Michigan Solar Communities Guidebook - Executive Summary

A Practical Guide for Individuals, Organizations, and Local Governments Wanting to Expand Renewable Energy - Especially Community Solar!

Introduction

GLREA's Michigan Solar Communities Guidebook is intended to be a practical guide for individuals, organizations, and local governments that want to support and expand renewable energy, with a particular focus on community solar. Pursuing renewable energy can help save money on energy expenditures, drive economic development, reduce climate risk, and support environmental justice. According to a 2020 report by the Great Plains Institute, wind and solar energy have become the most cost-effective resources for generating electricity in Michigan. Solar energy is an effective way of harvesting energy from the sun that can then be made available to residents and businesses as electricity either directly from an on-site system, through the electric grid when generated by an electric utility, or through the electric grid of a community solar energy system.

Chapter 1: Solar Deployment in Michigan

A few key federal policies have allowed solar to become much more widespread and affordable in Michigan. The Public Utility Regulatory Policies Act (PURPA) (1978) represents one of the earliest efforts to encourage the use of alternative energy sources. It obligated utilities to purchase power from smaller-scale generators like rooftop solar owners, as well as established the levelized cost of electricity (LCOE), a method for determining the cost of different sources of energy and related equipment, construction, maintenance and more. PURPA also created power purchase agreements (PPAs), long-term contacts reached between energy buyers and sellers that can help developers more easily secure financing for renewable energy projects. Another major federal policy is the Inflation Reduction Act (IRA) (2022), which constitutes the single largest federal investment in combating climate change and supporting clean energy in U.S. history. It provided billions of dollars in funding for solar, energy efficiency, electric vehicle, climate resilience, and environmental conservation projects.

State-level policies have also contributed to the growth of solar in Michigan. The Clean, Renewable, and Efficient Energy Act (P.A. 295) (2008), established the Net Metering program, which allowed owners of small-scale solar systems to export extra electricity back to the grid equal to the retail rate of buying electricity from their utility. It also imposed a Renewable Portfolio Standard (RPS) on local utilities, which required them to begin purchasing or generating 10% of the electricity they sold from renewable sources by 2015. P.A. 341 and P.A. 342 (2016) amended P.A. 295 to replace the Net Metering Program with the Distributed Generation Program, which compensates owners of small-scale solar at about half of the retail rate of buying electricity from utilities when they export extra electricity back to the grid. These acts also increased utilities' RPS to 15% by 2021 and required them to submit Integrated Resource Plans (IRPs) outlining how they intend to produce electricity in a resource- and cost-effective way to the Michigan Public Service Commission (MPSC) every five years.

More recently, Governor Whitmer's MI Healthy Climate Plan (2022) calls for a 28% reduction of greenhouse gas emissions from 2005 levels by 2025 and a 52% reduction by 2030, as well as achieving carbon neutrality by

2050. Additionally, a package of bills called the Clean Energy Future Plan (2023) now allows Michigan residents to install larger solar energy systems, increases the distributed generation cap, Renewable Portfolio Standard, and Clean Energy Standard, and authorizes solar, wind, and energy storage developers to obtain building approval directly from the MPSC.

Chapter 2: Community Solar in Michigan

Distributed solar, or solar not owned by utilities, has become much more common due to rising energy costs, increasing climate change and resilience concerns, solar technology innovation, and supportive policies like those outlined in Chapter 1. One distributed solar model that is growing in popularity is Community Solar, which allows individuals and organizations to purchase or subscribe to a number of solar panels located within their community and receive credits on their utility bill for the value of the electricity generated by those panels. Community solar projects are important because they allow people who can't install solar panels on their homes and businesses (because they are renters, have unsuitable roofs, can't afford them. etc.) to obtain the benefits of lower-cost electricity, improved grid reliability, lower carbon emissions, and local economic development.

Although the benefits of community solar are clear, there is no explicit law in Michigan that supports the development of community solar projects. As a result, investor-owned utilities refuse to work with developers to build them. As of 2024, 24 states have enacted community solar laws, including Minnesota, New York, and Massachusetts. A community solar policy supporting these projects needs to be enacted into Michigan law to ensure utility cooperation and more equitable access to solar energy across the state.

Chapter 3: Community Solar Case Studies

The U.S. Department of Energy's (DOE) Clean Energy for Low Income Communities Accelerator (CELICA) helped to fund and gather data on various community solar pilot projects around Michigan. The first of these projects was with Cherryland Electric, which began a community solar program for 50 low-income households in 2018. Each participating household was allocated nine solar panels in the community solar array and was required to receive free energy efficiency upgrades and energy education materials to further reduce their energy usage and costs. It was found that participating households saved an average of $20-$30 per month on their energy bills, helping them make fewer late payments and allowing them to use savings to pay for medical bills and food.

The second CELICA project was with the Village of L'Anse, which began a community solar program for their 2,000 residents in 2019. Participating households could lease up to ten solar panels for a specific number of years and, like the Cherryland Electric program, were required to receive energy efficiency upgrades and education materials. It was found that participating households saved an average of $21-$23 per month on their energy bills, and an on-bill financing mechanism reduced barriers to participation for low-income residents.

Some investor-owned, co-operative, and municipal utilities across Michigan have also launched impactful community solar programs. Tiered pricing models, local climate considerations, and strong partnerships between utilities, state energy agencies, and weatherization organizations have proven to be critical in ensuring the success and accessibility of community solar projects.

Chapter 4: GLREA Solarize Program

Both community solar and rooftop solar projects have an important role to play in expanding renewable energy use across Michigan. GLREA's Solarize program works with community members who are interested in installing rooftop solar to provide local educational meetings about the benefits of solar and the purchasing and installation processes. If a certain threshold of meeting attendees agree to install rooftop solar, they will all receive a 5-15% discount from the solar installer, as well as potential additional discounts from the solar panel manufacturer or local government. By combining these savings with the 30% Investment Tax Credit, rooftop solar in Michigan is more affordable than ever! If you are interested in learning more or having a Solarize meeting in your community, please contact GLREA's Solarize Program Coordinator, Marshall Clabeaux at clabeaux12@gmail.com or 616-914-4131.

Chapter 5: Solar and Geothermal Energy- Return on Investment

There are three main return on investment (ROI) performance measurements used to evaluate the investment in a solar, community solar, geothermal, or non-solar energy system. The Financial Return on Investment calculates how long it takes for a purchaser of solar energy or a geothermal system to pay for their investment by saving on the cost of energy from their utility. The Environmental Justice Return on Investment compares the increasing cost of disaster recovery with the cost paid by a purchaser of solar energy or a geothermal system and its associated climate change risk reductions. The Embodied Carbon Return on Investment calculates how long it takes the carbon emissions displaced by a purchaser of solar energy or a geothermal system to offset the carbon emissions from the materials and fuels used to manufacture and install the solar energy and geothermal system equipment.

Chapter 6: Utilizing Other Sources of Renewable Energy

Along with solar and wind energy, geothermal systems and energy efficiency measures can also significantly reduce energy costs and carbon emissions. Geothermal systems provide a more sustainable alternative to heating, ventilation, and air-conditioning (HVAC) systems by harnessing the differential heat between the surface of the Earth and underground. A geothermal system includes a group of pipes buried in the ground called a ground heat exchanger. These pipes are full of liquid that absorbs thermal energy from the surrounding environment. A heat pump then transfers this liquid to the ducts in a building, allowing underground heat to warm buildings in winter and excess heat from buildings to be pumped underground in summer. Along with smaller systems installed by homeowners, there have been various large-scale geothermal systems implemented throughout Michigan (such as those in Wyandotte and at the State Capitol building in Lansing). Additionally, local initiatives like Architecture 2030 Districts, Michigan Saves, and the Property Assessed Clean Energy (PACE) program can help residents and businesses make energy efficiency upgrades to the appliances and materials in their buildings.

Chapter 7: Resources to Support Local Communities

There are a variety of resources available to help local units of government and advocates expand renewable energy across Michigan. O ne particularly helpful resource is the U.S. DOE's SolSmart program, which offers free technical assistance to local governments seeking to reduce barriers to solar in their community through permitting, zoning, and education. SolSmart communities like Ann Arbor, Grand Rapids, and East Lansing have received national recognition for undertaking these efforts. The National Community Solar Partnership (NCSP) through the U.S. DOE is similar to Solarize, but provides more specific support for community solar initiatives. Many SolSmart communities also utilize SolarAPP+, a software tool developed by the National Renewable

Energy Laboratory (NREL) that shortens the permitting process by automatically running compliance checks on residential solar energy systems. The University of Michigan, Michigan State University, and the Michigan Department of Environment, Great Lakes, and Energy have also developed a solar planning and zoning guide for local governments.

Michigan Saves is another important resource for homeowners and businesses interested in installing solar, as this non-profit organization partners with credit unions and banks to provide lower-cost financing. The Rural Energy for America and the Rural Energy Savings programs through the U.S. Department of Agriculture also provide loans and grants to farmers and rural utilities to implement renewable energy systems and energy efficiency upgrades. Additionally, the state of Michigan has applied to the U.S. Environmental Protection Agency's (EPA) Solar for All competition, which will award grants to states, territories, Tribal governments, municipalities, and nonprofits for the expansion of solar in low-income and disadvantaged communities.

Chapter 8: Electrical Energy Storage

Electricity for lighting, heating, or any other use requires continuous production and distribution. Because solar panels produce the most electricity on sunny days, battery storage is often paired with solar projects to ensure that residents and businesses have access to enough electricity during cloudy days or at night. The U.S. is expected to deploy 10 to 100 GW of energy storage systems in the next decade to maximize renewable energy resources, reduce the need for expensive "peaker-power" plants during periods of high demand, and improve the overall resiliency of the electric grid.

Most of the energy storage projects that have been deployed to-date are operated by utilities and utilize lithium-ion batteries with 4 to 6 hours of capacity. But projects using flow batteries, compressed air storage, and gravity storage with larger capacities are becoming increasingly common. The cost of battery storage projects has decreased over time, but their deployment has been hindered because the value of energy delivered from storage is not addressed in utility rate structures. In order to determine the best battery type, size, and configuration for a community energy storage project, it is important to draw from case histories and consider the commercial offerings available from companies like Tesla, Sonnen, and Alpine.

Become a Member of GLREA

If you are passionate about securing a more clean, equitable, and reliable energy future for all and want to stay up-to-date on the latest local, state, and federal clean energy legislation, you can become a member of GLREA by clicking here https://www.2glrea.org/membership and then scroll down and click on the yellow 'Become a GLREA Member' button and then follow the directions. If you are already a member and want to do more, you can give an additional contribution to GLREA HERE.

Please don't hesitate to reach out to John Freeman, the Executive Director of GLREA, with any questions using the contact information below:

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