



Renew300

# Solar Project Development for Public Housing Authorities

Webinar: May 31, 2017





# Welcome!

## Welcome to the Solar Project Development for Public Housing Authorities Webinar

- Brought to you by U.S. Department of Housing and Urban Development's (HUD) Renew300 Program
  - Crystal Bergemann, Energy Team Lead, Office of Economic Development
- Presented by ICF under a Technical Assistance (TA) Grant Agreement with HUD

*The goal of this webinar is to provide an overview of solar photovoltaic (PV) project development opportunities for Public Housing Authorities (PHAs) with a framework for planning, pursuing and financing viable projects*



# Panelists & Presenters

- ICF's Presenters:
  - Benjamin Foster (ICF Expert Consultant)
  - Richard Santangelo (Apollo Engineering Solutions; subcontractor to ICF)
- We are also joined today by:
  - Robert Havlicek, Executive Director, Housing Authority of the County of Santa Barbara



# Agenda

- Why Solar for Public Housing?
  - Overview of Solar Project Development
  - Approaches for Common Barriers to Solar on Affordable Housing
- Project Financing
  - Financing Options
  - Project Economics and HUD Incentives
  - HUD Approval Process
- Case Studies
- Moving Forward
- Questions



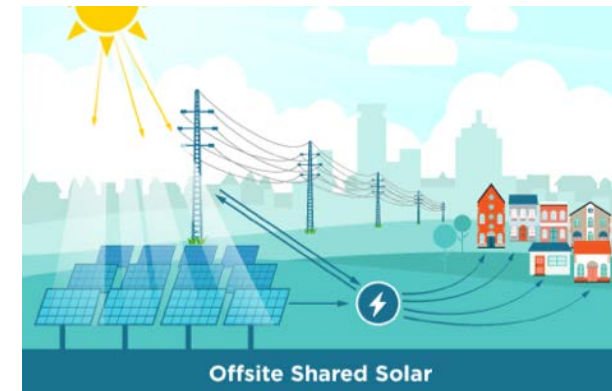


# Why Solar for Public Housing?



# Overview of Solar Project Development

- Solar project types
  - Onsite single meter solar (directly reduces building load - also called net metering)
  - Onsite shared solar (offsets multiple meters at one or more PHA buildings)
  - Offsite shared solar (remote community array or virtual net metering)





# Overview of Solar Project Development

- Public Housing Authority drivers and impacts:
  - Reduce energy costs
  - Provide revenue opportunities via leasing agreements
  - Utilize targeted incentive programs to reduce costs
  - Support and achieve clean energy/environmental goals
  - Engage and educate residents on solar power
  - Create jobs & training opportunities







# Overview of Solar Project Development Technology Applications

## Solar Rooftop Arrays



## Covered Parking *Solar Canopies*







# Overview of Solar Project Development

Development involves a team of internal & external parties

## Internal

Operations & maintenance

Accounting & finance

Security

Board of Directors

Capital planning

Legal & procurement

Resident engagement

## External

HUD

Community stakeholders

Electric utility

Solar developers



# Approaches for Common Barriers to Solar on Affordable Housing

## ***Potential Barrier***

## ***Development Approach***

1. No upfront capital available



Consider contract structures to reduce or avoid PHA funding

2. Individual project size is small to medium



Explore and screen portfolio, group sites, and consider remote options

3. Project economic viability and availability of incentives



Early economic analysis & identification of all incentives with awareness of risks

4. Lack of staff time and expertise



Use affordable housing-specific tools/resources early on; learn from other housing orgs

5. Parallel asset or program impact (e.g., roof replacement schedule)



Close coordination with asset/program leaders within the organization



# Project Financing







# Financing Options & Primary Considerations

Options	Benefits	Risks
EPC Lease–Purchase Agreement	Turn key, aggregated savings - larger projects	Long term financial commitment; black out period; Section 30
Power Purchase Agreement	Turn key; 3 <sup>rd</sup> party operates, maintains	Long term financial commitment
Capital Fund	PHA owns system	Limited funds; self maintained
Tax Credit Financing	Key source of financing affordable housing	Availability of tax credits
Community/Shared Project	Shared cost; reduces financial and technical barriers	Board approval, long term commitment
Grants, Utility Rebates	Free money to offset costs	Availability, eligibility





# HUD Rate Reduction Incentives (RRI)

- HUD RRI policy makes it financially advantageous to pursue both rate and consumption reduction activities
- Energy Performance Contracting - Uses cost savings from reduced energy consumption to repay the cost of installing energy conservation measures
  - Leading to larger energy and water efficiency retrofits - PIH Notice 2014-18
  - Can accommodate most financing approaches, previously discussed
  - Turn key process using an Energy Services Contractor (ESCO)
  - Aggregates cash flow for larger project
  - Under EPC, 100 percent is awarded for utility cost savings
    - $\$60 = (1500\text{kWh} \times (\$.10/\text{kWh} - \$.06/\text{kWh}))$

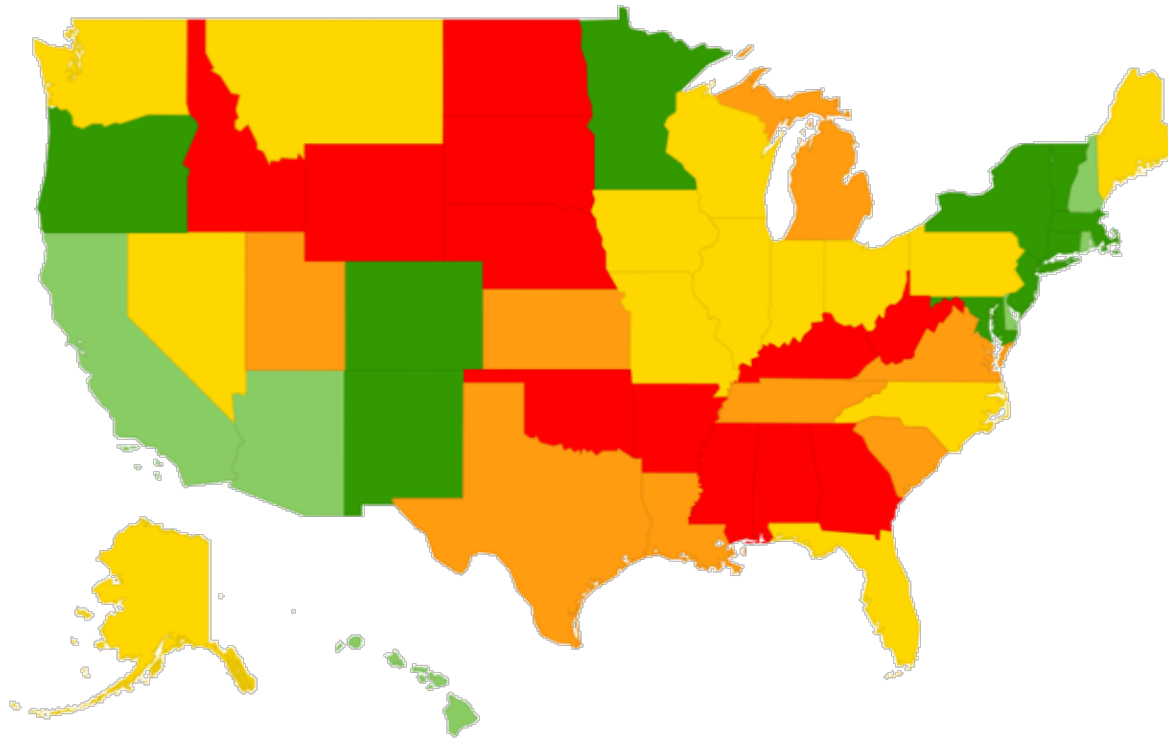


## HUD RRIs (cont.)

- Power Purchase Agreement or Capital Fund project without EPC has financial reward equivalent to 50 percent of utility cost savings
  - $\$30 = .5 \times (1500\text{kWh} \times (\$.10/\text{kWh} - \$.06/\text{kWh}))$
- Federal and PHA procurement rules apply
- RRI must be approved annually as part of operating subsidy review; PPA contracts > 5 years require FO approval



# Evaluating Project Economics – Location Matters



## Solar Report Grading Scale



## Important Factors

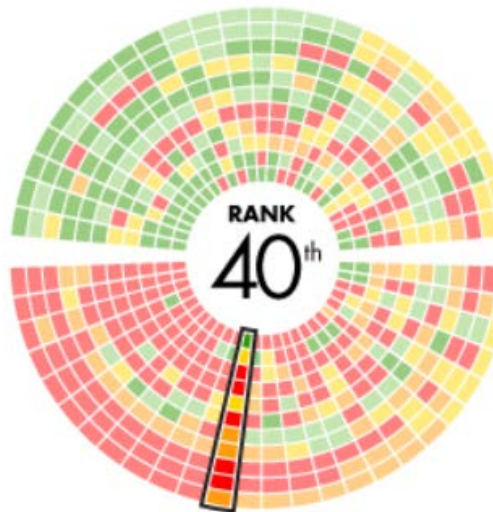
1. RPS Law
2. Solar Carve-Out
3. Electricity Cost
4. Net Metering
5. Interconnection
6. Tax Rebates
7. Rebates
8. Performance Payments
9. Property Tax Exemption
10. Sales Tax Exemption

Make sure solar contractors are familiar with weather, technical & legal issues unique to the area



# Evaluating Project Economics

## Tennessee



**Overall Grade: D**

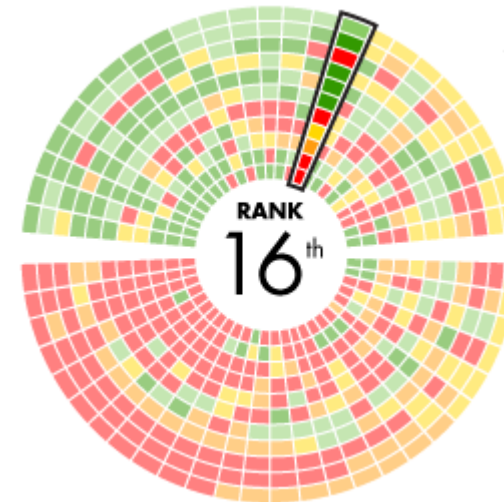
### Policy

F	RPS Law
F	Solar Carve-Out
D	Electricity Cost
D	Net Metering
F	Interconnection

### Incentives

C	Tax Credits
F	Rebates
F	Performance Payments
C	Property Tax Exemption
A	Sales Tax Exemption

## California



**Overall Grade: B**

### Policy

A	RPS Law
F	Solar Carve-Out
A	Electricity Cost
A	Net Metering
A	Interconnection

### Incentives

F	Tax Credits
C	Rebates
D	Performance Payments
F	Property Tax Exemption
F	Sales Tax Exemption





# Case Studies





# Cleveland (TN) Housing Authority



- CHA has 434 units
  - Mostly PHA-paid utilities, transitioning to tenant-paid utilities
- Phase I - \$2M Energy Performance Contract
  - JCI
  - Traditional water, lighting & HVAC measures
- Phase II - 600 KW solar ground-mounted array
  - Generated annual value: Approx. \$81,000 (PV Watts)
  - Approximate system cost: \$2.1M
  - Useful life: 20 years
- Status: Phase I EPC project approved by HUD; Phase II solar in design stage



# Evaluating Project Economics (Costs & Returns) – CHA Example

- **Preliminary “Go- No Go” evaluation metrics**
  - Net Present Value (NPV) – look for positive number (excel)
  - Return on Investment (ROI) – greater than 10 percent (excel)
  - PV Watts – generates energy value in dollars (Energy value ~ \$81,000/year)  
<http://pvwatts.nrel.gov/>

## Purchase/Loan Solar System

- NPV – **Negative value**
  - 10.1¢/kWh
- ROI – **Positive value**

## Power Purchase Agreement

- NPV – **Positive value**
  - Tax credits
  - Depreciation
- ROI – **Positive value (higher)**



# Evaluating Project Economics – CHA Example (cont'd)

- **Benefits to CHA**

- Reduced operating expenses; Net metering permits CHA to purchase at lower locked rate for PHA paid utilities
  - CHA applies annually to HUD for RRI incentive (subject to proration)
- CHA revenue generator; Solar developer to lease CHA land
- No upfront CHA capital required: developer responsible for insurance and maintenance





# Housing Authority of the County of Santa Barbara (HACSB)

- Energy Performance Contracts Can be Staged in Phases to:
  - Better organize the project, generate cash flow from fast-payback measures
  - Excess utility savings can be used to address secondary priorities
- Prior to Solar Project, HACSB Implemented an EPC
  - Modernized over 428 units with high efficiency lighting, windows, furnaces, and water fixtures (\$5,200,000) through a Constellation
- Solar Project Drivers
  - Excess energy savings from EPC (Phase 1) leveraged
  - EPC extended from 12-years to 20 years, increasing cash flow timeline
  - EPC savings + CA incentives + American Recovery and Reinvestment Act (ARRA) enabled HACSB to add solar as Phase 2



## HACSB (cont.)

- Solar Project Impact - 21 Multifamily Affordable Housing Properties (LIHTC & Public Housing)
  - 863 Units (95% Dwelling; 5% Common Area); 250 Buildings
  - 7200 panels; 1.7 MW (DC); 2.6 million kWh/yr.
  - Located in 3 Utility Jurisdictions
  - Producing 100% + of Tenant Energy Consumption = Net Zero
- Total System Cost \$12,000,000
  - CA Solar Multifamily Affordable Solar Housing Rebate: **40%**
  - HOUSING AUTHORITY FUNDS (ARRA+ Comp Grant): **30%**
  - 1603 GRANT: **30%**



# Lessons Learned

- Why Solar for Public Housing?
  - 22% of operating expense in PH is attributable to utility costs
  - Solar systems can reduce PHA operating expenses
  - In some instances, can also generate revenue (e.g., land or roof leases)
- Project Financing
  - Financing options exist for solar w/wo an energy performance contract
  - In mature solar markets, PPA alone can be primary/preferred financing vehicle
  - What's in the best economic interest of PHA? Location critical
  - HUD incentives are a motivator



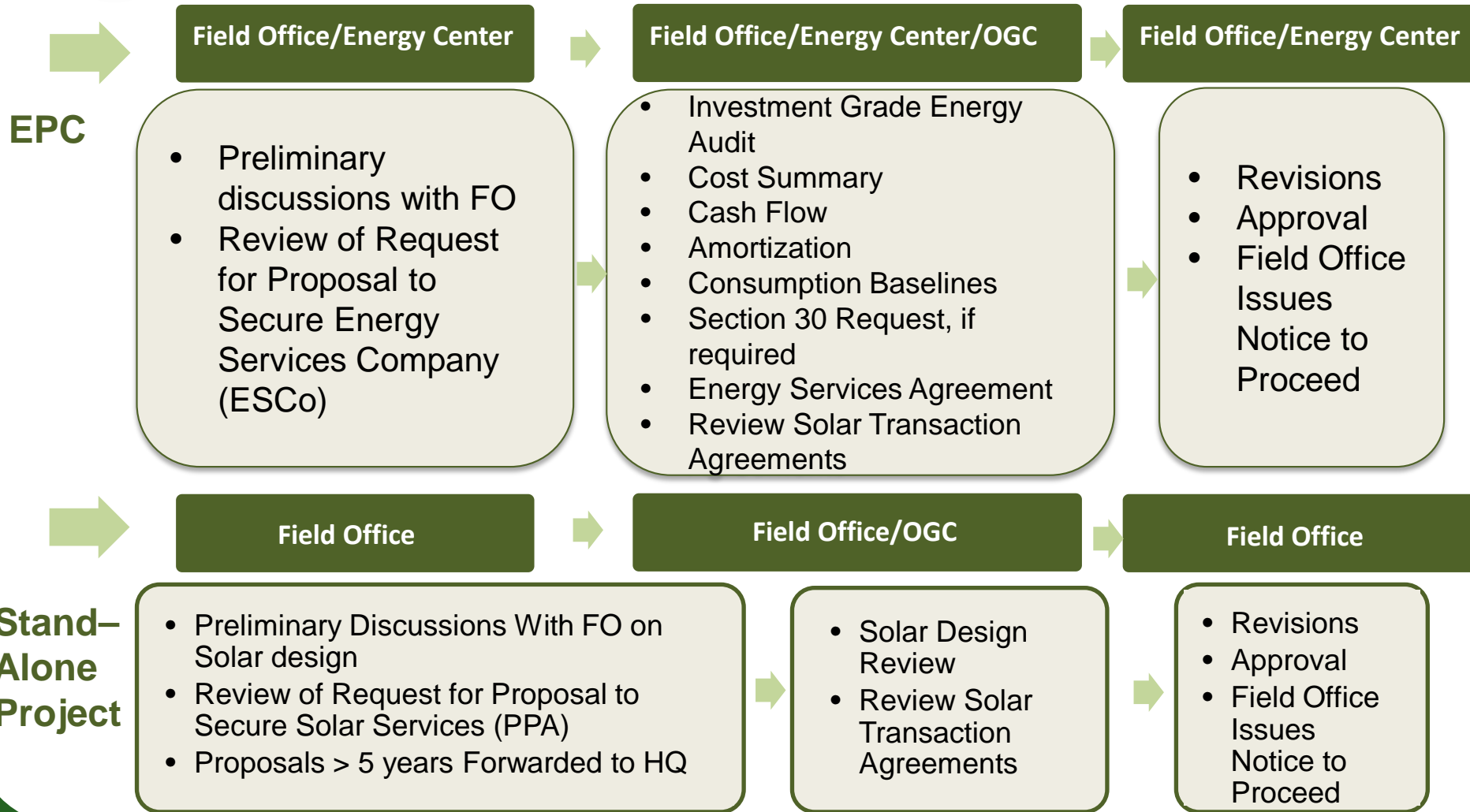
# Lessons Learned (cont.)

- Economic Development Opportunities
  - 1 out of every 50 new jobs in 2016 was created by solar industry
  - Solar jobs in U.S. increased at least 20 percent per year in past 4 years
  - Provides opportunities to direct economic benefits to residents and resident-owned business through resident training and employment and to meet Section 3 requirements
- Case Studies
  - Cleveland demonstrated that small PHA's can do solar
  - HACSB demonstrated net zero is possible with skilled technical and financial team
  - In more complex projects, have contingency plans; trust the process





# Project Approval Process





# Moving Forward





# Moving Forward at Different Stages of Solar Project Development

- Getting started?
  - Contact your HUD Field Office
  - Review HUD Renew300 materials & resources
  - Talk to other PHAs that have completed solar projects
  - See what TA is available through HUD or other entities
- Already reviewing solar options?
  - What economics work best for your PHA
  - Review financing and EPC options to maximize benefits
- Procuring a solar provider?
  - Must comply with all HUD, State & local agency procurement requirements
  - Release RFPs through national sources for wide dissemination



# Questions and Answers





# Resources

- Renew300 on HUD Exchange – location of many resources  
<https://www.hudexchange.info/programs/renewable-energy/>
  - Organizational Solar Readiness Assessment  
<https://www.hudexchange.info/resource/5047/organizational-solar-readiness-assessment/>
  - Solar RFP Toolkit  
<https://www.hudexchange.info/programs/renewable-energy/resources/solar-rfp-toolkit/>
- HUD PIH Resources:
  - PIH Notice 2014-18  
<https://portal.hud.gov/hudportal/documents/huddoc?id=pih2014-18.pdf>
  - HUD EPC Guidance  
[https://portal.hud.gov/hudportal/HUD?src=/program\\_offices/public\\_indian\\_housing/programs/ph/phecc/eperformance](https://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/programs/ph/phecc/eperformance)
  - HUD Procurement Handbook for Public Housing Agencies  
<https://www.hud.gov/offices/pih/programs/ph/phecc/resources/prohndbk.pdf>



# Resources (cont.) & Contacts

- PV Watts – simplified tool for evaluating solar potential
  - <http://pvwatts.nrel.gov/>
- DSIRE - Database of State Incentives for Renewables & Efficiency
  - <http://www.dsireusa.org/>
- For technical assistance or guidance, please contact:
  - [Crystal.A.Bergemann@hud.gov](mailto:Crystal.A.Bergemann@hud.gov) in HUD's Office of Economic Development
  - [Joshua.R.Noonan@hud.gov](mailto:Joshua.R.Noonan@hud.gov) in HUD's Office of Public and Indian Housing (PIH)
  - [Allison.L.Ackerman@hud.gov](mailto:Allison.L.Ackerman@hud.gov) in HUD's Office of Public and Indian Housing (PIH)
- For further information on the HACSB case study, contact:
  - [bobhavlicek@HASBARCO.ORG](mailto:bobhavlicek@HASBARCO.ORG), Executive Director, Housing Authority of the County of Santa Barbara



# Thank You for Participating!

- We appreciate your attendance today.
- You will be sent a post-webinar email requesting feedback on today's session. We welcome any input you have including on any related topics you would like more information on in the future.