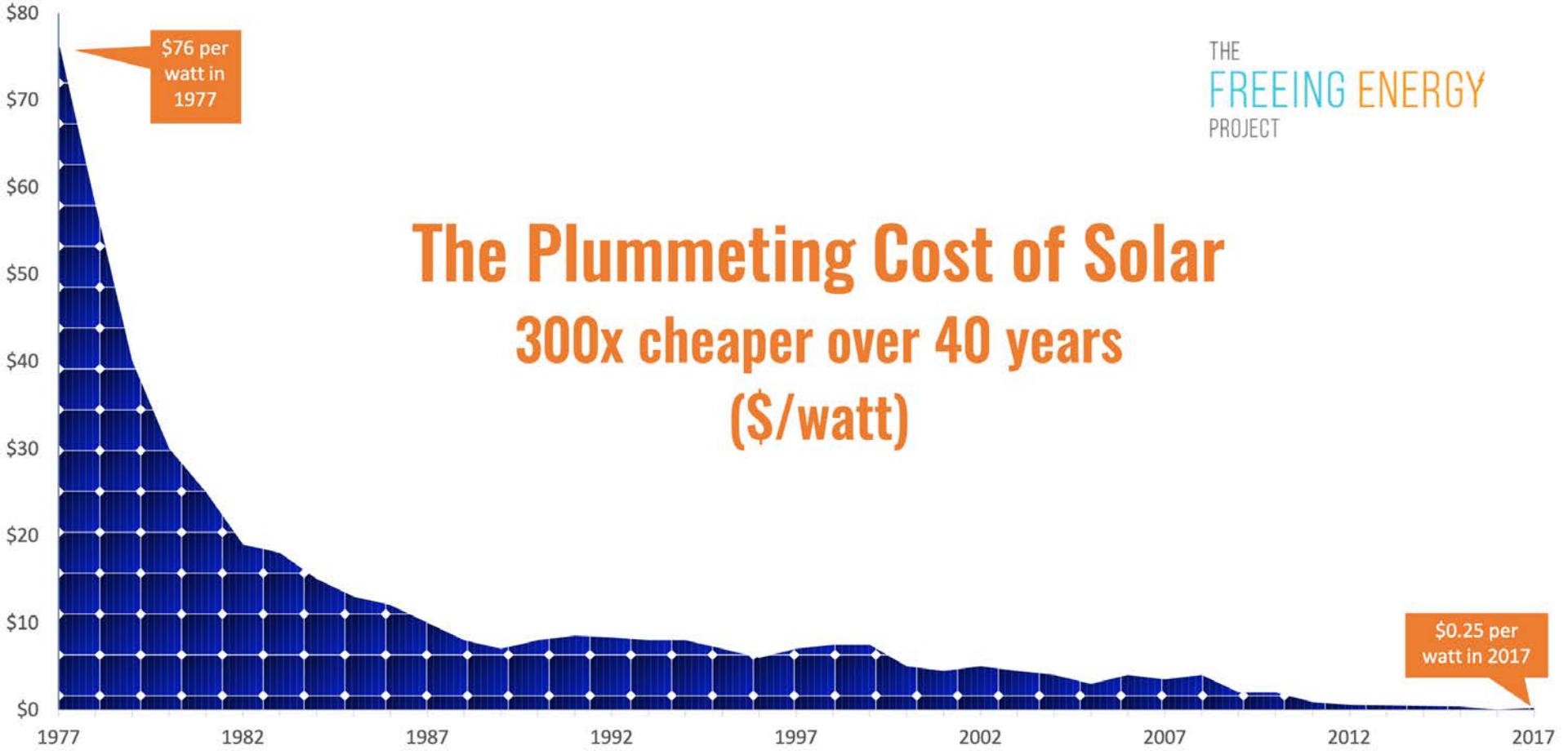
DOCKETED	
Docket Number:	19-SB-100
Project Title:	SB 100 Joint Agency Report: Charting a path to a 100% Clean Energy Future
TN #:	230987
Document Title:	Leila Madrone - Solar PV
Description:	Presentation by Leila Madrone, Sunfolding
Filer:	Harinder Kaur
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	12/4/2019 9:41:04 AM
Docketed Date:	12/4/2019

sunfolding

Next-Generation Solar Infrastructure



THE FREEING ENERGY PROJECT

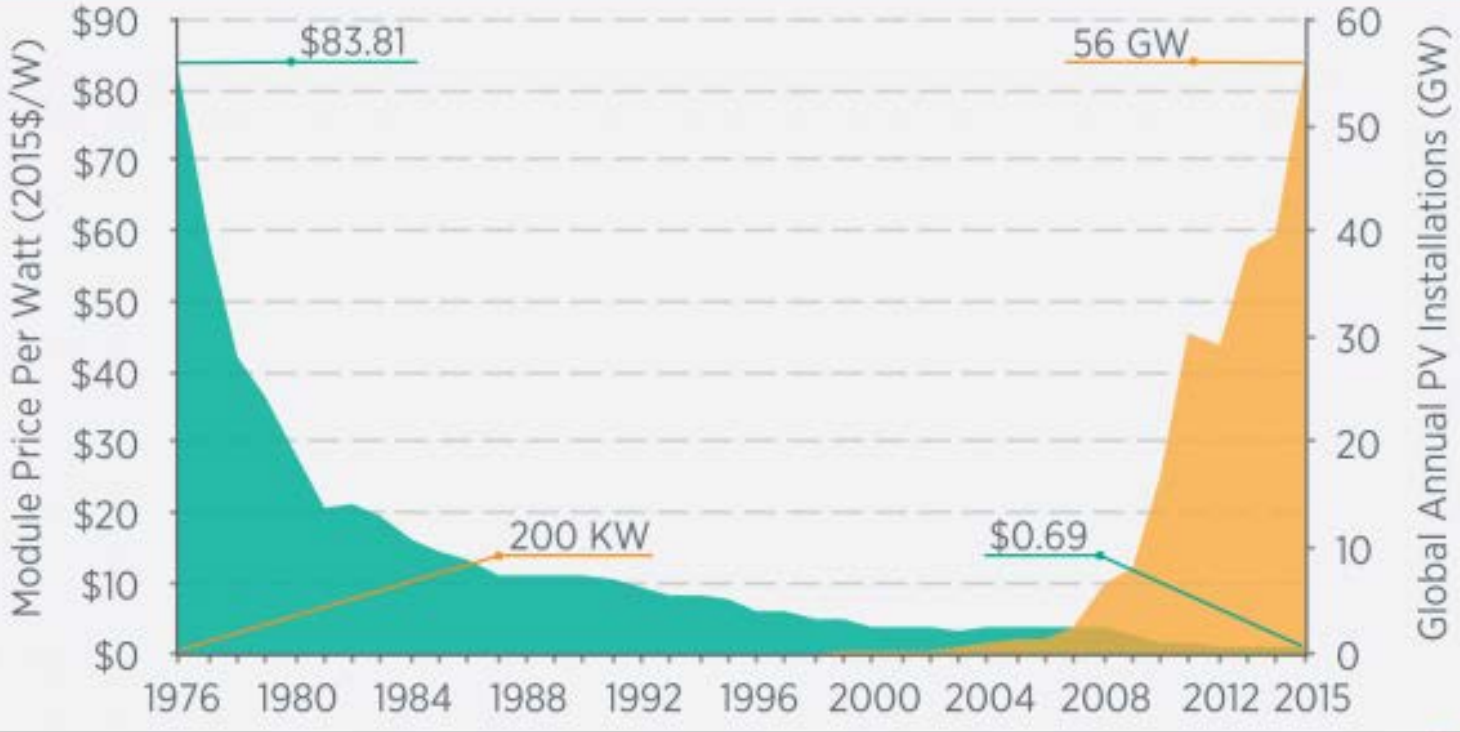
The Plummeting Cost of Solar

300x cheaper over 40 years

($/watt)

Sources: Bloomberg New Energy Finance, National Renewable Laboratories, Freeing Energy

AS SOLAR MODULE COSTS DECLINE, ANNUAL INSTALLATIONS RISE

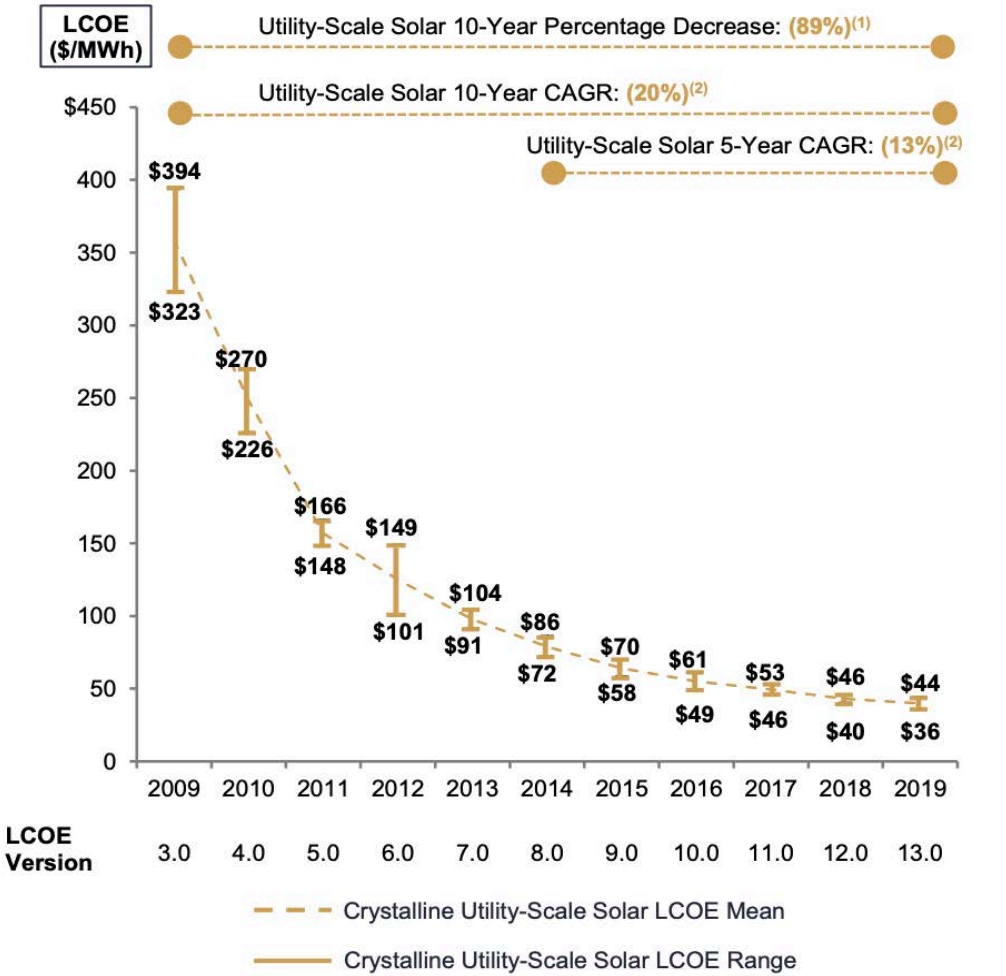


energy.gov/sunshot

SunShot U.S. Department of Energy

sunfolding

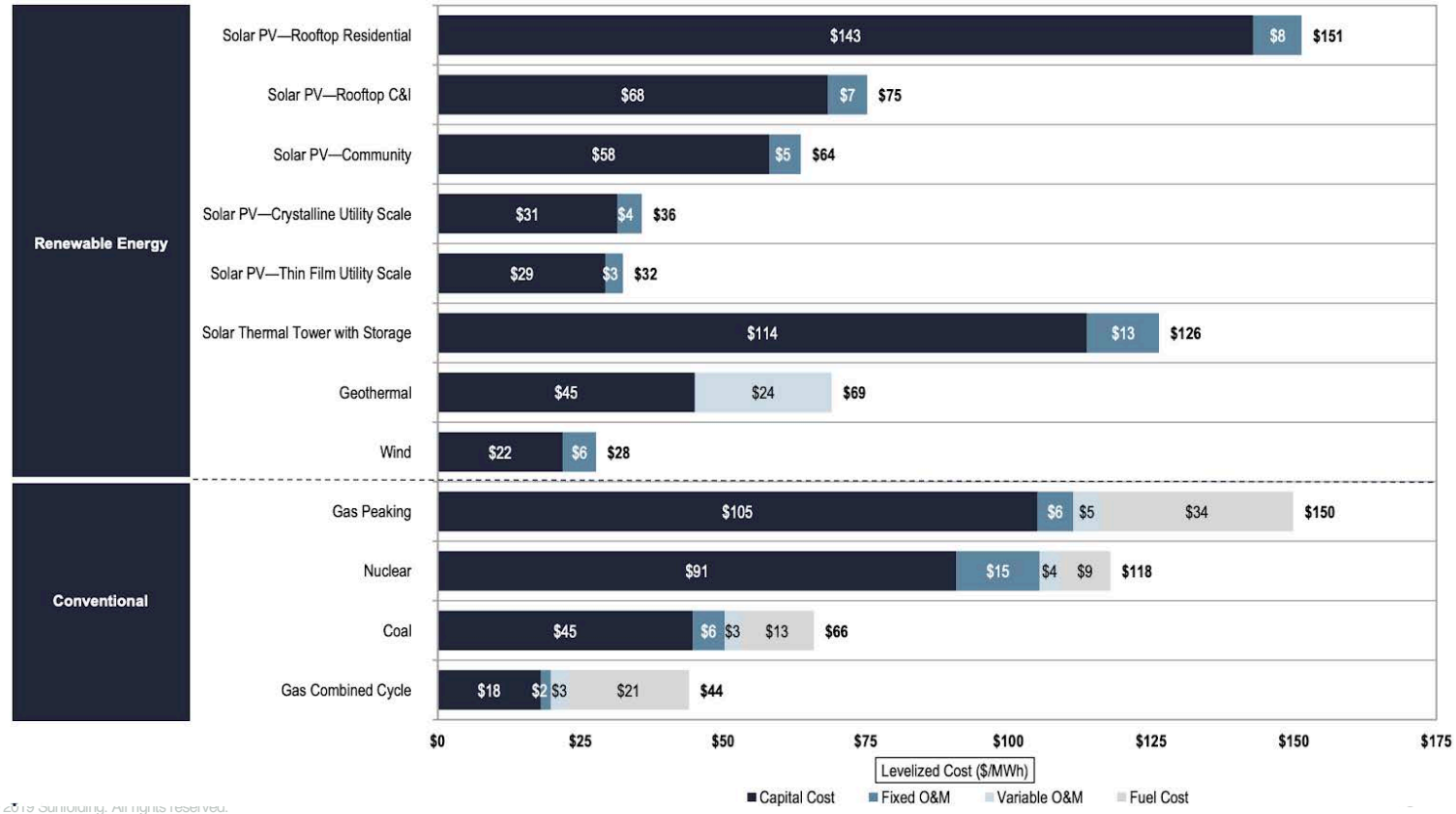
Unsubsidized Solar PV LCOE



sunfolding

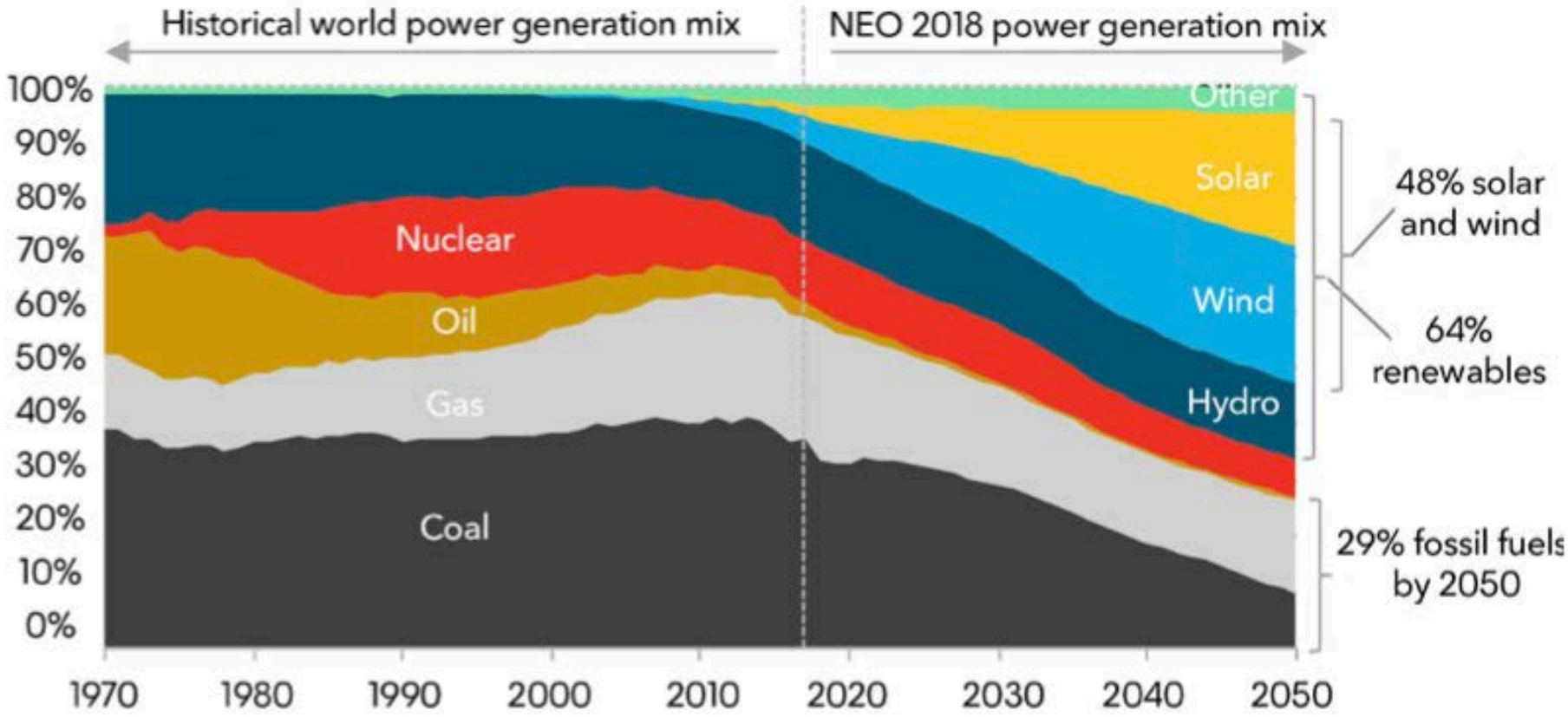
Levelized Cost of Energy Components—Low End

Certain renewable energy generation technologies are already cost-competitive with conventional generation technologies; a key factor regarding the continued cost decline of renewable energy generation technologies is the ability of technological development and industry scale to continue lowering operating expenses and capital costs for renewable energy generation technologies



unfolding

Power generation mix

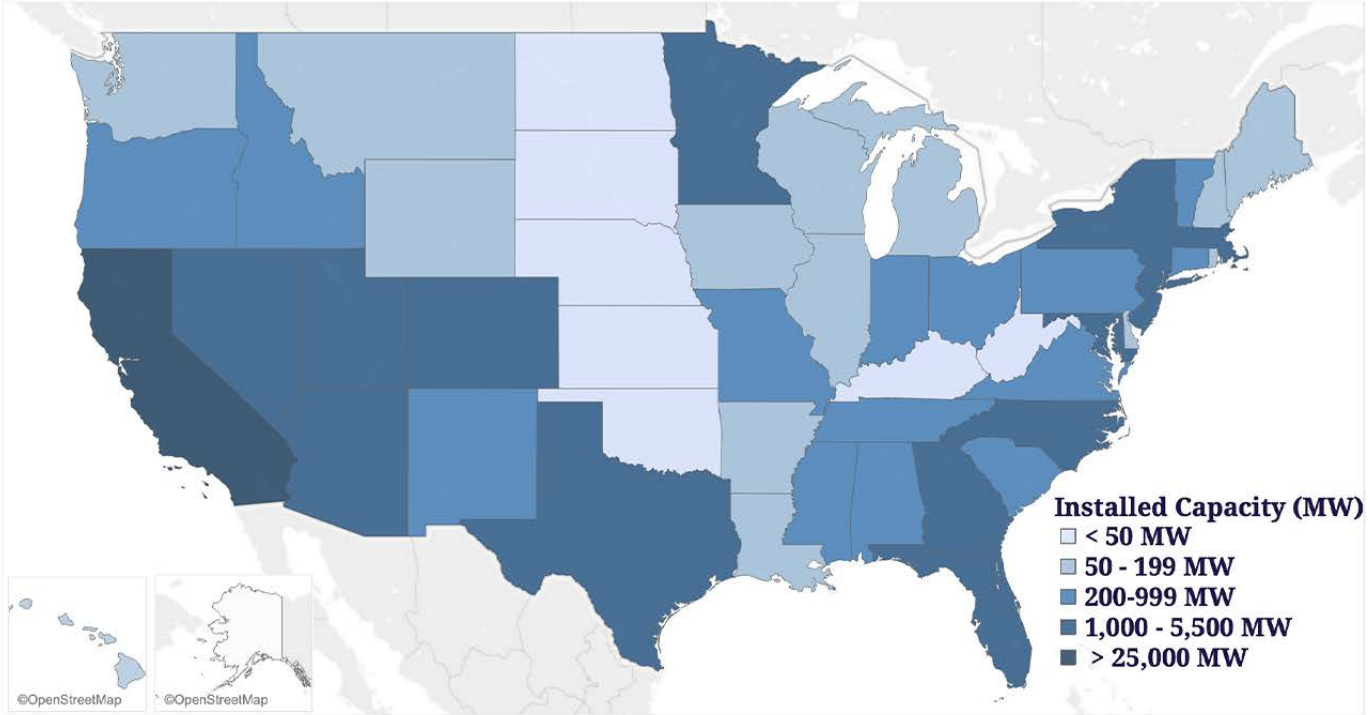


Source: Bloomberg NEF, IEA.

California Ranks First

Top 10 States

California	25,016 MW
North Carolina	5,467 MW
Arizona	3,788 MW
Nevada	3,452 MW
Florida	3,156 MW
Texas	2,957 MW
New Jersey	2,829 MW
Massachusetts	2,535 MW
New York	1,718 MW
Utah	1,661 MW
Georgia	1,572 MW



Wood Mackenzie POWER & RENEWABLES

SEIA Solar Energy Industries Association®

© 2019

sunfolding

California Fact Sheet

- Solar Installed: 25,772.8 MW (3,396.2 MW installed in 2018)
- National Ranking: 1st (1st in 2018)
- Enough Solar Installed to Power: 6,709,000 homes
- Percentage of State's Electricity from Solar: 18.74%
- Solar Jobs and Ranking: 76,838 (1st in 2018)
- Solar Companies in State: 2,767 companies total; 477 Manufacturers, 1,310 Installers, 980 Others
- Price Declines: 32% in the last 5 years
- Growth Projections and Ranking: 15,132 MW over the next 5 years (ranks 1st)

Solar is cheaper than coal

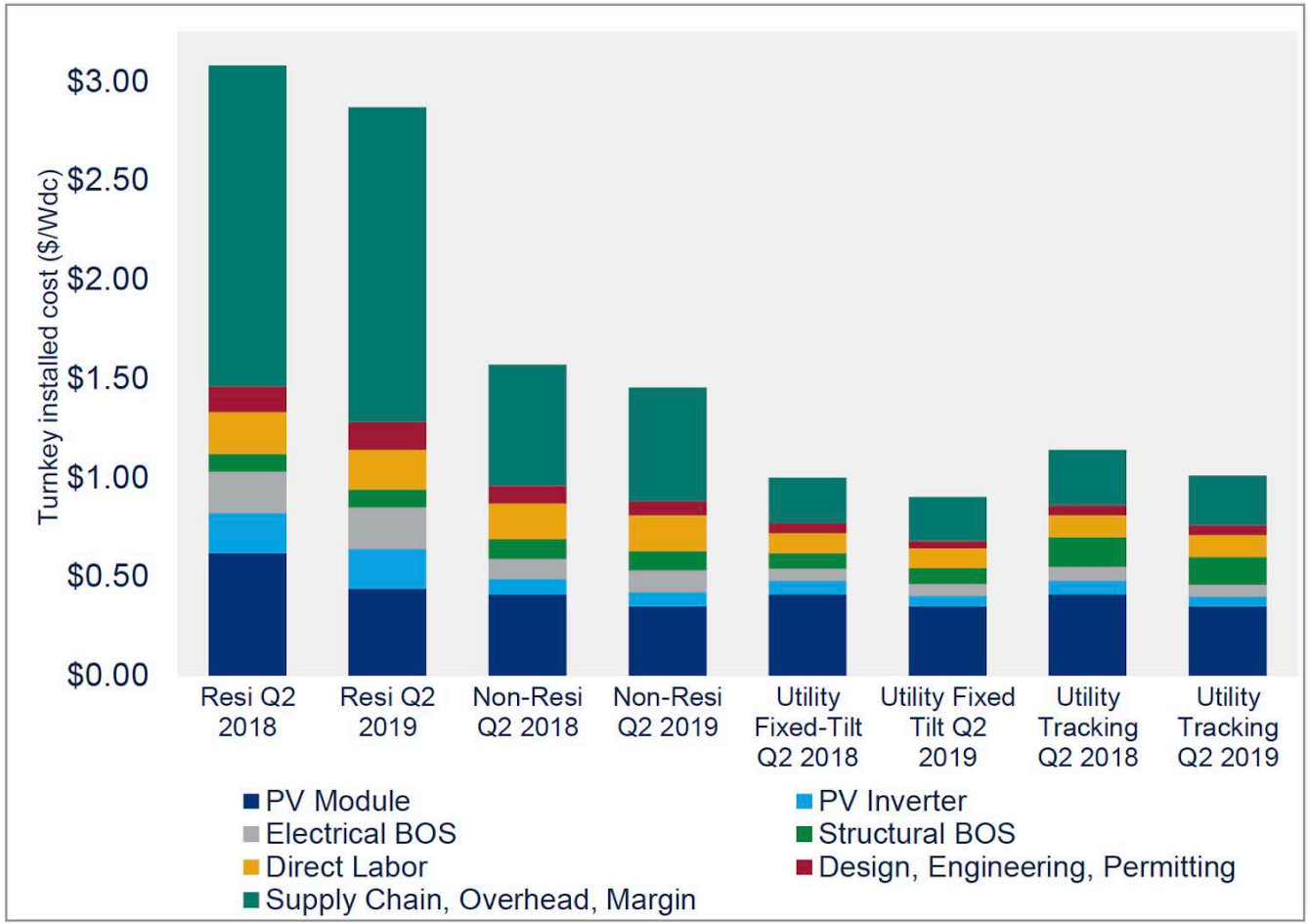
Solar is cheaper than coal (sometimes)

Solar is cheaper than coal

(sometimes)

It’s complicated.

US Average System Costs by Market Segment, 2018Q2 and 2019Q2



Source: Wood Mackenzie Power & Renewables

sunfolding

The problem:

How to make Future ROI ≥ Predicted ROI

At a time when:

- **Project sites/conditions are getting more challenging**
- **PPA prices are only going down**

New factors in solar keep contributing to drive up fully installed/operating costs while prices keep going down.

The problem:

How to make Future ROI ≥ Predicted ROI

Solar continues to be a viable solution only if innovation continues to drive down costs and expand the boundaries of where solar can go.

Next Generation Solar Infrastructure

Opportunities:

- LAND USAGE
- CONSTRUCTION
- MAINTENANCE

sunfolding

Solar sites built in the past look like this:

and the future of solar looks like this:

The opportunity:

How to make Future ROI ≥ Predicted ROI

LAND USAGE
More capacity, higher efficiency, develop any site

CONSTRUCTION
Faster/automated installation, reduce civil work

MAINTENANCE
Less O&M locations, reduce long-term operating costs