

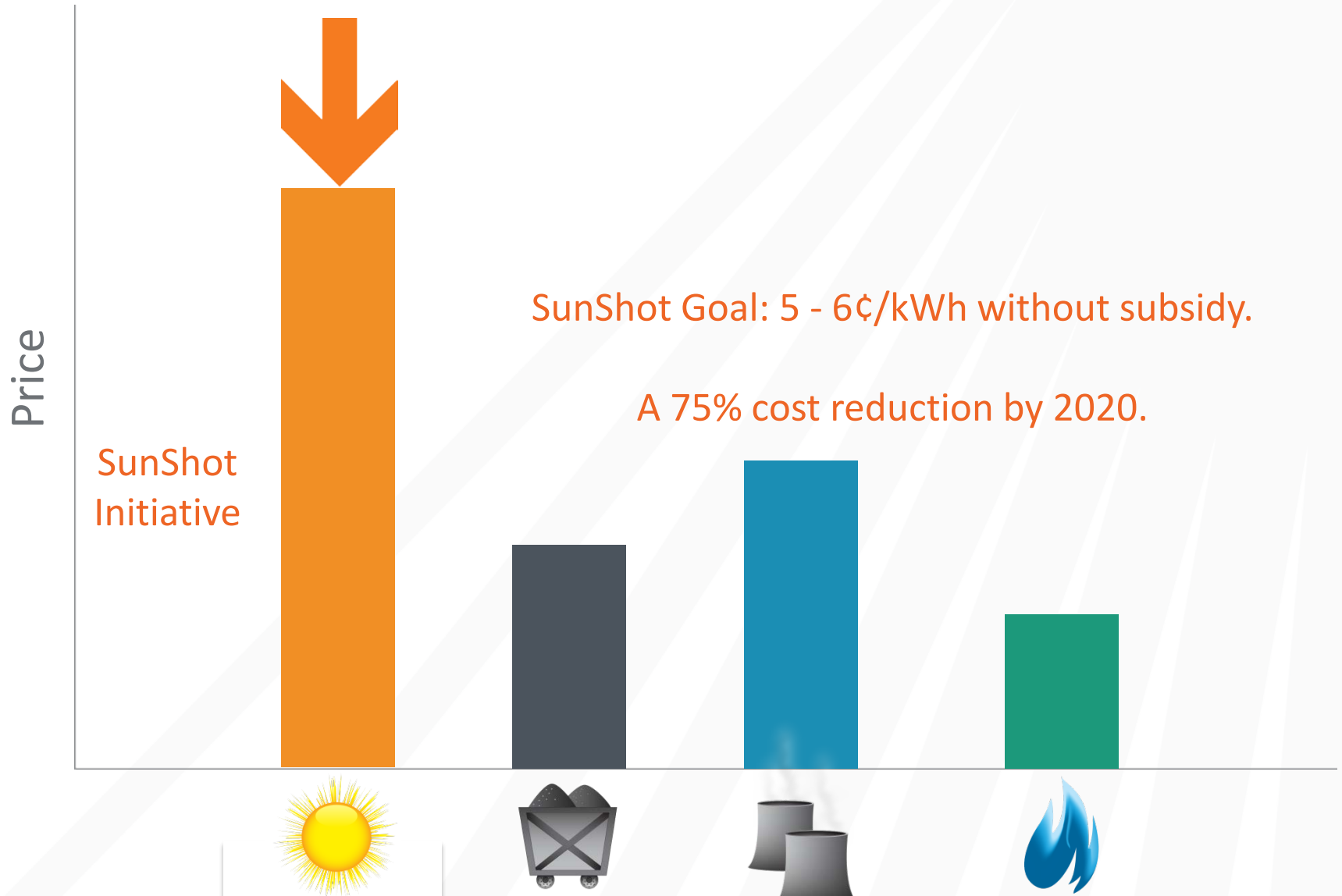


Cutting Costs of Solar Energy Getting to Ubiquitous Solar

energy.gov/sunshot

Minh Le, Director, SunShot Initiative
Solar Energy Technologies Office
U.S. Department of Energy

SunShot

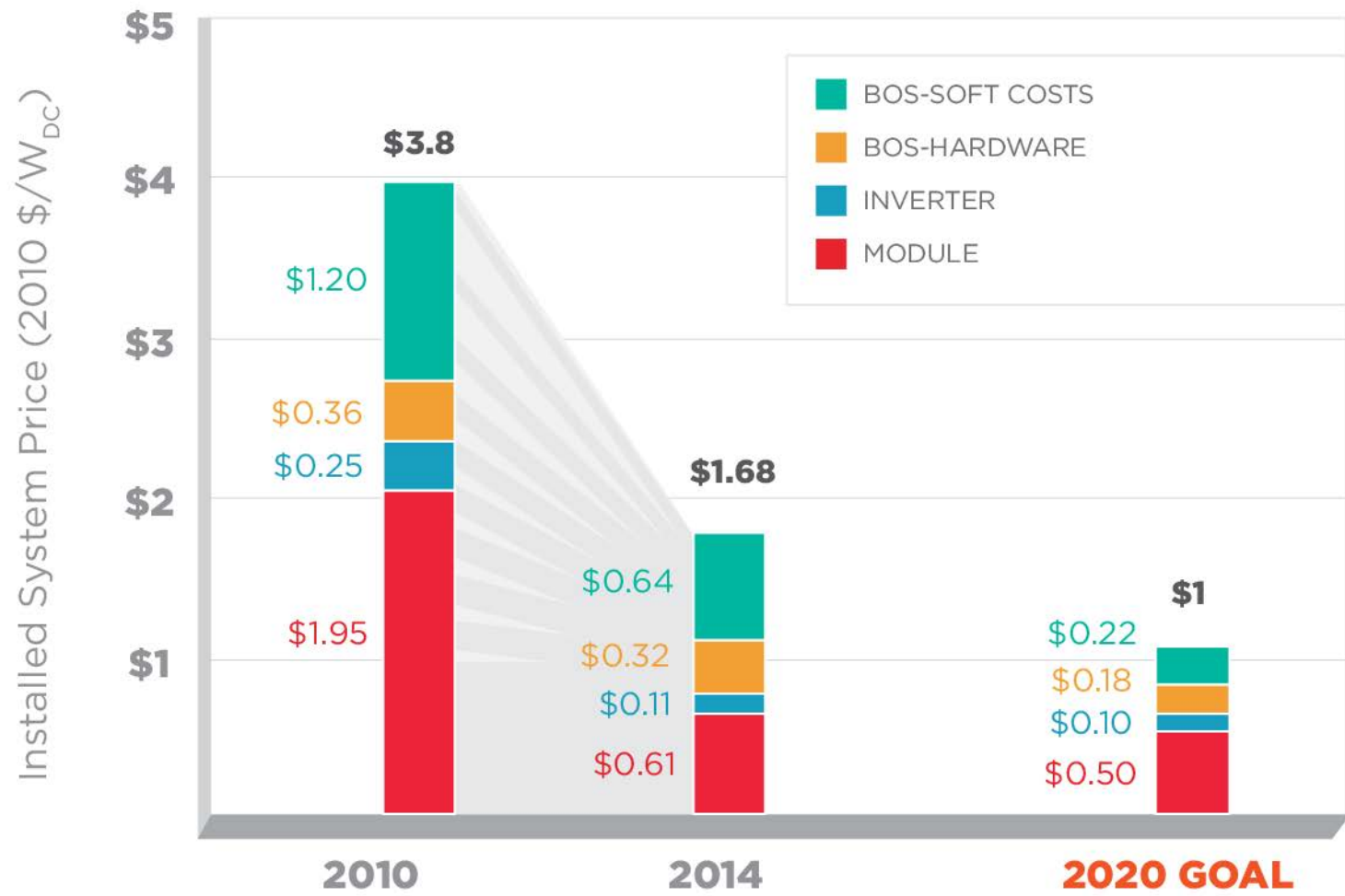


SunShot Initiative

SunShot Goal: 5 - 6¢/kWh without subsidy.

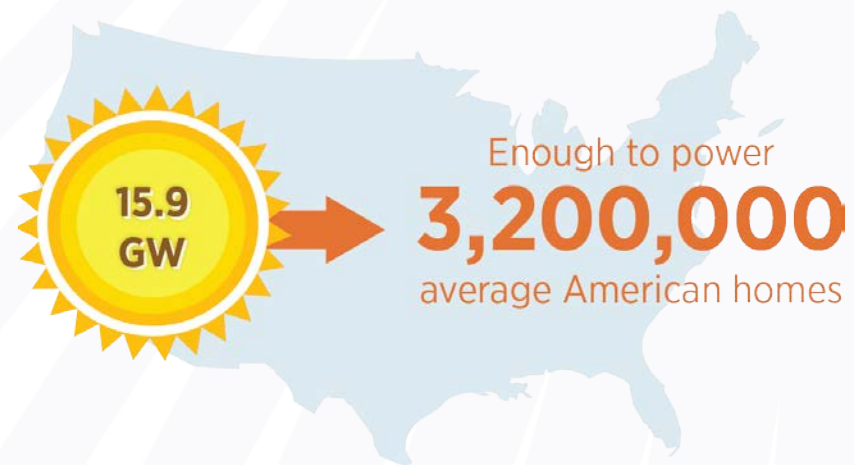
A 75% cost reduction by 2020.

PV Utility-Scale System Pathway to SunShot



Growing Capacity, Building Our Economy

- Since 2010, the cost of a solar PV system has dropped by about 60%. Solar continues to shatter deployment records nationwide. By end of 2014, more than 20 GW of solar capacity are expected.
- Demand for solar is creating jobs across America.



nearly **143,000** workers¹



10%
13,000
Veterans

↑ 20%
since fall of 2012

Americans Choose Solar Energy

- Solar installations are overwhelmingly occurring in middle class neighborhoods with incomes ranging from **\$40K-\$90K.**



- Numerous, large corporations and organizations are deploying solar at a massive scale—including Apple, Berkshire Hathaway, FedEx, GE, GM, Google, IKEA, Macy's, Target, Walmart, and the U.S. military.

SunShot FY14 Activities and Successes

- **Enhancing U.S. Leadership in PV R&D**
 - More than 50% of the solar cell efficiency records were supported by the DOE over 30+ years; NREL PV cell efficiency world records have grown at a rate of **3.5x**, compared to the prior decade with level funding.
- **Developing New Financing Tools to Deploy Solar**
 - SunShot is increasing access to financing options and standardizing processes to make solar more accessible and affordable for Americans through NREL's Solar Access to Public Capital (SAPC) working group.
- **Building a Skilled Solar Workforce**
 - Since 2010, SunShot's Solar Instructor Training Network has trained more than 30,000 community college students on the way to the goal of 50,000 by 2020.

Solar Instructor Training Network



1

National administrator



9

Regional training providers



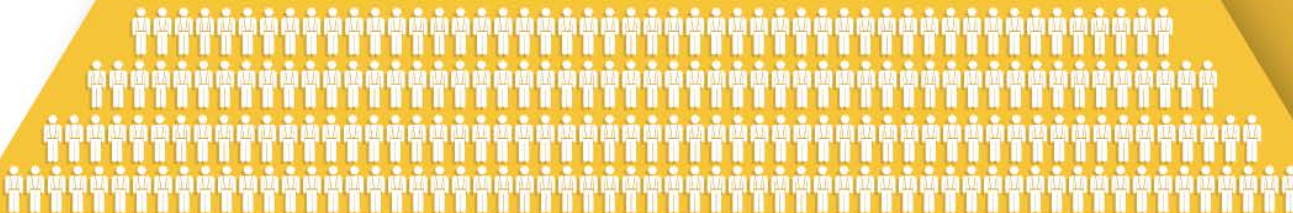
400

Colleges, technical high schools,
labor training centers, and
mobile training units



1000

Solar instructors



30,000*

Students trained

*September, 2014

SunShot FY14 Activities and Successes

- **Supporting American Solar Manufacturing**

- 4 SunShot partners – **Suniva, SolarCity/Silevo, SolarWorld, and First Solar** – announced new factories or factory expansions in the U.S. By 2015, once all announced new manufacturing facilities and expansions are completed, we are projected to double U.S. manufacturing capacity (with a potential to triple). This puts us well on the way to meeting U.S. market demand by 2020, a SunShot manufacturing goal.

- **Cutting Solar Soft Costs**

- SunShot's Rooftop Solar Challenge is helping states and local governments reduce solar soft costs, like permitting timelines and cutting red tape to make it faster, cheaper, and easier for Americans to go solar.

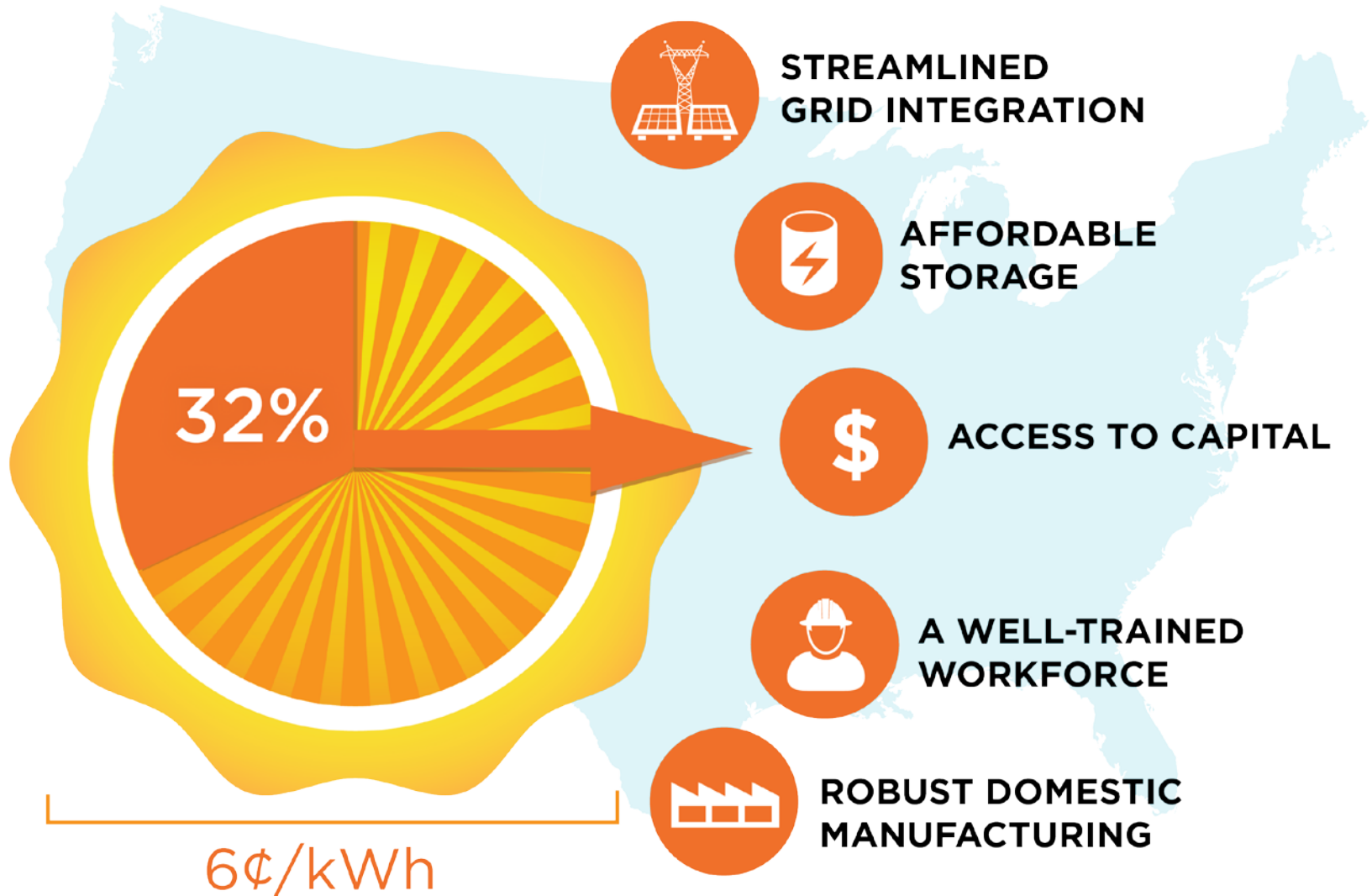
- **Working with Utilities**

- Developing approaches to handle higher solar penetration
- Developing community and shared solar business models to engage utilities as partners
- Developing technologies to make interconnection easier

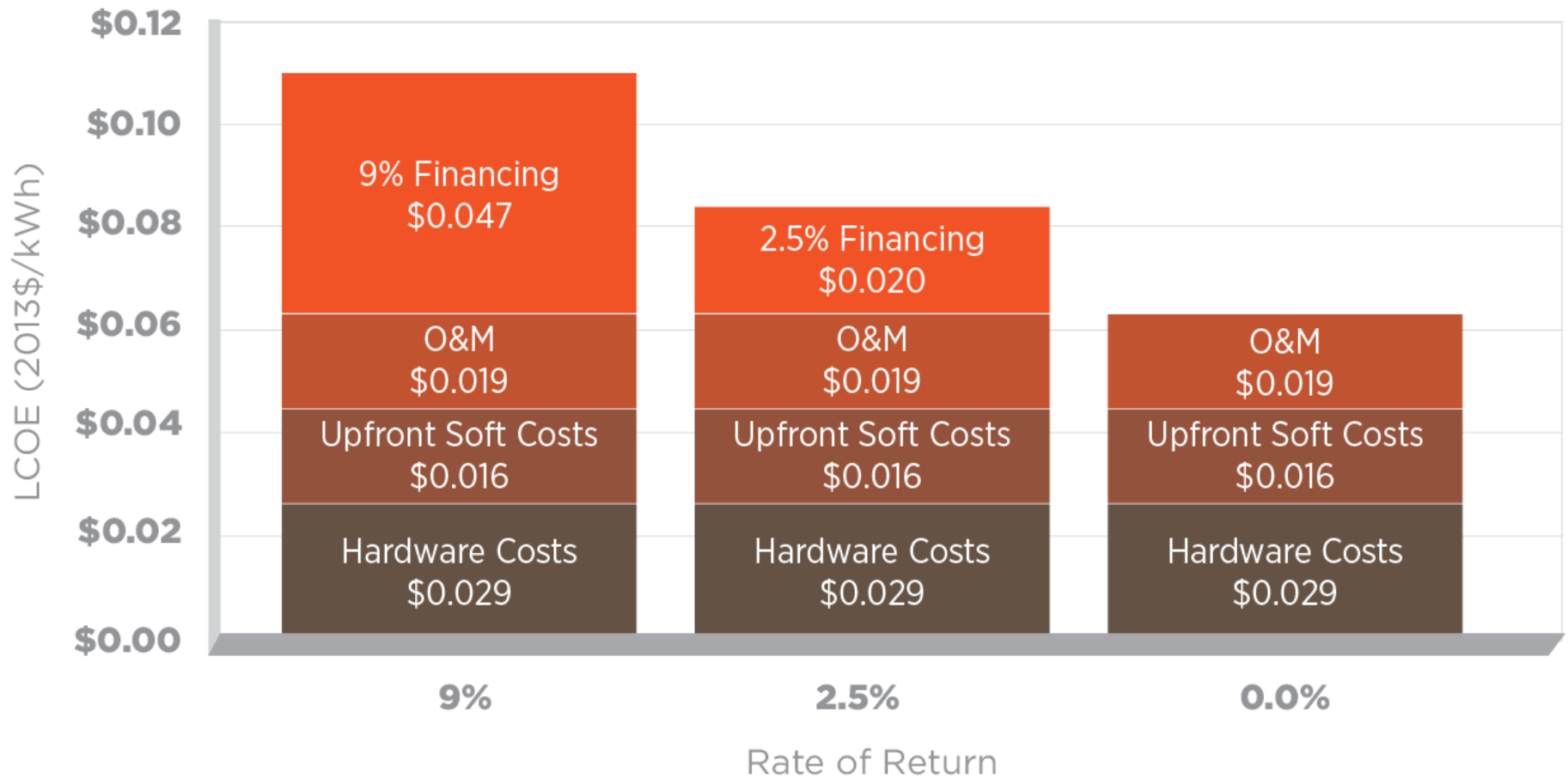
- **Major Progress to the SunShot Affordability Goal**

- Less than 4 years into this decade-long initiative, the solar industry is **>68% of the way to achieving SunShot's cost target of \$0.06/kWh for utility-scale PV.**

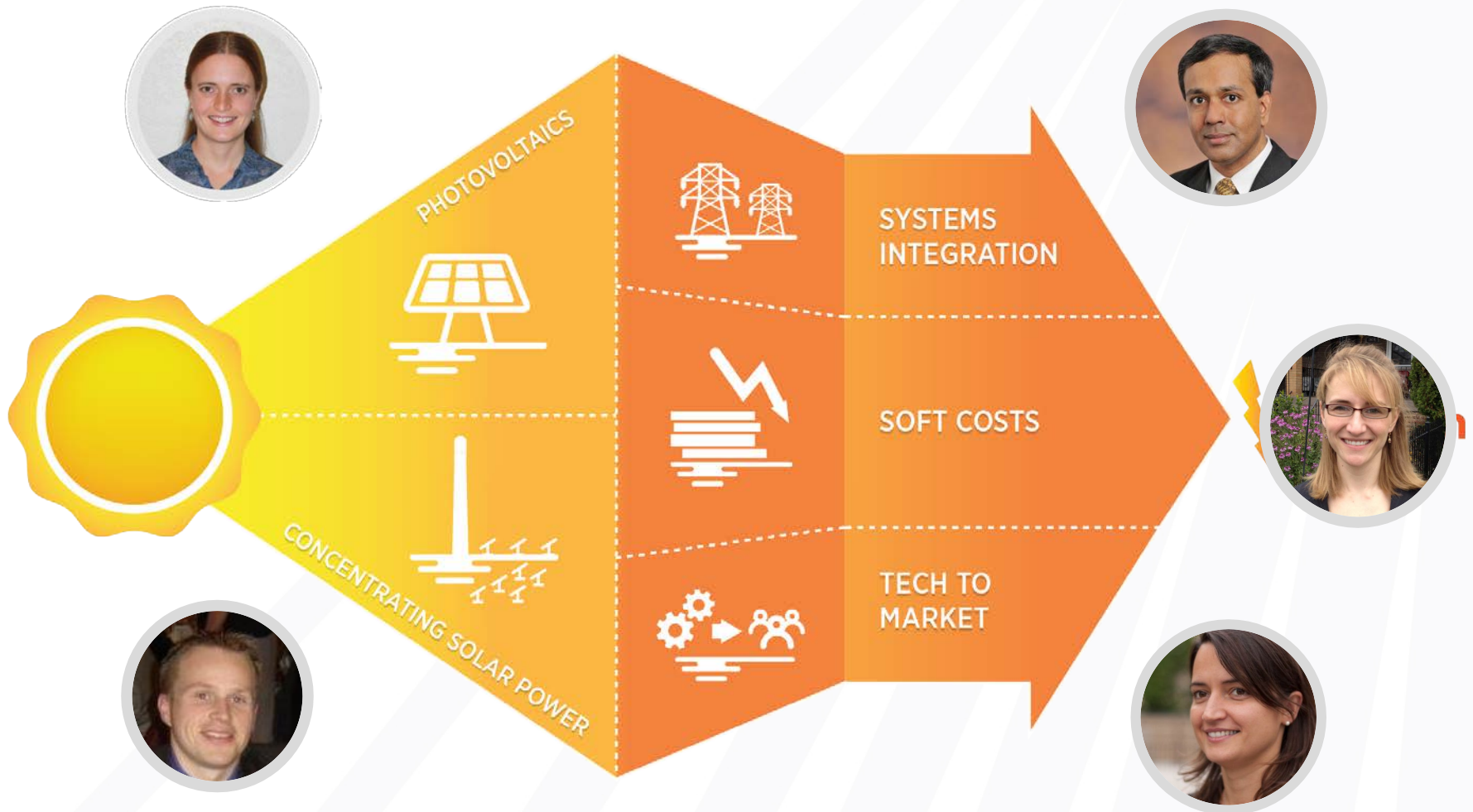
SUNSHOT GOAL: THE FINAL PUSH



The Cost of Capital (and access to Capital) is now the dominant opportunity to achieve SunShot targets



SunShot: Tackling Solar Costs from Every Angle



Challenges Ahead

- Talent - Adoption of ARPA-E like 4 year term appointments creates different challenges when federal hiring process is slow
- Rapid growth of Solar has created new challenges that now dominate over traditional areas of focus for the DOE
 - As we approach our 2020 goals, Efficiency is no longer the most important issue to tackle
 - Soft costs, finance costs as well as grid integration now dominate
 - Pivoting the portfolio will be required to maximize impact towards the SunShot goal