



AUGUST 21-23, 2018 • CLEVELAND, OHIO

Follow the Sun

Successful Strategies for Solar Adoption

Speakers

- Krystal Laymon, U.S. Dept. of Energy (moderator)
- Chris Castro, City of Orlando, FL
- Terri Novak, State of Michigan
- Sameer Doshi, Illinois Power Agency
- Daniel White, District of Columbia



GREEN WORKS ORLANDO



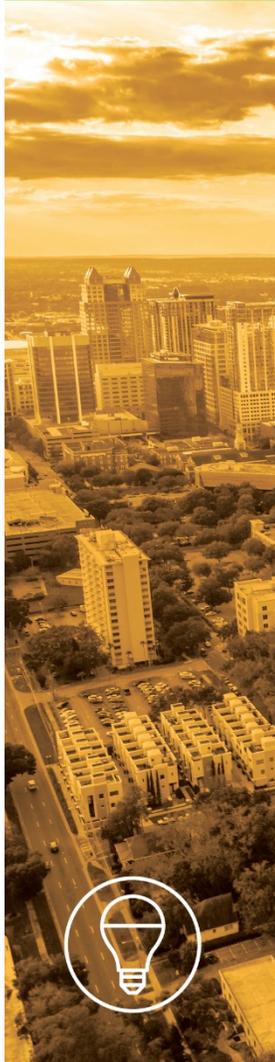
Challenges to Solar Adoption

- Lack of RPS
- Low-cost of electricity rates
- Outlawed 3rd party PPA
- No rebates or incentives
- No REC market
- Strong utility influence to PSC





GREEN WORKS ORLANDO

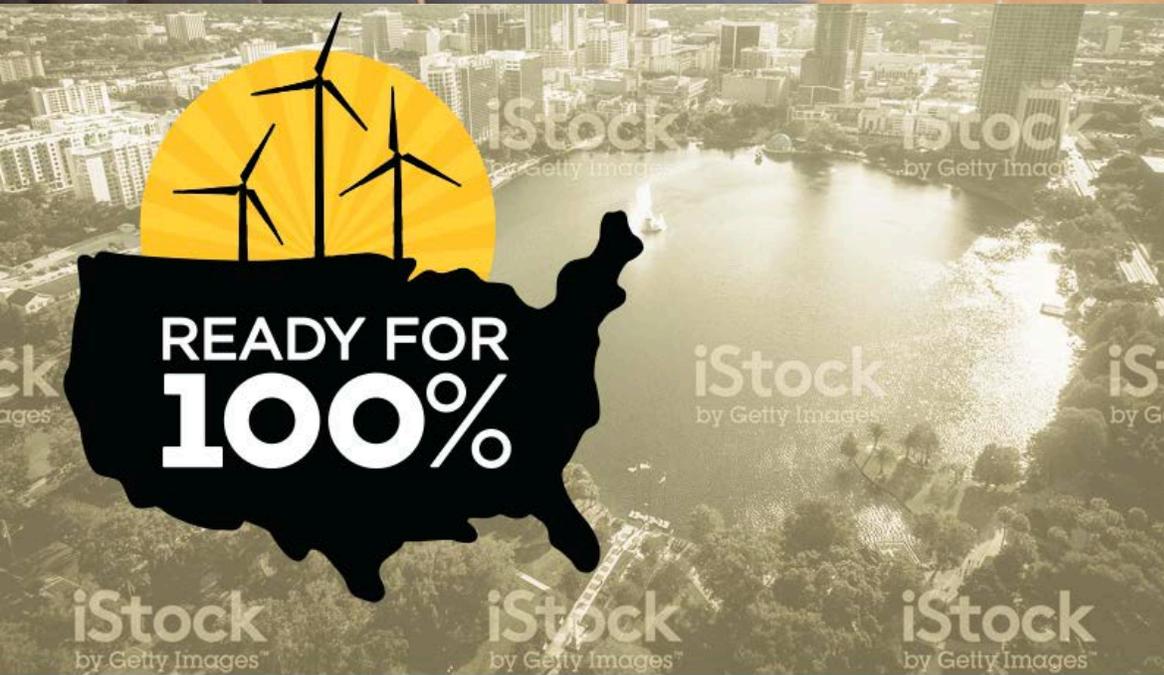




City of Orlando passes City RPS in August 2017

- **100% Renewable Electricity**

- City Ops by 2030
- City-wide 2050



"I am proud to support a vision of transitioning entirely to 100 percent clean and renewable energy in our City."

—MAYOR BUDDY DYER of Orlando, Florida



SolSmart GOLD designation



- U.S. DOE recognition program to help local governments reduce “soft-cost” barriers to solar energy growth.
- Solutions Implemented:
 - Solar Contractor Permit Training
 - Solar Permitting Guide
 - Planning / Permitting staff training
 - LDC definition of “Solar equipment”
 - Solar financing programs





PACE Policy passed
in March 2016

Enabled 4 PACE
providers

\$500M in capital
available

Commercial +
Residential market



PACE PROGRAM

HELP IMPROVE
YOUR HOME
AND BUSINESS?



Community Solar + Collective Solar Programs

- **20+ MW OUCommunity Solar:** offsets consumption through virtual net metering



- **OUCollective Solar** makes it easier for homeowners to put Solar Photovoltaic (PV) panels on their roofs.



13MW Community Solar Farm – Dec 2017



5.2 Megawatts solar electricity procurement

- Orlando City Hall
- Orlando Police HQ
- 17 Fire stations

Currently 10.4% of municipal
operations powered by Solar

Prevention of
5,912,000
pounds of coal from
being burned

Reduction of
12,216,000
pounds of CO2 emissions



Welcome to the



**FLORIDA MUNICIPAL
SOLAR PROJECT**

**Announcement Event
and Signing Ceremony**

Florida Municipal Power Agency's Solar Project Cities

Alachua	Jacksonville Beach	Ocala
Bartow	Key West	Orlando
Fort Pierce	Kissimmee	Wauchula
Homestead	Lake Worth	Winter Park



Florida Municipal Solar Project

- Solar cooperative model for utilities
- 14 municipal utilities
- 223.5 MW of capacity
- PPA rate \$35/mWh





OUC solar power sized for new era



orlandosentinel.com/news/os-orlando-solar-big-increase-20180121... electricity from solar panels

Today's Mortgage Rate
3.04% APR
15 Year Fixed



Select Loan Amount

OUC commits to an additional 108.5 MW by June 2020



OUC Collective Solar

- Solar Cooperative model (e.g. Solar United Neighbors)
- Fixed price for residential customers
 - \$2.40-\$2.50/watt installed
- OUC select the contractor, hardware, BOS, etc.

OUC Collective SOLAR LOCALS SAVING TOGETHER

OU Collective | About Partners | Solar Videos | Log In | Sign Up | 833.372.7652

Go Solar In Orlando

Enter your home address [SEE ESTIMATES](#)

Powered By **pickmysolar**

In Partnership With **OUC** The Reliable One | **esaSolar**

Financing Options

These amounts are just estimates. There are a large number of factors that go into calculating your exact payment amounts. Please fine-tune your estimates below for exact amounts.

Cash	Loan	PACE
\$8 Monthly Payment	\$319 Monthly Payment (12 Year Term)	\$240 Monthly Payment (20 Year Term)
Up Front Cost \$30,308 Lifetime Savings \$73,771	Up Front Cost \$ 0 Lifetime Savings \$ 59,325	Up Front Cost \$ 0 Lifetime Savings \$ 48,459



One[®]



OxBlue[®]



Solar + Storage for Back-up Power

- **Procured 35 Solar + Storage mobile generators**
- **Use power for:**
 - Security lighting
 - Traffic signals
 - Lift stations
 - Pumps
 - Community Shelters
 - Public Service





Solar + Storage for Back-up Power





GREEN WORKS ORLANDO



MI CELICA: Cherryland Community Solar Pilot

Terri Novak
Michigan Energy Office

2018 Energy Exchange & Better Buildings
Summit

August 22, 2018



Agenda

- **Michigan Agency for Energy/Energy Office**
- **US DOE CELICA Accelerator**
- **MI CELICA - Cherryland Pilot Project**
- **Successes/Challenges**
- **Lessons Learned**
- **Next Steps**
- **Resources**

Michigan Agency for Energy



- **Michigan Energy Office**
 - ✓ State Energy Program
 - ✓ Technical Assistance
 - ✓ Financial Assistance
- **Energy Security**
- **Outreach and Education**

Michigan Energy Office

Promote healthy communities, economic growth and environmental sustainability through EWR and RE.

- Engage stakeholders to achieve combined 35% EWR/RE by 2025
- Accelerate economic growth thru advanced mobility, manufacturing and healthy communities
- Lead-by-example initiatives
- Provide and support energy education
- Encourage the use and transparency of energy data

MI CELICA



Pairing:

- Weatherization
- Income Eligibility
- EWR and Solar

Demonstrations:

- Cooperative
- Municipal
- Investor Owned

MI CELICA - Cherryland Pilot **Project Partners**

- **Federal Partners:**

- Department of Energy, Better Buildings Initiative
- National Renewable Energy Laboratory (NREL)

- **State Agencies:**

- Michigan Agency for Energy (MAE) - MI Energy Office
- Michigan Public Service Commission (MPSC) – Customer Service
- Department of Health and Human Services (DHHS) – Weatherization Assistance Program

- **Local Utility:** Cherryland Electric Cooperative

- **Local Community Action Agency:** Northwest Community Action (NWCAA)

MI CELICA - Cherryland Pilot Project Roles

• Cherryland Electric Cooperative

- Marketing, recruitment, and education
- Develop billing structure
- Collect routine energy data on electricity usage
- Lead on Power Purchase Agreement with Wolverine Power/Spartan Solar
- Support shares for 250 panel subscriptions from Spartan Solar Community Array

• North West Community Action Agency

- Identify and select 50 eligible households
- Marketing and educate customers
- Weatherization Assistance

• State of Michigan

- Coordinate partner relations and Fed TA, implementation, reporting and initial work plan
- Establish eligibility criteria
- Support shares for 200 solar panel subscriptions
- Conduct data analysis, evaluate metrics, and case study

MI CELICA - Cherryland Electric Cooperative

- Member owned, electricity distribution cooperative
- Purchase power through Wolverine Power Cooperative
 - Wolverine owns Spartan Solar, a community solar array near Cadillac, MI
<https://www.spartansolar.com/>
- Covers six counties in N. Michigan
(Benzie, Grand Traverse, Kalkaska, Leelanau, Manistee, Wexford)
 - Rural, low-moderate income populations
 - Most receive heat through propane and wood

MI CELICA - Cherryland Pilot Project Overview

- Cherryland Pilot Project launched in Fall, 2017
- Serving 50 low income households
- Eligibility criteria includes
 - Income at/below Federal poverty line
 - Previously received weatherization services
 - Own or rent their house, and designated as single-family
 - Willingness to share energy data
- Households enrolled on an annual basis
- Solar generated through existing community solar array

MI CELICA - Cherryland Pilot **Successes**

- Partnerships (Ready, Willing and Able)
- Leveraging Resources
- Enrolled 50 households
- Bill credits began March 1, 2018 (est. to save 30-40%)
- Testimonial:

Roblero-Gomez and Ogemagededo are both looking forward to seeing what those shares do for their power bill. It's been higher than usual lately, and their struggle to make ends meet has only gotten worse as costs rise and Ogemagededo deals with health issues. "We've just got to get over this hump, and we're really fortunate to have programs that can help us."

http://www.record-eagle.com/news/local_news/solar-for-struggling-households/article_16f40b22-4db8-536a-a19c-d599523570d9.html

MI CELICA - Cherryland Pilot Challenges

- Funding/Mgt of Solar Subscriptions
- Size and Scope
- Ownership Model
- Selection and Eligibility

- Timing and Partnerships
- Investor Owned Utility issues
- State Policy
- Model Replication
- Subscription Management

MI CELICA - Cherryland Pilot **Lessons Learned**

- **Messaging matters**
 - Local Leads on program education and enrollment
- **Strong partnerships essential**
 - Community Action Agency (weatherization provider), and Utility
 - 3rd party facilitator to help facilitate and educate
- **Start small scale**
 - Can always expand
 - Don't assume energy literacy
 - Educate, educate, educate
- **Spread the word**

MI CELICA – Cherryland Pilot **Additional Background**

- Podcast Interview
 - <https://www.cherrylandelectric.coop/2018/02/cherryland-pilots-low-income-solar-program/>
- News Articles
 - <https://www.cherrylandelectric.coop/2018/05/caring-for-the-forgotten/>
 - <https://www.cherrylandelectric.coop/2018/02/cherryland-pilots-low-income-solar-program/>
 - <https://www.solarpowerworldonline.com/2018/03/michigans-first-renewable-energy-program-low-income-customers/>
 - <http://www.9and10news.com/2018/03/10/cherryland-electric-cooperative-helping-lower-bills-solar-energy/>

MI CELICA – What's Next

- Continue monitoring the Cherryland pilot project
- Data analysis and project evaluation
- Find additional pilot sites to replicate
- Promote pilots



Thank you

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Solar Incentives in Illinois: **Iterating Towards a Green Wave**

August 23, 2018

U.S. Department of Energy / Better Buildings Summit

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What is the IPA?

- Created by IL legislature in 2007, sister agency to Illinois Commerce Commission
- Moved to oversight of Executive Ethics Commission, 2011
- Established to prepare procurement plans and conduct procurement events to meet electric supply requirements of “eligible retail customers” of utilities (default supply customer load)
- Tasked with implementing state’s renewable energy portfolio standard, including conducting competitive procurements and administering state renewables fund

Pre-2017 Renewables Requirements

1-75(c)(1) obligations re: eligible retail customers of utilities

- Bill surcharge to recover expenditures of renewables procurements
- 2.015% rate impact cap
- 25% by 2025 with technology-specific subtargets
- Part of annual IPA planning process, met through procurement events

1-75(c)(5) obligations re: hourly pricing tariff customers

- Alternative compliance payments made by hourly customers
- Money held by the utilities
- Also part of annual IPA planning process, utility-held funds

16-115D obligations re: alternative retail electric suppliers

- Self-procurement (up to 50% of obligation)
- Alternative compliance payments (remainder)
- State-held funds, administered by IPA but not part of annual plans

Pre-2017 Procurements for New Solar Build

2010 Long-term Power Purchase Agreements

- 20 year bundled (REC + energy) contracts
- Mostly wind, minor amount of solar
- Drove new utility-scale development but created budget constraints

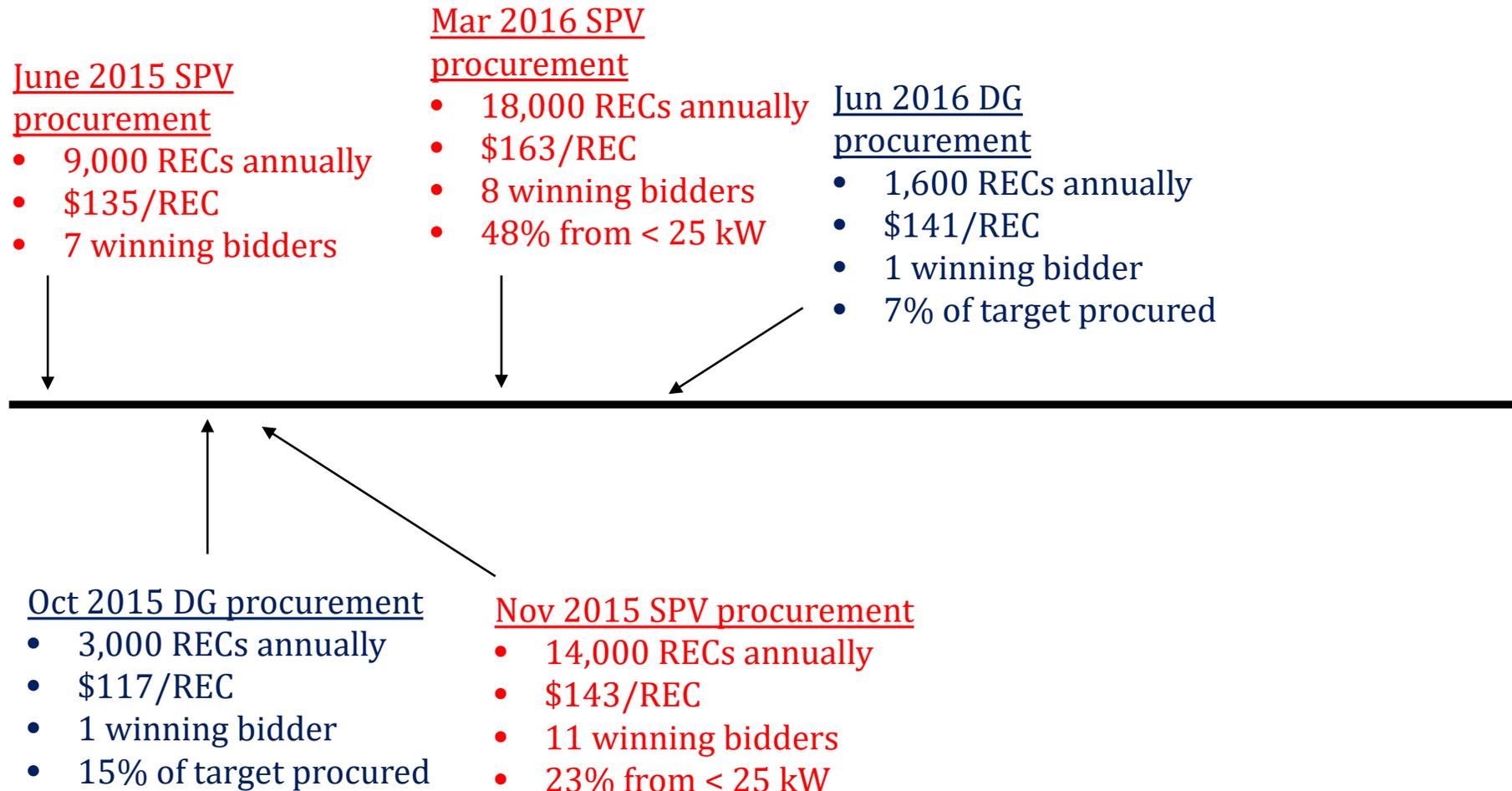
Supplemental Photovoltaic Procurements

- \$30 mil. of state-held funds (from ARES RPS payments) used for **new** PV DG systems within Illinois of up to 2,000 kW (half from under 25 kW)
- 3 competitive procurement events, 2015-2016
- Half from systems under 25 kW, half from 25-2,000 kW
- 5-year competitively-bid REC contracts
- Bids permitted for identified and non-identified (below 25 kW) systems

Distributed Generation Procurements

- 4 competitive procurement events, 2015-2017
- Half from systems under 25 kW, half from 25-2,000 kW
- Uses utility-held RPS funds (utility as contractual counterparty)
- 5-year competitively-bid REC contracts
- Bids must be at least 1 MW of installed capacity

Pre-2017 Procurements for New Solar Build



Distributed Generation procurements vs. Supplemental Photovoltaic procurements

- **Offer Size**

DG procurement: 1 MW minimum (1,200 RECs annually)

SPV procurement: 100 RECs annually

- **Speculative bidding**

DG procurement: All bids must be project-specific

SPV procurement: Speculative bidding allowed for < 25 kW systems (ID within 9 months)

- **Time frame**

DG procurement: defined 5-year contractual period regardless of energization date

SPV procurement: flexible 5-year period beginning with first delivery

- **Default terms**

DG procurement: Portfolio-based contract; requirement to deliver 80% of portfolio

SPV procurement: System-specific contracts with individual defaults

- **Collateral**

DG bidders required to post \$8/REC in pre-bid deposit, + 10% of contract value after winning

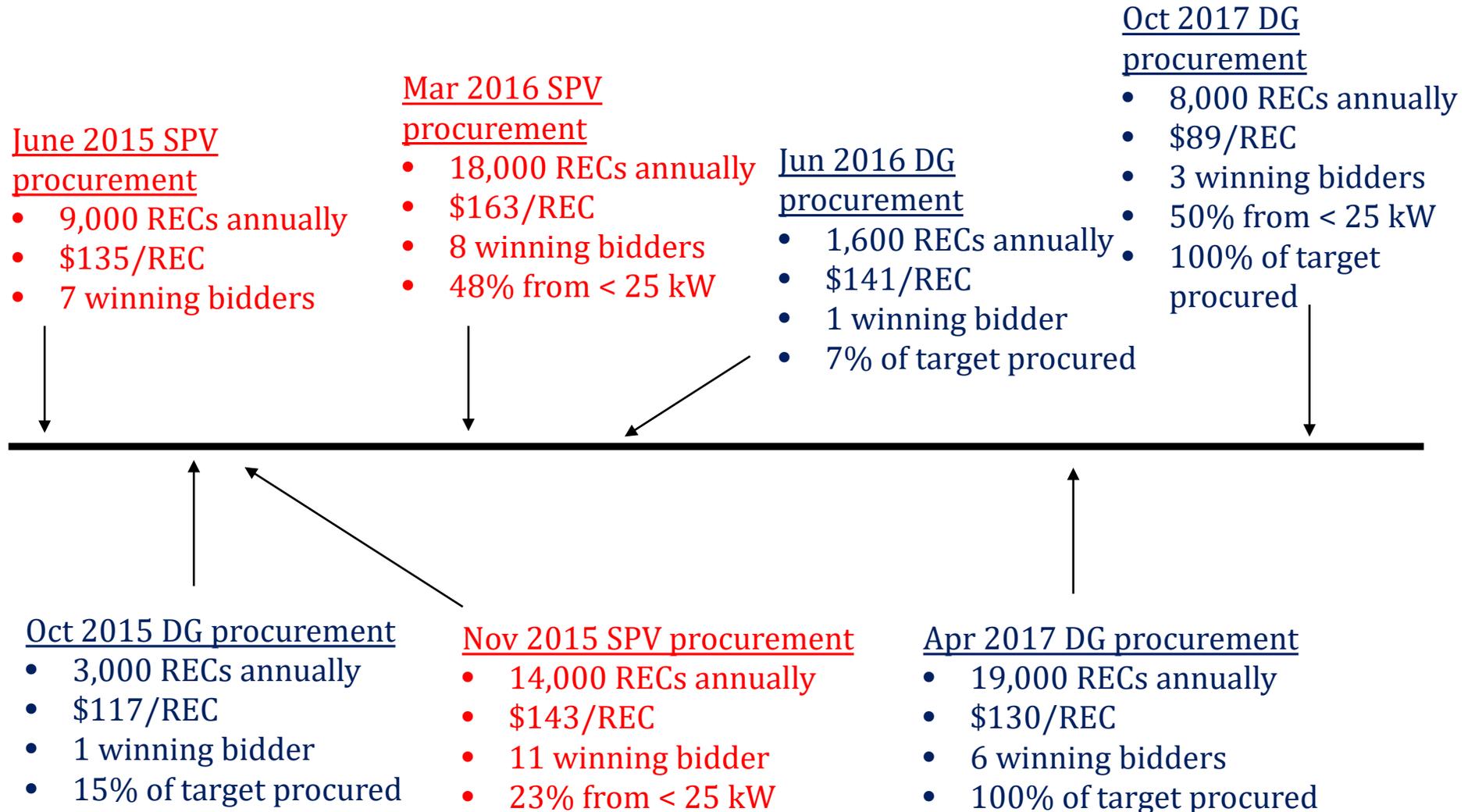
SPV bidders required to post \$4/REC for identified systems and \$8/REC for forecast quantities

- **Substitutions of projects**

DG procurement: not allowed

SPV procurement: allowed

Pre-2017 Procurements for New Solar Build



Public Act 99-0906: Future Energy Jobs Act

(enacted Dec. 7, 2016; effective June 1, 2017)

- Expands and consolidates state RPS standard (25% of load by 2025) into a central procurement model, funded by surcharge on all retail customers
- Adds targets for each of new wind & new photovoltaics: minimum 2,000,000 RECs annually by 2020-2021, 3 mil. by 2025-2026, 4 mil. by 2030-2031
- **Creates Adjustable Block Program to pay for RECs from new photovoltaic distributed generation and community generation facilities**
- **Leverages renewable energy state-held funds for development of Illinois Solar for All Program for low-income customers** (also REC payments)
- Net metering credits for ratepayers subscribed to community solar generating facilities
- Smart inverter rebate for distributed generation facilities
- Expands and consolidates state energy efficiency portfolio standard
- Establishes zero emission standard to support continued operation of at-risk nuclear facilities

Illinois Solar for All Program: Objectives

- “Bring photovoltaics to low-income communities in this State in a manner that maximizes the development of new photovoltaic generating facilities”

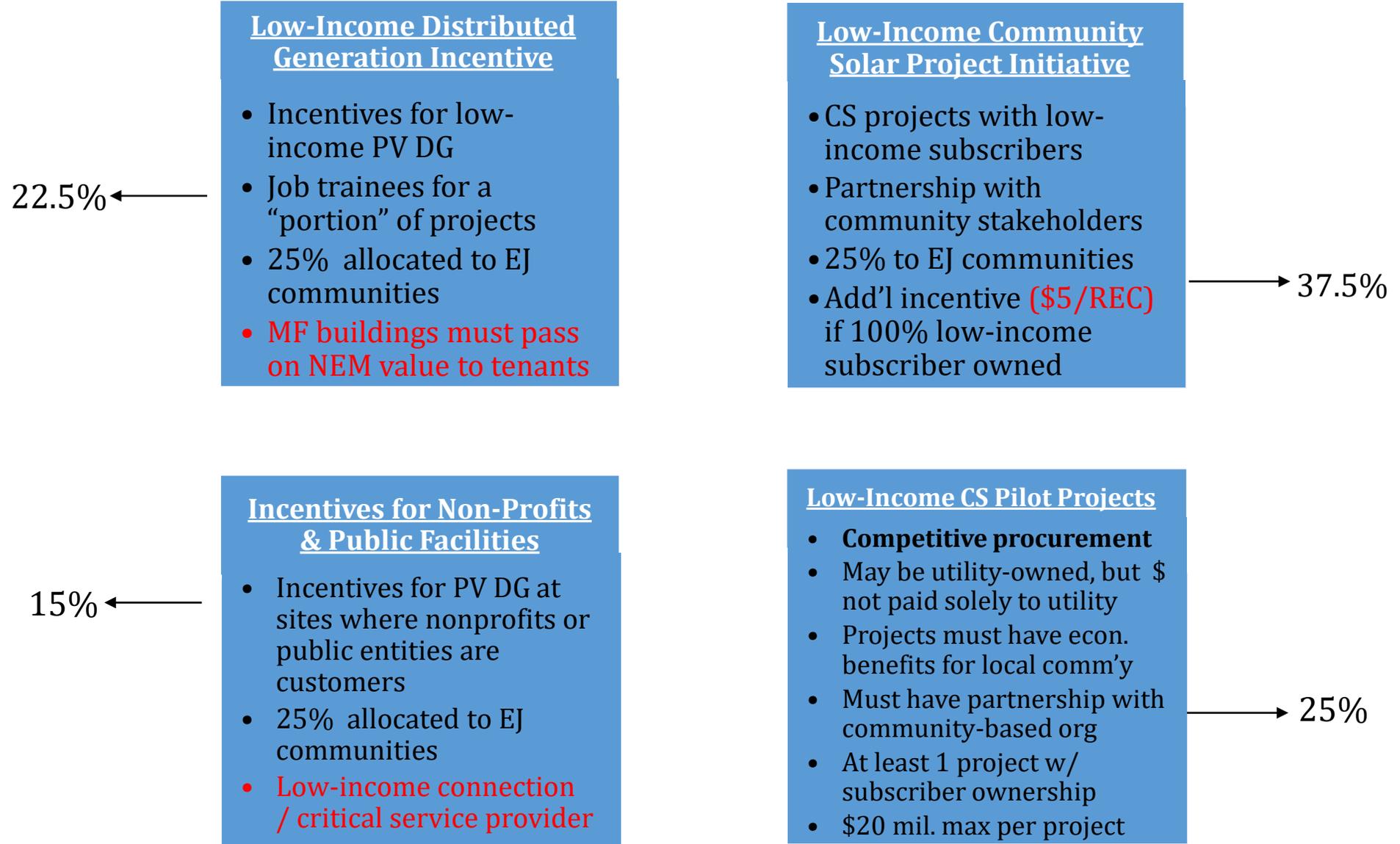
- “Ensure tangible economic benefits flow directly to program participants, except in the case of low-income multi-family housing”

- “Priority shall be given to projects that demonstrate meaningful involvement of low-income community members in designing the initial proposals”

- “Projects must include job training opportunities if available, and shall endeavor to coordinate with the job training programs described in [] Section 16-108.12 of the Public Utilities Act”

(20 ILCS 3855/1-56(b)(2))

Illinois Solar for All Sub-programs



Funding for Illinois Solar for All

- IPA Renewable Energy Resources Fund (old receipts from ARES RPS Alternative Compliance Payments) – around \$150 MM available
- \$10 million annually from utility-collected funds (will be used to supplement all sub-programs except Low-Income CS Pilot Projects)

Program Year	Renewable Energy Resources Fund	Utility Funding	Funding Shortfall	Total Funding
2018-2019	\$20,000,000	\$10,000,000	To be Determined	\$30,000,000
2019-2020	\$20,000,000	\$11,708,367	To be Determined	\$31,708,367
2020-2021	\$20,000,000	\$11,694,637	To be Determined	\$31,694,637

2018-2019 Sub-program allocations:

Funding Source	Low-Income Distributed Generation Incentive	Low-Income Community Solar Project Initiative	Incentives for Non-Profits and Public Facilities	Low-Income Community Solar Pilot Projects
	22.5%	37.5%	15%	25%
RERF	\$4,500,000	\$7,500,000	\$3,000,000	\$5,000,000
Utility	\$3,000,000	\$5,000,000	\$2,000,000	
Total	\$7,500,000	\$12,500,000	\$5,000,000	\$5,000,000

- 25% of budget each year allocated to projects in EJ communities (in all sub-programs except Low-Income CS Pilot Projects)
- 5% of budget allocated to community groups for grassroots education

REC payments

- 15-year REC contracts with IPA or utility as counterparty
- Full, one-time pre-payment (upon energization) to **Approved Vendor** for 15 years' worth of RECs
- To apply, must show site control or host acknowledgement
- For systems over 25 kW, must show interconnection, non-ministerial permits
- Payment upon energization & interconnection (DG projects have 12 months after contract execution to energize; CS, 18 months)
- Collateral requirement (5% of contract value) to ensure delivery
- REC prices based on NREL CREST model
- RECs procured shall count towards utilities' annual RPS goals

Illinois Solar for All REC Prices

Low-Income DG REC Prices (Multi-Family Building)

Bin	Ameren Illinois REC Price (\$/REC)	ComEd REC Price (\$/REC)
≤ 10 kW AC	\$117.62	\$118.20
> 10 to 25 kW AC	\$107.08	\$107.65
> 25 to 100 kW AC	\$87.70	\$88.28
> 100 to 200 kW AC	\$74.67	\$75.26
> 200 to 500 kW AC	\$68.59	\$69.19
> 500 to 2,000 kW AC	\$65.32	\$65.92

Low-Income DG REC Prices (1-4 Unit Building)

Bin	Ameren Illinois REC Price (\$/REC)	ComEd REC Price (\$/REC)
≤ 10 kW AC	\$143.09	\$143.09
> 10 to 25 kW AC	\$127.55	\$127.55
> 25 to 100 kW AC	\$103.28	\$103.28
> 100 to 200 kW AC	\$90.40	\$90.40
> 200 to 500 kW AC	\$84.41	\$84.41
> 500 to 2,000 kW AC	\$80.69	\$80.69

Low-Income Community Solar REC Prices

Bin	Ameren Illinois REC Price (\$/REC)	ComEd REC Price (\$/REC)
≤ 10 kW AC	\$121.99	\$119.55
> 10 to 25 kW AC	\$111.98	\$109.52
> 25 to 100 kW AC	\$93.32	\$90.82
> 100 to 200 kW AC	\$80.72	\$78.20
> 200 to 500 kW AC	\$74.78	\$72.23
> 500 to 2,000 kW AC	\$71.29	\$68.74

Non-Profits and Public Facilities REC Prices

Bin	Ameren Illinois REC Price (\$/REC)	ComEd REC Price (\$/REC)
≤ 10 kW AC	\$155.87	\$156.57
> 10 to 25 kW AC	\$142.55	\$143.26
> 25 to 100 kW AC	\$118.57	\$119.28
> 100 to 200 kW AC	\$102.83	\$103.55
> 200 to 500 kW AC	\$95.61	\$96.34
> 500 to 2,000 kW AC	\$91.31	\$92.04

* plus adders for small subscribers (< 25 kW)

Approved Vendor Requirements

Unique to Illinois Solar for All:

- Plan for community involvement in projects
- Plan for inclusion of job training opportunities
- Coordinate with IPA on income verification
- Agree to abide by IL Solar for All consumer protections
- Demonstrate no upfront payments

Applicable to IL Solar for All and Adjustable Block Program:

- Coordinate reporting information from systems
- Complete registration and training
- Provide samples of marketing materials
- Provide and maintain credit and collateral requirements
- Submit Annual Reports
- Register in REC tracking systems

Consumer Protection Issues

Consumer protections applicable to ABP and IL SfA

- Contract with standardized components
- Standard disclosure form including production estimates, electric retail rate forecast, and cash flow / ROR analysis
- Consumer rights brochure
- Generally applicable state laws (Consumer Fraud Act, Telephone Solicitations Act, etc.)
- Subscriptions must be portable and transferable
- For DG projects or CS subscriptions under 25 kW, equivalent of ARES regulations (83 Ill. Admin. Code Part 412)
- For Community Solar subscriptions only: plain-language disclosure of terms, including pricing/fees, duration, cancellation, and possibility of changes; dispute procedure; data privacy; compensation for underperformance

Consumer Protection Issues

Consumer protections unique to Illinois Solar for All

- No upfront payments by participant
- Approved Vendor must document in advance how customer participation will be cash-flow positive (ongoing payments < expected energy saving)
- DG projects require roof inspection report; any needed repairs cannot place financial burden on building owner
- Contract requires cost disclosure 7 days before execution and right to cancel 7 days after execution
- Financing based on ability to repay as defined by Regulation Z
- No loans secured by home or home equity
- Contracts may not include prepayment penalties
- Marketing and contractual materials in customer's preferred language

Job Training

- “Qualified Person” requirement for installers in Adjustable Block Program (but does not apply to IL Solar for All)
- New solar job training program funded by Commonwealth Edison ratepayer collections (220 ILCS 5/16-108.12; ICC Docket 17-0332)
- \$30 million total -- \$10 million in each of 2017, 2021, 2025
 - 30% solar training pipeline program (emphasis on EJ communities, foster children, persons w/criminal record)
 - 30% craft apprenticeship
 - 40% multi-cultural jobs programs
- IL Solar for All Low-Income DG sub-program: installers must hire job trainees for “a portion” of installations
 - IPA interpretation: 33% of projects (and 33% of hours worked) must be from job trainees



Adjustable Block Program, Illinois Solar for All: Next Steps

- Publish final REC prices (June 4, 2018)
- Choose Program Administrators (summer 2018)
- Program Manual, consumer protection guidelines (fall / winter)
- Trainings, webinars, grassroots education (fall / winter)
- Develop online portal
- Register Approved Vendors (fall / winter)
- Develop Environmental Justice Communities methodology (for IL SfA)
- Accept and review project applications (winter 2019)
- Contract execution (after ICC approval of contracts)
- Full pre-payment upon energization (for IL SfA and small DG in Adjustable Block Program)
- Independent evaluation in 2019 for IL SfA
- Update Long-Term Renewable Resources Procurement Plan (fall 2019)

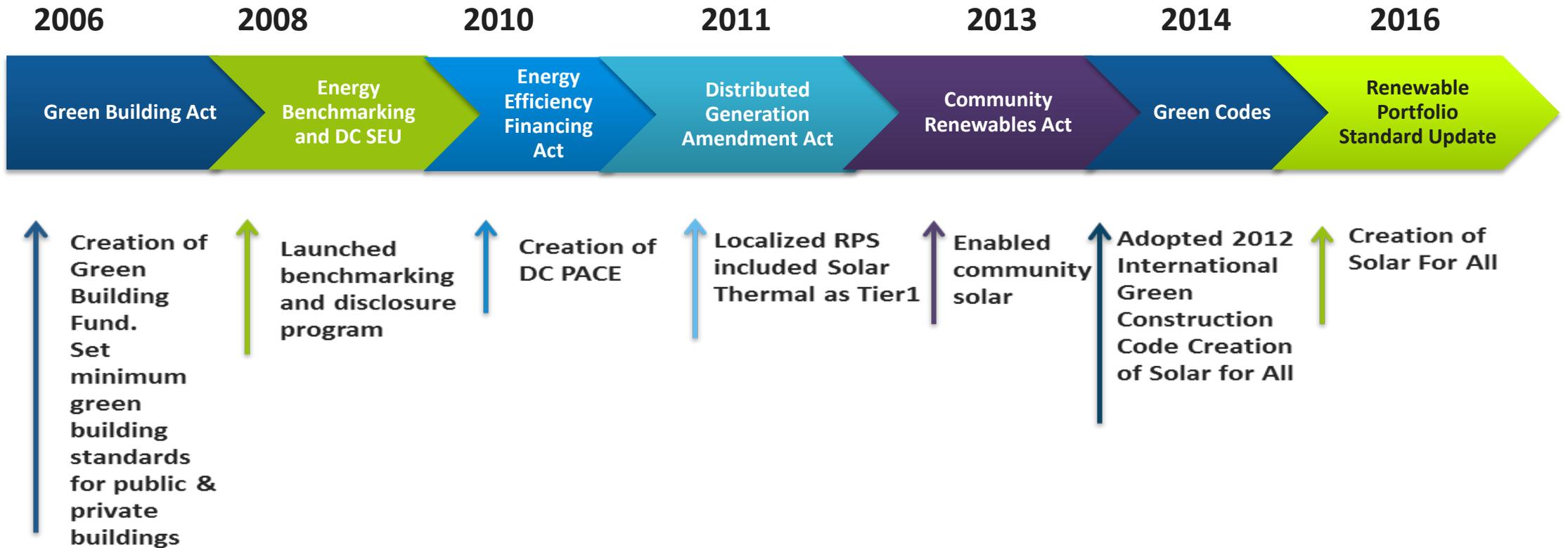


SOLAR FOR ALL

A PROGRAM OF DC'S DEPARTMENT OF ENERGY AND ENVIRONMENT



BACKGROUND



The logo features three green stars of varying sizes arranged in an arc above a stylized green swoosh that curves from the left towards the right.

SOLAR FOR ALL

- Serve 100,000 low-income households & cut their electric bills by an amount equivalent to at least 50% of the District's average residential electric bills.
- Task Force of stakeholders informed the development of the Solar for All Implementation Plan.



BARRIERS TO SOLAR IN DC

Limited
Available
Real Estate
And
Site Accessibility

Customer
Acquisition
and
Education

Workforce
Development

ACTIVITIES FUNDED IN FY 2017

Innovation and
Expansion Grants
for
solar developers

Job training
Solar Works DC

Projects by
sister agencies
and institutions

Lead by example:
community solar,
resiliency, and
innovation

\$23+ million awarded in FY 2017

Innovation and Expansion Grantees

Grantee Name:	Project Description:
Solar United Neighbors of DC	750 kW, serving at least 215 households.
Grid Alternatives	Up to 300kW, serving up to 100 households
Groundswell, Inc.	366 kW, serving up to 122 households.
New Partners Community Solar Corp.	1 MW, serving at least 325 households.
Urban Energy Advisors	1 MW, serving up to 402 households.
PEER Consultants, P.C.	500 kW, serving 100 households.
Neighborhood Solar Equity, LLC	595 kW, serving up to 100 households.
Open Market ESCO	548 kW, serving 195 households.
Ethos Strategic Consulting, LLC	1 MW, serving up to 350 households.
Community Preservation and Development Corporation (CPDC)	1 MW, serving 2,800 households.

Job-Training for careers

- 3 cohorts/year
- 75 trainees
- Part of the Marion Barry Summer Youth Employment Program

Solar for DC residents

- Installations on 60-100 low-income, single family homes

Partnering with local NGOs

- Training by Grid Alternatives

@DOEE_DC





AGENCIES AND INSTITUTIONS



Name	Amount	Description
D.C. Housing Authority	\$7.4M	Roof repair/replacement, weatherization, solar and battery storage at DCHA properties.
D.C. Public Library	\$1M	Solar + Battery project at the Southwest Branch public library to increase resiliency for the neighborhood.
D.C. Department of General Services	\$3.5M	Community Solar project in Oxon Run, on a brownfield sight.



Early Successes: Open Market ESCO's 651 kW Community Solar Project





SOLAR FOR ALL

A PROGRAM OF DC'S DEPARTMENT OF ENERGY AND ENVIRONMENT

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