



**Revitalizing American Competitiveness in Solar Technologies**

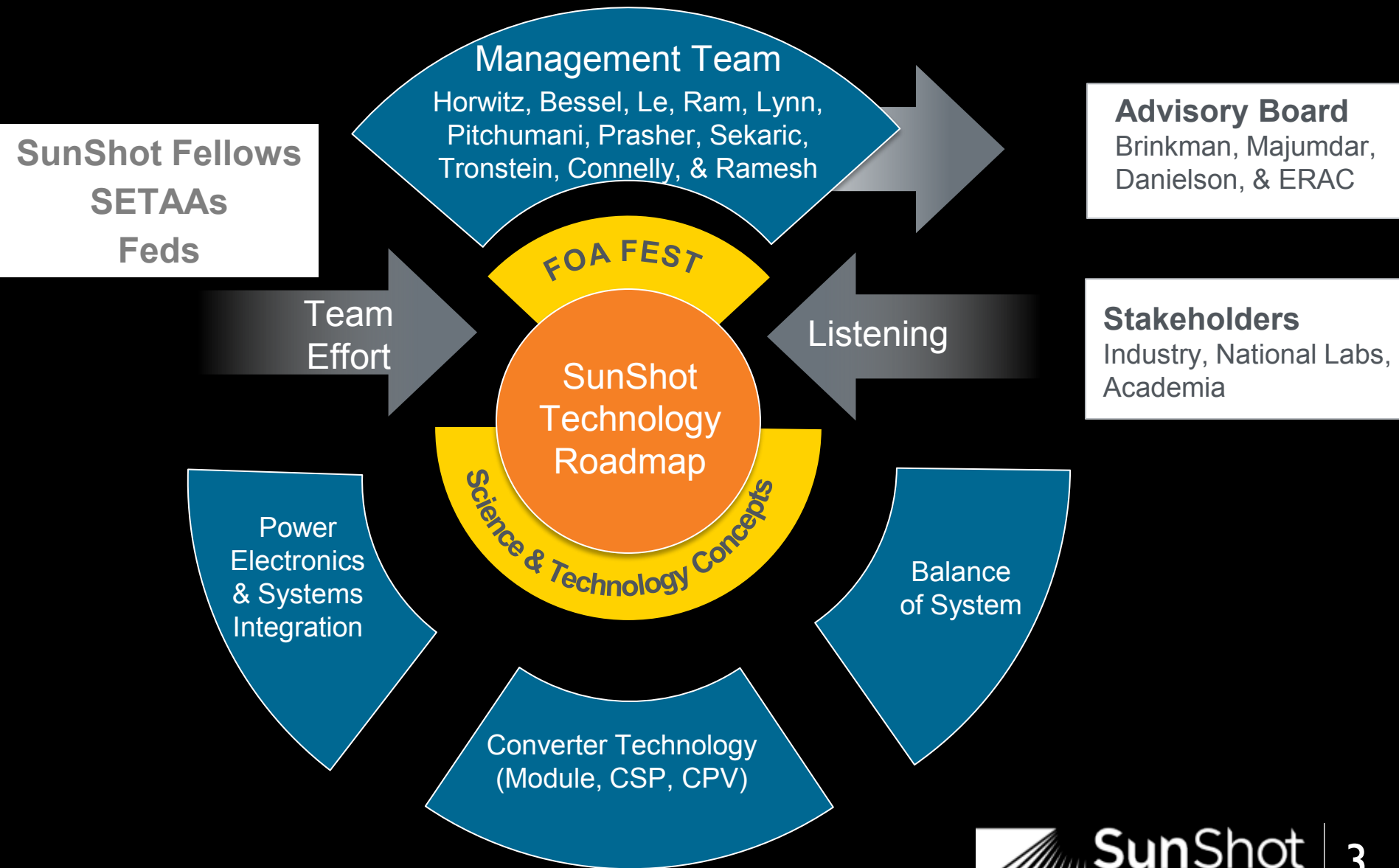
**The SunShot Team**

# Fundamental Premise for SunShot...

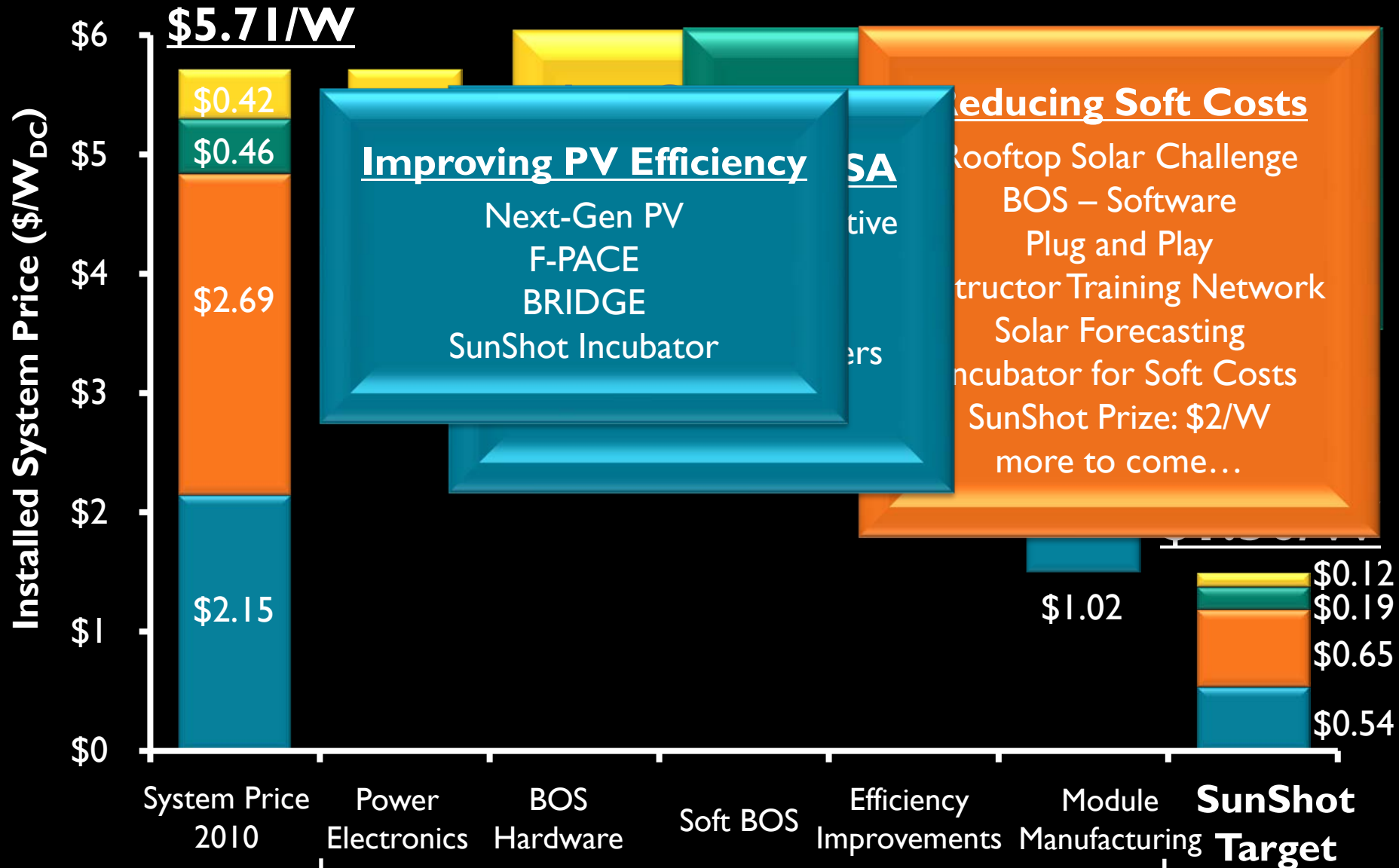


- Subsidy-free solar electricity
- 75% cost reduction by end of the decade
- 5-6¢/kWh at utility scale
- Global competitiveness

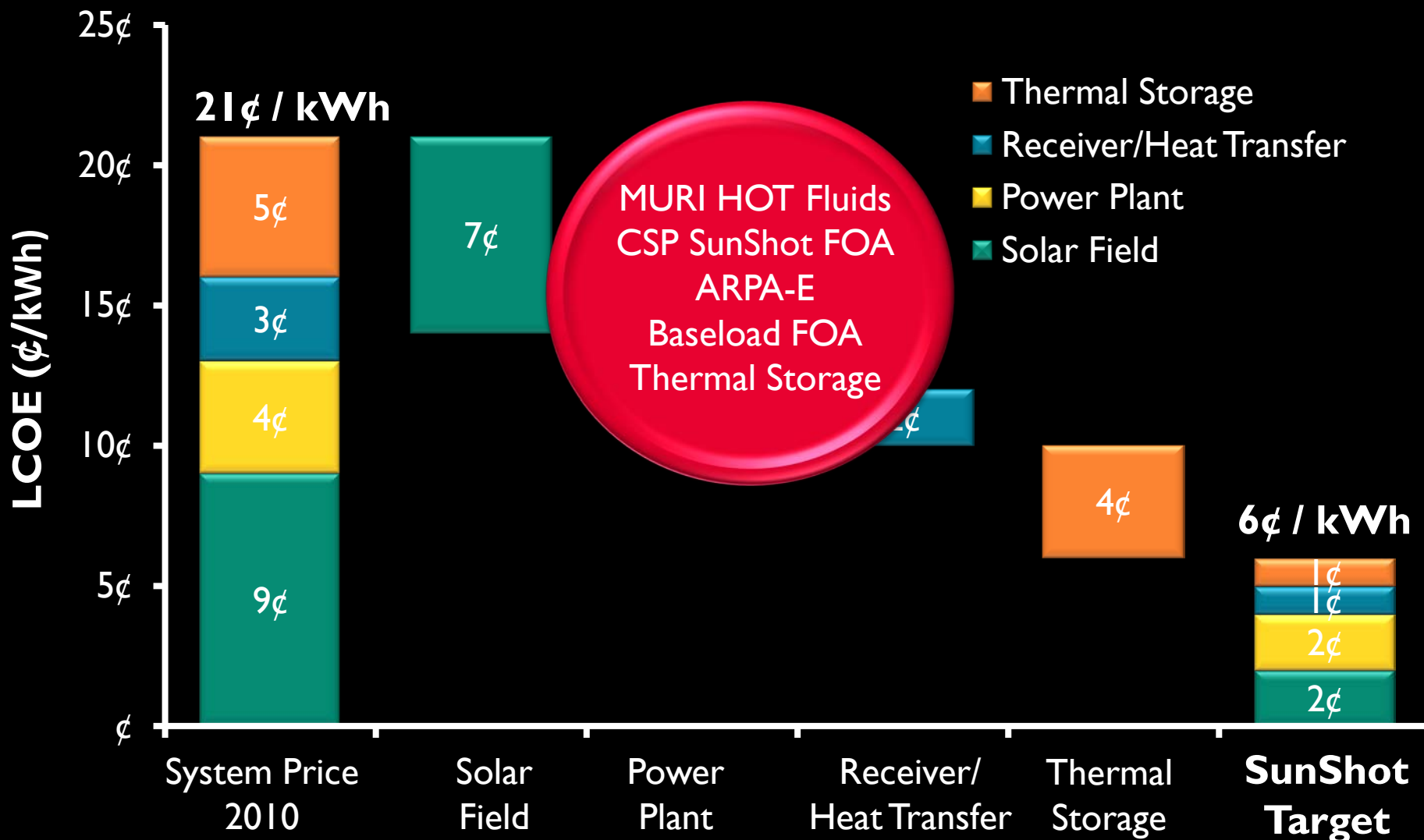
# SunShot Management Structure



# SunShot Funding Philosophy



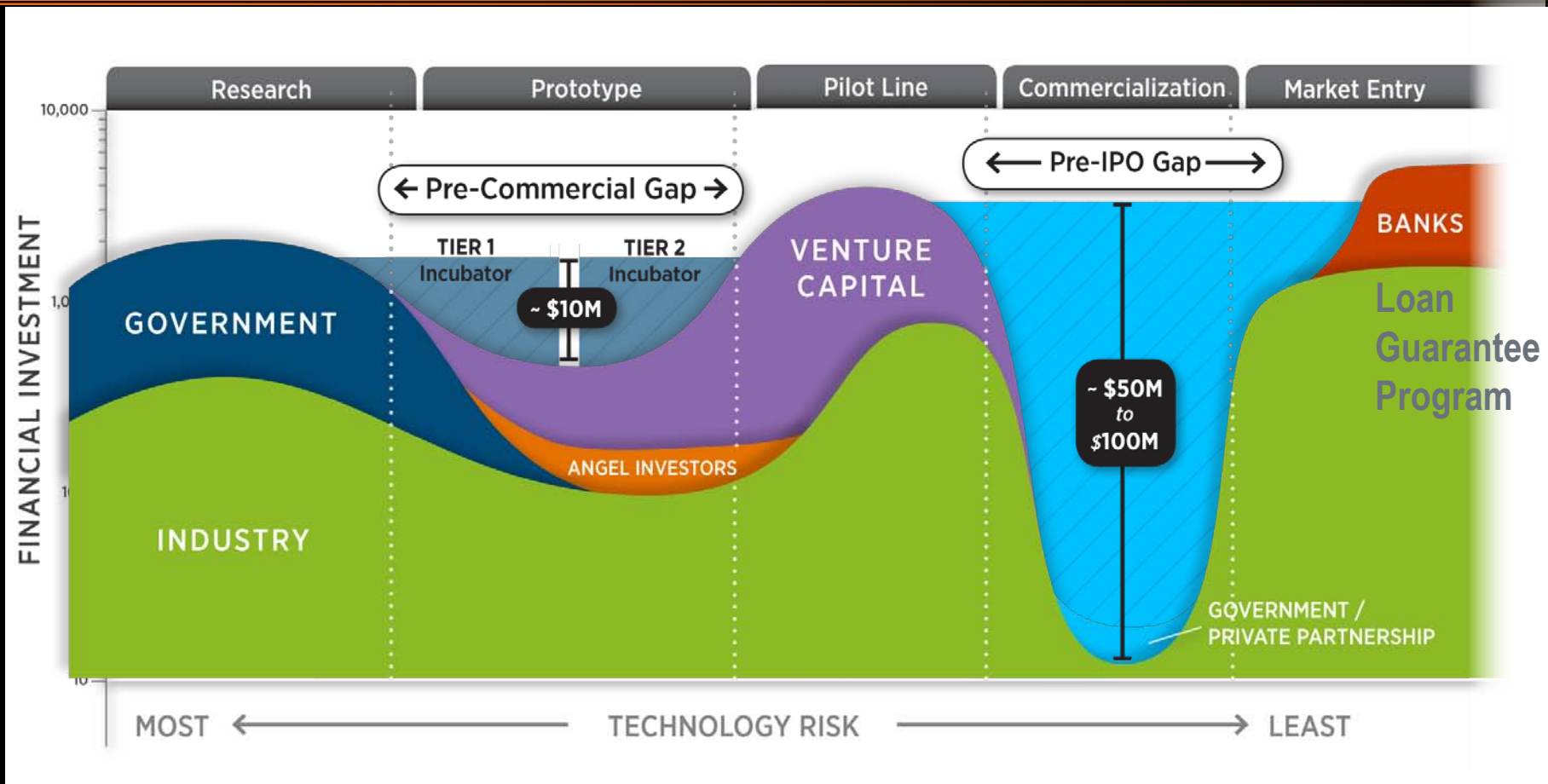
# Pathway to SunShot – CSP



# \$2/W SunShot Residential Prize

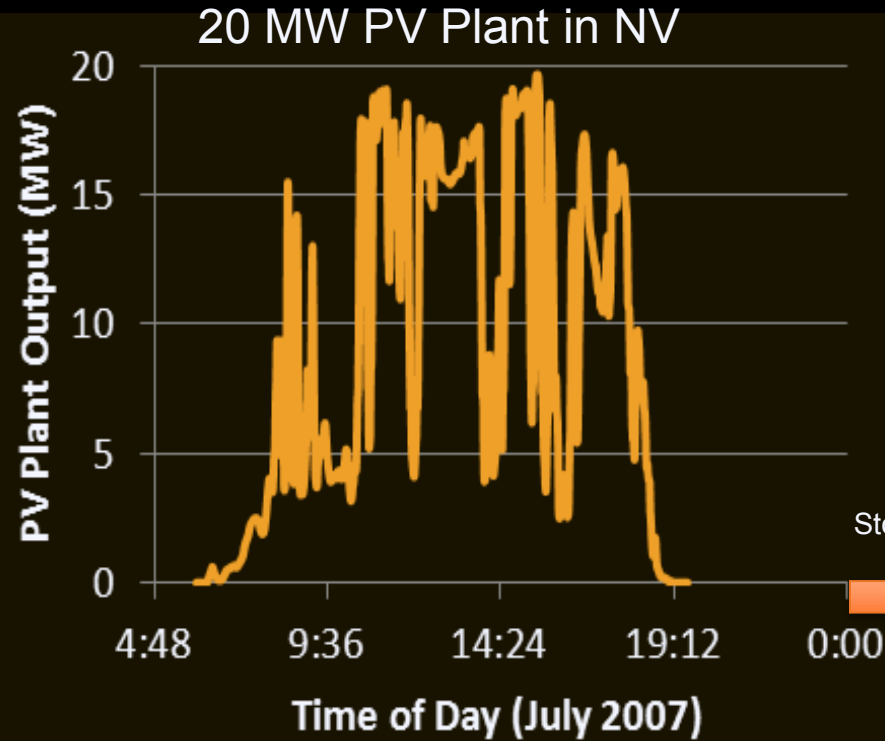
- In Germany, residential PV systems are sold at ~\$2.44/W
- RFI on the street that asks the question “Can we have residential PV systems at \$2/W?”
- At the scale of about 1,000 homes (~5 MW), demonstrate that \$2/W (no incentives) can be achieved
  - Grid parity at average U.S. residential rates
  - Local, state, utility processes would need to be streamlined
  - Installation would need to be streamlined
- \$5M Prize to first team to achieve this
  - \$3M Prize to second team/region
  - \$2M Prize to third team/region

# SUNPATH II (Scaling Up Nascent PV AT Home)



First pilot to first commercial-scale manufacturing facility: access to capital for innovative companies; the goal is scaling up and retaining innovation and jobs

# Solutions for PV Variability: Forecasting & Energy Storage



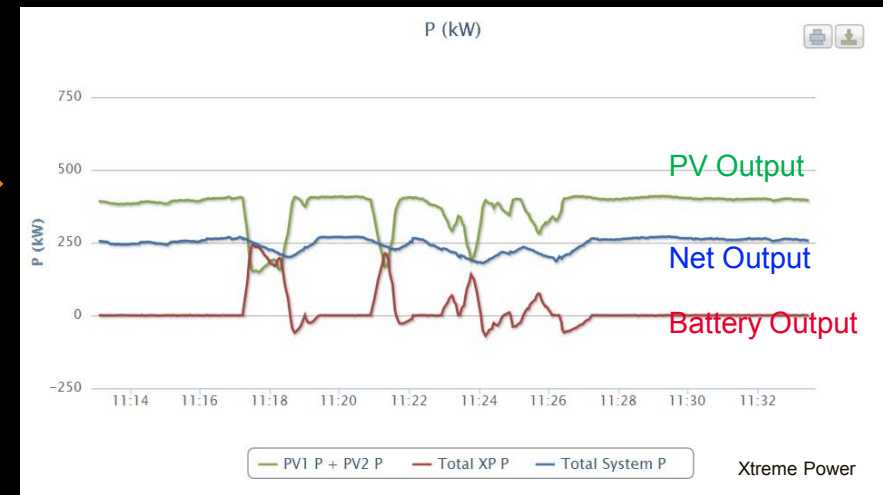
Forecasting



Solar Forecasting Program

Total Sky Imager allows forecasting 15-30 minutes ahead

Storage



■ Forecasting

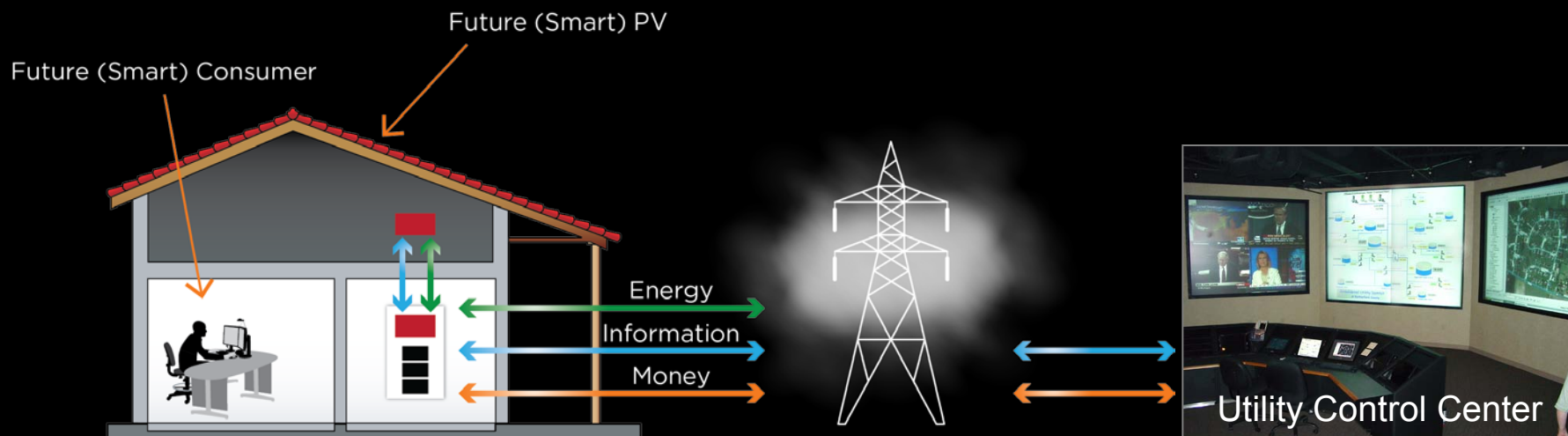
■ Storage



# Plug-and-Play

## Vision: PV as an Appliance

No permitting    Easy installation    Seamless grid integration



### Future (Smart) Home

- Smart outlet
- Smart circuit
- Smart breaker panel
- Smart appliances
- Home area network (HAN)

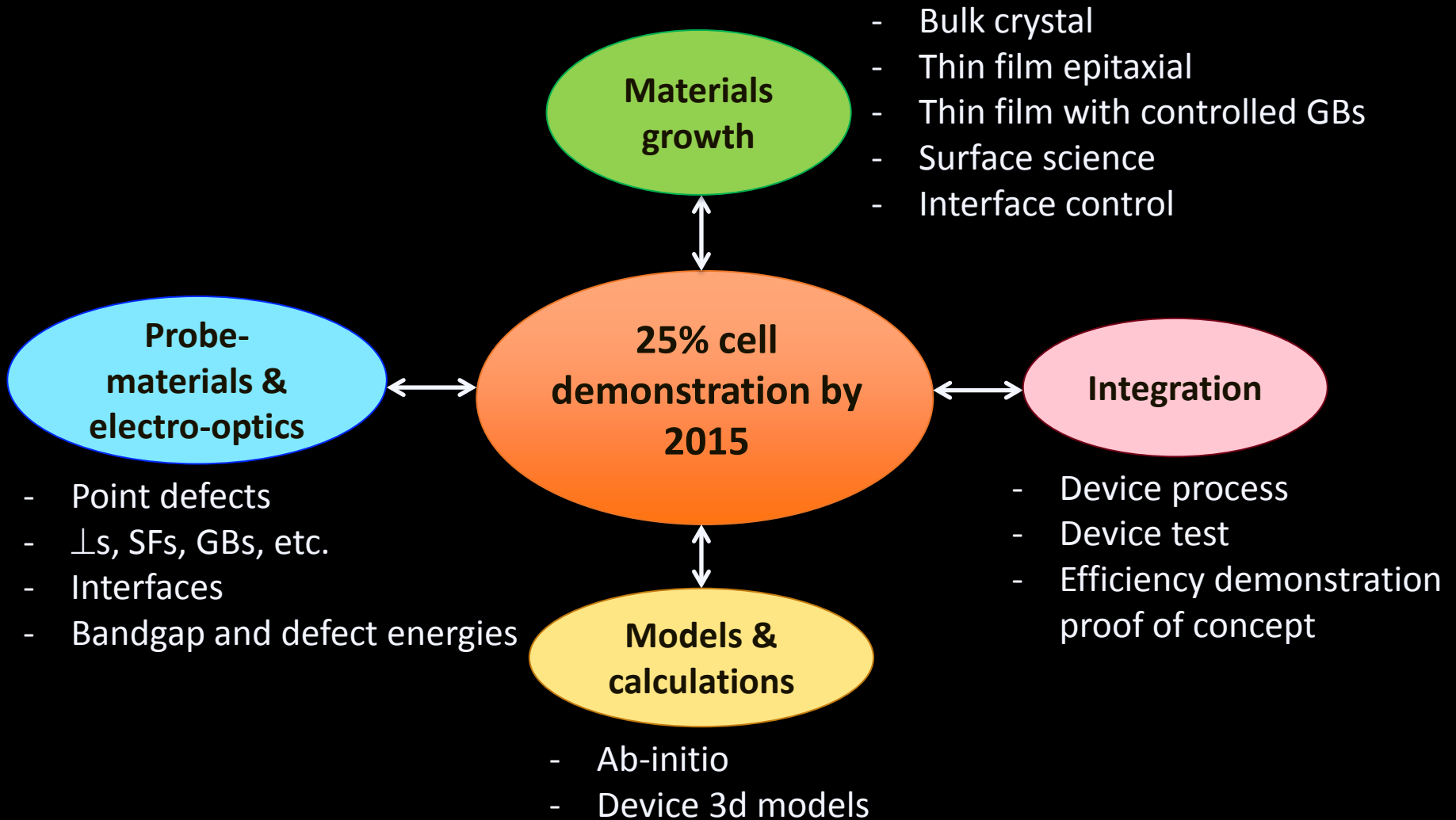
### Future (Smart) Grid

- Distributed generation
- Two-way power flow
- Communication and control
- Rich energy information and transactions
- Microgrid

### Future (Smart) City

- Integrated grid and city planning

# Enabling “Quantum Leaps” in Technology through Science



# GEARED - Grid Engineers for Accelerated Renewable Energy Employment

## Problem:

- Electric Grid workforce is aging – mass retirements in 5-15 years
- Lack of skilled personnel conflicts with need for a new “smart grid”
- Center for Energy Workforce Development estimates the need for 92,000 new grid workers, including ~18,000 engineers

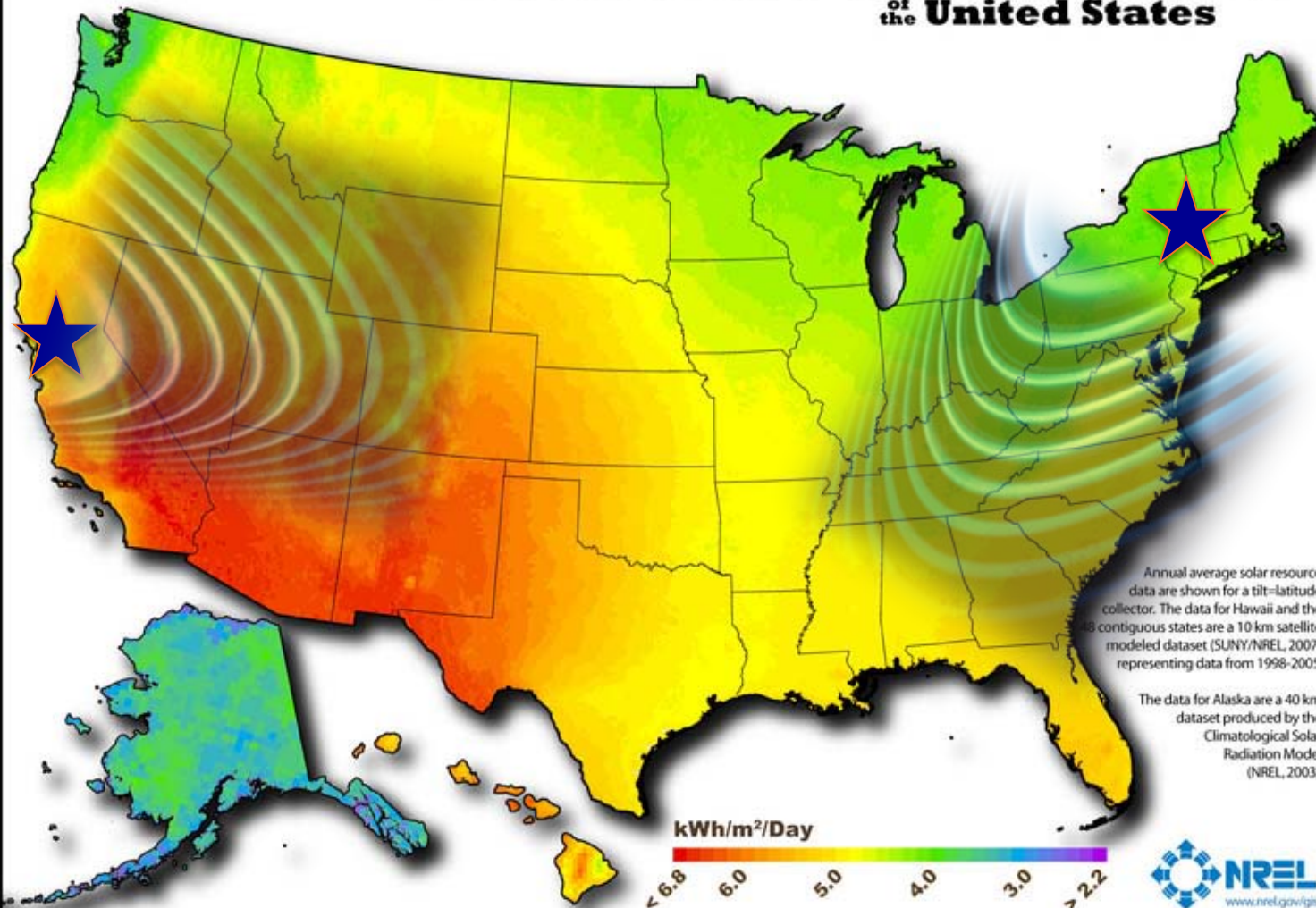
## Goal:

- Establish **University** programs to train a **network of grid engineering STEM professionals** ready for a 21<sup>st</sup> century renewable economy



# Creating a New Solar Eco-System

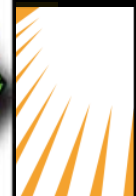
## Photovoltaic Solar Resource of the United States



Author: Billy Roberts - October 20, 2008

This map was produced by the National Renewable Energy Laboratory for the U.S. Department of Energy.

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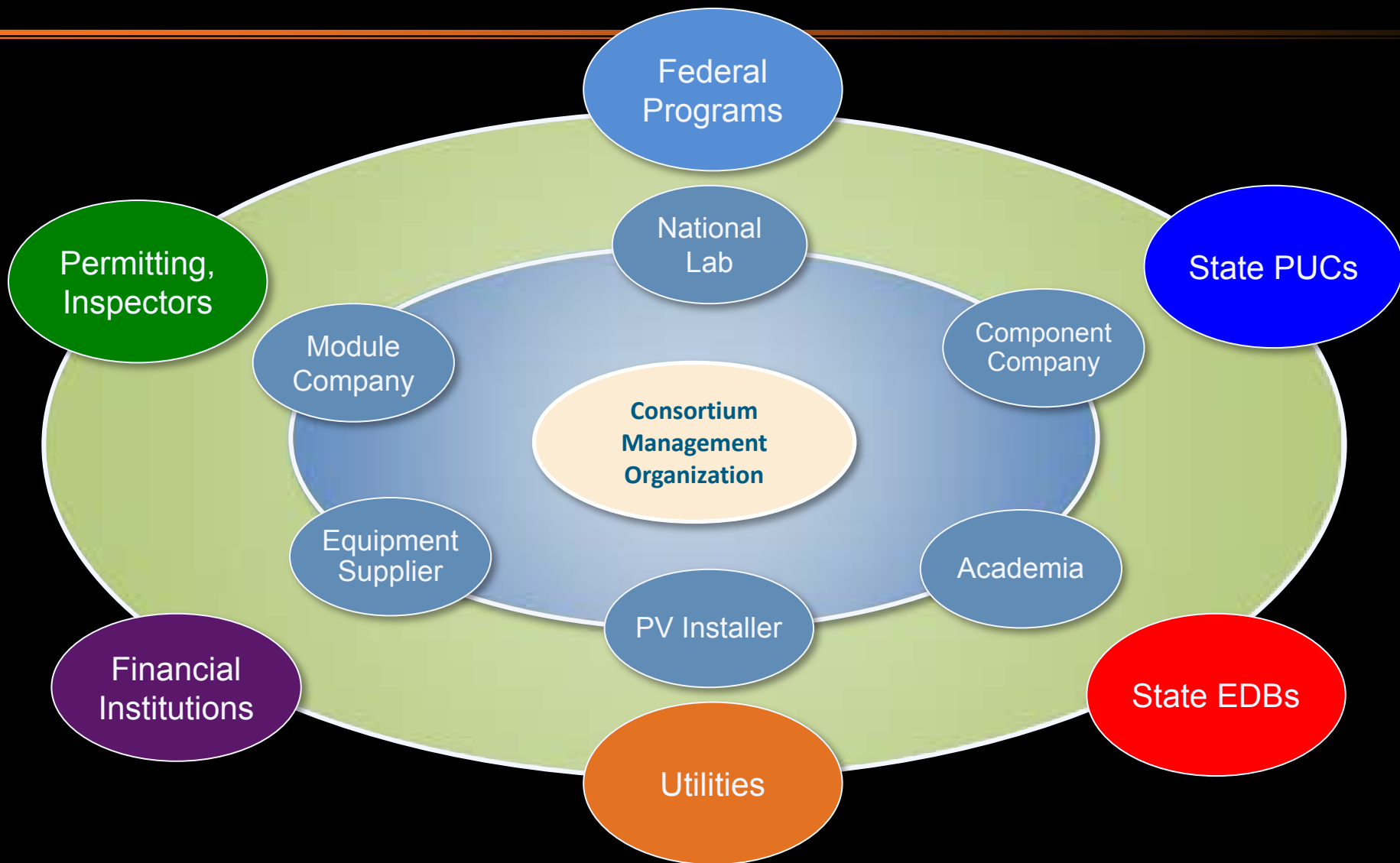


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# Creating a New Solar Eco-System



America has the opportunity to lead the world in clean energy technologies and provide a foundation for our future prosperity.

We remain the most innovative country in the world ... but “Invented in America” is not good enough to guarantee our prosperity.

“Invented in America, Made in America,  
Sold Worldwide”