

Streamlined and Standardized Permitting and Interconnection
Processes for Rooftop PV in Puerto Rico
Puerto Rico Energy Affairs Administration
University of Puerto Rico-Mayaguez (ECE Department)



ROOFTOP SOLAR CHALLENGE

Kick-off Activity

San Juan, Wednesday May 2, 2012

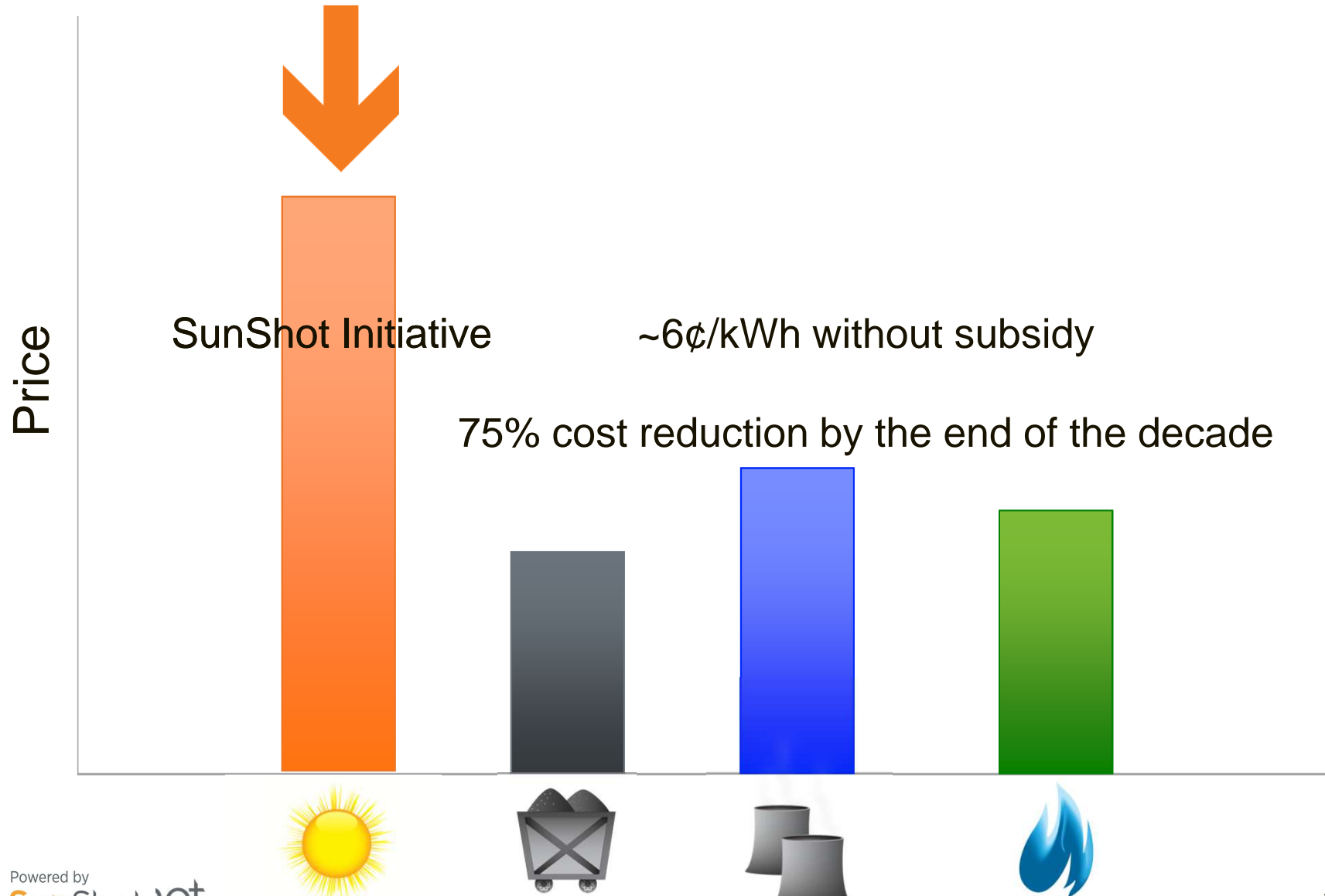
Mayaguez, Tuesday May 8, 2012



Background – Market Transformation

- The mission of the U.S. DOE Solar Energy Technologies Program (SETP) is:
 - To accelerate research, development, demonstration, and large-scale deployment of solar technologies in the United States
 - To ensure that solar power is a viable source for the nation’s power needs and economic growth.
- On February 4, 2011, Department of Energy Secretary Steven Chu formally announced the “SunShot” Initiative.
 - Rooftop Solar Challenge is part of the Initiative

Why we're here: Big Picture



Background – Market Transformation

- Non-hardware BOS costs and market barriers present one of the most significant challenges to meeting the SunShot goals.
 - Customer acquisition, permitting, inspection, installation, and interconnection currently make up approximately 30-40% of the total installed cost of a rooftop PV system (US).
 - Standardization challenge: Over 18,000 “authorities-having jurisdiction” (AHJs), over 5,000 utilities, and thousands of solar sales and installation companies.

Rooftop Solar Challenge

- Partnerships among relevant stakeholders to improve market conditions for rooftop PV in major regions of the USA.
- Focus on grid-connected rooftop PV in the residential and commercial sectors
- Emphasis on streamlined and standardized permitting and interconnection processes.
- Encourage participation to ensure meaningful, measurable results.

Rooftop Solar Challenge

- Improvements to permitting processes could reduce PV system costs by up to \$1/Watt, or approximately 15%-20% of current residential system costs.
- Process predictability and standardization enables solar companies to more efficiently manage their labor, material and cash flows, and customer interactions, resulting in significant cost reductions and lower prices for consumers.

Action Areas

I. PERMITTING AND INTERCONNECTION PROCESSES

Develop and implement a transparent, consistent, and expedient permitting and interconnection process for residential (less than approximately 10kW) and small commercial (less than approximately 300kW) rooftop PV systems, throughout all participating jurisdictions.

Action Areas

2. NET METERING AND INTERCONNECTION STANDARDS

Improve interconnection and net metering standards, as evaluated by the Network for New Energy Choices grading scheme, for the primary load-serving utility in each participating jurisdiction.

Action Areas

3. FINANCING OPTIONS

Increase distributed PV market activity in models other than self-financed ownership by enabling direct financing options, community solar programs, and/or utility-owned distributed generation and resolving legal issues around third party ownership models.

Action Areas

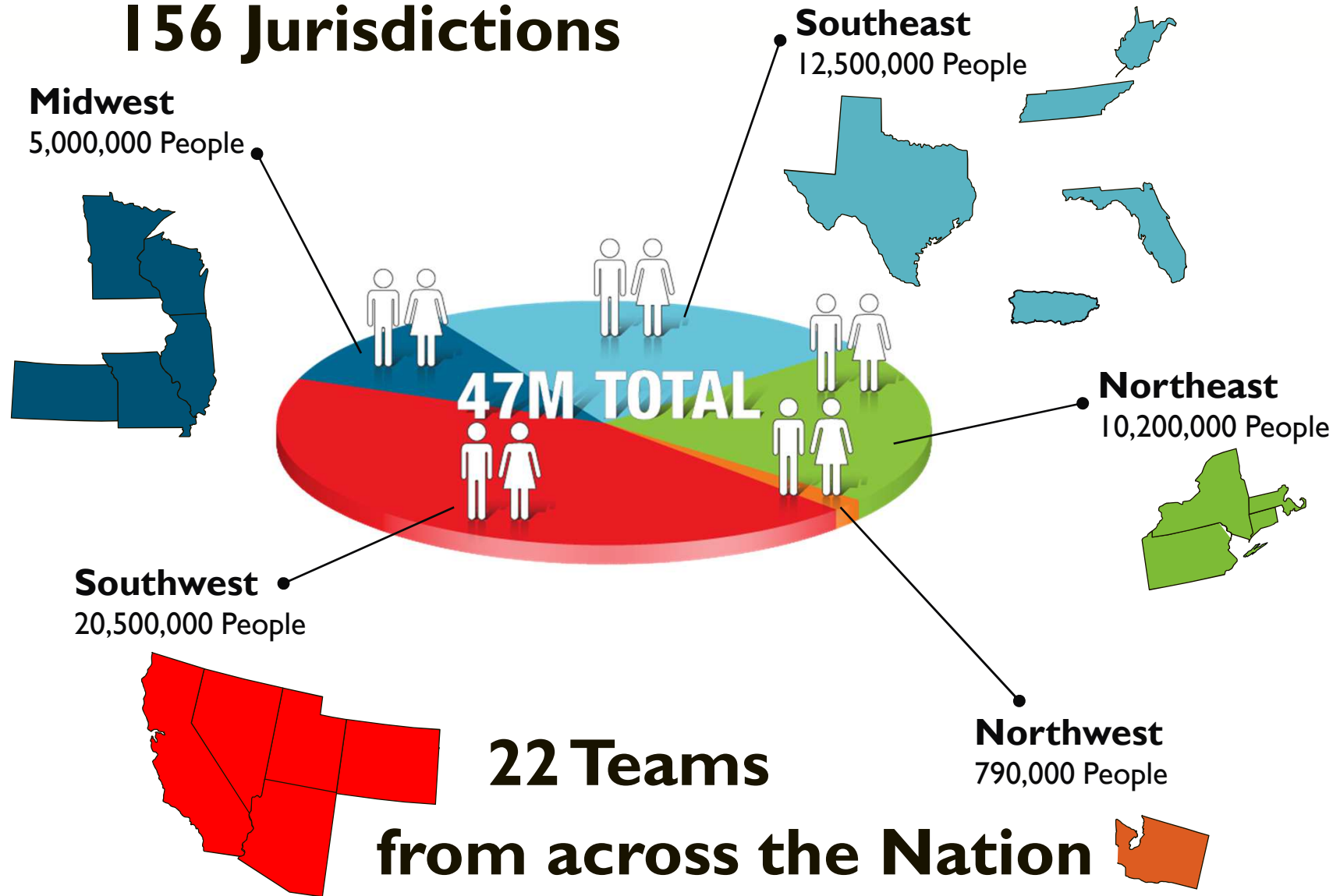
4. PLANNING AND ZONING

Remove siting restrictions and incorporate favorable provisions in state and local codes and land use policies in every participating jurisdiction to maximize PV siting options.

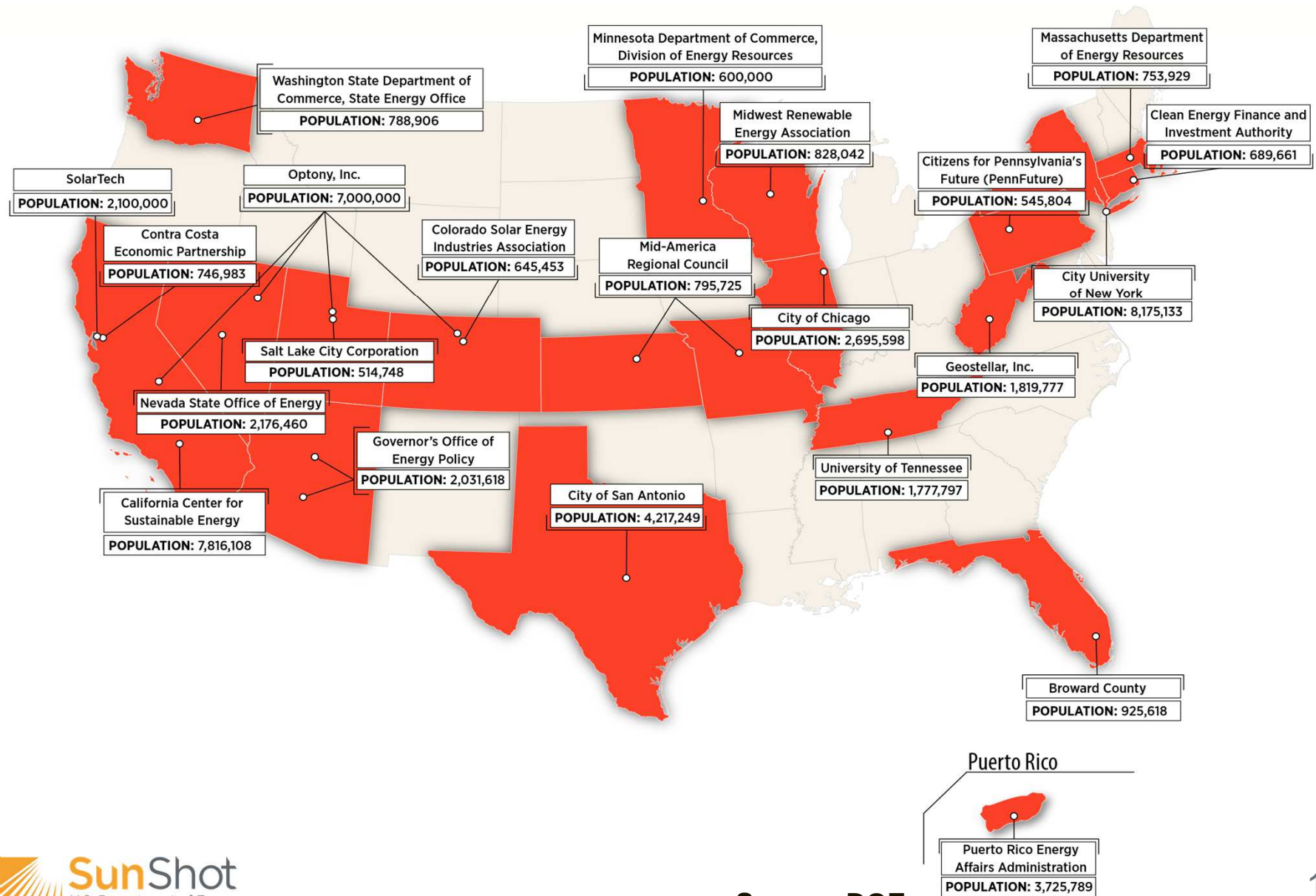
Rooftop Solar Challenge to Induce Market Transformation in Puerto Rico

- On February 24, 2012 the PREAA-UPRM proposal was formally approved by DOE to participate in the initiative to transform the rooftop PV market in Puerto Rico.
- This initiative is sponsored by the U.S Department of Energy Golden Field Office
- The PREAA is the prime recipient, working closely with UPRM as sub-grantee.

Who's leading the way: 156 Jurisdictions



Who's leading the way:



Rooftop Solar Challenge to Induce Market Transformation in Puerto Rico

Puerto Rico Energy Affairs Administration



- State energy office for the Government of Puerto Rico.
- Responsible for the implementation of energy policies in order to:
 - economic development
 - strengthen energy security
 - environmental quality

University of Puerto Rico, Mayagüez Campus (UPRM)



- UPRM is the second largest campus of the state university system in Puerto Rico.
- It has been Puerto Rico's Land-grant college since 1911.

Puerto Rico Team

- **Puerto Rico Energy Affairs Administration**
 - Luis Bernal, Esq. Executive Director
 - Damarys González, EEC Program Manager
- **University of Puerto Rico-Mayaguez (ECE Dep.)**
 - Efrain O’Neill-Carrillo, PhD, PE
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Rooftop Solar Challenge to Induce Market Transformation in Puerto Rico

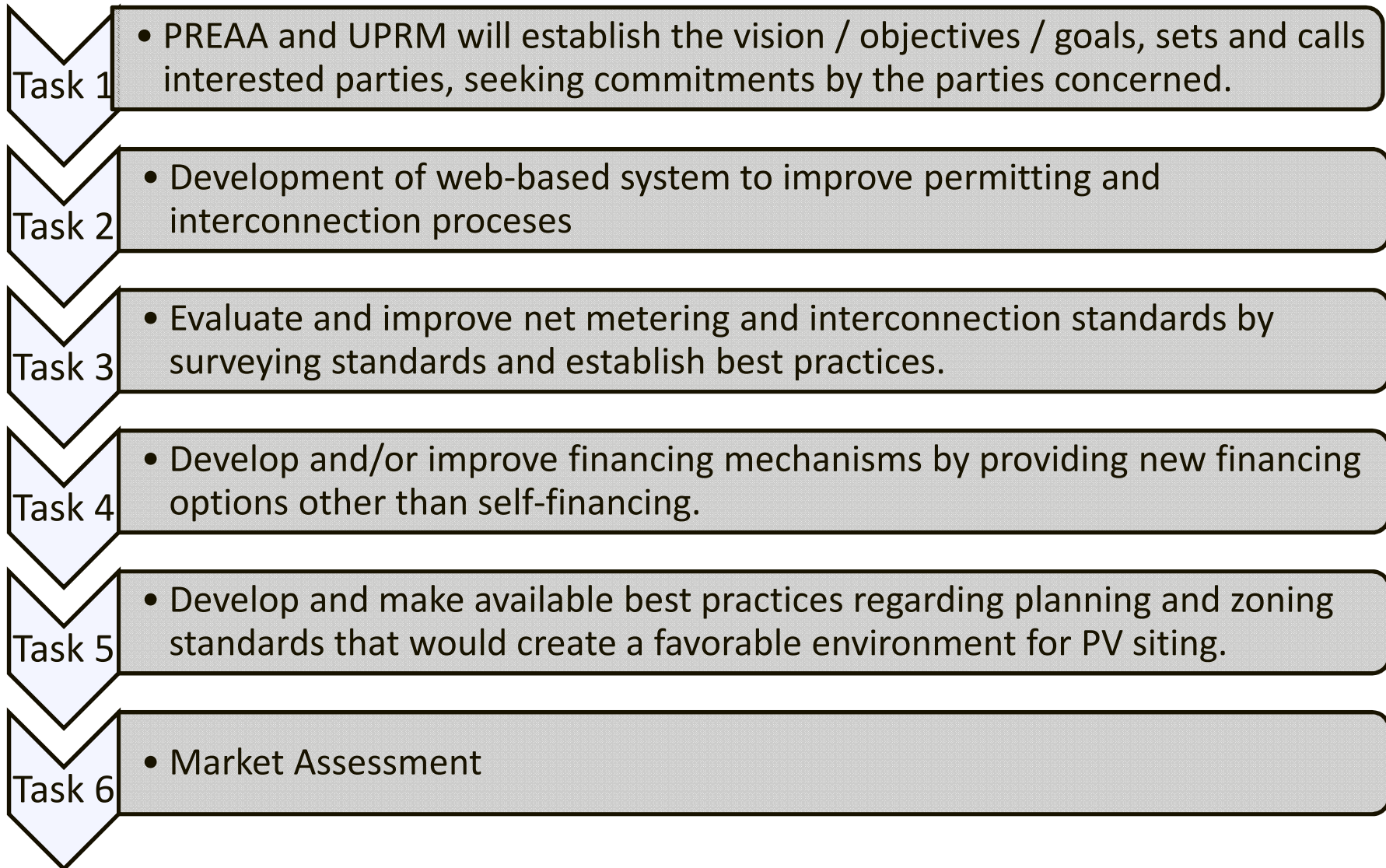
Objectives

- Create a standardized framework for PV deployment.
- Streamlined and organized, lean permitting and interconnection processes.
- Safely and quickly installations of residential and small commercial PV systems
- Evaluate and adopt recommendations proposed by Solar ABC and the Network for New Energy Choices.
- Identify, analyze, and provide best practices that overcomes permitting and interconnection obstacles.
- Create a holistic framework that ensures process predictability and standardization while dealing with rooftop PV market barriers.
- Bolster the incipient PV market in the Island.

Rooftop Solar Challenge to Induce Market Transformation in Puerto Rico - Scope

- Evaluation and identification of actions required to streamline the permit process related to rooftop PV systems at the residential and small commercial levels.
- Create a streamlined process that will first ensure safety, by establishing or fine-tuning technical guidelines for systems with similar characteristics.
- Standardization of PV permitting and interconnection processes, in order to standardize the forms and the mechanisms required by current regulations.
- Evaluate the current standards, with a focus on fast interconnection of distributed rooftop PV systems without compromising safety.
- Evaluation of third party ownership options in Puerto Rico will be performed.
- Study financing options for community solar projects, through a cooperative-type operation.
- Establish best practices regarding the use of rooftop photovoltaic systems, among other renewable energy sources, including third party ownership and leases, as well as Power Purchase Agreements (PPA) for all sectors.
- Explore and create, financing programs that will be performed at the State or Municipal level in Puerto Rico.

Rooftop Solar Challenge to Induce Market Transformation in Puerto Rico



Key References

Solar ABC

- Report from the Solar America Board for Codes and Standards (Solar ABCs). The full report documents legal issues for solar access and solar rights. The report provides model statutes for use by state and local governments.

Network for New Energy Choices

- Network for New Energy Choices promotes environmentally responsible energy policies and technologies through in-depth reports and web content.
- Freeing the Grid (2011) - Best Practices in State Net Metering Policies and Interconnection Procedures

Solar America Board for Codes and Standards

- Awardees should draw from the Solar America Board for Codes and Standards Expedited Permit Process for PV Systems, available at www.solarabcs.org/permitting.

Solar America Board for Codes and Standards

- Begin with a consistent starting point and using the nationally standardized Expedited Permit Process. Jurisdictions and contractors can be assured.
- The term “expedited permit process” refers to an organized permitting process by which a majority of small PV systems can be permitted quickly and easily.
 - It is not intended to apply to all types of PV systems.
 - Systems of less than 15kW maximum power
- Using one standard permitting process will eliminate confusion, conflicts, and reduce the time required to issue the permit.

Solar America Board for Codes and Standards

Expedited Permit Process Eligibility Requirements

- An array composed of 4 or fewer series strings.
- An inverter with rated output of 13.44 kW or less.
- Use of an engineered mounting system on a code-compliant roof
- Use of listed components (PV, inverter, etc.).
- The report, forms, and diagrams in the Expedited Permit Process are available online at www.solarabcs.org/permitting
- The recommendation of this report is that local jurisdictions use this nationally standardized expedited permit process for awarding building permits to installers of small PV systems.

Network for New Energy Choices (NNEC)

- The Network for New Energy Choices publishes *Freeing the Grid: Best Practices in State Net Metering Policies and Interconnection Procedures*

Network for New Energy Choices (NNEC) – Net Metering

- Allow net metering system size limits to cover large commercial and industrial customers' loads; systems at the 2 MW level are no longer uncommon.
- Do not arbitrarily limit net metering as a percent of a utility's peak demand.
- Allow monthly carryover of excess electricity at the utility's full retail rate.
- Specify that customer-sited generators retain all renewable energy credits for energy they produce.
- Allow all renewable technologies to net meter.
- Allow all customer classes to net meter.
- Protect customer-sited generators from unnecessary and burdensome red tape and special fees.
- Apply net metering standards to all utilities in the state, so customers and installers fully understand the policy, regardless of service territory.

Network for New Energy Choices (NNEC) - Interconnection

- Set fair fees that are proportional to a project's size.
- Cover all generators in order to close any state or federal jurisdictional gaps in standards.
- Screen applications by degree of complexity and adopt plug-and-play rules for residential- scale systems and expedited procedures for other systems.
- Ensure that policies are transparent, uniform, detailed and public.
- Prohibit requirements for extraneous devices, such as redundant disconnect switches, and do not require additional insurance. Clearly safety is first but redundant components create a more complex system and increase cost.
- Apply existing relevant technical standards, such as IEEE 1547 and UL 1741.
- Process applications quickly; a determination should occur within a few days.
- Standardize and simplify forms.

Market Evaluation Points

ACTION AREA	POINTS
Permitting Process	460
Application	110
Information Access	60
Process Time	110
Fee	30
Model Process	30
Inspection	80
Communication w/ Utility	40
Interconnection Process	110
Application	40
Information Access	20
Process Time	20
Inspection	30

Market Evaluation Points (cntd)

Interconnection Standard	100
Net Metering Standard	100
Financing Options	
Third Party Ownership (or equivalent)	90
Direct Finance Options	25
Community Solar	15
Other	20
Planning and Zoning	
Solar Rights and Access	54
Zoning	20
New Construction	6
TOTAL POINTS POSSIBLE	1000

Stakeholder engagement is vital

- Dynamic, non-linear process
- Need multi-sector collaborations: Government, industry, NGOs, communities.
 - From distrust to a lasting commitment with PR's social, environmental and economic welfare and a different energy future
- Changes needed to improve Rooftop PV market in PR require a multi-sector approach
 - Puerto Rico Solar: PV Community
- Stakeholder references
 - Peter Senge
 - V. Ramaswamy

Peter Senge

- A sustainable world will only be possible by thinking differently. Core capabilities:
 - Seeing systems
 - Collaborating across boundaries (all types)
 - Creating (desired futures) vs Problem-solving

The Necessary Revolution: How Individuals and Organizations are Working Together to Create a Sustainable World, 2008

Co-Creation: Stakeholder Engagement

- The expectations of informed and connected people have dramatically changed... people demand more engagement with providers of goods and services, with their employers, and with their government....In spite of their best efforts, many organizations are locked into a firm-centric paradigm of value and its creation.
 - Co-creation: All stakeholders have a say and benefit from the outcomes.
 - “Social eco-system” : Freer flow of information, engage people more **WHOLEHEARTEDLY** and enable richer, fuller stakeholder interactions. Transform relationships and social realities.
- Institutions of public governance and civic engagement can be transformed, making governments more attuned and responsive to social needs and demands. Key to rebuilding the trust that institutions have lost.

Rooftop Solar Challenge to Induce Market Transformation in Puerto Rico

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Stakeholder meetings

PV industry, utility, government, professional organizations, community and environmental groups, financing groups, construction industry, legal experts and policymakers .

Establish a PV community

Summative PV Summit (October 2012)

Rooftop Solar Challenge to Induce Market Transformation in Puerto Rico



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 - Efrain O'Neill – Project's Principal Investigator

- We invite you to visit the following websites for more info:
 - www.eere.energy.gov/solar/sunshot/rooftop_challenge.html
 - <http://www.aae.gobierno.pr/>