



U.S. Department of Energy
Energy Efficiency and Renewable Energy

The President's Solar America Initiative



Market Transformation

Thomas P. Kimbis

U.S. Department of Energy

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U.S. Department of Energy
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Solar America Initiative (SAI) Strategy in Brief

“Changing the Way We Power Our Homes and Businesses”



President Bush's Advanced Energy Initiative

“Reduce the cost of solar photovoltaic technologies so that they become cost-competitive by 2015.”

R&D Solicitation

Employ public-private partnerships to pursue component and system technologies and demonstrate manufacturing approaches that deliver low-cost, high-reliability commercial products.

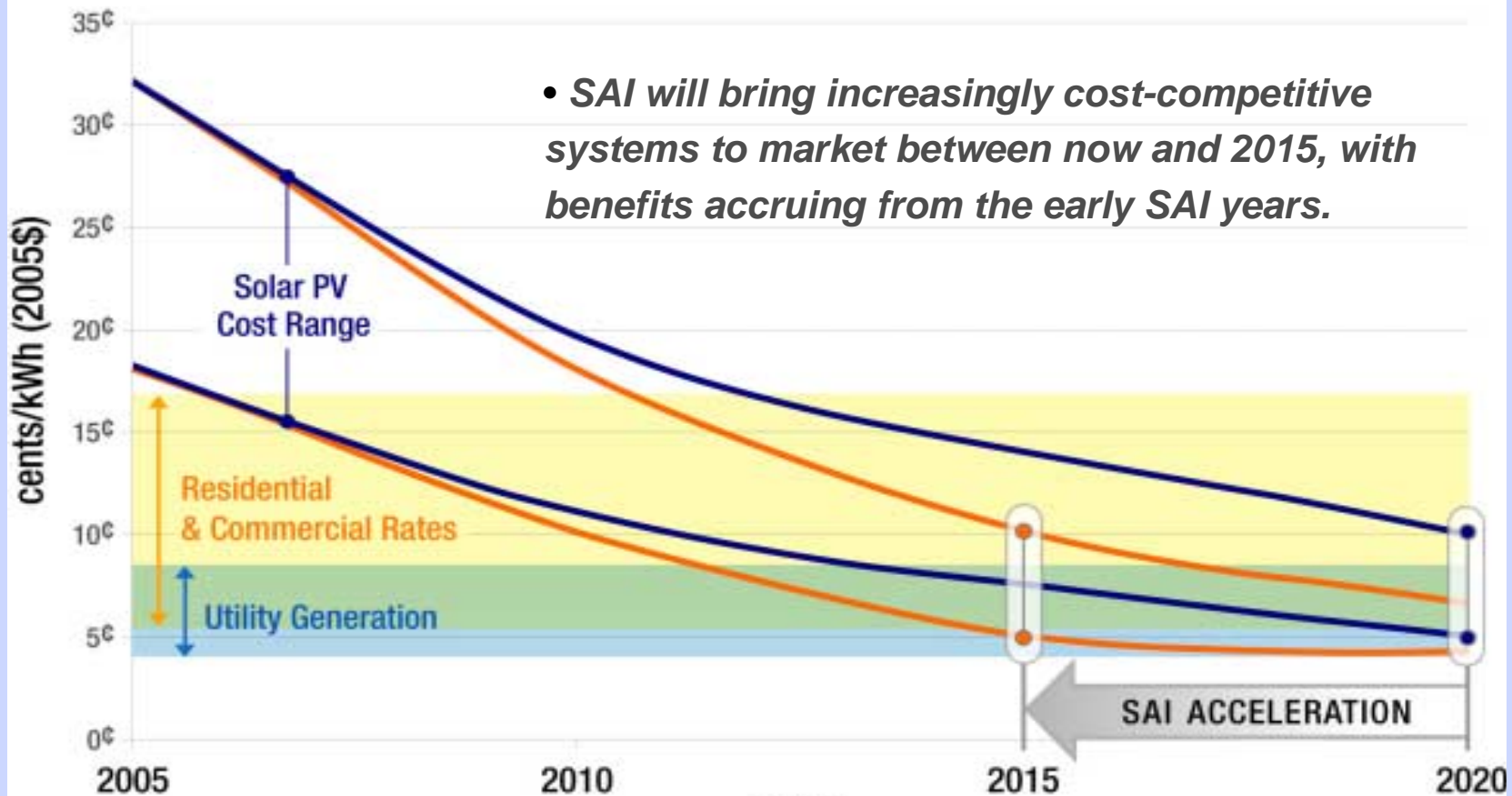
Market Transformation Solicitations

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



SAI Cost Reductions

Projected Cost Reductions for Solar PV



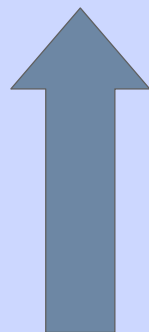
Market Sector	CONVENTIONAL Current U.S. Market Price Range (¢/kWh)	SOLAR Cost (¢/kWh) Benchmark 2005	SOLAR Cost (¢/kWh) Target 2010	SOLAR Cost (¢/kWh) Target 2015
Residential	5.8-16.7	23-32	13-18	8-10
Commercial	5.4-15.0	16-22	9-12	6-8
Utility	4.0-7.6	13-22	10-15	5-7



Missions of SAI & SAI Market Transformation

SAI Mission

Achieve cost-competitiveness of photovoltaic electricity by 2015 across all sectors.

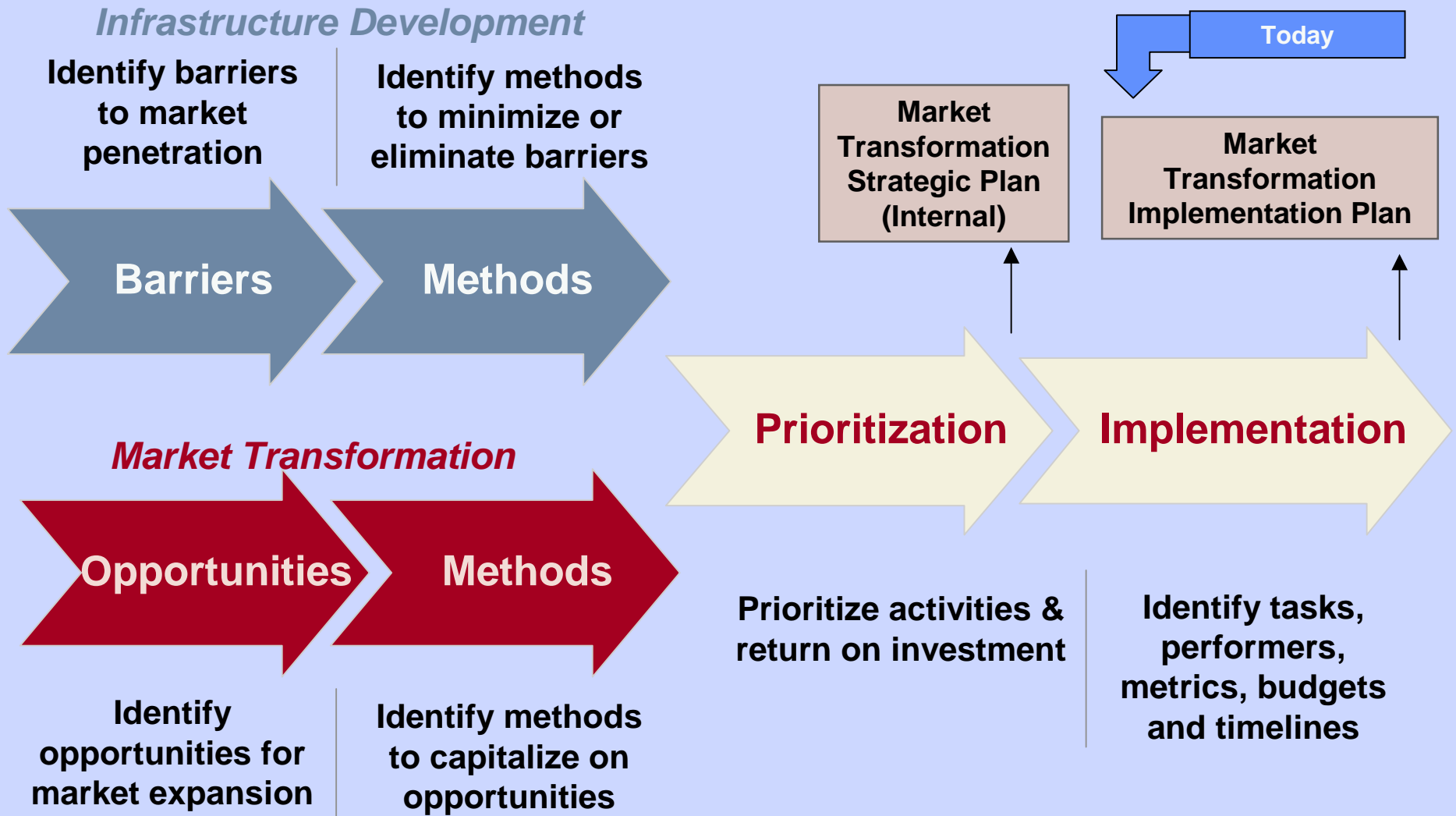


SAI Market Transformation Mission

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



Market Transformation Pathways





Non-Technical Barriers to Solar Commercialization

Most frequently identified non-technical barriers to solar energy implementation, listed in order of frequency.

High cost (*addressed by all SAI activities, including R&D effort*)

Lack of trained technical personnel, reliable installers, and maintenance services

Lack of communication, information dissemination, and consumer awareness

Inadequate financing options

Lack of appropriate, consistent interconnection standards

Inadequate government incentives

Lack of equitable and effective net-metering guidelines

Inadequate codes and standards

Liability issues / insurance requirements

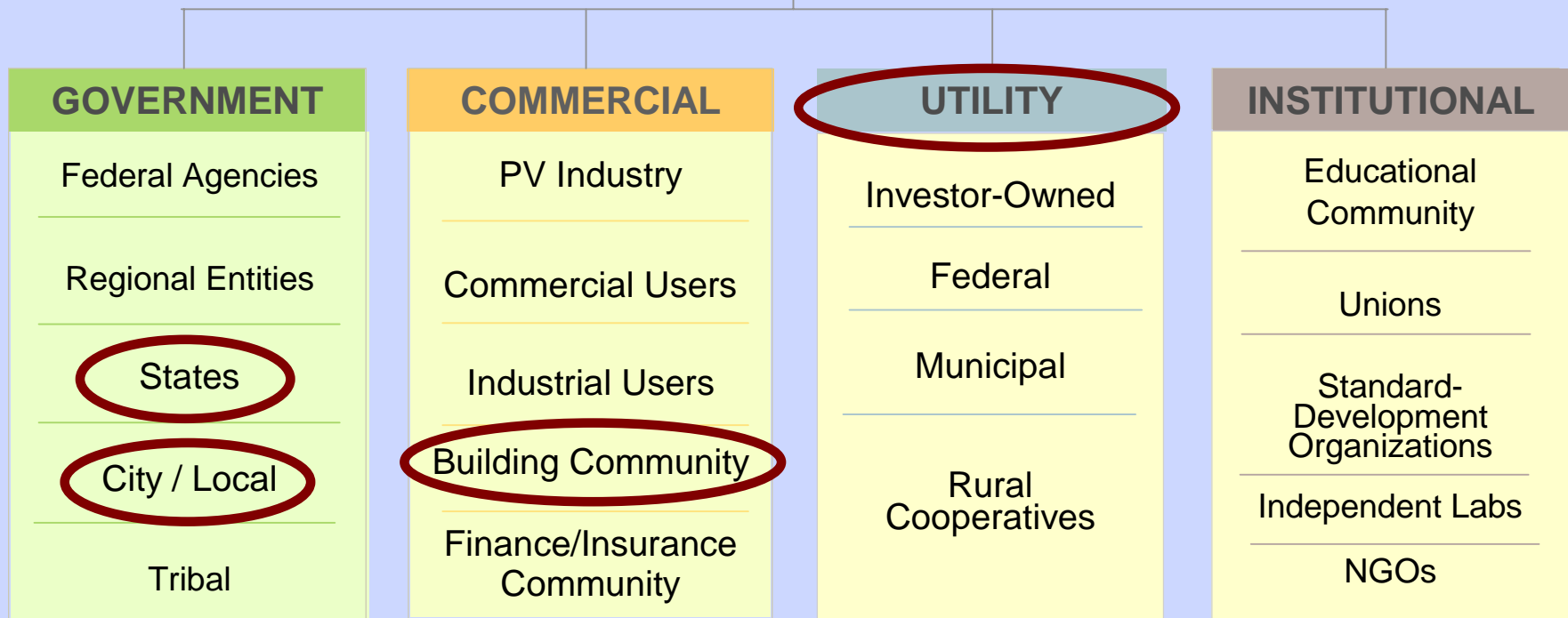
Poor public perception of solar system aesthetics



SAI Participants

Potential SAI Market Transformation Partners

Potential SAI Participants





SAI Market Transformation Acquisition Schedule

- *Request for Information (RFI) Release (April 2006)*
 - *Tech Acceptance Strategic Planning Group (April-June)*
 - *Technical Exchange Meetings (San Francisco, Washington) – (June 2006)*
 - *RFI Closes (June 2006)*
 - ***Solicitations Issued (October 12, 2006)***
-
- Solicitations Close (Dec 2006 – Jan 2007)
 - Announcement of Winners (Jan 2006 - Mar 2007)
 - Awards Completed (Jan 2007 – April 2007)
 - Release of Tech Acceptance Implementation Plan (part of SAI Implementation Plan) (May 2007)



Four Solicitations Issued

- On October 12, 2006, in St. Louis, Secretary Bodman announced the release of four SAI Market Transformation solicitations.
- The four solicitations will be open 60-90 days.
- Some solicitations have more than one Topic Area.
- All solicitations are subject to Congressional appropriations, including earmarks.
- The following summary slides are NOT official parts of the solicitations.

**See actual solicitations for
all formal requirements!**



Solar Codes and Standards: Solar Codes & Standards Working Group Leadership

- **Purpose:** To create and operate a national working group to handle solar codes and standards issues of importance to DOE and to the success of SAI.
- **Sample Work:**
 - Recommend or develop model solar codes and standards and assist in their implementation.
 - Conduct studies on codes and standards issues.
 - Hold regular meetings of the working group and lead agenda.
 - Stay vigilant to developing codes and standards issues and act upon them.
 - Serve as a resource to DOE stakeholders.
- Total Federal Value FY 2007: \$1,200,000.
- Cost Share Requirement: n/a
- Total Award Value Including Cost Share FY 2007: \$1,200,000.
- Additional FY 2007 Support: \$350,000 laboratory assistance.
- Period of Performance: 5 years (FY 2007 – FY 2011)
- Total Project Funding: \$4,200,000.
- Number of Awards: 1-2.
- Applicant Restrictions: n/a.

See actual solicitation for
all formal requirements!



Solar Codes and Standards: Experience-Based Utility PV Capacity Credits Study

- **Purpose:** To acquire a system to value capacity credits that will be acceptable to utilities and utility policy-makers to measure the system benefits of distributed PV.
- **Sample Work:**
 - Deliverable is a system of measurement, potentially within a study, software, etc.
 - Must work closely with utilities and policy-makers.
 - Must consider issues of system and utility characteristics, net metering, rates, rebates, and interconnection approaches.
- Total Federal Value FY 2007: \$100,000.
- Cost Share Requirement: n/a
- Total Award Value Including Cost Share FY 2007: \$100,000.
- Additional FY 2007 Support: n/a.
- Period of Performance: 1 year (FY 2007)
- Total Project Funding: \$100,000.
- Number of Awards: 1-2.
- Applicant Restrictions: n/a.

See actual solicitation for
all formal requirements!



National Voluntary PV Module Perf. Rating System

- **Purpose:** To create a national voluntary PV module performance rating standard to increase consumer confidence in expected PV module performance.
- **Sample Work:**
 - Standard must include performance, reliability, safety, anticipated degradation, operational limits issues.
 - Must specify testing procedures and protocols.
 - Establish the standard through the IEEE/IEC standard formation process, unless a simpler method can be used.
 - Performance ratings should be based on actual module testing.
- Total Federal Value FY 2007: \$1,000,000.
- Cost Share Requirement: n/a
- Total Award Value Including Cost Share FY 2007: \$1,000,000.
- Additional FY 2007 Support: \$200,000 laboratory assistance.
- Period of Performance: 3 years (FY 2007 – FY 2009)
- Total Project Funding: \$3,000,000.
- Number of Awards: 1-2.
- Applicant Restrictions: n/a.

See actual solicitation for all formal requirements!



State and Utility Solar Technical Outreach: State Solar Technical Outreach

- **Purpose:** To provide technical outreach on solar issues to the states through third-party state membership organizations.
- **Sample Work:**
 - Identify and promote efforts by relevant decision makers within states to accelerate the adoption of solar technologies.
 - Foster strong relationships with state actors to identify and remove barriers to solar energy.
 - Facilitate implementation of “best practices” by states in the areas of RPSs, Clean Energy Funds, codes and standards.
 - Develop and promote model legislation.
- Total Federal Value FY 2007: \$300,000.
- Cost Share Requirement: 33%
- Total Award Value Including Cost Share FY 2007: \$400,000.
- Additional FY 2007 Support: \$100,000 laboratory assistance.
- Period of Performance: 3 years (FY 2007 – FY 2009)
- Total Project Funding: \$900,000 (\$1,200,000 with cost share).
- Number of Awards: 4-6.
- Applicant Restrictions: n/a.

See actual solicitation for
all formal requirements!



State and Utility Solar Technical Outreach: Utility Solar Technical Outreach

- **Purpose:** To provide technical outreach on solar issues to utilities through third-party utility membership organizations.
- **Sample Work:**
 - Provide targeted technical solar information, education and other resources to electric utilities.
 - Facilitate “best practices” by utilities in integrating solar (both centralized and distributed) into the utilities’ business models.
 - Develop and promote model fee structures (including exit fees, stand-by fees, time of use rates) that encourage solar use.
 - Act as a resource for DOE’s utility stakeholders.
- Total Federal Value FY 2007: \$300,000.
- Cost Share Requirement: 33%
- Total Award Value Including Cost Share FY 2007: \$400,000.
- Additional FY 2007 Support: \$100,000 laboratory assistance.
- Period of Performance: 3 years (FY 2007 – FY 2009)
- Total Project Funding: \$900,000 (\$1,200,000 with cost share).
- Number of Awards: 1-2.
- Applicant Restrictions: n/a.

See actual solicitation for
all formal requirements!



Solar City Strategic Partnerships

- **Purpose:** To support U.S. cities that are ready to develop a comprehensive, systemic, city-wide approach to solar technology.
- **Sample Work:**
 - Cities must commit to building toward a sustainable solar future.
 - Integration of solar into city planning and processes, as applicable.
 - Large-scale implementation of solar technologies by 2015.
 - Development of a city-wide solar implementation plan.
 - Streamline city regulations, codes and practices to make them more “solar-friendly.”
- Total Federal Value FY 2007: \$1,600,000.
- Cost Share Requirement: 50%
- Total Award Value Including Cost Share FY 2007: \$3,200,000.
- Additional FY 2007 Support: \$1,600,000 Tiger Team Technical Assistance.
- Period of Performance: 2 years (FY 2007 – FY 2008)
- Total Project Funding: \$1,600,000 (\$3,200,000 with cost share).
- Number of Awards: 6-10.
- Applicant Restrictions: Cities (Incorporated places) of 100,000 or more.

See actual solicitation for
all formal requirements!



Building Off MSR Successes

Several SAI Market Transformation activities continue the good work performed by Million Solar Roofs. City Strategic Partnerships is perhaps the most similar activity to MSR under SAI.

Million Solar Roofs	City Strategic Partnerships
Funding allocated through regional offices to MSR partnerships.	Funding through competitive solicitation to cities of 100,000+.
Hundreds of small projects.	Fewer, larger, higher-visibility projects.
Work weighted toward solar water heating installations.	Emphasis on PV based on SAI mission.
National goal of reaching 1 million solar roofs.	<i>By 2015, create 50-100 (est.) Solar America Cities that are committed to a sustainable solar future, yielding XXMW in new solar installations. (Metrics still under development).</i>



Solar America Showcases

- **Purpose:** To provide technical assistance to large-scale, high-visibility, solar installation projects that can impact solar markets.
- **Project Characteristics:**
 - Must be more than 100kW.
 - Replicable.
 - High-visibility.
 - Large project size, or
 - Novel solar technology, or
 - Novel application for solar technology.
- No DOE Funding will be provided under this notice.
- Recipients of Technical Assistance will enter into a MOA with DOE.
- Total Federal Value FY 2007: \$0.
- Cost Share Requirement: n/a
- Total Award Value Including Cost Share FY 2007: \$0.
- Additional FY 2007 Support: \$2,700,000 in Tiger Team Technical Assistance.
- Period of Performance: 1 year (FY 2007)
- Total Project Value: \$2,700,000.
- Number of Awards: up to 25.
- Applicant Restrictions: none.
- Project Restrictions: must include installation of a solar project of 100kW or more.

See actual solicitation for
all formal requirements!



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http://www.irecusa.org/articles/static/1/1160615228_1018302029.html

<http://tinyurl.com/ygpx8e>

DE-PS36-07GO97005

Topic Area 1: Solar Codes and Standards Working Group Leadership \$4,200,000

Topic Area 2: Experience-Based Utility PV Capacity Credits \$100,000

Topic Area 3: National Voluntary PV Module Performance Rating System \$3,000,000

No cost share; Total \$7.3 million; \$2.3 million in FY07.

DE-PS36-07GO97006 Outreach

Topic Area 1: State Solar Technical Outreach \$225,000 max; 4 to 6 awards

Topic Area 2: Utility Solar Technical Outreach \$900,000 max; 1 to 2 awards

Required cost share 33%; \$1.8 million; \$600,000 in FY2007.

DE-PS36-07GO97007 Solar City Strategic Partnerships;

Cities with populations of 100,000 or more; DOE will provide funding as well as tailored Technical Assistance to the recipient Cities to accomplish the project goals.

Required cost share of 50%; \$1.6 million FY07-FY08; \$80,000 up to \$200,000 in DOE funding; 6 to 10 awards.

DE-PS36-07GO97008 Solar America Showcases, Technical Assistance for installation projects.

High visibility in excess of 100 kW project; novel solar technology, novel solar application, replicability.

\$2,700,000 for FY2007; up to 25 MOAs; (\$108,000 each).



Outreach

- DOE has chosen to enlist the assistance of select utility membership organizations who are well positioned to deliver key assistance to utilities as needed to enable the success of the SAI.
- The Recipient(s) will provide targeted solar information, education, and resources to electric utilities. Target utilities should include those that have: 1) limited or no photovoltaic programs; 2) service territories in States that do not have solar set-aside renewable portfolio standard regulations; 3) demonstrated a commitment to progressive change in non-solar related areas such as conservation, other renewables, emissions controls, etc. beyond required regulations; and/or 4) support from their executive authorities in some manner.
- Examples of desired activities include:
 - • Creation and dissemination of utility case studies documenting innovative program design or use of advanced solar technology
 - • Assisting utilities in making the business case for solar with model approaches and accurate up-to-date technology information
 - • Responding to utility inquiries as to the technical characteristics of solar technologies.
 - • Facilitating peer-to-peer communication among utilities to accelerate the spread of best practices for solar adoption.
- In addition, the Recipient(s) will strengthen outreach to utilities who already maintain advanced solar programs and assist such utilities in advancing their acceptance and promotion of solar even further. Recipient(s) will foster strong strategic relationships with utilities on solar issues to identify and provide solutions to strategic market barriers to solar energy technology adoption and enable key commercialization activities to promote the SAI.



Barrier/Opportunity Matrix to Activities

ACTIVITIES	BARRIERS / OPPORTUNITIES						
	Misunderstanding of Technologies	Regulatory Barriers	Poor Consumer Confidence	Lack of Trained Installers	Lack of Technical Expertise	Difficult or Costly Transactions	Increased Technology Usage
INFRASTRUCTURE DEVELOPMENT							
Codes & Standards							
Installer/Official Training							
PV Rating System							
Financing & Insurance							
MARKET EXPANSION							
Large-Scale Installations							
Solar America Cities							



The Important Role of the Building Community

Building integration issues are of critical importance across many, if not all, of our infrastructure development issues, and offer great opportunities for market expansion.

- *Codes, standards, and regulations* include building codes as well as metering and connection issues.
- *Education of code officials* involves training professionals who work on analyzing buildings and their components.
- *Education of installers* necessarily involves an understanding of whole building issues, not just solar systems.
- *PV rating systems* must be understood by the building community, as they, and homeowners, are the main audience for such ratings.
- *Financing & insurance* issues involve, e.g., the integration of systems into the home for purposes of financing the system within a conventional mortgage.
- New home communities are among the greatest opportunities for *market expansion opportunities*.



State Input to SAI Market Transformation

- Solar Program personnel met with California State officials to ensure SAI coordination with the California Solar Initiative to avoid duplicative efforts:
 - **California Energy Commission**
 - **California Public Utilities Commission**
- Several States and State organizations responded to the T.A. Request for Information – those opinions are being used to inform our strategic plan and solicitation:
 - **Clean Energy States Alliance (CESA)**
 - **National Association of State Utility Consumer Advocates (NASUCA)**
 - **State of Hawaii**
 - **State of Maine**
 - **State of Michigan**
- Other States provided input during our TEMs through State university representatives:
 - **State of Arizona**
 - **State of California**
 - **State of Delaware**
 - **State of Florida**
 - **State of North Carolina**
 - **State of Washington**



Areas of Joint State-Federal Interest in SAI Market Transformation

- More consistent *interconnection standards* across U.S. enables States to benefit from solar advances.
- Advanced *net metering* regulations allow State residents and businesses to better utilize solar.
- More uniform *installer training and national certification* makes it easier for State certification programs.
- National funding for *code official and inspector training* assists local governments.
- A *national voluntary PV module rating system* would boost consumer confidence and relieve States from having to create and adopt their own rating systems.
- Analysis of *potential financing mechanisms* will help define “best practices” to bring solar to all States.



Federal Technical Assistance

- **Large-Scale Installations:** DOE will send “tiger teams” of laboratory, university, and private sector personnel to provide technical assistance to States (among other applicants) that are considering installing solar.
- **Solar America Cities:** DOE will form partnerships with cities for mutual benefit.
 - DOE will provide technical assistance on solar installations, make recommendations on city energy and emergency preparedness plans, and potentially offer financial vehicles.
 - Cities will work to remove existing local market barriers to solar and promote solar installations, while integrating solar and energy efficiency measures into various city processes/activities (master planning, education).



Strong Potential for Continued State Involvement

- SAI will continue to rely upon States for significant involvement and input.
 - Best Practices
 - Legislative & Regulatory advances.
- SAI will continue to coordinate with individual States, as well as organizations such as:
 - National Association of Regulatory Utility Commissioners (NARUC)
 - National Association of State Energy Offices (NASEO)
 - National Conference of State Legislatures (NCSL)
 - National Governors Association (NGA)
 - Western Governors Association (WGA)



Program Cooperation

The Solar Program intends to work closely with the Buildings Program through the duration of the SAI.

- Natural Partners.
 - The “zero energy building” (ZEB) mission of the Buildings Program requires solar technologies for energy production.
 - Likewise, achieving SAI requires buildings to site solar systems.
- Sample Means of Interaction
 - Jointly develop BIPV portion of ZEB Roadmap.
 - Roadmap tasks divided between Solar and Buildings Programs
 - Laboratory interaction on R&D activities.
 - Cross-promotion of activities / outreach (Solar Decathlon)
 - Buildings Program input on key SAI activities (e.g. solicitation review).
 - Solar communication to builders via Building America networks.
 - Solar engagement with Building America partners in identifying building community barriers to solar technology acceptance.



The Important Role of the Building Community

New home communities are among the greatest opportunities for BIPV market expansion, yet issues remain.

- ***Improve R&D / Engineering:*** To realize projected savings from a BIPV system, the savings of omitting façade materials should approximate the cost of BIPV.
- ***Improve communication with builders on BIPV issues.***
 - If the building community is contemplating changes that may create a barrier to BIPV, e.g. requiring additional roof vents for plumbing, the solar community can propose solutions.
 - Need to work with builders to develop BIPV buildings with optimal orientation and simpler roofing designs.
- ***Improve understanding of builder preferences and market dynamics:*** PV industry estimates that market for BIPV is ~ 60 GW, yet the percentage of grid-connected PV that is BIPV remains a small fraction of that. Why?



Sample Results from RFI

Northeastern State:

- “[W]e applaud the **significant effort that DOE has made to thoughtfully redesign [Million Solar Roofs]** and to solicit comment on its proposed goals and objectives, as well as the overall design of the new Solar America Initiative (SAI) and its twin themes –1) bringing down the costs of solar components through research and development of PV components, systems and manufacturing approaches; and 2) technology acceptance activities that address marketplace barriers and provide opportunities for market expansion.
- “Solar America Cities” ... is another area in which we applaud the far-sighted emphasis of the emerging SAI. Cities are both load centers, as identified, and centers of education, visibility and market innovation. **The designation of a “Solar America City” would be a coveted recognition**, especially as promoted nationally by DOE and other federal agencies.

Midwestern State:

“**Many of [our former State PV] projects could have benefited from technical assistance** and future grantees will be interested in value analysis, design and/or proposal reviews, site visits, independent acceptance testing, and performance monitoring. Technical assistance from peers should be considered as part of this effort.”

Southwestern State:

“For retrofit residential installations, low- or zero-interest loans are useful. Some revolving low-interest loan funds in [our State] are supported by public money, allowing additional systems to be funded as loans are repaid. **Another option is leasebacks, which could be managed by electric utilities** or other entities that put up the initial cost of the installation, which is then repaid from savings on the utility bill.”