Community Shared Solar Models in Massachusetts

Solar Webinar III
September 11, 2015
2 – 3pm EST

MAPC
METROPOLITAN AREA PLANNING COUNCIL
MAPC Solar Webinar Series

• Webinar I: Solar Permitting & Bylaws
  • March 30, 2015; video recording (40 minutes).

• Webinar II: Solar Outreach Program Models
  • June 2015; presentation slides.

• Webinar III: Community Shared Solar (CSS)
  • Today; webinar will be recorded

• Webinar IV: Managing Solar Arrays
  • September 30; details TBD.
Agenda

1. Brief Introduction to MAPC
   • Ani Krishnan

2. Regulatory and Policy Context for CSS in Massachusetts
   • Emma Krause, Department of Energy Resources (DOER)

3. Commercial CSS Models
   a. Hannah Masterjohn, Clean Energy Collective (CEC)
   b. Lynn Benander, Co-op Power

4. Q&A
MAPC: About Us

MAPC is the regional planning agency serving the 101 cities and towns in the Greater Boston Region.

www.mapc.org
Clean Energy Division

1. Regional Energy Projects
   - ESCO Procurements
   - Regional Solar Initiative
   - LED Streetlight Purchasing & Retrofit Program

2. Local Energy Action Program
   - Community energy baselining
   - Outreach, visioning, and program implementation
   - Connection to utilities and incentives

3. Energy Resources & Technical Assistance
   - Community Electricity Aggregation (CEA)
   - Resiliency and preparedness
   - Green Communities designation support
   - Grant writing & reporting
   - Clean Energy Toolkit
Creating A Cleaner Energy Future For the Commonwealth

Community Shared Solar Opportunities in Massachusetts

Emma Krause, Rooftop Solar Challenge Coordinator, DOER
MA CSS Policy – SREC’s

<table>
<thead>
<tr>
<th>Market Sector</th>
<th>SREC Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Generation Units with a capacity &lt;=25 kW</td>
<td>1.0</td>
</tr>
<tr>
<td>2. Solar Canopies</td>
<td></td>
</tr>
<tr>
<td>3. Emergency Power Generation Units</td>
<td></td>
</tr>
<tr>
<td>4. Community Shared Solar Generation Units</td>
<td></td>
</tr>
<tr>
<td>5. Low or moderate income housing units</td>
<td></td>
</tr>
</tbody>
</table>

- RPS Solar Carve-Out Phase II program defines CSS projects as follows:
  Community Shared Solar Generation Unit. A solar photovoltaic Generation Unit that provides net metering credits to three or more utility accounts, whose participants have an interest in the production of the Generation Unit or the entity that owns the Generation Unit, in the form of formal ownership, a lease agreement, or a net metering contract. No more than two participants may receive net metering credits in excess of those produced annually by 25 kW of nameplate DC capacity, and the combined share of said participants' capacity shall not exceed 50% of the total capacity of the Generation Unit.
MA CSS Policy – Net Metering

- Net metering is an incentive program designed to encourage customers to install distributed generation
  - Customers offset own electricity usage
  - Customers are compensated for electricity they generate and don’t use
- If consumption exceeds generation, customer pays for net kWh consumed
- If generation exceeds consumption, customer receives credit on bill for net excess generation
- Many non-residential and most municipal solar projects depend on the net metering credit incentive, along with SREC revenue
- MA market is non-uniform in the availability and value of net metering credits by utility territory
- Legislature raised net metering caps last summer
- Current net metering caps are set at 5% for public projects and 4% for private projects
- 17 member task force established by the legislature in 2014
- Final report delivered to the legislature on May 1st
- The legislature currently has the net metering taskforce report and several bills before it to address the net metering cap issue
DOER Resources and Programs

• Green communities META grants for municipalities
• Mass Solar Loan program
• Roof top Solar Challenge
  - RSC I - Portion of grant funding used to hire consultants to develop a review and recommendations as well as an implementation guide for CSS
  - RSC II – 3 different municipal projects
• Green Communities CSS webinar
Thank You

Emma Krause

emma.krause@state.ma.us

(617) 626 7371
Community Shared Solar: Opportunities for MA Local Gov’ts

9/11/15
Clean Energy Collective | Community solar

- **Nation’s leading community solar provider**
  - Projects in 11 states with 25 utilities
  - Built, own & operate 50+ community solar facilities
  - Community Solar Platform - Software as a Service to support utilities’ and developers’ programs

- **Focused solely on community-owned solar**
  - Built the nation’s first and largest community-owned solar facilities
  - More community solar built than all other vendors combined (60%+ of all systems)
  - Worldwide recognition for having the best program available

- **Partners in local communities to provide utility and consumer value**
  - Worked with utilities from small rural cooperatives to nationwide IOUs
  - CEC can fully fund, build, and administer projects – or provide tools
  - Provide significant investment in the community and long-term local savings
Jimmy’s Deli

Your local school

Your panels

Your neighbor’s panels

The 996.6 kW Rehoboth, MA - Community Solar Array
Local Gov’ts as Customers

- **Purchase rights to bill credits**
  - Long term contract
- **Cash flow positive from Day 1**
  - No upfront cost
  - Monthly payments
  - Monthly utility bill savings exceed monthly payments (think $100k’s+ of savings)
- **Developer assumes risk**
  - Responsible for maintaining project, ensuring production, you only pay for bill credits you already received
- **Get it while the getting’s good**
Local Gov’ts as Hosts

- Host project on local gov’t land
  - Lease revenue
  - Positive use for marginal/brownfield sites
- Landfills
- Water treatment plants
- Airports
  - Experience in working through FAA certification to build near small airports
- Always looking for similar sites
  - Cheap land is key to community solar, and it provides a good way of flipping the narrative for a site that formerly caused negative impacts
Local Gov’ts as Partners

- **Help market program**
  - Lend local gov’t credibility & channels to help market community solar program
  - Maximize participation in Solarize programs
  - Direct interested customers who can’t do rooftop do community solar
  - Value in lead acquisition can = discount

- **Innovative planning/siting permitting**
  - Upfront coordination can result in lower cost, better integrated projects
  - Example: Fort Collins project on infill site – former pickle factory. Municipal utility allowed extensive coordination with planning and zoning committees
Benefits to Local Governments

- **Revenue**
  - Significant property tax revenue – often through PILOTs
  - Permitting fees

- **Jobs**
  - We partner with local contractors to build and maintain all our facilities

- **Community Pride**
  - Affordable clean power is being generated right in your community
  - Participating customers, community members, school groups can all view project

- **Sustainability & Environment**
  - Lower greenhouse gas emissions
  - Cleaner air
  - Far less water consumption than other energy sources
Need to raise Net Metering caps for community solar projects to go forward

- Community shared solar is dependent on the mechanism of net metering to provide bill credits to participating customers
- Net metering caps have been hit in National Grid territory. Close to full in Nstar / Eversource territory.
- Senate has passed legislation to raise net metering caps
- Governor has introduced legislation to raise net metering caps – H.3724
- House needs to pass legislation before Thanksgiving in order to prevent significant disruption in state solar market
Thank you!

Hannah Masterjohn
Director of Policy & New Markets
607-431-8811
hannah.masterjohn@easycleanenergy.com
Community Shared Solar

9.11.2015
Co-op Power is a network of local communities

- Hampshire Community Energy Co-op
- Franklin Community Energy Co-op
- Southern Vermont Community Energy Co-op
- Blackstone Valley Community Energy Co-op
- Hampden Community Energy Co-op
- Boston Metro East Community Energy Co-op
ACCOMPLISHMENTS

22 Green Enterprises, 200 Good Green Jobs and a growing multi-class, multi-race network of 7,000 people across Massachusetts and Vermont

- 2004: Co-op Power Community Based Business Development Initiative launched
- 2005 to 2015: Six Solar Installation businesses started
- 2008: Co-op Power Solar Vendor Network established (marketing for 15 installers)
- 2008: Co-op Power Solar Hot Water System Installation Program launched (>100 systems installed)
- 2009: Green Job Training Program launched
- 2009: Co-op Power Member Loan Program launched ($2 million)
- 2009: Co-op Power Residential Energy Efficiency Business launched ($1 million/year)
- 2009: Energía launched ($3 million/year energy efficiency business in Holyoke)
ACCOMPLISHMENTS

22 Green Enterprises, 200 Good Green Jobs and a growing multi-class, multi-year network of 7,000 people across Massachusetts and Vermont

• 2010: Thermal window insert fabrication business supported
• 2011: Two green electricians expansion supported
• 2012: Co-op Power Boston Residential Energy Efficiency Services launched ($700,000/year)
• 2012: Brattleboro Food Co-op Solar System Installed ($30,000/year)
• 2013: Recycled Vegetable Oil Collection (250 restaurants)
• 2015: Northeast Biodiesel ($5.2 million/year biodiesel plant in Greenfield)
• 2015: Biodiesel Fuel Pump Station Network launched
• 2015: Community Shared Solar LLCs launching now
What is Community Shared Solar?
A solar-electric system that provides electricity (or virtual net metering credits) to electric meters on more than one building.
Community Shared Solar

Why is it useful for everybody?

1) Reduces electricity costs
2) Easier access to solar
3) Smaller investment
4) Environmental peace of mind
5) Available to everyone even if you don’t own a home, don’t have a strong new roof, don’t have enough sun, don’t have enough money, or can’t use the tax credits
Opportunities

Tremendous Market Interest

Attractive Government Incentives
1) Solar Loan Program
2) Solar Renewable Energy Credits (SRECs)
3) Virtual Net Metering Credits (VNMCs)
4) Power Purchase Agreement (PPA)
5) Investment Tax Credit (ITC: 30%)
6) 5-Year MACRS Depreciation

National Solar Installation Costs Decrease

Rising Electric Rates Making Solar More Competitive
Development Plan

• Plan: 10 projects before Dec. 31, 2016 when ITC legislation expires
• 4 Site Visits & Technical Reviews Completed
• 17 projects under development across Massachusetts and Vermont with interest from other communities in New England

Pipeline of Community Shared Solar Projects
## Community Shared Solar Overview

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<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong># of Projects</strong></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>MW’s</strong></td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Cost</strong></td>
<td>$20 million</td>
<td></td>
</tr>
<tr>
<td><strong>ITC Investor Equity</strong></td>
<td>$8.6 million</td>
<td>42.5%</td>
</tr>
<tr>
<td><strong>ITC IRR</strong></td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td><strong>Loans (SRECs)</strong></td>
<td>$4.4 million</td>
<td>22.1%</td>
</tr>
<tr>
<td><strong>Loans (VNMCs)</strong></td>
<td>$7 million</td>
<td>35.0%</td>
</tr>
<tr>
<td><strong>Sponsor Equity</strong></td>
<td>$86,123</td>
<td>0.4%</td>
</tr>
</tbody>
</table>
What We Need To Get There

1. Community Partners
2. Design/Build Contractors
3. Financing
4. Tax Equity Investors
Single Project Benefits

Eliminate
- 425 tons of carbon each year

Enable
- 200-400 families to go solar

Produce
- 771,000 KWh of clean electricity
Benefits to Consumers

Consumers pay $2,000 for the Net Metering Credits generated by 1 kilowatt of the array’s production for 25 years

<table>
<thead>
<tr>
<th>Co-op Power Model</th>
<th>Owning Your Own PV System</th>
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<tbody>
<tr>
<td>$2.00 per watt</td>
<td>$3.75 to $4.25 per watt</td>
</tr>
<tr>
<td>Includes payment for inverter replacement Year 12</td>
<td>Plus payment for inverter Replacement in Year 12</td>
</tr>
<tr>
<td>Tax Credit and SREC’s are used to pay other investors and lenders</td>
<td>30% tax credit and SREC’s go to the Homeowner</td>
</tr>
<tr>
<td>For Renters and Homeowners</td>
<td>For Homeowners</td>
</tr>
<tr>
<td>Local Control and Local Ownership after 5-7 years</td>
<td>Local Ownership and Control</td>
</tr>
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</table>

Both are likely eligible for the MA Solar Loan Program (3% or less interest; 10 years; 20-30% reduction in cost for people who are 100% to 120% of the state’s median income.
Benefits to Municipalities

Municipalities can sign up for as many kilowatts of production as you choose for $2,000 for the Net Metering Credits generated by each kilowatt of the array’s production for 25 years.

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<tr>
<td>Tax Credit and SREC’s are used to pay other investors and lenders</td>
<td>SREC’s can go to the Municipality</td>
</tr>
<tr>
<td>Local Control and Local Ownership of Project after 5-7 years</td>
<td>Local Ownership and Control of Project</td>
</tr>
<tr>
<td>Local Economic Development</td>
<td>Local Economic Development</td>
</tr>
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Municipalities can lease land for use as a community shared solar site or support development of a community shared solar program to benefit people in their communities.
Project Timeline

- Raise Money
- Environmental and Permitting Review
- Building & Electrical Application
- Procure PV System Equipment
- Installations of Systems
  - Commission Systems
  - Request Net Meter Installation
  - Installation of Net Meter
  - Utility Witness Test
  - Guide & Review of Systems
  - Operation Approval
  - Operation Approval
  - Guide & Review of Systems
  - Operation Approval

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<tbody>
<tr>
<td>Project Month</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>End</td>
</tr>
</tbody>
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Project 1: Greenfield Industrial Park

Located on 23 acres owned by Northeast Biodiesel

600 kW generation

Northeast Biodiesel will use 200 kW

200 households will use the other 400 kW – with 40% of those households being families on fuel assistance with shares purchased with CAP agency grant funds.
### Solar LLC Funding Sources

<table>
<thead>
<tr>
<th>Sources</th>
<th>$</th>
<th>% of total Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tax Equity Investor</td>
<td>$852,616</td>
<td>42.5%</td>
</tr>
<tr>
<td>Co-op Power Loan (VNMC secured)</td>
<td>$702,154</td>
<td>35%</td>
</tr>
<tr>
<td>Bank Loan (SREC secured)</td>
<td>$442,773</td>
<td>22.1%</td>
</tr>
<tr>
<td>Co-op Power Investment</td>
<td>$8,612</td>
<td>0.4%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2,006,155</strong></td>
<td></td>
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</table>

![Bar chart showing funding sources](chart.png)
# Solar LLC Start Up Costs

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Array, construction permitting</td>
<td>$1,749,955</td>
</tr>
<tr>
<td>Interconnection</td>
<td>$50,000</td>
</tr>
<tr>
<td>Legal Expenses</td>
<td>$57,500</td>
</tr>
<tr>
<td>Project Management (until Operation)</td>
<td>$148,700</td>
</tr>
<tr>
<td><strong>Total Startup Cost</strong></td>
<td><strong>$2,006,155</strong></td>
</tr>
</tbody>
</table>
Co-op Power’s Community Shared Solar...
• Is great for Consumers, especially people with Limited Resources
• Is a Successful Enterprise
• Is Good for the Environment
• Brings valuable Economic Benefits to communities across our region

Community Shared Solar needs your support in the legislature. We need to raise Net Metering Caps and keep Virtual Net Metering.
Thank you for your time!
Lynn Benander, President and CEO 413-552-6446, lynn@cooppower.coop
Q&A

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