Market Transformation Program

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U.S. Department of Energy
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Key Barriers to Solar Commercialization

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- Lack of consumer awareness
- Inconsistent financial incentives
- Inexperience with proven financial approaches
- Complex permitting procedures
- Inadequate codes & standards
- Inconsistent interconnection rules
- Ineffective net-metering policies
- Inappropriate utility rate structures
- Limited solar experience in key building trades
- Shortage of trained technical personnel and installers

Market barriers increase the price of solar systems and the time before use.
Market transformation activities aim to reduce prices and time, resulting in widespread deployment.

Market Transformation Stakeholders

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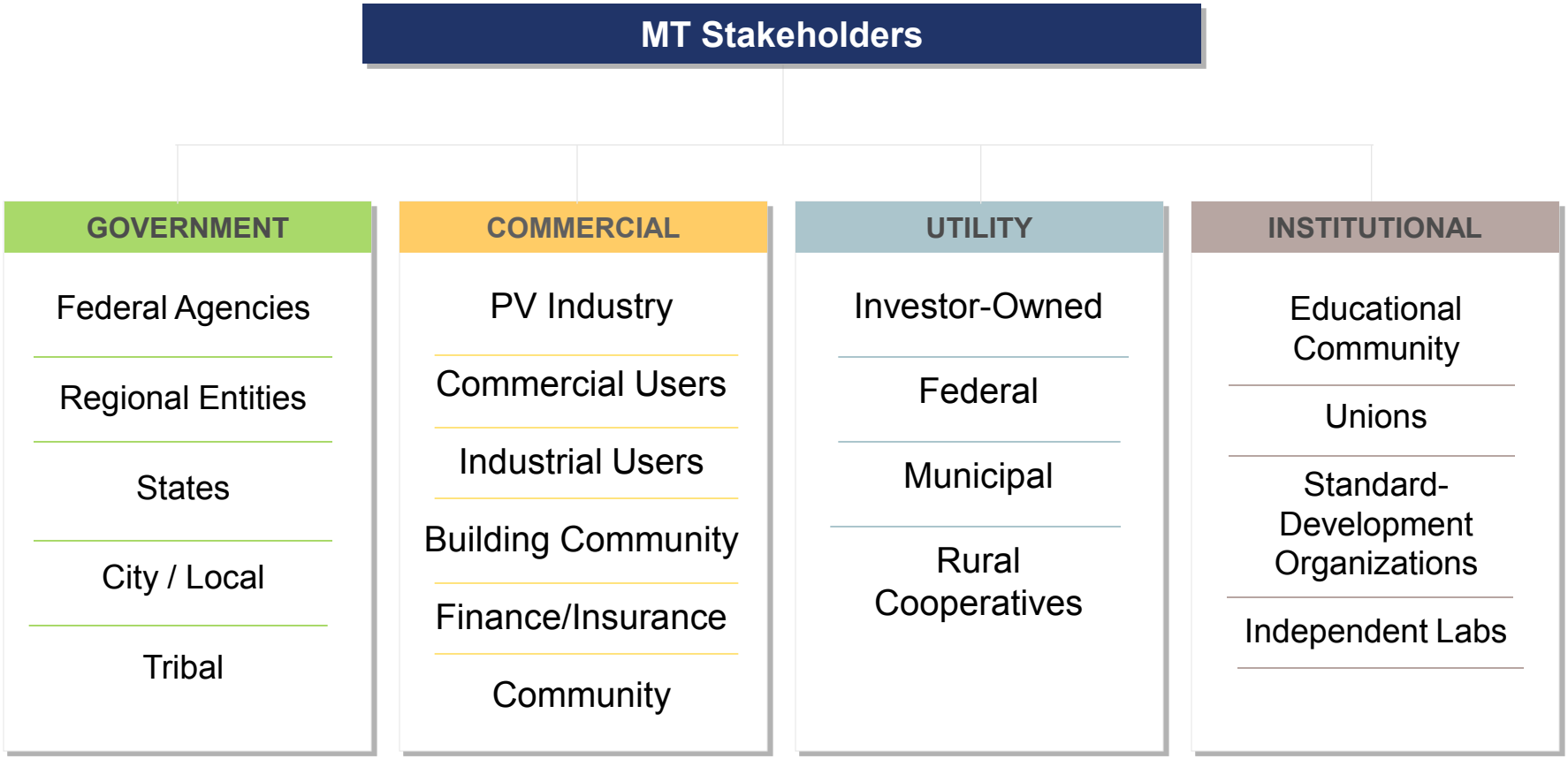

DOE's Approach to Solar Market Transformation

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GOAL Reduce market barriers to, and promote market expansion of, solar energy technologies through non-R&D activities.

Activities

- Solar America Cities
- Solar America Board for Codes and Standards
- State & Utility Technical Outreach
- Solar America Showcases
- Government Solar Installation Program
- Workforce Development

Recent Accomplishments

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- Solar America Cities: Provided technical assistance to assist the Tucson use CREBS to installation 700 kW Solar America Showcases: Installation of a 1 MW PV system at the Orange County Convention Center in Orlando, FL
- GSIP: Design of a technical specification for GSA to install PV on 30 of their building using money acquired through ARRA
- Utility Technical Outreach: Providing technical assistance through NARUC to states to assist in developing feed-in tariff programs,
- Solar ABC's: Developed PV cell procurement specification guideline to help module manufacturers ensure quality and reliability when purchasing cells from many manufacturers
- Solar America Showcases: Installation of a 1 MW PV system at the Orange County Convention Center

Solar America Cities

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SELECTION PROCESS

Competitive awards granted to cities of 100,000 or more **committed** to:

- achieving a sustainable solar infrastructure
- through a comprehensive, city-wide approach
- that facilitates mainstream adoption of solar
- and serves as a model for other cities to follow.

Solar America Cities

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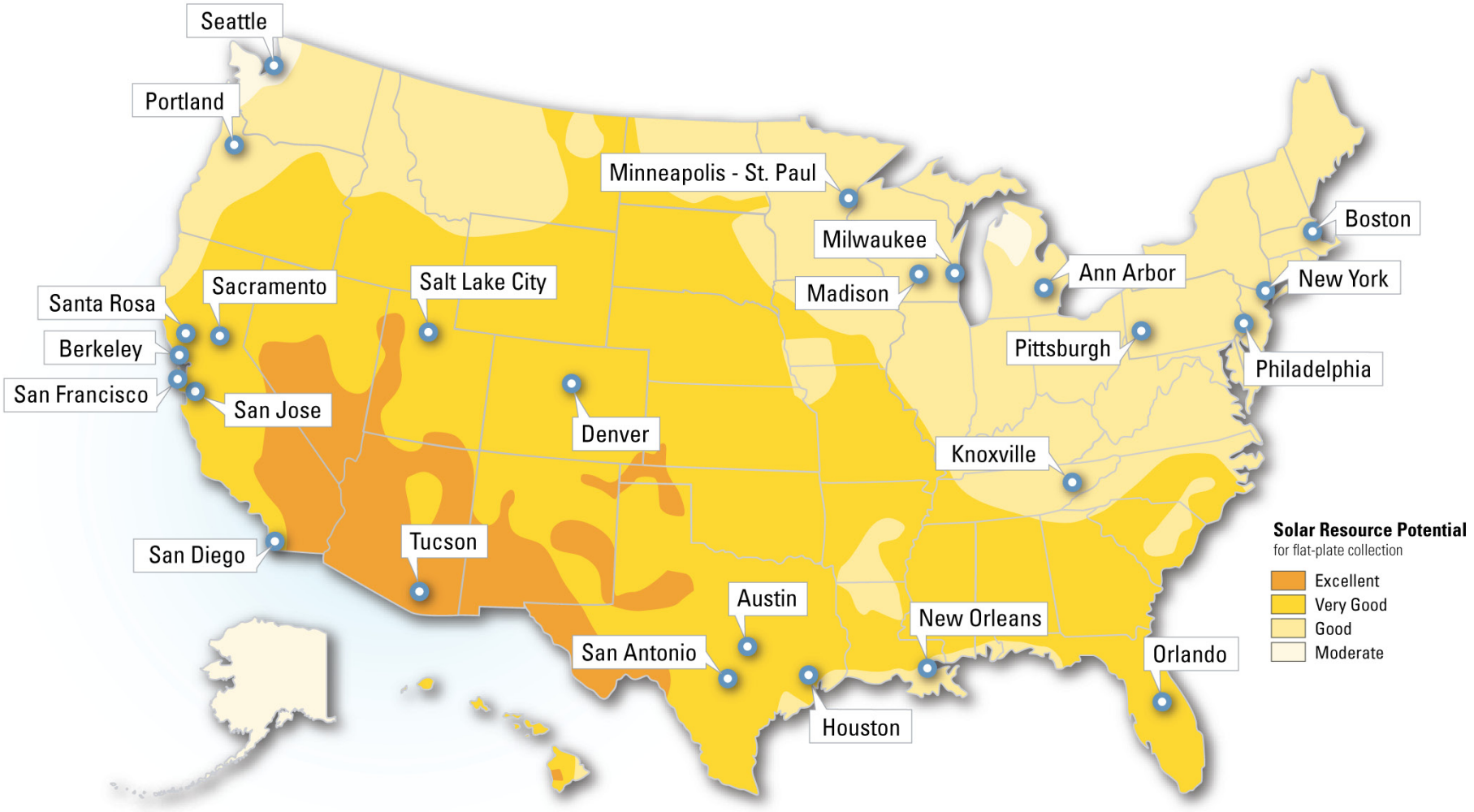

Solar America Cities

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Financial Assistance:

~$200,000 per city

Technical Assistance:

~$250,000 per city

Multi-institutional "tiger teams" of solar experts provide tailored assistance based on city's needs

NREL National Renewable Energy Laboratory

NM STATE UNIVERSITY

CH2MHILL

Sandia National Laboratories

fsec

Solar Powering Your Community
A Guide for Local Governments

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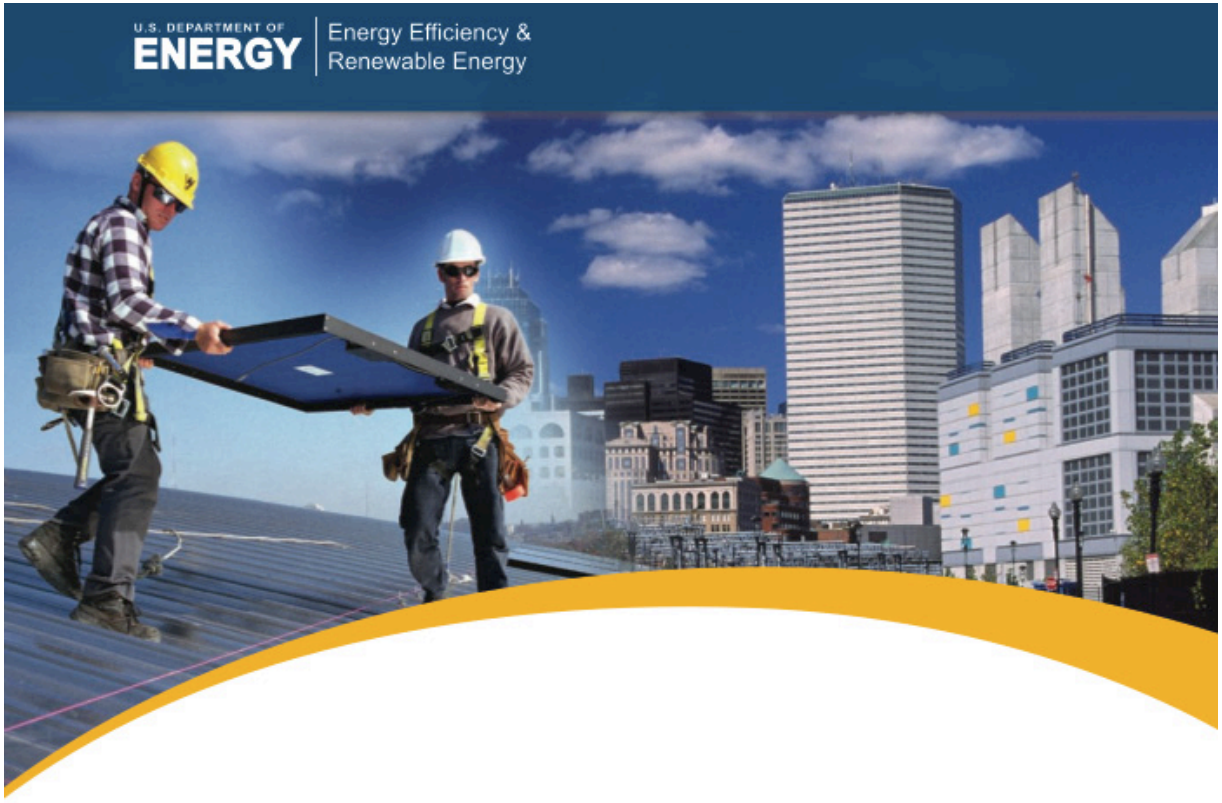

Solar America Cities Program

Each of the 25 cities is assigned a tiger team lead which provides technical assistance to the city.

Cross Cutting Project	Lead	Publication
Finance	Coughlin (NREL)	
Site Survey Program	Truitt (Sentech)	ASES Paper
Area Networks	Coddington (NREL)	IEEE Paper
Rate Structures	Doris (NREL)	ASES Paper
In My Back Yard (IMBY)	Helm (NREL)	
Solar Mapping	Dean (NREL)	ASES Paper
PV Train the trainer program	Frickel (Sentech)	
Solar Hot Water Training	Fate (Sandia)	
City Metrics	CH2M Hill	In Progress
Installation Targets	CH2M Hill	In Progress

New Funding Opportunity!
Solar America Cities: Special Projects

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- Projects should *target key barriers* preventing the city from reaching its *solar energy goals*
- Projects should demonstrate *significant impact on the city's long-term goal for solar energy*.
- Projects should *contribute* (directly or indirectly) *toward reaching city's solar installation targets*.
- Projects should be *incorporated as a key component of* the city's *comprehensive solar plan,* and should support the city's *energy and master plan*

Solar America Cities: Special Projects
Eligible Projects

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Each selected project must demonstrate that it can *rapidly accelerate solar energy adoption*, be *sustainable past the period of DOE funding*, and be *replicable in cities across the U.S*.

- Potential project areas may include workforce development, creative financing, streamlining permitting, and updating building and zoning codes, among others.
- DOE is not prescribing project areas; cities are encouraged to be creative.
- May propose new project or significantly ramp up an existing project

Solar ABCs

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Solar ABCs is a collaborative effort among experts to provide coordinated recommendations to codes and standards making bodies for existing and new solar technologies.

Solar ABCs Steering Committee

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NM STATE

Underwriters Laboratories

ASU Arizona State University Polytechnic Campus

NREL

BROOKS ENGINEERING

BEW ENGINEERING

IREC Interstate Renewable Energy Council

Sunset Technology, Inc.

Sandia National Laboratories

PowerMark Corporation
Photovoltaic Module and Component Certification Program

Florida Solar Energy Center
A Research Institute of the University of Central Florida

Sherwood Associates

Reports

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- *Comparison of the Four Leading Small Generator Interconnection Procedures*
- *Utility External Disconnect Switch: Practical, Legal, and Technical Reasons to Eliminate the Requirement*
- *A Comprehensive Review of Solar Access Law in the United State: Suggested Standards for a Model Statute and Ordinance*
- *Crystalline Silicon Terrestrial Photovoltaic Cells – Supply Chain Procurement Specification Guideline*
- *Coming Soon: Expedited Permitting Process for PV Systems*

State Technical Outreach

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Goals:

- Build relationships with decisionmakers responsible for developing policies, programs, regulations and plans that are key drivers for solar technology market transformation.
- Provide state policymakers with the most current data about solar technologies and costs as well as policy best practices, so they can make informed solar policy decisions.
- Partner with organizations with unique strengths in providing state lawmakers and regulatory utility commissioners with accurate information about solar energy.

Utility Technical Outreach

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Goals:

- Deliver key technical and informational assistance to utilities to promote their acceptance and use of solar.
- Partner with organizations with unique strengths in providing all utilities – IOUs, municipal utilities and cooperatives – with accurate information about solar energy technologies, business models and costs.

State Technical Outreach

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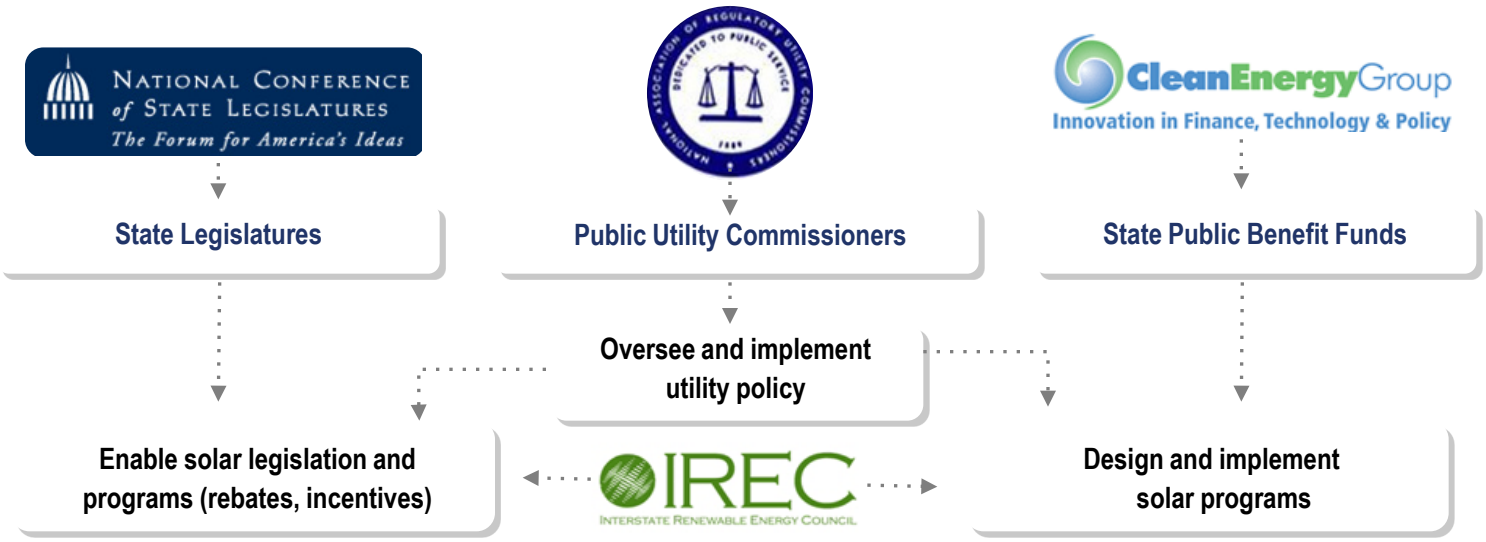
Partners: National Conference of State Legislatures (NCSL)
Clean Energy Group (CEG)
National Association of Regulatory Utility Commissioners (NARUC)
Interstate Renewable Energy Council (IREC)



3-yr and 5-yr Awards = $7,000,000

Utility Technical Outreach

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Partner: Solar Electric Power Association

SEPA will assist their more than 560 utility and solar industry members as well as non-member utilities by:

- Developing new business cases for solar.
- Providing current information on solar technologies.
- Disseminating innovative solar program design information to utilities.

3-yr Award = $990,000

Activity Highlights

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State Technical Outreach

Interstate Renewable Energy Council (IREC) Technical Outreach on Net Metering Laws

- Provided technical expertise that helped pass the first net metering law in Kansas in June 2009.

National Association of Regulatory Utility Commissioners (NARUC) Technical Assistance Award

- In May 2009, nine states plus the District of Columbia received technical assistance awards totaling $350,000 to receive tailored state-specific technical assistance from DOE laboratory experts .Topic areas include feed-in tariff policies (HI, WA, MI, CO), resource assessment (CO, KY, TN, MO, GA, OH, MI) and grid integration (DC).

Utility Technical Outreach – Solar Electric Power Association

Fact Finding Missions to Germany and Spain

- Hosted educational mission for utility executives in 2008, resulting in the adoption of a Feed-in Tariff in Gainesville, Florida in March 2009.
- Hosted a second educational mission to Spain for utility executives to learn about utility-scale solar characteristics in May 2009.

Utility Solar Conference – July 2009.

- Hosted the first utility solar conference with more than 200 utility participants.

Government Solar Installation Program (GSIP)

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Purpose

To work in tandem with the Federal Energy Management Program (FEMP) to provide technical assistance to government entities with the goal of ***overcoming market barriers*** inhibiting the installation of solar systems at their facilities.

Examples of Technical Assistance

- Technology Selection
- User Training
- System Monitoring
- Project Financing
- Preparation of bid-specifications
- Building Codes Review
- Structural Analysis

GSIP Projects

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- Rooftop Forrestal PV System
- Architects on the Capitol
- Smithsonian Zoo (Elephant House)
- Princeton Plasma Physics Laboratory
- Kennedy Center
- Papago Park Military Reservation
- Federico Degerau Federal Building (Puerto Rico)
- Kauai Test Facility
- EPA Facility in Edison, NJ
- GSA

Forrestal PV System

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What

- $2.3 million procurement
- 205 kW PV system
- 2000 ft.^{2} Technology Showcase (Four 1 kW demonstration systems)
- Educational display in Forrestal lobby

Solar America Showcases

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Forest City:

- PV warehouse analysis
- SHW performance monitoring
- Hybrid PV-Thermal Systems
- Solar Adoption Survey
- PV Grid-Integration Analysis

San Jose:

- Solar Finance Options
- Solar Site Evaluations
- Solar Economic Development

Workforce Development

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- Solar Installer Instructor Training – New Funding Opportunity!
- Installer Certification
- Accrediting Training Organizations
- National Training Coordination

Solar Installer Instructor Training FOA

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Purpose/Role: To promote an increase in the quality and availability of instruction related to the installation of PV and SHC systems

Specific Activities: Provide up to $17 million from 2009-2013 to six to ten regional training providers and a national administrator

Organizational Diagram of FOA Awardees and Beneficiaries

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U.S. DEPARTMENT OF ENERGY

DOE will fund a system of centers to speed and improve the development of the workforce required for the expansion of the solar industry. The FOA for these centers is ready for release.

Awardee

CATEGORY 2:

National Administrator

- Identifies and convenes solar experts, educators and industry representatives
- Facilitates the development of model curricula, of best practices and the definition of career pathways
- Conducts national communication and outreach

Funded by the U.S. Department of Energy

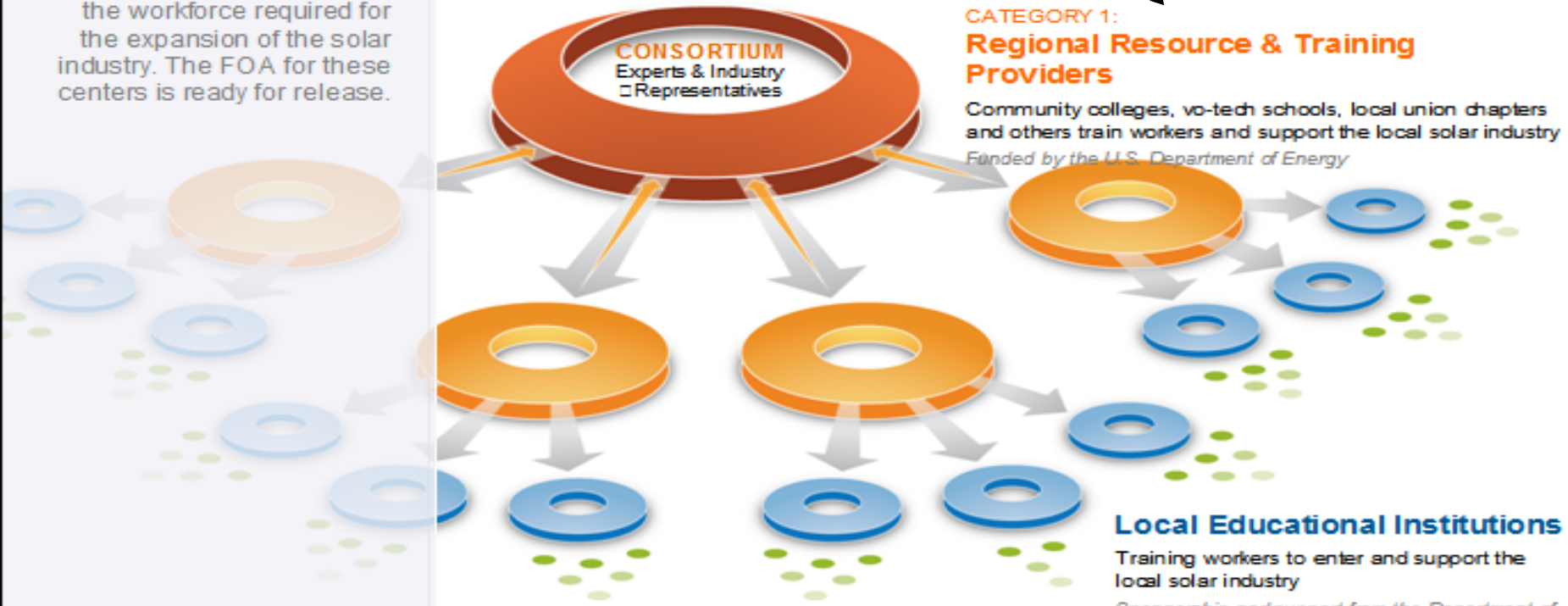
Awardee

CATEGORY 1:

Regional Resource & Training Providers

Community colleges, vo-tech schools, local union chapters and others train workers and support the local solar industry

Funded by the U.S. Department of Energy



Local Educational Institutions

Training workers to enter and support the local solar industry

Sponsorship and support from the Department of Labor, the National Science Foundation, industry and other groups

Trained Solar Installation Workforce

Includes installers, technicians, system designers, engineers, sales people and code officials

Beneficiaries

NABCEP Certification

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Purpose/Role: To promote high quality installations through installer certification and continuing education

Specific Activities: NABCEP is the only nationally accredited body which certifies installers; it develops installer task analyses for examinations – these are also used externally by training providers to develop courses

Progress to date:

- Estimated 10% of installers are NABCEP-certified
- Several state and local agencies require that NABCEP-certified installers perform installations in order for system owners to receive rebates

ISPQ Accreditation

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Purpose/Role: To ensure continuity, consistency, and quality in the delivery of training

Specific Activities: Accredit organizations and certify instructors; implement a framework of standards and metrics to provide a means to compare content, quality, and resource

Progress to date:

- 13 Accredited Programs and CE Providers
- 7 Master Trainers
- 16 Certified Instructors

IREC Workforce Development, Education and Training

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Purpose/Role: To expedite installation time and ensure high quality installations

Specific Activities:

- IREC develops best practices
- Performs education and outreach
- Coordinates national training conference
- Hosts nationwide training workshops led by code experts and course developers
- Assists in Solar America Cities train-the-trainer program

Thank You

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