




Community Solar Initiatives

Opportunities for Brownfield - Community Solar Initiatives in the Commonwealth



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Community Solar - a power plant that utilizes solar energy and whose electricity is dispersed among a community

What is a **Brownfield Sites**?

Brownfield Site - land that is no longer in use had previously been developed on and contaminated with hazardous materials

Intersection of Community Solar and Brownfields



The cooperative by the name of CERO looked to combine the effects of community solar, a brownfield site, and waste management. CERO was hoping to develop a brownfield site in Boston by building an anaerobic digester, which uses energy from a community solar project on site. The objective was to demonstrate that a closed loop system around food waste can be created within communities or even on a larger scale.

Community Solar: Incentives

Low Income Solar Policy

SMART

“Massachusetts is updating the method by which incentives are awarded. The Solar Massachusetts Renewable Target (SMART) program will continue to award higher incentives to projects serving low-income customers. Under the SMART program, the state will conduct an initial auction to determine a base incentive rate for solar projects, which will fall under a declining-block schedule over time. The base incentive rate will be multiplied by 230 percent for residential and small projects (under 25 kW) that serve low-income customers. The new incentive program is expected to be fully implemented by mid-2018 and aims to develop 1,600 MW of new solar in the state.” (<https://www.nrel.gov/technical-assistance/lmi-solar.html>)

Massachusetts Solar Loan Program

“The Department of Energy Resources (DOER) and the Massachusetts Clean Energy Center (MassCEC) have also developed the Massachusetts Solar Loan program, a loan program through which the state will provide interest rate buy-downs and loan guarantees, with emphasis put on low-income solar. The goal of the program is to provide loans that are cash-flow positive from day one for customers, and provide risk protection for lenders who offer these loans to homeowners with lower credit ratings. The Solar Loan Program applies to homeowners, owner-occupied multi-family homes with three or fewer units, or residents interested in purchasing a share in a shared solar project.” (<https://www.nrel.gov/technical-assistance/lmi-solar.ht>)

Brownfields Redevelopment Access to Capital (BRAC) Program

Backs private sector loans with environmental insurance to ensure that the cleanup is completed, the loan is repaid and the collateral is restored to its "clean" value. The borrowers' risks are protected through the BRAC Pollution Legal Liability and Cleanup Cost Cap Policies. The state, through MassBusiness, subsidizes the premiums of insurance policies up to 50%.

(<https://www.bu.edu/rccp/files/2009/11/What-Community-Solar-Can-Do-BU-April-2018-1.pdf>)

The Brownfields Redevelopment Fund (BRF)

Provides low-interest loans and grants for site assessment and cleanup in the List of Economically Distressed Areas (EDAs). EDAs include all Economic Target Areas (ETAs), areas that meet the criteria for ETA designation, but have not been formally designated, and former manufactured gas plant sites. Eligibility is limited to municipalities, redevelopment authorities and agencies, economic development and industrial corporations, community development corporations, and economic development authorities.

<https://www.bu.edu/rccp/files/2009/11/What-Community-Solar-Can-Do-BU-April-2018-1.pdf>

Tax Benefits

https://www.epa.gov/sites/production/files/2014-08/documents/tax_guide.pdf

- By using the federal brownfields tax incentive, environmental cleanup costs are fully deductible in the year that they are incurred, rather than capitalized over time (up to 30 years in some cases).
- There are three requirements to qualify:
 - The property must be owned by the taxpayer incurring the eligible cleanup expenses, and be used in a trade or business or for the production of income.
 - Hazardous substances or petroleum contamination must be present or potentially present on the property.
 - Taxpayers must obtain a statement from a designated state agency (typically, the state's environmental agency overseeing the state's voluntary cleanup program (VCP) that confirms the site is a brownfield and therefore eligible for the tax incentive. Participation in a state VCP satisfies this requirement.
- Steps to qualify for and claim the tax incentive are simple and straightforward:
 - The site owner determines that a hazardous substance or petroleum contamination is present or potentially present on the property and begins planning for a cleanup and redevelopment project.
 - The site owner contacts the designated state agency to inquire about procedures for obtaining a statement that confirms the property is a brownfield site. The owner then provides the agency with documentation that shows whether hazardous substances or petroleum contamination is present or may be potentially present on the property.
 - The designated state agency verifies submitted information and provides the site owner with a statement of eligibility for the tax incentive. In most cases, the review process is very quick.
- Brownfields Tax Incentive program

- A Dorchester neighborhood that at one time included 23 abandoned or demolished buildings now is a new intergenerational neighborhood called Boston's Hope, which is home to young children, their new foster families, and their new "grandparents."

New Markets Tax Credit

- Defined as: The New Markets Tax Credit (NMTC) program is designed to stimulate the economies of distressed urban and rural communities and create jobs in low-income communities by expanding the availability of credit, investment capital, and financial services. Focuses on distressed areas
- Advantages for Brownfields Site Redevelopers: The NMTC program offers several advantages to developers seeking financing to clean up and reuse brownfields properties.
- CDEs may be willing to structure a more favorable deal than traditional lending institutions for brownfields projects, which can be a key consideration when lending is tight.
- CDEs can offer funding for a full range of redevelopment activities, including land acquisition, environmental remediation, demolition, site preparation, construction, renovation, and infrastructure improvements, making them a true "one-stop" financing source.
- CDEs involved in brownfields cleanup and redevelopment projects, especially non-profit entities, can facilitate packaging of different public financing sources for one project. Financing sources can include state and local programs and credits, initiatives such as tax increment financing, and federal programs such as the Department of Housing and Urban Development's Community Development Block Grants (CDBG) and EPA's Brownfields Grants.

Community Solar: Contractors

SEIA Project

<https://www.seia.org/initiatives/community-solar>

Special Purpose Entity (SPE) Model:

In this approach, individuals or companies join in a business enterprise to develop a community solar project. The business may design, construct, and own the facility, then work with the local utility to allocate benefits to subscribers. By using an SPE, organizations may be able to take advantage of incentives and tax credits that are unavailable to utilities. University Park Solar and the Clean Energy Collective are examples of this model.

Utility-Sponsored Model:

Some utilities provide their customers with the option to purchase renewable energy from a shared facility. The utility owns the array, then sells or leases shares to customers. The customer may purchase a set amount of electricity at a fixed rate for a term, ranging from as short as a kilowatt-hour block to as long as 20 years. The rate, while typically slightly higher than the current retail rate, may provide protection and stability against rising rates for grid electricity. Utility models generally limit subscription to within their distribution territory.

Mass Solar Loan Program Manual

<http://files.masscec.com/solar-loan/MassSolarLoanProgramManual.pdf>

“To be eligible for the Program, the Member-System Owner’s portion of the CSS project will be capped at 25 kW. For projects larger than 100 kW DC, the definition of CSS Generation Unit as contained in the RPS Class I regulation shall determine eligibility as a CSS Project under the Program”

1. Minimum requirements to qualify for a CSS project include, but are not limited to, the following:
2. Participants must demonstrate a direct ownership stake in a solar project with a net metering off-take of 25 kW or less
3. Participants must demonstrate a direct ownership in the CSS project through an LLC, cooperative, condo association, or other collaboration subject to MassCEC approval
4. Technical specifications for ground mounted CSS Projects will be determined on a case-by-case basis and will be based on industry-standard best practices. Roof-mounted CSS

Projects must meet Mass Solar Loan program technical eligibility criteria found in Attachment C

5. The Lender participating in the CSS project must be qualified under the Program
6. The project CSS participant need not be a homeowner, but must meet Lender underwriting criteria

BlueWave Solar

- Developed a platform to make it easier for households & businesses to go solar without an installation – perfect for renters
- Homeowners in Massachusetts can go “AllBlue” by adding Community Solar to their home solar installations
- Mostly used for homeowners interested in purchasing Community Solar

EnergySage

- Gathers competitive offers from pre-screened installers
- Provides unbiased guidance to help compare options
- Customers set up a profile to start getting quotes from pre-screened installers

Nexamp Inc.

- Through Nexamp’s Solarize My Bill Community Solar program, the value of the electricity generated by Nexamp’s solar projects is credited to participating energy consumers to offset their electricity costs
- Nexamp knows how to build successful solar installations. They are a leader among Northeast solar engineering, procurement and construction (EPC) firms with a proven track record of award-winning utility-scale and commercial solar installations.
- Example projects can be found [here](#)
- Works with property owners to develop solar energy systems on their land or buildings that maximize revenue and ROI, while minimizing risk. Approach to site selection, evaluation, and development can optimize value for development partners of all sizes. Full spectrum solar project lifecycle expertise enables Nexamp to achieve its partners’ goals rapidly and efficiently.

- Flexible development offerings include land and rooftop lease arrangements or project co-development options, including: Technical and Financial Feasibility Studies, Design and Engineering, Permitting and Interconnection, Financing Support

Resonant Energy

- The Solar Access Program allows any non-profit building to host solar panels in exchange for clean power and energy savings.
- Group Purchase is an option where purchasers can take advantage of the full range of state and federal incentives for solar electricity. They issue a Request for Proposals to their installation network and select a installation partner. In this style, they can deliver competitive quotes on top equipment and maintain a high level of customer service

Revision Energy

- ReVision Energy provides an ownership model of community solar, meaning, each participant in one of our solar farms actually owns a share of solar in one of the community projects.
- This is in contrast to models of community solar that are investor-owned, where the solar customers change over time and do not have a stake in the actual solar generation asset
- In the model, a group of homeowners are paired up with a host and invest together in a large solar array which is built on the ground in an ideal solar location (typically an open field, or business park, or brownfield). 100% of the generation from the solar farm is sent to the grid and automatically credited to the accounts of the solar shareholders based on their stake in the solar farm. This billing function is called “Virtual net metering”.

Solstice

See example projects [here](#)

- Helps with CS installation
- Solstice is not a solar developer (i.e. does not build the community solar gardens). They partner with developers and handle customer acquisition and management (works more with consumers looking to access community solar).

Solventerra

- Solventerra develops, owns, and operates solar energy projects in Massachusetts and across the country. Development focus is on mid-scale solar photovoltaic facilities from 200 KW to 20 MW.
- Projects are typically located on either 5+ acres of underutilized land or large commercial rooftops of at least 20,000 square feet. They offer Power Purchase Agreements (PPAs), participating land leases, and other financing alternatives Solventerra will work with land and building owners to customize solar offering to meet their energy and economic objectives.
- In addition to development and management of solar projects, Solventerra offers Renewable Energy Development and Clean Energy Advisory to assist land and building owners in implementing their own sustainability initiatives.
- Solventerra a good option if own the land, but they also lease land from 3-35 acres for mid-scale solar energy projects.
- Current and completed projects here
- Has a tool to determine solar potential of your property

Asidaco

- Solar installer: specialize in providing electrical repair services, renewable energy solutions, power quality and distribution services, and electrical system design and installation services and products.
- ASIDACO is also a product supplier of innovative energy reduction and power quality solutions. Products include: Power Management systems, Energy Storage equipment, Solar PV equipment, Small wind turbines, ELSPEC Power Conditioning and Metering Equipment, and more.
- Serve as the owner's guide through the development of projects from design through construction, exploring specific solutions with a team of professionals to assess their accuracy, feasibility and most efficient use.
- Provide maintenance service and operation options for completed projects in order to maximize their lifespan and utilization.

Brownfields: Incentives

-Tax Incentives-

- ❑ The Brownfields Tax Incentive was intended for land that meets land use and contamination requirements. For the land use requirement, the plot must either be held by the taxpayer or be included in the taxpayer's inventory. For the contamination requirements, the property must have or have been exposed to hazardous substances, as this is what differentiates a brownfield from other sites.

-Grants-

Assessing Levels of Contamination on a Site:

- ❑ Community-Wide Assessment Grants
 - ❑ Generally used for locations in which buyer hopes to obtain more than one site.
 - ❑ Applicants can request up to \$300,000 to assess sites that may have been contaminated or exposed to contaminants.
- ❑ Site-specific Assessment Grants
 - ❑ Generally for one site only options.
 - ❑ Applicants can request up to \$200,000 or \$350,000 to assess sites that may have been contaminated or exposed to contaminants, depending on the contaminant.
- ❑ Assessment Coalition Grants
 - ❑ Generally used for one coalition member seeking three or more entities
 - ❑ Applicants can request up to \$600,000 to assess sites that may have been contaminated or exposed to contaminants.

Clean-Up of Brownfield Sites:

- Revolving Loan Fund Grants (RLF)
 - provide funding to clean up brownfield sites by cycling money within a community, making for economic development
- Cleanup Grants
 - funding that is acquired only after site has been purchased by applicant
- Multipurpose Grants
 - provides cleanup and assessment grants to those eligible

-Grants of 2019-

- **FY 2019 Multipurpose Grants** – funded up to \$800,000 over a five year period
 - EPA looking to select 10 proposals
- **FY 2019 Assessment Grants** – funded up to \$200,000-\$600,000 over three years
 - EPA looking to select 114 proposals.
- **FY 2019 Clean-Up Grants**– funded up to \$500,000
 - EPA looking to select 40 proposals.

Brownfield Case Studies

Brockton Brightfields (Brockton, MA)

<https://brownfields.org.uic.edu/research-results/documents/BrocktonBrightfield-finalforposting-May102013.pdf>

- Officially opened on October 26, 2006, on the site of the former Brockton Gas Work
- Consists of 1,395 photovoltaic panels on a 3.7-acre site
- Has generated nearly \$145,000 in annual revenue for the city, which goes towards paying off the cost to build and maintain the brightfield.
- It is estimated that the loan will be paid off in full by 2026

Philadelphia Navy Yard (Philadelphia, PA)

- PV Solar Generation on Former Brownfield will Power 1,800 Homes
- Largest solar PV facility within a major U.S. city is being built on a former brownfield.
- 7-acre, 1.5 MW solar facility will produce enough energy to power 1,800 homes.
- Electricity generated by the facility will be sold as solar renewable energy certificates.

Options for Community Solar Ownership

Table 6: CSS Business Models Categorized by Site and System Ownership

		Site Owner	
		Private Entity	Public Entity
System Owner	Private Entity	<p>PARTICIPANT OWNERSHIP MODEL</p> <ul style="list-style-type: none"> Private entity (e.g., LLC) is formed by organizing participants for the purposes of developing a CSS project Private entity owns or leases property on which the PV system will be installed Participants realize a return on investment and benefit from net metering credits generated by the system 	<p>PUBLIC LEASE MODEL</p> <ul style="list-style-type: none"> Public entity leases property to a private entity for the installation of the CSS project Private entity owns and operates the PV system Participants benefit from net metering credits generated by the system
	Public Entity	<p>NOT RECOMMENDED</p> <ul style="list-style-type: none"> Due to MA net metering regulations, projects are limited to a capacity of 60 kW (AC) or less Public entity will need to serve as aggregator and execute net metering credit allocation agreements with participants Public entity cannot take advantage of the 30% ITC 	<p>NOT RECOMMENDED</p> <ul style="list-style-type: none"> Due to MA net metering regulations, projects are limited to a capacity of 60 kW (AC) or less Public entity will need to serve as the aggregator and execute net metering credit allocation agreements with participants Public entity cannot take advantage of the 30% ITC

Power Purchase Agreement

“A Solar Power Purchase Agreement (SPPA) is a financial arrangement in which a third-party developer owns, operates, and maintains the photovoltaic (PV) system, and a host customer agrees to site the system on its property and purchases the system's electric output from the solar services provider for a predetermined period. This financial arrangement allows the host customer to receive stable and often low-cost electricity, while the solar services provider or another party acquires valuable financial benefits, such as tax credits and income generated from the sale of electricity.”

“An investor provides equity financing and receives the federal and state tax benefits for which the system is eligible. Under certain circumstances, the investor and the solar services provider may together form a special purpose entity for the project to function as the legal entity that

receives and distributes to the investor payments from tax benefits and the sale of the system’s output.”

“Public projects have distinct advantages over private projects, including:

- Larger maximum capacity: If a net metering facility’s host customer is a public entity, the system falls under the public net metering cap and can be up to ten megawatts (“MW”) in size, as opposed to a private project which cannot exceed two MW. Please note that individual units (e.g. a wind turbine) can be no larger than two MW.
- Higher credit value for projects over one MW: For projects under one MW, both private and public entities are credited for the supply, transition, transmission, and distribution costs associated with electricity bills. However, for projects over one MW, public entities continue to receive credit for the distribution charges while private entities do not, resulting in a significantly higher credit value for public projects.”

<https://www.mass.gov/files/documents/2016/08/wg/ppa-and-nma-guidance.pdf>

Benefits & Challenges of SPPAs	
<i>Benefits for host customer</i>	<i>Challenges for host customer</i>
<ul style="list-style-type: none"> • No upfront capital cost. • Predictable energy pricing. • No system performance or operating risk. • Projects can be cash flow positive from day one. • Visibly demonstrable environmental commitment. • Potential to make claims about being solar powered (if associated RECs are retained). • Potential reduction in carbon footprint (if associated RECs are retained). • Potential increase in property value. • Support for local economy and job creation. 	<ul style="list-style-type: none"> • More complex negotiations and potentially higher transaction costs than buying PV system outright. • Administrative cost of paying two separate electricity bills if system does not meet 100 percent of site's electric load. • Potential increase in property taxes if property value is reassessed. • Site lease may limit ability to make changes to property that would affect PV system performance or access to the system. • Understand tradeoffs related to REC ownership/sale.

<https://www.epa.gov/greenpower/solar-power-purchase-agreements>

Land Lease Agreements

A municipal site owner can choose to lease out the project site for the purposes of CSS. Through this competitive procurement process, the site owner selects a qualified CSS vendor to develop and

administer the project. The CSS vendor acts as the aggregator and host customer, prepares for a third-party (i.e., system owner) to own and install the system, and pays the system owner for the electricity generated. To install the PV system and occupy the site over the lifetime of the project, the system owner enters into a lease agreement with the site owner and makes lease payments.

Example of Co-op 20 Year Lease: Brewster, Massachusetts (My Generation Energy)

“My Generation Energy (MGE), a full-service solar installation firm, organized and built a CSS project in Brewster, Massachusetts. The Brewster Community Solar Garden® Cooperative, Inc., a member-owned cooperative, serves as the aggregator of this 346 kW system.

The Town of Brewster conducted a competitive solicitation for the lease of a municipally owned industrial park site, under Massachusetts General Law (M.G.L.) Chapter 30B §16, for the purpose of solar development. Through this process, Brewster entered into a 20-year lease agreement with Brewster Community Solar Garden LLC (the system owner entity). The solicitation documents are publicly available.¹³ MGE serves as the project developer and provides operations and maintenance services for the PV system...

The Brewster Community Solar Garden® Cooperative has an agreement with Brewster Community Solar Garden LLC, an entity presumably established to own the PV system and provide a vehicle for a tax equity investor to monetize the tax benefits”

<https://www.mass.gov/files/documents/2016/08/nv/community-shared-solar-model-frameworks-032813.pdf>

Buy Outright

Buying outright will create implications for CSS projects as they are not likely to receive the property tax exemption available to some solar PV projects in Massachusetts. This may increase the cost of participating in a CSS project.

Cost-Benefit Analysis of Community Solar

Benefits of Solar

Environmental benefits (obvious), allows residents to tap into clean energy without maintaining/monitoring equipment themselves. Accessible to renters and condominium owners, suitable rooftop is not needed. Clean jobs, energy security for community, more reliable grid, less greenhouse gas emissions

Increase property value surrounding brownfield

Federal funds can be used for:

- Planning for redevelopment or revitalization
- Site acquisition
- Environmental site assessment
- Site clearance/preparation, including demolition
- Removal or remediation of contamination from sites
- Rehabilitation of buildings
- Construction of real estate improvements

<http://narc.org/wp-content/uploads/Brownfields-2011-Philadelphia.pdf>

Solar Savings Types	Value of Savings
Federal Solar Tax Credit (ITC)	30% of the total system cost
Residential Renewable Energy Income	25% Tax Credit (of total system cost) or up to \$1,000
Massachusetts Solar Renewable Energy Credit (SREC)	Varies depending on market value
Other Programs	Variable (Net Metering)

****Customer's ability to monetize rebates, incentives and tax credits depends on several factors, including, without limitation, continued state subsidization of these policies, the applicable Sunrun product type, and whether a customer purchases or leases a solar system from Sunrun.**

Table 1. Mass's Energy Incentives (According to Sunrun)

Cost of Solar

Billing system is Virtual Net Metering VNM (like Net Metering, but for community solar)

Consumers receive VNM credits that offset (or nearly offset) cost of electricity from utility company (e.g. so, if customer's share of a community solar garden is worth 10kWh, their power bill will be reduced by 10kWh). Households can only source amount of energy to meet needs (i.e. can't source more energy than annual needs, energy savings through community solar is not considered income). After recouping initial investment through savings, you continue to receive free electricity through solar credits until you sell your share (or project decommissioned).

Cost will depend on contractor and location

<https://www.letsgosolar.com/consumer-education/community-solar/>

Final Recommendations: How to bring Community Solar to Massachusetts

Source: <https://news.energysage.com/massachusetts-community-solar-everything-need-know/>

There are several **factors to consider** in the decision to bringing community solar to Massachusetts:

- Community solar providers
- Community solar contract options: ownership vs. subscription
- Local vs. national community solar
- Community solar vs. rooftop solar in Massachusetts
- Massachusetts solar incentives
- Maintenance costs

Solar Warranty

<https://news.energysage.com/shopping-solar-panels-pay-attention-to-solar-panels-warranty/>

According to energysage, solar panel has two warranties: a performance and equipment guarantee. A solar panels performance warranty usually guarantees 90% production at 10 years and 80% at 25 years. An equipment warranty will usually guarantee 10-12 years without failing. SunPower offers the best warranties.

A solar panel's product warranty insurance covers: integrity of the panel itself and protects against problems like manufacturing defects, environmental issues, premature wear and tear etc. With most warranties, longer period is the best option for you if you own your solar panel system. In the process of evaluating a solar panel warranty and its manufacturer, there are two important factors that should be of focus:

- Product (or materials) warranty
- The performance warranty

Community Shared Solar

<https://www.mass.gov/files/documents/2016/08/nv/community-shared-solar-model-frameworks-032813.pdf>

The following information was directly gathered from the Massachusetts Community Shared Solar Review and Recommendations for Massachusetts Models document.

CSS business models vary significantly; however, the parties involved with a CSS project can be broadly categorized as follows:

- The site owner is the owner of the property on which the CSS system is located. The site owner may be a public entity, such as a municipality, or a private entity;
- CSS project participants are the community members who participate in a CSS project by purchasing the electricity generated from the PV system or net metering credits or take an ownership stake in the project. Participants may be individuals or businesses;
- The aggregator brings together the collective demand of the participants and administers the project. The aggregator also serves as the host customer of the PV system. Host customers apply for net metering services and complete a Schedule Z with the utility company, which directs the utility how to allocate net metering credits;
- The system owner owns the CSS project. The system owner typically partners with a tax equity investor to monetize the ITC and other available tax incentives; and
- The tax equity partner is an investor(s) with taxable passive income that is allowed to take advantage of the 30% ITC and other tax benefits available to investors in solar PV systems.

