authority to consider climate, equity, and affordability in

278. <https://www.nrel.gov/docs/fy24osti/87524.pdf>

its decision-making.²⁷⁹ Building on this expansion of authority, the MPSC could also introduce performance-based regulation to incentivize initiatives.

2. Study the feasibility of creating a Municipal Utility or Sustainable Energy Utility in Detroit

The City of Detroit should consider commissioning a feasibility study for the creation of a municipal utility and/or a Sustainable Energy Utility (SEU) to determine the economic, social, and technical viability of these options.

In the absence of the state legislative changes detailed in our first recommendation, IOUs are unlikely to pursue development of community solar in Michigan. Detroit can circumvent dependency on IOUs for the transition to renewable energy by replacing or supplementing DTE with a municipal utility in Detroit. Several municipal utilities already exist in Michigan, in Lansing and L'Anse, and an SEU is in the planning phase in Ann Arbor. Even if these options do not reach fruition, a secondary benefit could be to put pressure on IOUs to meet community solar demands. In Colorado, the City of Boulder failed to municipalize, but ultimately reached a settlement with their IOU to achieve emissions goals.²⁸⁰

3. Prioritize energy resilience and reliability of energy sources by developing battery storage solutions

If Detroit decides to implement community solar initiatives, it is advisable to consider the example of New York City by investing in battery energy storage at the same time (see Energy resilience section). Specifically, Detroit should consider strategically placing storage systems on or near critical facilities. This strategy can guarantee a consistent power supply for vital services during broader grid disruptions. Additionally, conducting further research and planning on tax incentives, policies, and the benefit of co-location is crucial for effectively integrating energy resilience considerations into community solar projects in Detroit.

4. Facilitate collaboration among stakeholders including community members, local leaders, and solar developers to ensure effective community engagement and procedural justice in solar projects

Drawing from successful models (see Sunset Park Solar project in New York City case study) and community solar standards such as the DOE Community Solar Guidelines, the City of Detroit can adopt a robust community engagement structure. The City should prioritize fostering community-owned community solar energy initiatives. At the very least, engaging with Detroiters to understand current inequities and desired impact areas that center community experiences, values, and goals is a crucial first step in developing energy equity strategies for the City and DTE to achieve a just and equitable distribution of energy benefits and burdens in Detroit's energy transition.²⁸¹

279. *An Overview of Michigan's Landmark Climate Legislation*. Michigan Environmental Council.

280. Sakas, Michael Elizabeth. "Boulder Ends Decade Long Pursuit Of City-Owned Power Utility." *Colorado Public Radio*, 20 Nov. 2020, <https://www.cpr.org/2020/11/20/boulder-ends-decade-long-pursuit-of-city-owned-power-utility/>.

281. Rosner, N., Blanco, L., Romero-Lankao, P., & Zimny-Schmitt, D. (2023). "Chapter 2: Procedural Justice." In: LA100 Equity Strategies: Final Report. National Renewable Energy Laboratory (NREL). <https://www.nrel.gov/docs/fy24osti/85949.pdf>

5. Assess municipal level policies that can support community solar in Detroit

While widespread community solar development in Detroit is unlikely without previous legislation modifications (see Recommendation 1) or shifting to a Municipal Utility system (see Recommendation 2), the following set of recommendations assume the eventual passage of legislation enabling community solar and provides best practices for future community solar projects:

- Streamline enrollment processes and provide targeted support for low-income households, including:
 - Funding a comprehensive study to provide stakeholders with essential information on costs, permitting, available sites, and relevant legislation regarding community solar.
 - Implementing an opt-out community solar program in Detroit, modeled after the Villages of Brockport and Lima, in New York. By enrolling residents automatically, without requiring contracts or credit checks, Detroit can greatly simplify the process of joining the community solar program. This straightforward approach encourages removing barriers that often prevent low- and moderate-income (LMI) residents from accessing traditional opt-in programs.
 - Emulating Community Solar NY's success to enhance solar energy accessibility by partnering with local stakeholders, including government agencies and community organizations. Specifically, replicate the Inclusive Community Solar Adder within Community Solar NY to benefit low-to-moderate income subscribers, affordable housing units, and other organizations supporting disadvantaged communities.
- Implement policies to streamline permitting for all solar projects within the City. Following the Chicago Solar Express initiative example, this could include providing clear permitting guidelines, shortening permitting time, and reducing permitting fees.

7. Conclusion

The Detroit Climate Strategy lays out Detroit's framework for residents, businesses, city departments, and industry to achieve the City's ambitious emission reduction goals and increase resilience to climate change.²⁸² By prioritizing transitioning to clean energy, increasing sustainable mobility, accelerating energy efficiency and reducing waste, and supporting vulnerable residents, the City of Detroit aims to achieve net-zero emissions by 2050. To advance these goals, the Detroit Office of Sustainability requested our team of master's students to examine opportunities and challenges for community solar development in Detroit.

Part 1 of this report offers a review of U.S. Community Solar Initiatives. The first section provides definitions and preliminary information key for contextualizing the rest of our study. This includes conceptual definitions, an overview of Michigan's relevant legislation, and a review of the City of Detroit's interest in community solar. We follow with a review of five community solar projects within the state of Michigan, in which we highlight community engagement within each project. In the

282. <https://detroitclimatestrategy.com/>

subsequent section, we present the experiences of three US cities, Los Angeles, Chicago, and New York, around community solar. For these three cases, we discuss the relevant legal framework and the key policies that play a role in shaping the community solar landscape of each city, as well as specific examples of how these have led to the development of community solar within them.

In Part 2 of this report, Expert Conversations, we present the results of a survey we shared with a variety of community solar experts and advocates. Ultimately, we identify several key insights that should be considered in the development of future community solar projects. We further conclude that more extensive community engagement is critical to ensure that any future projects align with the needs and concerns of all stakeholders.

Lastly, Part 3, the discussion and recommendations sections of this report, synthesizes the information presented throughout the report and provides a critical analysis to derive policy recommendations tailored for the City of Detroit.

Overall, we conclude that community solar can be a valuable instrument to pursue climate mitigation and energy justice goals in Detroit. However, Michigan does not have state legislation that enables community solar. As such, substantive community solar development is unlikely within the current IOUs' service areas. We therefore recommend advocating for state-level legislative changes or shifting to a municipal utility system as critical strategies to address these barriers. Additionally, we recommend that energy resilience, justice, and reliability should be key considerations in all future community solar initiatives in Detroit for community solar to effectively contribute to the city's climate goals and provide community benefits. Ultimately, we find that community solar can offer considerable benefits to communities only if community solar projects are developed in partnership with communities and with their priorities at the forefront.