



CONNECTICUT
GREEN BANK SM

Connecticut Green Bank

Solar for All with PosiGen

Connecticut Green Bank

Delivering Results for Connecticut

- **Investment** – mobilized nearly **\$1.3 billion** of investment into Connecticut’s clean energy economy so far, using a **8:1 leverage** ratio
- **Energy Burden** – reduced the energy burden on over **30,000 households and businesses**, including “beyond parity” for LMI solar
- **Jobs** – created over an estimated **16,000 total job-years** – 6,200 direct and 9,700 indirect and induced*
- **Clean Energy** – deployed more than **285 MW** of clean renewable energy helping to reduce over 4.6 million tons of greenhouse gas emissions that cause climate change

Private investment drives economic growth

Creates jobs, lowers energy costs, and generates tax revenues



REFERENCES

CT Green Bank data warehouse report from July 1, 2011 through February 28, 2018

*62,500 private non-farm jobs created in the state over 5 years since Green Bank creation mid-2011. Green Bank statistics are in job-years; “total jobs” include direct, indirect and induced. CT DOL statistics are aggregated from monthly point-in-time estimates. CT Department of Labor - <http://www1.ctdol.state.ct.us/lmi/privatesectoremployment.asp>

Low-to-Moderate Income Strategy



- **Residential Solar Investment Program** provides incentives for solar PV on 1-4 unit owner-occupied homes (32,000 projects to-date)
- Low-to-Moderate Income **Performance Based Incentive** for Third Party Owners launched in 2015
- Income screen of <100% AMI
- Non-escalating lease terms
- Energy Burden model test
- Not enough tax burden for ITC, not credit qualifying for financing
- Nearly 3x market rate incentive

- 2015 LMI Solar Financing RFQ helped create a \$45MM+ Fund
- \$5MM CGB initial investment
- Product offering combines non-escalating solar lease with energy efficiency services
- Utility weatherization programs leveraged
- Alternative underwrite (no credit check)
- Community partnerships

Solar For All with PosiGen

Lease & ESA for Single Family LMI Market

Home

(New Haven – Oil Heat)



\$59,250 HHI
High Energy Costs

**High
Energy Burden**

Solar PV (Lease)



\$60 to \$110/month Lease
Solar \$ Savings

**Moderate
Energy Burden**

Energy Efficiency (ESA)



\$10/month ESA
Energy Savings
<<Additional Savings>>
Solar + EE \$ savings

**Reasonable
Energy Burden**

Average \$500 in savings after first year

Solar For All with PosiGen

Case Study: Saul Almazan

Description	6.16kW Solar + Energy Efficiency Services	
Green Bank Incentive	\$3,597.00	
Monthly cost	\$79.99 for solar + \$10 for ESA	
Terms	20 year lease	
Customer 20-yr Cost	\$21,597.60	Lease + ESA
Pre-Solar Electric Costs	\$53,017	(7,601 kWh/year)
Post-Solar Electric Costs	\$32,682	including lease + ESA
First Year Savings	\$564	
Net 20-yr Savings	\$20,334	Not including EE savings



Solar for All Campaign Progress

- ~2,110 contracts since 2015, ~14 MW of solar PV
- ~61% of contracts are LMI (*getting the LMI tiered incentive*)
- ~60% of projects in census tracts <80% AMI



Energy Efficiency Progress

- 87% of households get Direct Install EE measures, 21,708 MMBTUs saved
- **62% of households also undertake “deeper” energy efficiency projects** through \$10 ESA payment/month for 20 years



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Solar Access for the Underserved: How Property Owners Can Help Support Community Solar

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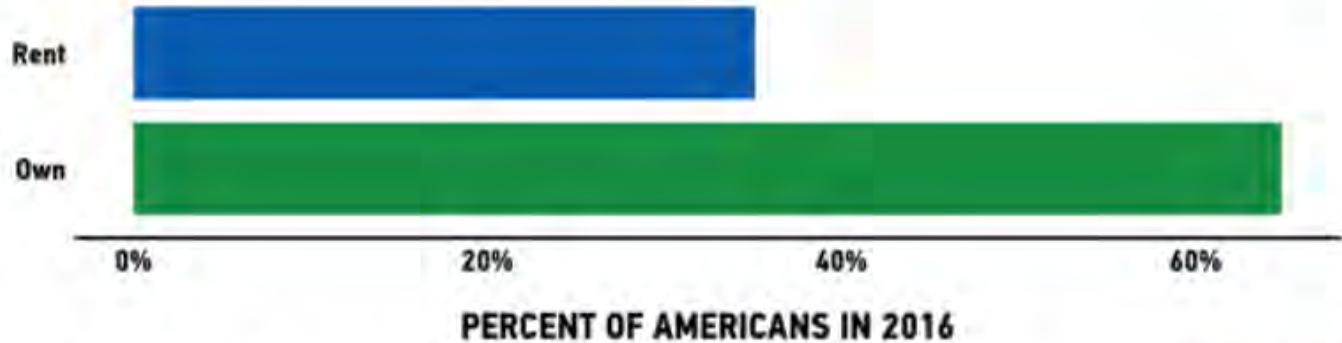
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Problem: Focus of Solar Industry

- The solar industry has historically focused on single family households with
 - Strong credit scores
 - Roofs facing ideal azimuths
 - Minimal obstructions on roof
 - Minimal shading
- This focus skips the majority of low to moderate income families that would greatly benefit from the energy savings of solar.



Problem: 100+ Million Renters



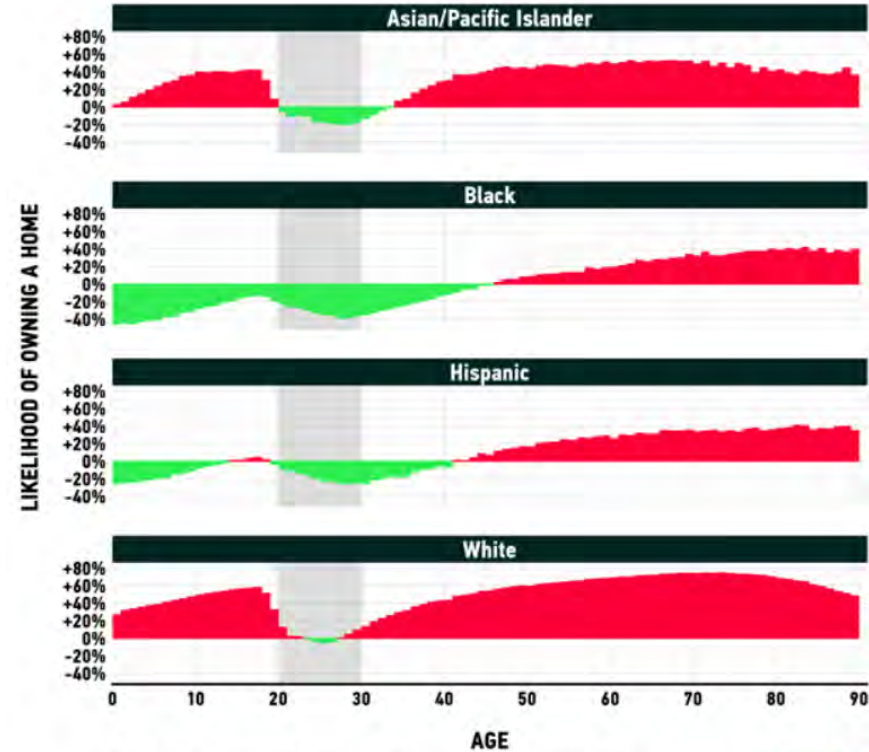
Source: IPUMS-USA, University of Minnesota. (David H. Montgomery / CityLab)

CITYLAB

- There were over 100 million renters in the US as of 2016
- With $\frac{1}{3}$ of Americans unable to traditionally benefit from solar, it creates a significant demand for energy options that renters can benefit from

Problem: Solar Inclusion

- Black and Hispanic Americans are more likely to rent
- Younger Americans from 20-35 years old, are more likely to be renting as they establish their financials and career
- Overall, the likelihood of owning a home is relatively low across all minorities in the US over a given lifetime



Source: IPUMS-USA, University of Minnesota. (David H. Montgomery/CityLab)

Problem: Solar Qualification



Solution: Community Solar



Community Solar Helps Renters, Non-Profits, Small Businesses, and Homeowners

- Electricity produced by community solar gardens allows you to save 10% on your monthly electric bill (\$20-30/month for homeowners)
- Can help most electric ratepayers regardless of property conditions
- Great option for renters, non-profits, small businesses, and homeowners to reduce electric costs



Agreement Structure & Considerations

- Offer: Discount of normal retail electric rates
- Contract Type: Fixed Rate, Escalator, Upfront, etc.
- Term: Pay-as-you-go, 1 year, 5 years, 20 Years, etc.
- Cancellation Fees and requirements (i.e. requiring a transfer or providing a 90 day notice)



Massachusetts SMART Program: Community Solar



- The new solar incentive program in MA allows for solar gardens to produce Alternative On-Bill Credits (AOBC) and be allocated to offsite electricity consumers
- The SMART Program allows for the transfer of AOBC across different load zones increasing the access larger solar farms can provide to urban energy off-takers
- SMART incentivizes projects serving low income customers by adding \$0.03/kWh for low income energy off-takers

How Property Owners Can Help: Land Lease

- Lease your land to a solar developer and allow us to install a solar farm on the property
- Electricity produced from the system gets sold to a wide range of energy offtakers including residential renters, small/medium sized businesses, industrial facilities, non-profits, etc.
- Supports the local economy through the development, operation, and maintenance of the facility



How Property Owners Can Help: Roof Lease

- Lease your roof space to a solar developer and receive rental income or have the costs of a new roof covered
- In urban settings, this is a popular option for property owners that rent their real estate to tenants and want to allow their tenants to benefit for solar while fully monetizing their real estate
- Recent Project in Southeastern MA >



THANK YOU!

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SOLAR ACCESS FOR THE UNDERSERVED

MASS SOLAR LOAN

March 2019



BUILDINGENERGY BOSTON

MARCH 14-15, 2019 • WESTIN BOSTON WATERFRONT • NESEA.ORG/BE19

Conference + Trade Show of the Northeast Sustainable Energy Association (NESEA)

MASS  **Solar Loan**
www.MassSolarLoan.com

OUR MISSION

Grow the state's clean energy industry while helping to meet the Commonwealth's clean energy and climate goals.

INVEST

Invest in programs to increase renewable energy adoption by residents, businesses and communities.

CONNECT

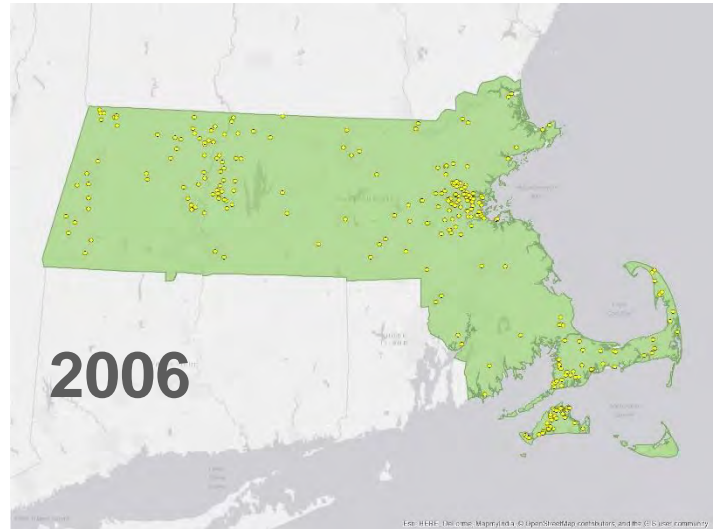
Connect employers, job seekers, students, communities and investors to the clean energy industry.

INNOVATE

Help to spur innovation through infrastructure, funding and technology development support.

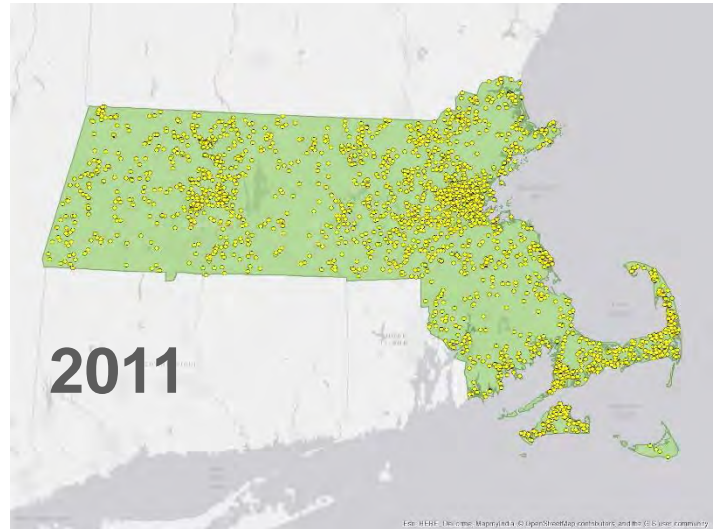
REACHING LOW-MODERATE INCOME (LMI) COMMUNITIES IN MASSACHUSETTS

- Solar has seen remarkable growth over past 10 years
- MassCEC programs designed to grow and support industry
- Programs for LMI community
 - ✓ Mass Solar Loan
 - ✓ ACRE (Combined Heat Pump and Solar Programs)
 - ✓ State Incentive Program (SMART) – LMI Adder (\$0.03/kWh)



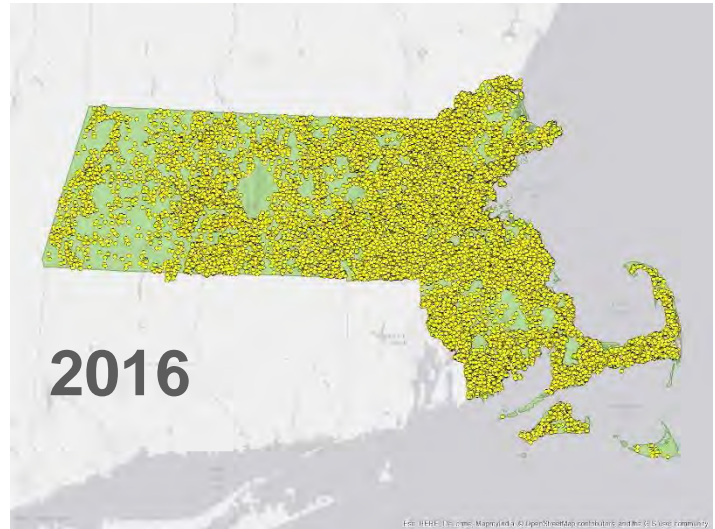
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MASS SOLAR LOAN PROGRAM

- Sparked by 2013 DOER study demonstrating benefits of direct solar ownership over third party owned solar
- Designed to expand financing options- and increase access to solar for income qualified residents
- Partnered with 17 local lenders to leverage expertise and local capital
- Over 100+ installers helping to reach underserved markets



MASS SOLAR LOAN PROGRAM

- Launched in December 2015 – connecting customers purchasing solar with local lenders
- Lenders offer solar loan products with standard underwriting
 - Fixed rate loans – capped interest rates and closing costs / fees
- Three types of loan support incentives available
- Over course of program incentives have stepped down to focus support on Income eligible participants



LOAN SUPPORT INCENTIVES

Income Based Loan Support

Principal Reduction of the loan

Below 80% State Median Income	Below 120% State Median Income
30% Principal Reduction – Capped \$10,500	10% Principal Reduction – Capped \$3,500

Interest Rate Buy Down

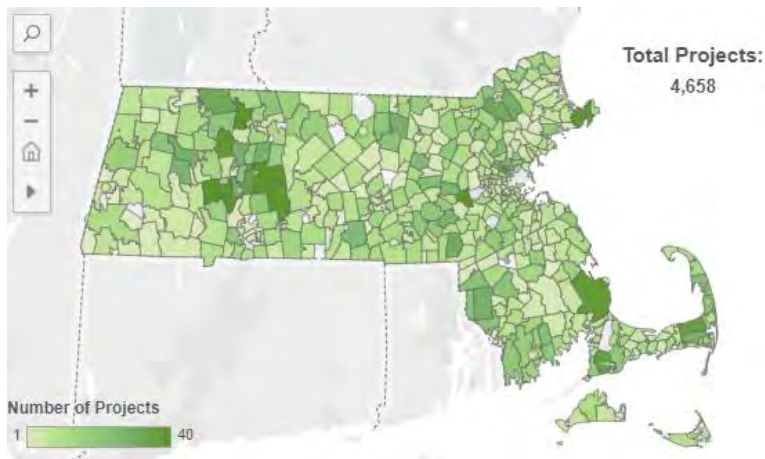
1.5% Reduction in Interest Rate for customers below 80%

Loan Loss Reserve

Funding set aside of 10-20% of the loan, lender can recover a portion of lost principal from this pool in the event of a loan default

- Available for income qualified customers with credit scores below 720.

PROGRAM RESULTS



The Results

- 4,770 loans closed
 - Over 2,300 (~50%) Income qualified
- Over \$150 million loan value
- \$34.7 Million in awards
 - 74% Income qualified
- ~40 MW of residential solar

Typical Project

- \$32,252 average loan
- 8.32 kW average project
- \$3.84 per watt

EXAMPLE

Below 80% State Median Income

5kw System at \$4.00/W

\$20,000	Total System Cost
<hr/>	
-\$6,000	30% Principal Reduction
-\$6,000	30% Federal Tax Credit *
-\$1,000	State Tax Credit *
<hr/>	
\$7,000	Net Cost financed over 10 year term
<hr/>	
4.5% Interest	Market Average 6% - 1.5% Buy Down



Assuming above and maximum state incentive –
~\$1,000 in average savings per year

LOAN PERFORMANCE

- Loan performance to date has been strong
- Default rate of 0.2% on nearly 4,500 loans
- Limited correlation to Income
 - Loans in Below 80 % Income Category:
Have a 0.25% default rate and a lower delinquency rate (4.2% - 30 days late) than higher incomes (6%)
- Better correlation to FICO (2.2% default rate)
 - Caveat- this is distorted by the Loan Loss Reserve

Income Category (% of Median)	Count of Projects	Average Months Seasoning	Count 30 Days Late	% 30 Days Late	Count Defaulted	% Defaulted
Not Income Qualified	2349	19	141	6.0%	2	0.09%
80 to 120%	874	14	33	3.8%	3	0.34%
Below 80%*	1188	15	50	4.2%	3	0.25%

QUESTIONS

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