**GROW SOLAR MUNICIPAL TOOLKIT FOR PROMOTING AND FINANCING SOLAR**

As the price of going solar continues to fall, approaching cost parity with traditional sources of energy, villages, towns and other municipal governments (better term than municipal governments?) will find it necessary to address issues related to zoning, permitting, interconnection, financing, and promotion of solar technology.

Led by the [Midwest Renewable Energy Association (MREA)](https://www.midwestrenew.org/%22%20%5Ct%20%22_blank%22%20%5Co%20%22MREA), the Grow Solar Partnership began in 2012 with funding from the [US Department of Energy SunShot Initiative](http://www1.eere.energy.gov/solar/sunshot/index.html%22%20%5Ct%20%22_blank%22%20%5Co%20%22SunShot). With an [initial focus](http://www.growsolar.org/growsolarwisconsin/%22%20%5Ct%20%22_blank%22%20%5Co%20%22GrowSolarWisconsin) on reducing PV systems permitting and inspection costs and advancing model financing in three Wisconsin cities, the partnership expanded efforts to Illinois and Minnesota with the expansion of the [Power Pack Program](http://www.growsolar.org/power-pack-program/%22%20%5Ct%20%22_blank%22%20%5Co%20%22Power%20Pack%20Program) and the development of the [Solar Powering the Midwest Conference Series](http://www.growsolar.org/education-training/workshops-events/%22%20%5Ct%20%22_blank%22%20%5Co%20%22Workshops%20%26%20Events).

With renewed support from SunShot as part of the [Rooftop Solar Challenge](http://energy.gov/eere/sunshot/rooftop-solar-challenge%22%20%5Ct%20%22_blank), Grow Solar is now working with a network of [regional partners](http://www.growsolar.org/grow-solar-partners/%22%20%5Ct%20%22_blank%22%20%5Co%20%22Partners) to leverage private, local, and state support to advance activities in Minnesota, Wisconsin, Illinois, Iowa, and Michigan that 1) facilitate the adoption of solar permitting, planning, and zoning best practices by municipalities, 2) develop model finance arrangements for solar installations, 3) build workforce capacity to properly design, sell, and interconnect code-compliant PV systems, and 4) improve rules, standards and policies to provide a framework for sustainable solar market growth.

This toolkit will address the multiple ways that local governments can finance solar on properties they own as well as strategies for promoting the development of solar throughout the community.

***FINANCING***

1. **POWER PURCHASE AGREEMENTS (PPA)**

A Power Purchase Agreement (PPA) is a convenient way for local governments and other entities to add solar to property they own without all the upfront capital costs. Under a PPA, a third party installs solar technology on a host site’s property. The third party retains ownership in the hardware while the host site enters in to a long term agreement to purchase the electricity generated by the system.

Typically, the third party is an entity with sizable tax liability that is able to take advantage of the federal tax credit not accessible by tax exempt governments.

Under PPAs, unlike Solar Leases, the owner of the system (third party) is responsible for maintaining the equipment and ensuring that it actually produces energy. The host site is only responsible for paying the bills.

* **PPA PROS AND CONS**
	+ Advantages to using a PPA
		- Little or No upfront capital cost
		- No maintenance costs for life of contract
		- Electrical production guarantee
		- Use of clean energy
		- Potential hedge against rising electricity prices (if kwh price is fixed)
	+ Potential disadvantages to using a PPA
		- Long term contract can stifle flexibility
		- Do not own system
		- Additional complexity if building needs sold or roof work needs done
		- May not be able to claim environmental benefits of use of clean energy
		- May not receive credit for using less electricity than what is produced
		- May involve price escalator
* **POTENTIAL LEGAL QUESTIONS**
	+ Are PPAs allowed in your jurisdiction?
	+ What kinds of easements exist or may be needed?
	+ Are there different laws governing the sale of electricity?
	+ Can you guarantee access to Sunlight?
	+ How, or under what condition can either party terminate the agreement?
	+ Are there any site issues that can pose complications?
	+ When does the agreement start?
	+ How confident can we be in estimates of output?
	+ Are there buyout options?
	+ Is there an escalator?
	+ Who performs maintenance?
* **BRIEF PPA CHECKLIST:** <http://www.nrel.gov/docs/fy10osti/46668.pdf>
	+ Find a suitable location, on the ground or on a rooftop
	+ RFP Process to find a developer (<http://www.growsolar.org/wp-content/uploads/2015/08/IREC-PPA-Toolkit.pdf>)
	+ Contract negotiations (<http://www.stoel.com/webfiles/lawofsolarenergy.pdf>)
	+ “Permitting and Rebate Processing” (Brian Ross Toolkit link and DCEO/Feds?)
	+ “Project Design, Procurement, Construction, and Commissioning”
* **CASE STUDY**: <http://icap.sustainability.illinois.edu/project/solar-farm>
* **PPA TOOLKIT:** <http://www.irecusa.org/wp-content/uploads/2015/04/FINALFINALNew-Cover_041015.pdf>
* **OTHER PPA RESOURCES**:

<http://www.solomonenergy.com/blog/wp-content/uploads/2015/07/2015-07-21-Where-Does-the-PPA-Price-Come-From.pdf>

<https://energycenter.org/california-solar-initiative/homeowners/purchase-vs-lease/ppa>

<http://greengigawatt.org/resources.php>

1. **SOLAR LEASE**

Similar to a PPA, a Solar Lease is another option for installing solar without paying huge upfront costs by gradually making payments to a third party who owns and installs the system.

Unlike a PPA, under a Solar Lease, the host site may be responsible for maintenance as well as meeting production targets. Another key difference between a Solar Lease and a PPA is that the monthly payments under a lease are technically payments toward ownership of equipment, as opposed to payment for electricity generated.

* **SOLAR LEASE PROS AND CONS**
	+ Advantages to using a solar lease
		- Simpler than a PPA
		- Little or No upfront capital cost
		- Use of clean energy
		- Potential hedge against rising electricity prices
	+ Potential disadvantages to using a solar lease
		- May not cover maintenance
		- May not cover replacement of equipment
		- Long term contract can stifle flexibility
		- Additional complexity if building needs sold or roof work needs done
* **POTENTIAL LEGAL QUESTIONS**
	+ Is host site responsible for making payments even if the system is inoperable?
	+ Who gets credit for surplus electricity sent to the grid?
	+ Are there buyout options?
	+ Who insures the system?
	+ Who performs maintenance?
	+ Will you be able to monitor production?
	+ Are there minimum production guarantees? If production falls short, what rate is paid to make up the difference?
* **CASE STUDY:** <http://www.seia.org/research-resources/brighter-future-study-solar-us-schools-report>
* **SOLAR LEASE CHECKLIST:** <http://www.cesa.org/assets/2015-Files/Homeowners-Guide-to-Solar-Financing.pdf>
* **OTHER SOLAR LEASE RESOURCES**:

<https://energycenter.org/california-solar-initiative/homeowners/purchase-vs-lease/ppa>

<http://solar.solarcity.com/downloads/SolarCity_Residential%20Solar-Lease%20Contract_sample.pdf>

1. **SREC**

Solar Renewable Energy Credits (SRECs) embody the environmental attributes of solar energy generation and are traded separately from the electricity commodity. SRECs can be used as a financial incentive if the owner of the SRECs chooses to sell them on the open market. One SREC is created for every megawatt-hour of solar energy generated and placed on the grid.

Electricity is created by forcing electrons on the utility grid. Since solar electrons are impossible to distinguish from electrons generated from other sources, the SREC is a way of accounting for the environmental benefits derived from generating electrons from a renewable source.

The SREC is originally owned by the entity that generated the megawatt-hour of electricity. It can then be bought and sold in REC markets from generation to final point of application. Once a buyer makes an environmental claim about an SREC, it is considered “retired” and no other entities can buy or sell that SREC or make any claims about it.

Owners of SRECs can make several claims upon having purchased the credit. Many entities buy an SREC in order to claim use of renewable energy, and all the environmental benefits that come along with it. The owner of an SREC can claim that their use of electricity avoids CO2 emissions and air pollution, for example. Utilities may use SRECs to satisfy state Renewable Portfolio Standards.

In Illinois, and many other states with Renewable Portfolio Standards, SRECs are used by utilities, Load Serving Entities, and other obligated parties to demonstrate compliance with RPS requirements. An entity buys the SREC, and its related environmental attributes, and then “retires” it for compliance with the RPS. <http://www.nrel.gov/docs/fy12osti/52868.pdf>

The Illinois Power Agency allotted $30 million to procure SRECs as part of their Illinois Supplemental PV Procurement Program, and plans to purchase SRECs from residential and small commercial solar facilities up to 2 MW of nameplate capacity for the next 5 years. <https://www.srectrade.com/srec_markets/illinois>

* **PROS AND CONS TO SELLING SRECS**
	+ Advantage to selling SRECs:
		- Makes a stronger financial case for going solar – reduces payback period
	+ Disadvantage to selling SRECs:
		- Can no longer claim environmental benefits associated with the SRECs
* **POTENTIAL LEGAL ISSUES**:
	+ Who owns them?
		- The entity that produces or purchases the SREC owns the SREC and all the environmental benefits associated with it. (I assume somebody is buying the SREC from the IPA after they procure it?)
	+ Where are they bought/sold?
		- SRECs are bought and sold on approved markets. In Illinois, the Illinois Power Agency (IPA) is hosting at least 3 rounds of procurements from eligible electricity generating solar systems.
	+ Who receives proceeds?
		- The entity that produces the electricity and sells the associated SREC receives
	+ What are responsibilities of seller?
	+ What are the responsibilities of purchaser?
	+ Utilities will typically solicit for the purchase of SRECs via a request for production (RFP) process. Here you will find the RFP from the Illinois Power Agency: <http://ipa-energyrfp.com/calendar/>
	+ Third Party Verification
		- SRECs and other Renewable Energy Credits are typically tracked regionally to ensure that they are not counted, bought, sold, or claimed multiple times. In Illinois, SRECs are tracked by M-RETS (Ameren), <http://www.mrets.org/>, and GATS (ComEd), <http://www.pjm-eis.com/>. At generation they are assigned a number, which gets tracked until the point of retirement. A number of third-party organizations (such as? - <http://www.green-e.org/> Center for Resource Solutions) verify and certify SRECs. It is recommended that buyers purchase only third-party verified SRECs.
	+ Making accurate claims
		- It is important to know what claims can and cannot be made about an SREC you purchase or sell. Once you sell an SREC, you may no longer make claims about the renewable energy you generated. Those benefits now belong to the buyer. When you buy an SREC, you may only make claims about the amount of power represented by the SREC. Here is a helpful guide: <http://www.resource-solutions.org/pub_pdfs/REC%20Best%20Practices%20and%20Claims.pdf>
* **SREC EXAMPLE**: <http://straightupsolar.com/illinois-new-solar-incentive-solar-renewable-energy-credits/>
* **SREC CHECKLIST**: <http://www.illinoissolar.org/blog/3819112>
* **SREC CALENDAR/RFP**: [https://www.ipa-energyrfp.com/download/5\_-\_renewables\_section\_2016/5b\_-\_rec\_rfp\_spring\_2016\_-\_rfp\_docs/IPA%20Spring%202016%20REC%20RFP%20Calendar%20(February%2002%202016).pdf](https://www.ipa-energyrfp.com/download/5_-_renewables_section_2016/5b_-_rec_rfp_spring_2016_-_rfp_docs/IPA%20Spring%202016%20REC%20RFP%20Calendar%20%28February%2002%202016%29.pdf)
* **OTHER RESOURCES**:
	+ <http://www.epa.gov/greenpower/documents/gpp_basics-recs.pdf>
1. **COMMUNITY BULK SOLAR**

While not a strategy for financing solar on local government property, a community bulk solar program is a great way to be a part of the effort to increase solar in your community. A community bulk solar program is when the community forms a group and uses their collective buying power to get a good deal on solar. Typically a community bulk solar program involves some, if not all, of the following elements:

* Competitive Contractor Selection
* Community-Led Outreach Campaign
* Limited-Time Offer

Competitive contractor selection builds trust in the process and in the contractor. A community-led outreach campaign also works to build trust as people in the community interact with each other to learn about the opportunity. Finally, the limited-time offer provides a small measure of urgency that nudges people to act.

While a community solar project won’t necessarily increase solar on government-owned properties, it does increase solar in your community, and may even convince voting citizens that going solar would be a good use of local tax dollars as well! It’s a great opportunity to connect with citizens and increase their knowledge about the importance of solar, renewable energy, and sustainability.

* **COMMUNITY SOLAR PROS AND CONS**
	+ Advantages to doing a community solar project
		- Increases solar in your community
	+ Potential disadvantages to doing a community solar project
		- Doesn’t necessarily increase solar on government-owned properties
* **POTENTIAL LEGAL QUESTIONS:**
	+ Is the government endorsing a private company, and if so, are there implications?

* **CASE STUDY:**
	+ <http://www.growsolar.org/solar-urbana-champaign/solar-urbana-champaign/>
* **COMMUNITY SOLAR CHECKLIST:**
	+ <http://www.nrel.gov/docs/fy12osti/54738.pdf>