PV Industry Perspective

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Photovoltaics and the 21st-C energy mix

- Worldwide "energy gap" in 2020 calls for ~5TW of Renewables (IPCC)
- PV must grow VERY rapidly if it is to be a significant piece of the 2020 mix [~70% CAGR]
- *How big a role will PV play in this mix?*

PV industry has grown to GW scale and <$1.00/W

FSLR example:

- 10 years since formation
- 1GW shipped over company history
- $1B in revenues for 2008
- 1GW/year manufacturing capacity
- $0.93/W manufacturing cost

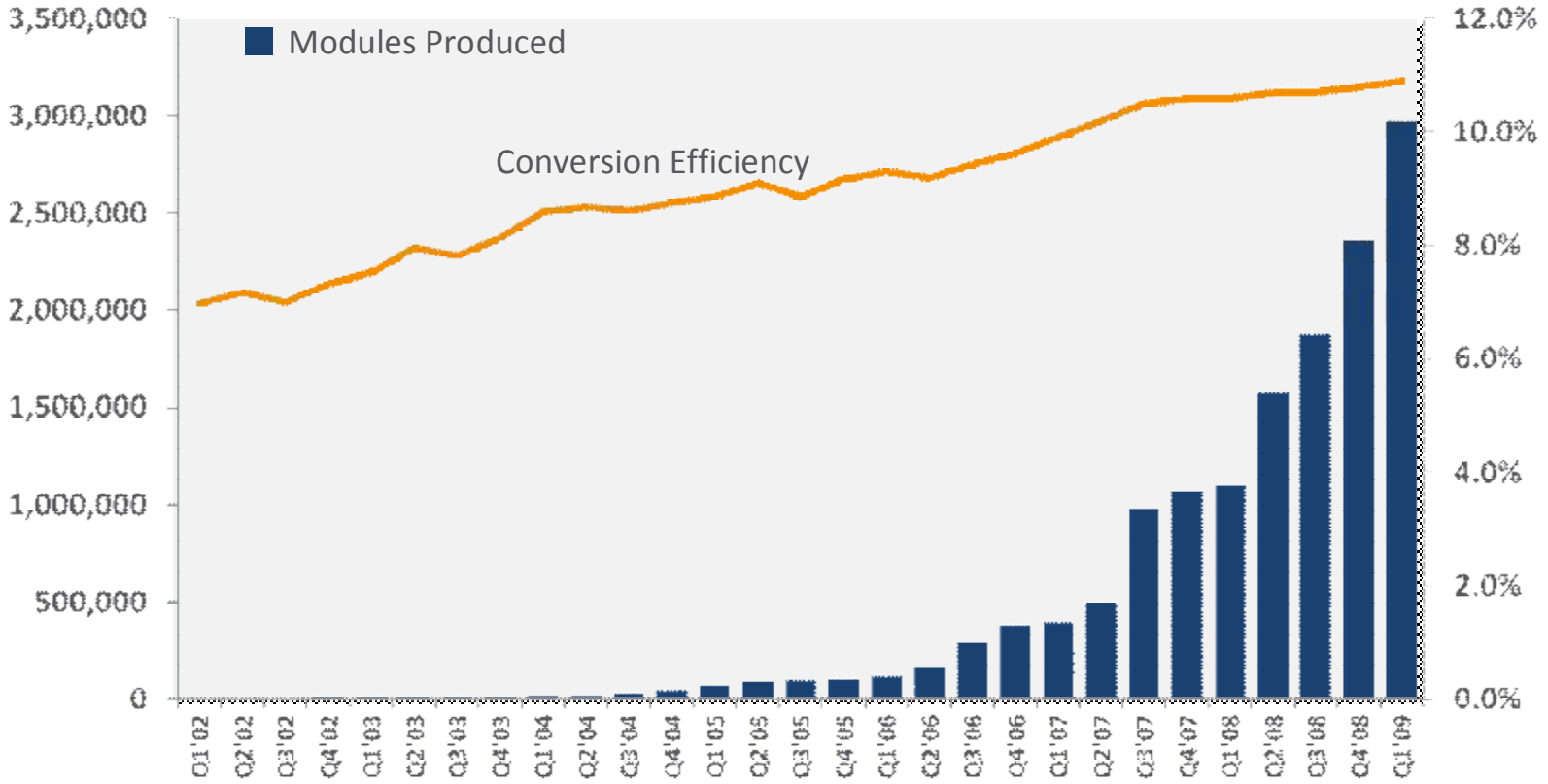
PV Industry is already contributing to the US utility grid

Southern California Edison

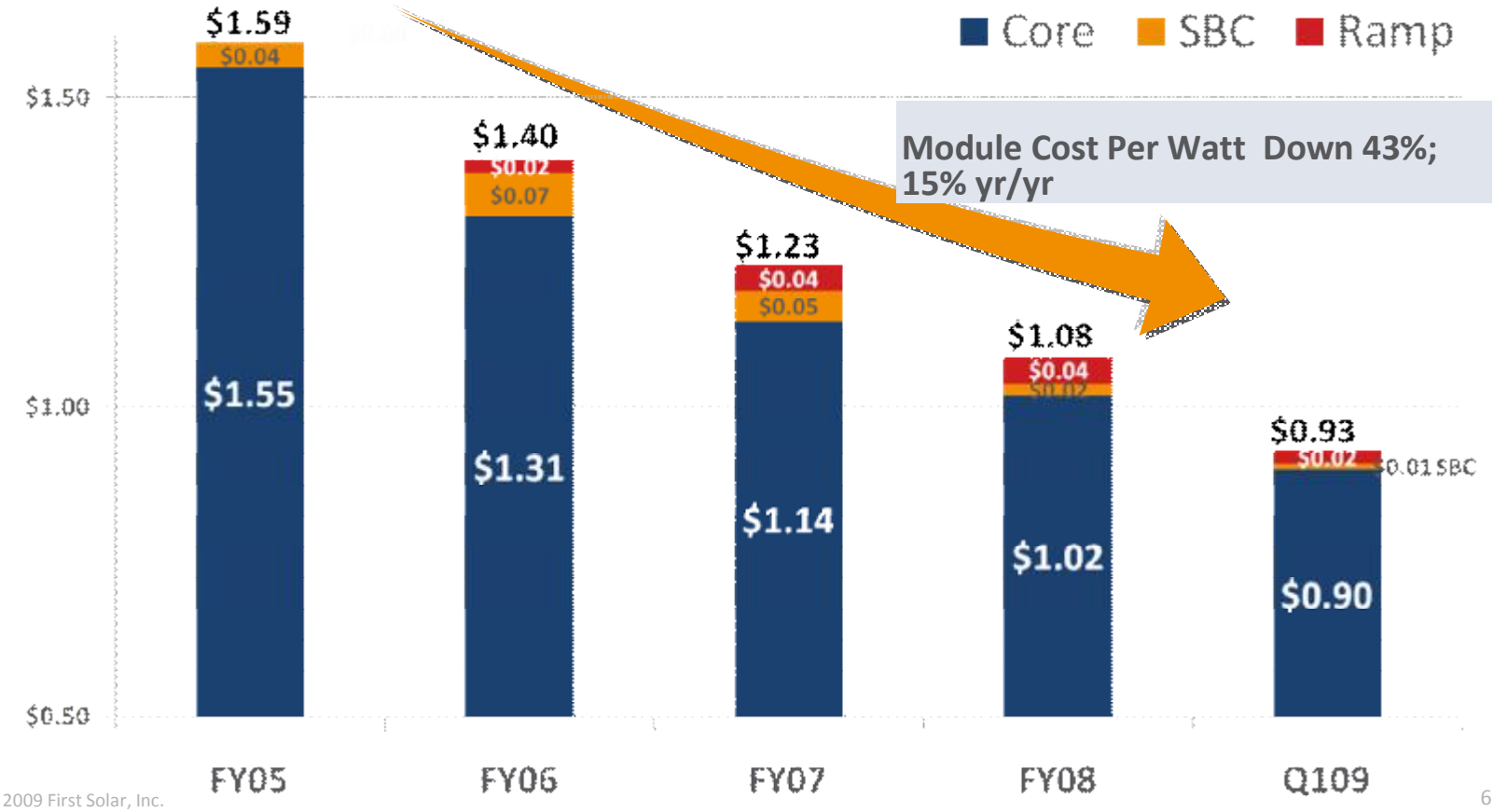
10 MWac – Boulder, NV

Manufacturing learning drives continuous-improvement

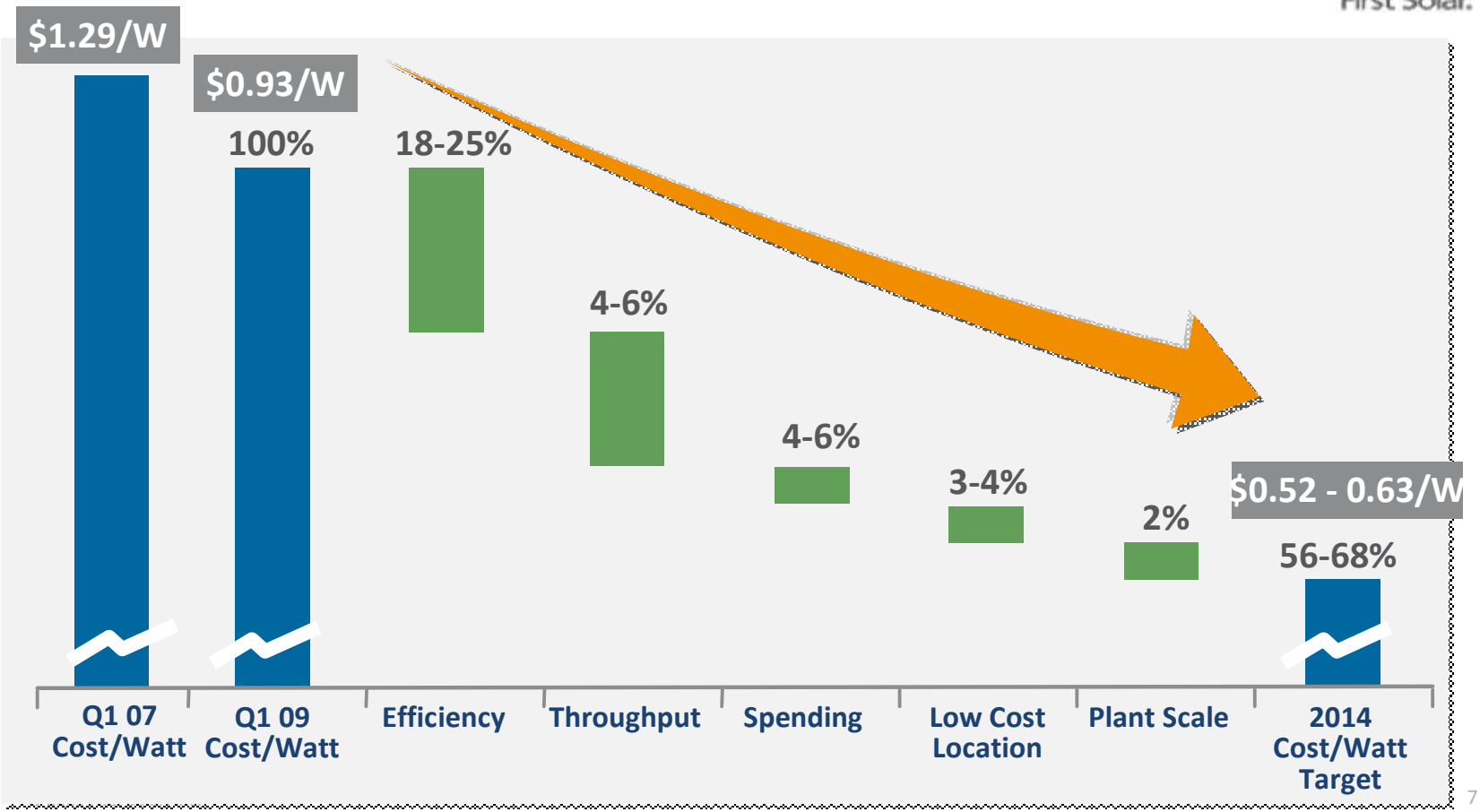
Increasing Module Conversion Efficiencies



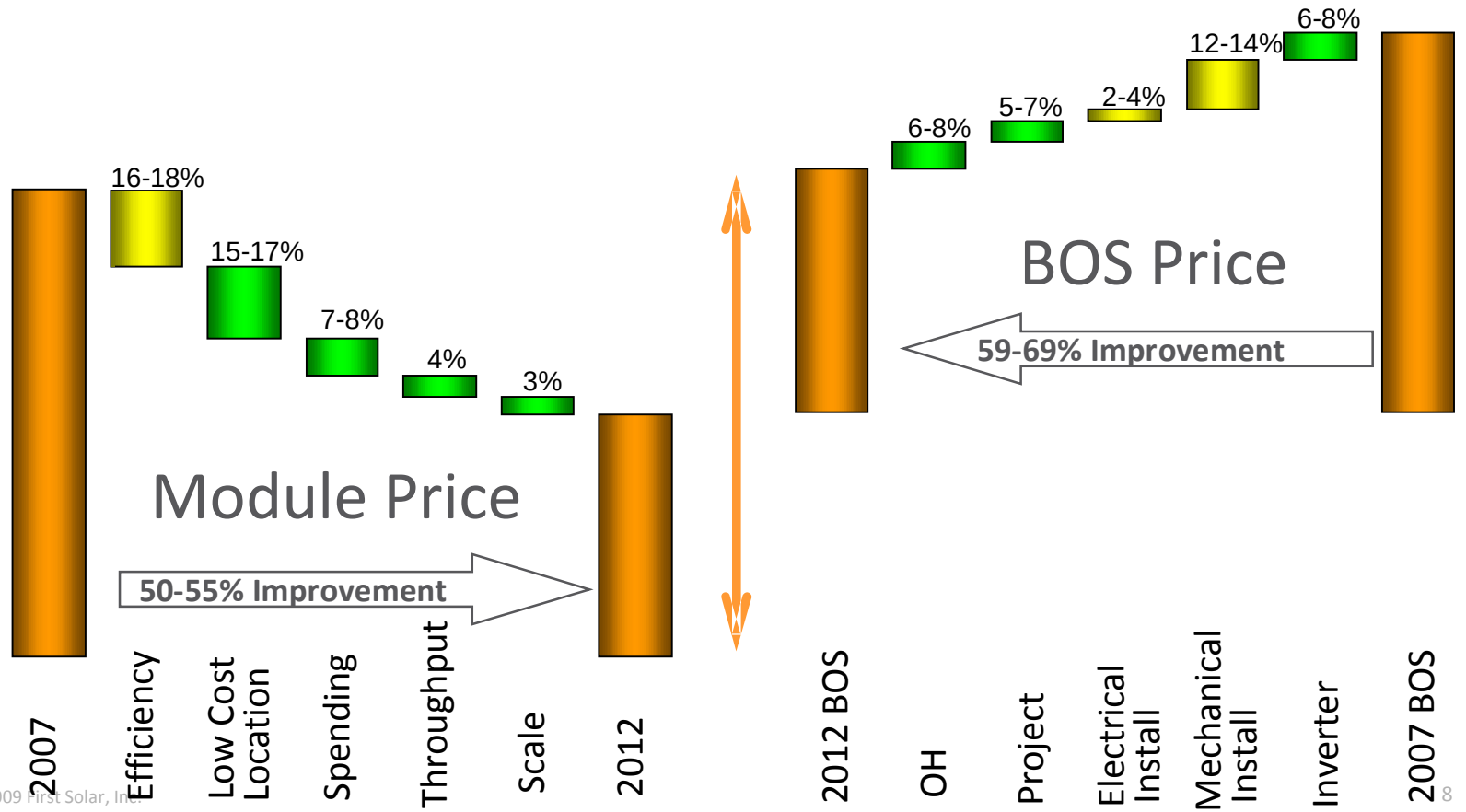
Improvements are delivering cost-reductions



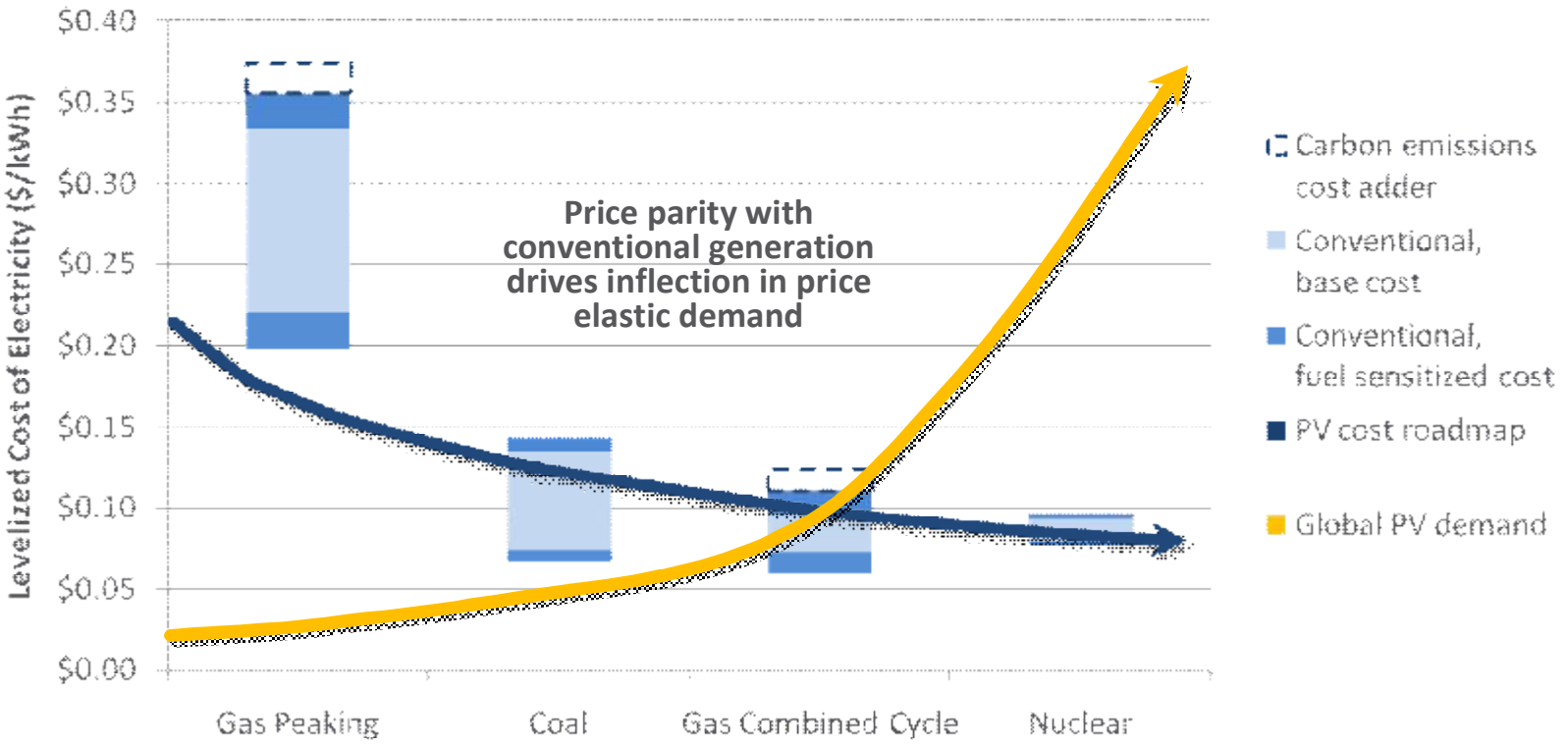
Future Cost Reduction Roadmap



Scale also delivers substantial BOS cost reductions

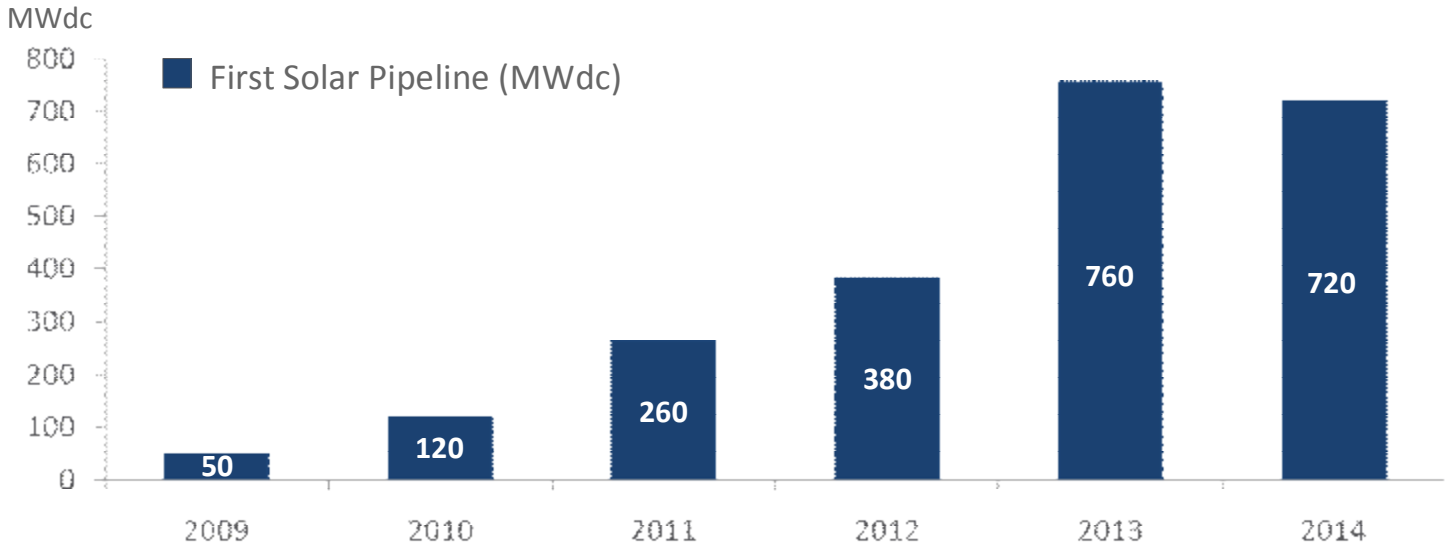


Crossing Over to Sustainable Markets



Note: Conventional generation LCOE, Lazard 2008. Carbon emissions cost assumes $30/ton CO2.
High end of coal costs incorporates 90% carbon capture – emissions adder does not apply.

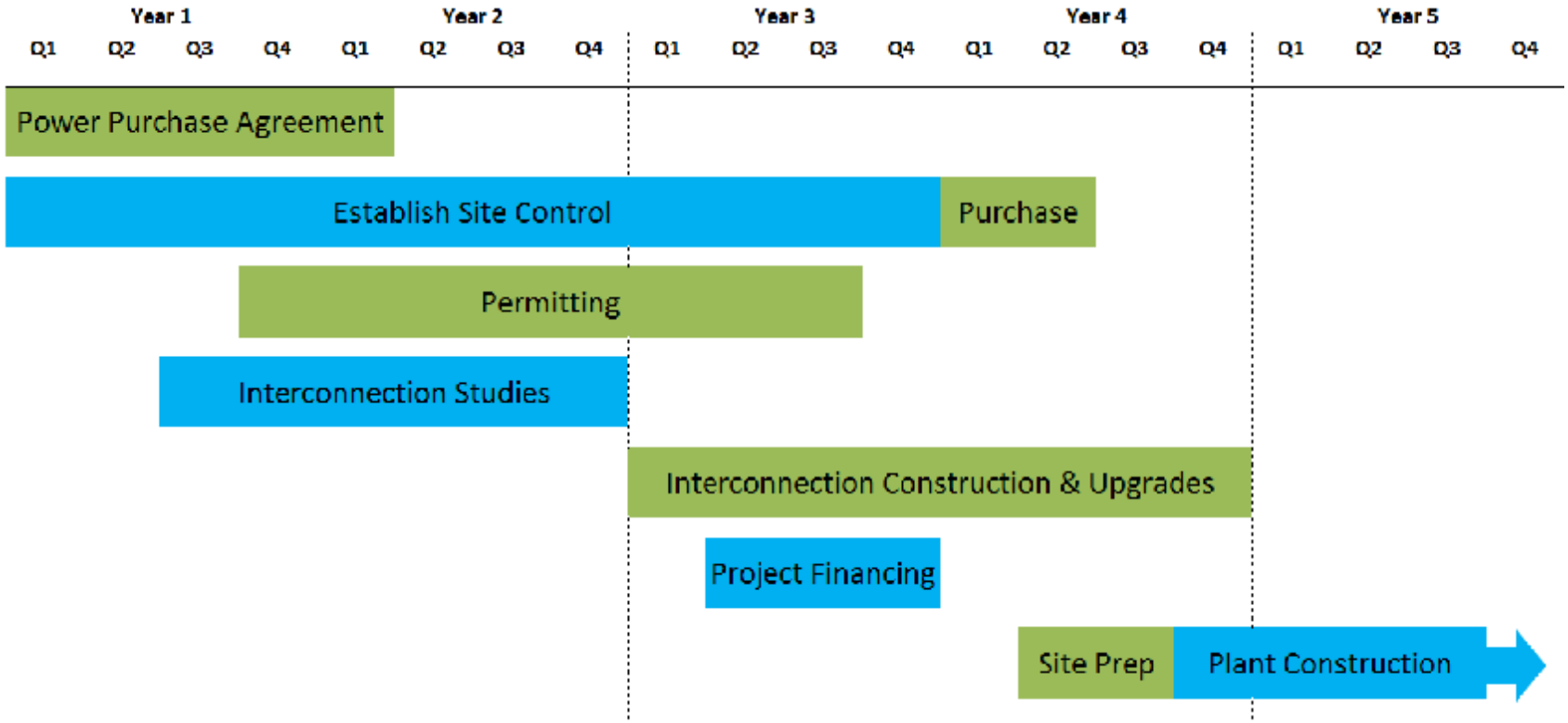
GW of PV are already planned or contemplated in the US…



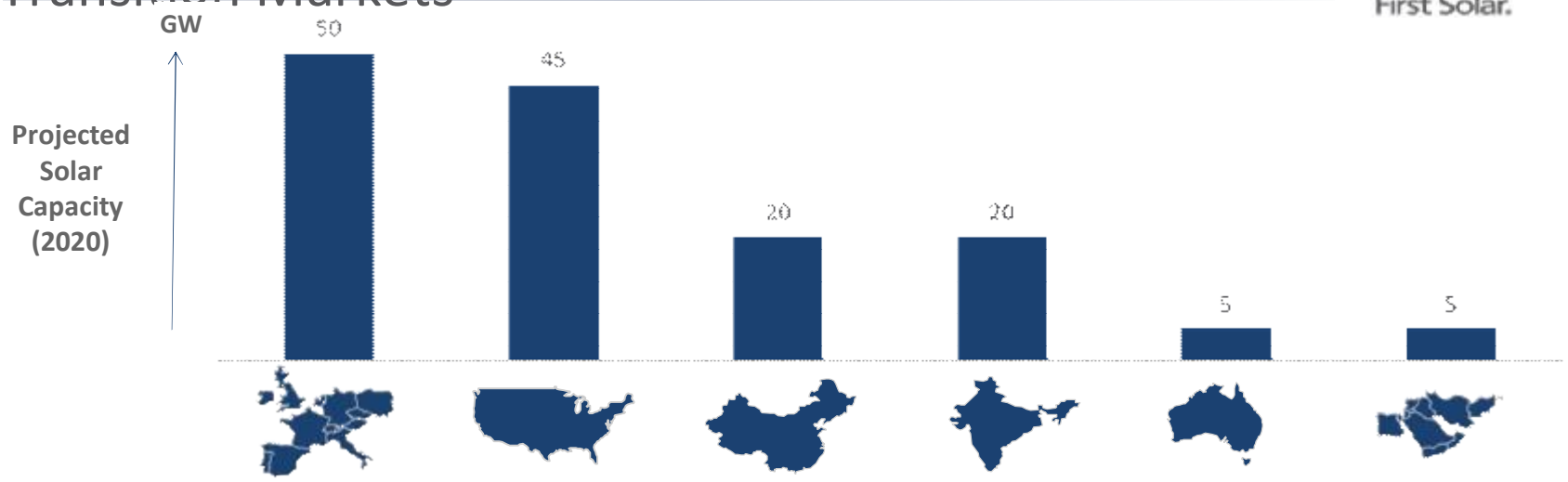
Cumulative Throughput (MWdc)	**50**	**170**	**430**	**810**	**1,570**	**2,290**

Note: Includes Blythe 21 MW AC project and Tri-State 30 MW AC project.

…but the Development timeline is very long



US has a pivotal role in setting global policy for Transition Markets

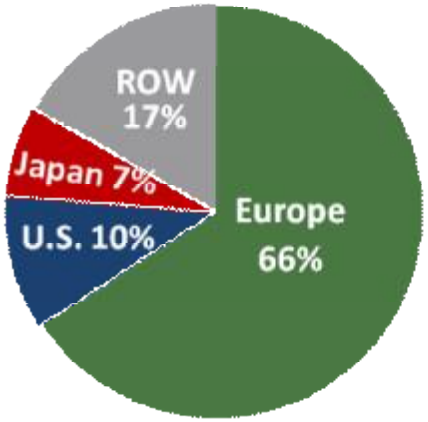


Policy Drivers	EU	U.S.	China	India	Australia	GCC
Feed-in Tariff	✓		✓	✓		
Renewable Goal	✓	✓	✓	✓	✓	✓
Solar Goal	✓	✓	✓	✓		
Carbon Reduction	✓	✓			✓	
Govt. Subsidy		✓	✓		✓	

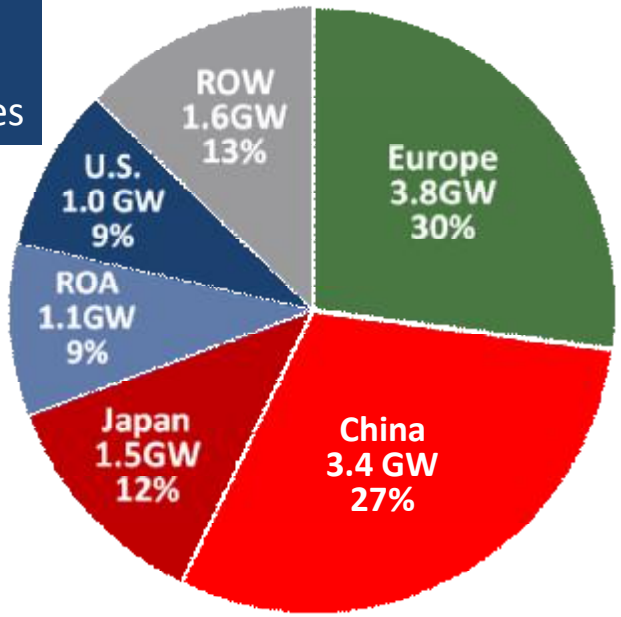
✓ Varies by region ✓ Proposed

Policy Focus Should be on Creating a Large, Robust Solar Market

- Global manufacturing capacity exceeds global demand
- Investment tracks market creation
- Innovation tracks market problems and learning cycles



Estimated Market 2009*
4.5- 5.5 GW



Existing and Announced Mfg Capacity Year-end 2009*

~12 GW, +43% Y/Y

* Source: Consensus of 10 street analysts covering solar sector as of 4/15/09

U.S. Policy Considerations

Today's Issues

R&D

Goals:
- Commercially viable technology

Needed:
- Fundamental R&D
- Applied R&D
- Concept/Pilot Lines
- Alpha Products

Federal Role:
- Selective grants
- Attractive market potential

Commercialization

Goals:
- Commercially proven technology

Needed:
- Commercially viable technology
- Entrepreneurial talent
- Risk capital

Federal Role:
- *Transparent and attractive market opportunities (non-selective)*
- Some federal and state mfg subsidies (non-selective)

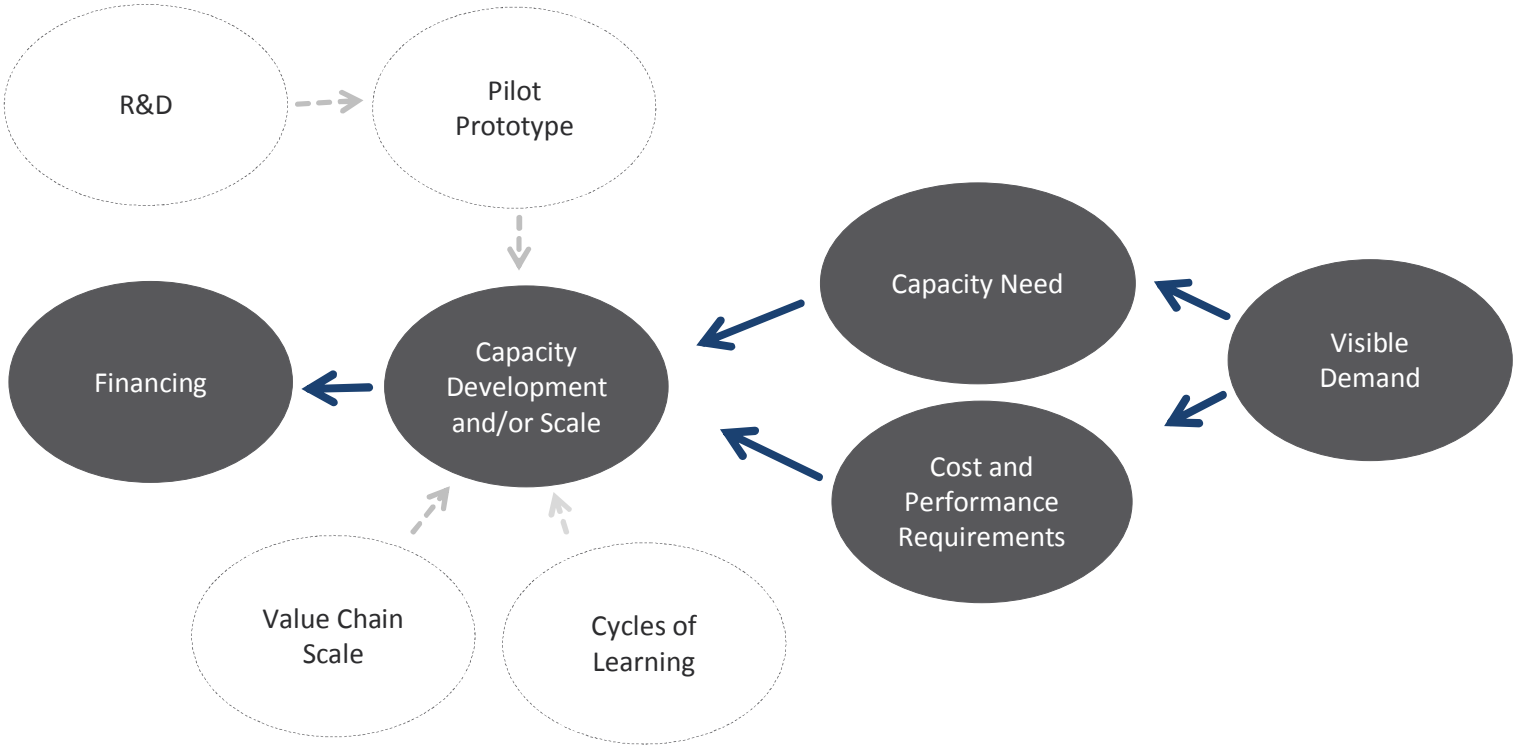
Scale-Up

Goals:
- Technology scaled to economic and performance potential
- Value chain capable of expansion to mass scale

Needed:
- Commercially proven technology
- Markets that enable efficient scale up
- Execution capability
- Growth capital

Federal Role:
- *Transparent and attractive market opportunities (non-selective)*
- Market longevity and volume
- Market price and program guidance
- Incentives for project finance

A Large, Well-Structured Solar Market Drives Investment and Innovation



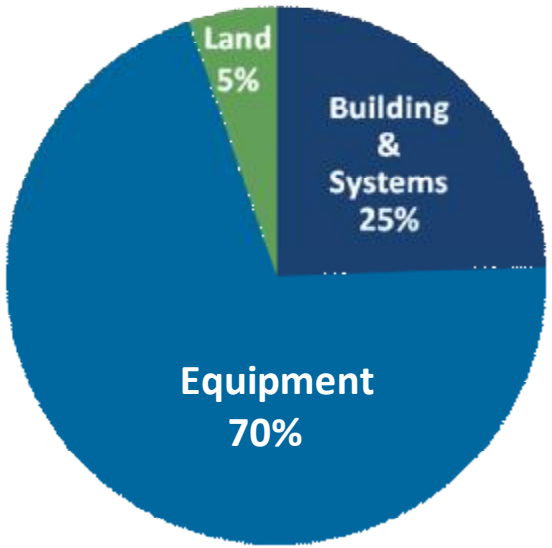
SUMMARY

- Current PV technologies are close to grid parity today at high/medium irradiance
  - $0.93/W tracking at 15%/yr cost/W reduction
- Invest in continuous-improvement pathways in addition to basic research
- Permitting, infrastructure and scale are major challenges that the DoE can help drive
  - Mandatory Renewable Portfolio Standards drive utility adoption
  - Incentives and loan guarantees at the utility level have an excellent risk/reward profile [market development]
  - Demonstration-scale programs in storage, intermittency will enable PV in a technology-agnostic fashion [Demonstration program]
  - Standardisation of the permitting procedures across utilities would enormously benefit all renewables
- PV industry will benefit from non-blocking IP provisions for basic research

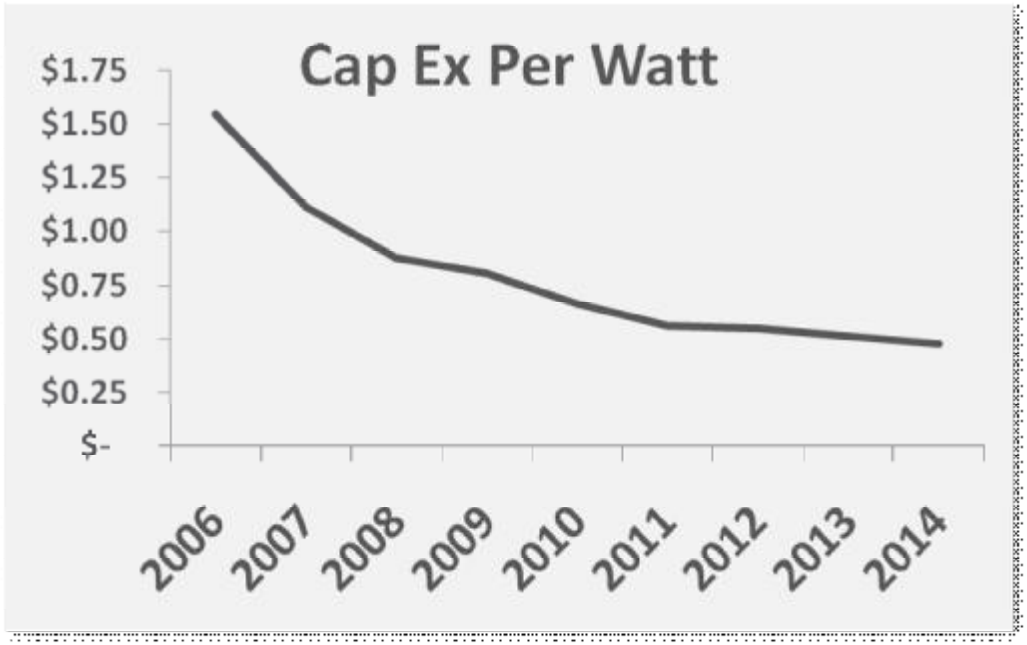
First Solar

Back-Up slides

Capital Expense Cost per Watt Scales

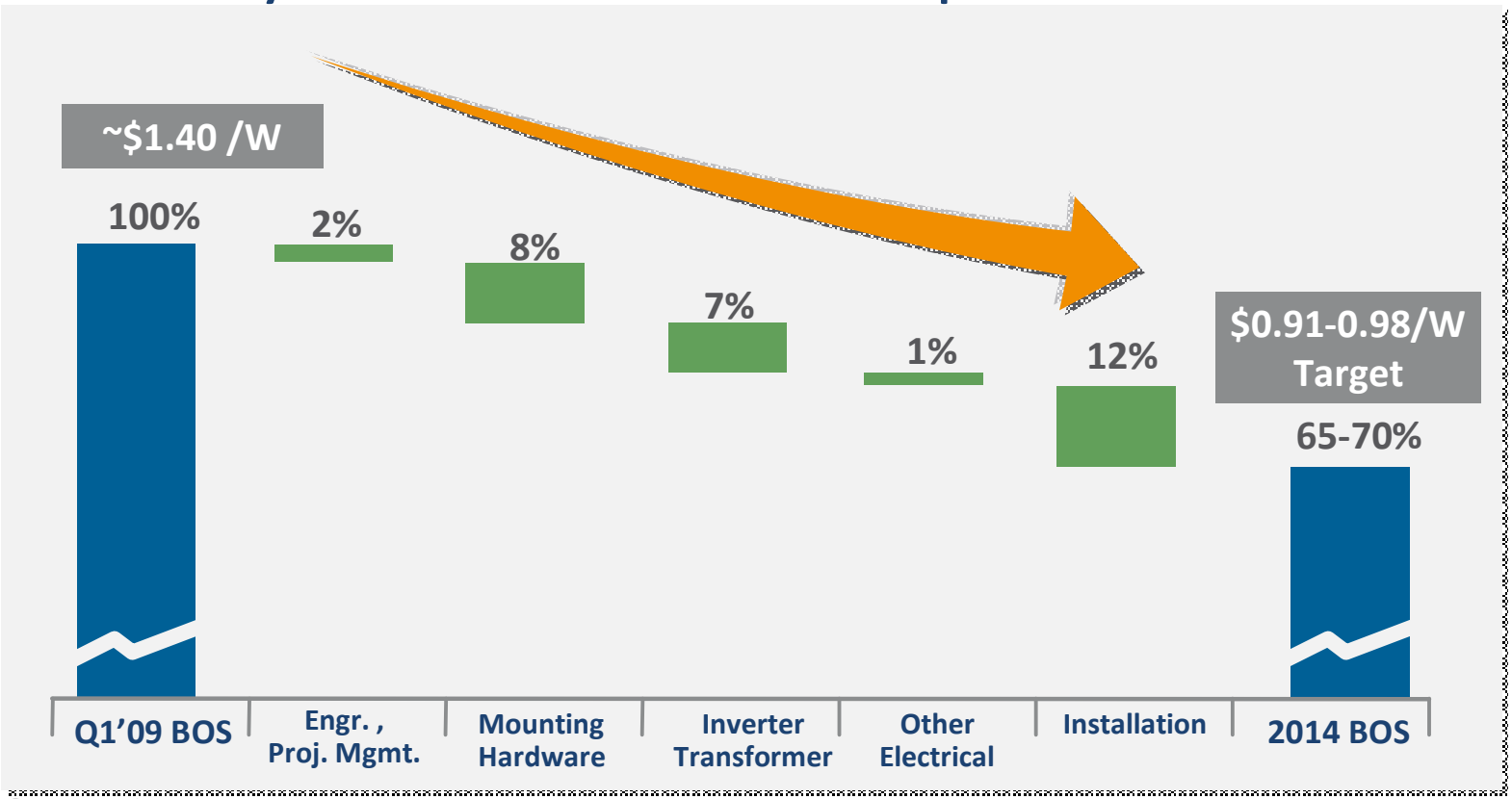


$160M/4 line plant



New Roadmap to Grid Parity

Balance of System* Cost Reduction Roadmap



* Excludes Site Specific costs, BOS profits, sales tax, finance costs, SG&A costs and project development costs and assumes optimal labor. costs