

The True Costs: Solar Photovoltaics

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Renewable cost analysis at IRENA

Fills an important gap in knowledge

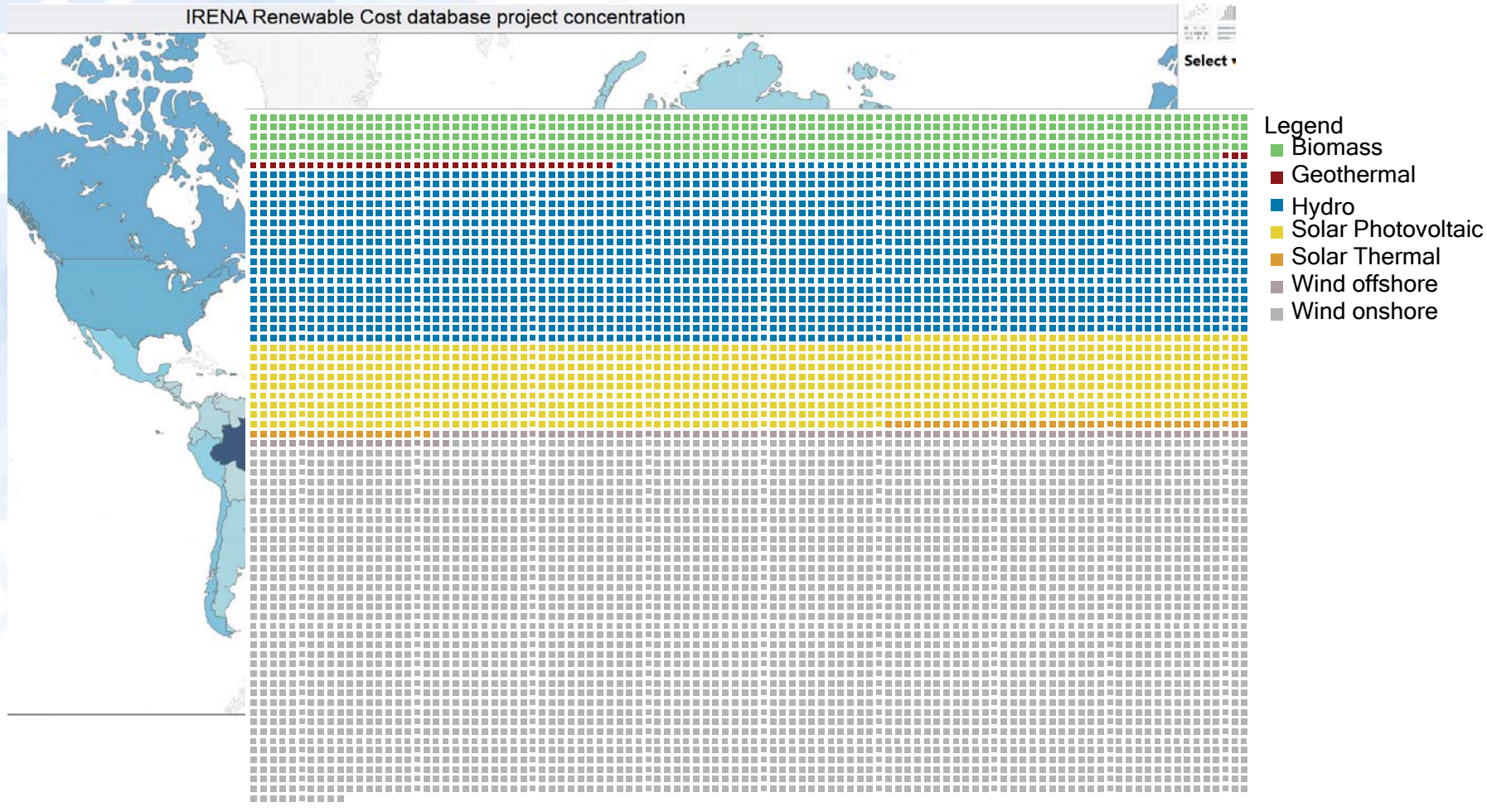
World-class database of costs

Cutting edge analysis, not just data

More products and analysis coming

Costing Alliance deepens engagement

Power generation database



15000 utility-scale projects, 9000 with LCOE data

Highlights

The relentless improvement in competitiveness continues

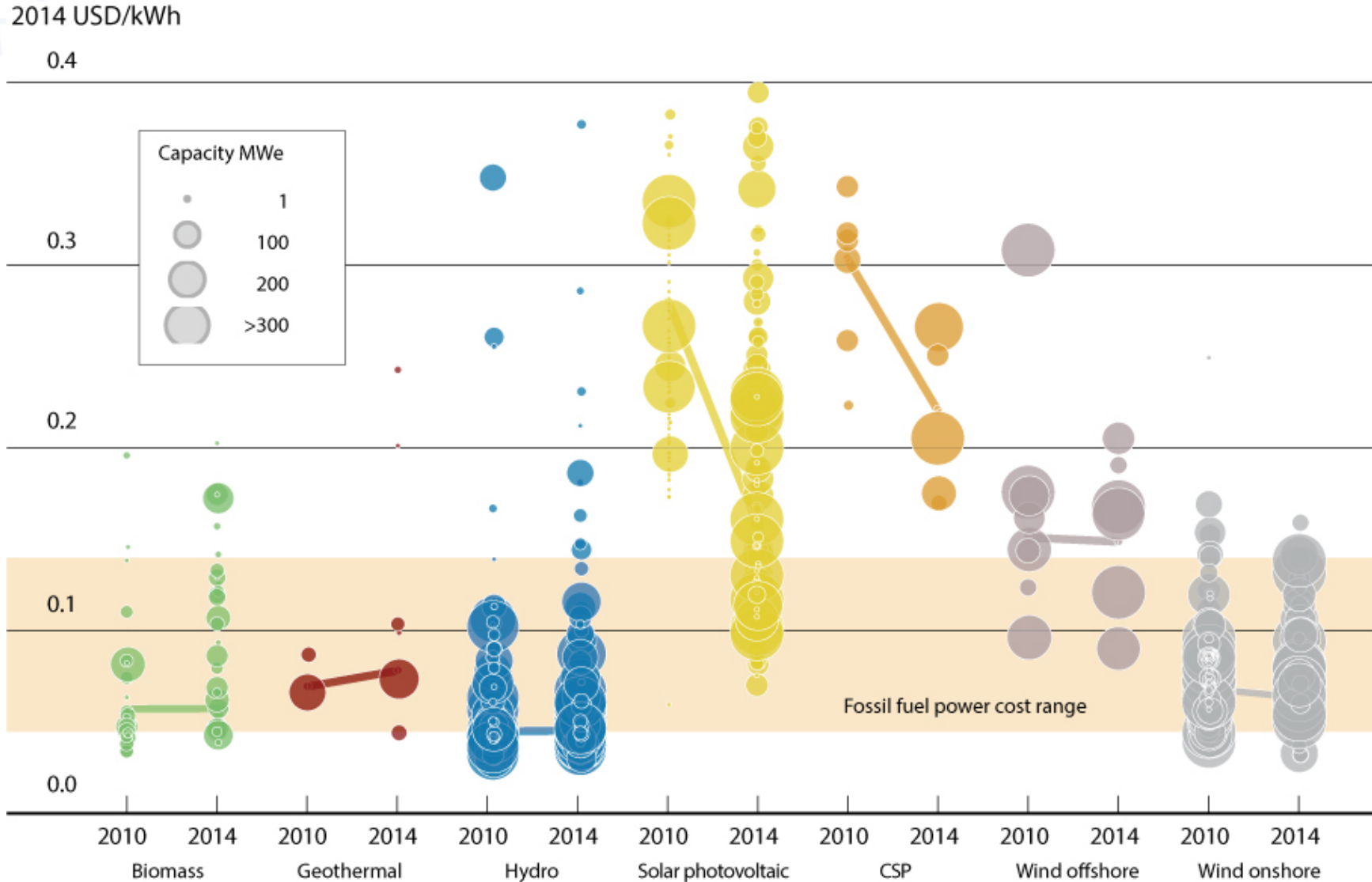
Renewables competing head-to-head with fossil fuels

Integrating variable renewables doesn't change the conclusions

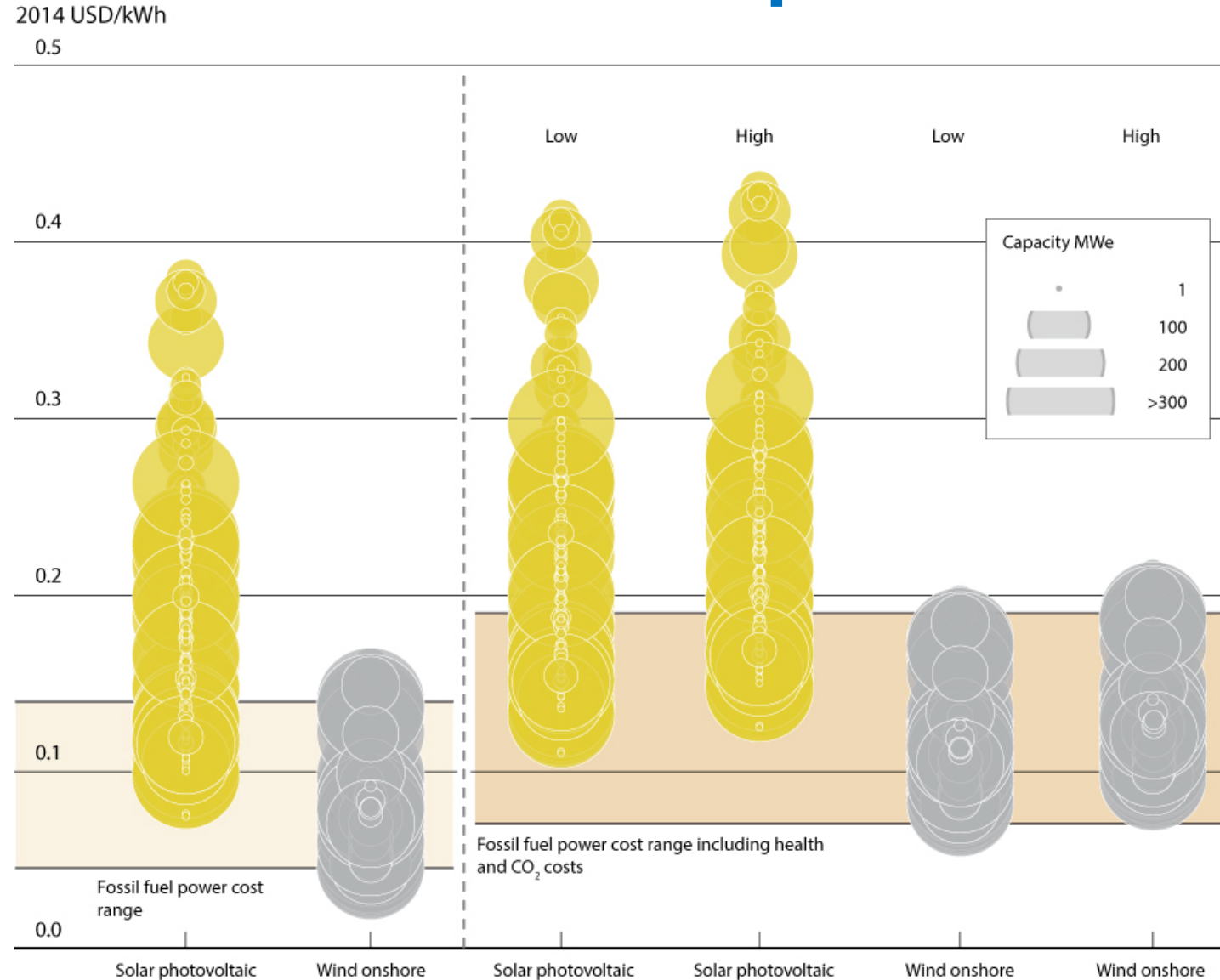


Future cost reductions will be more challenging
policy driven

Renewables competitiveness continues to improve



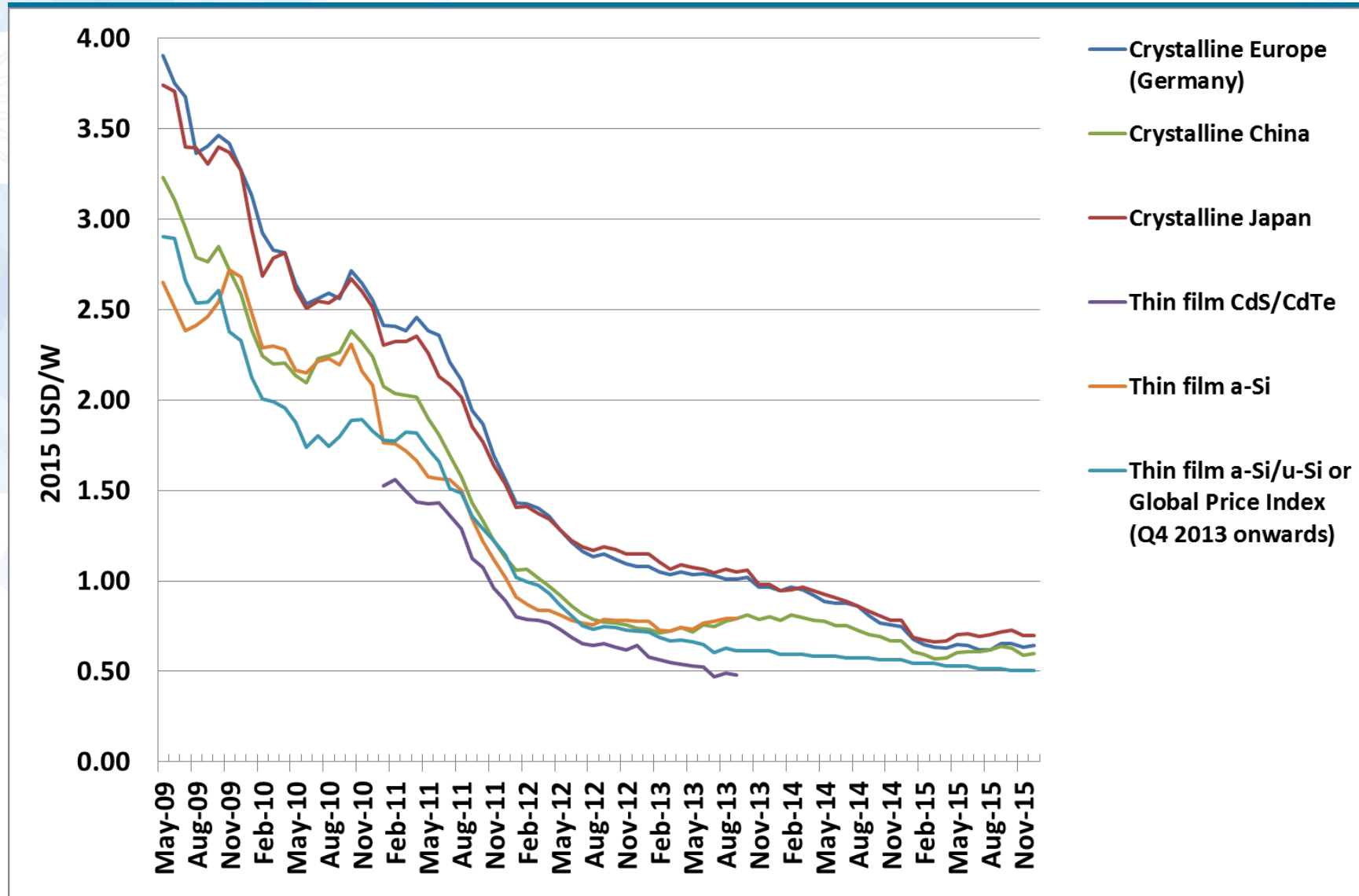
Integrating high levels of variable renewables is competitive





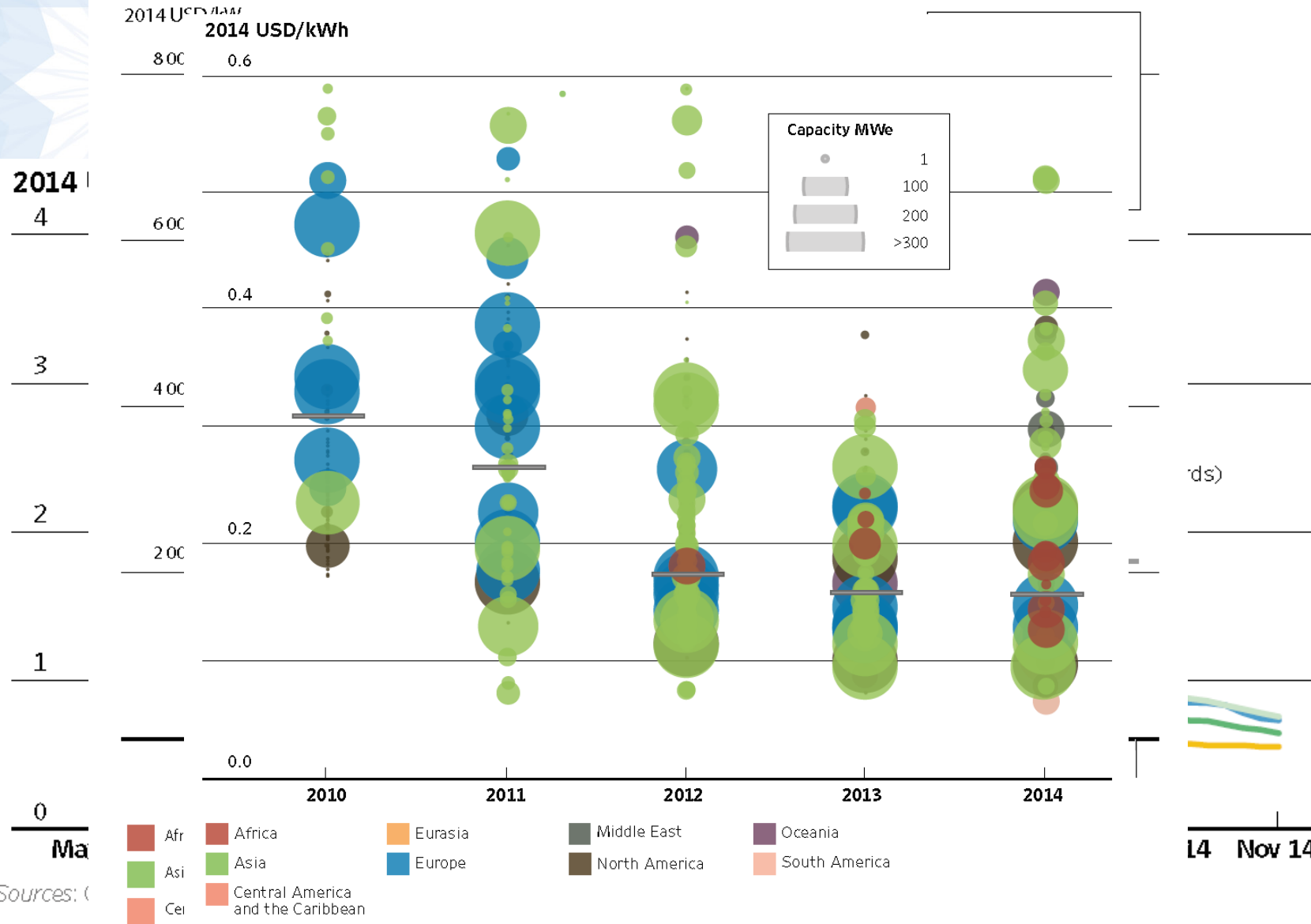
SOLAR PV COSTS

Solar PV module prices



Sources: Based on data from IFA and the Photovoltaic Technology Platform, 2011; GlobalData, 2014; GTM Research, 2014; Liebrecht, 2011; pvXchange, 2014 and IRENA analysis.

Solar PV modules and utility-scale projects



Technology improvements
and
cost reductions

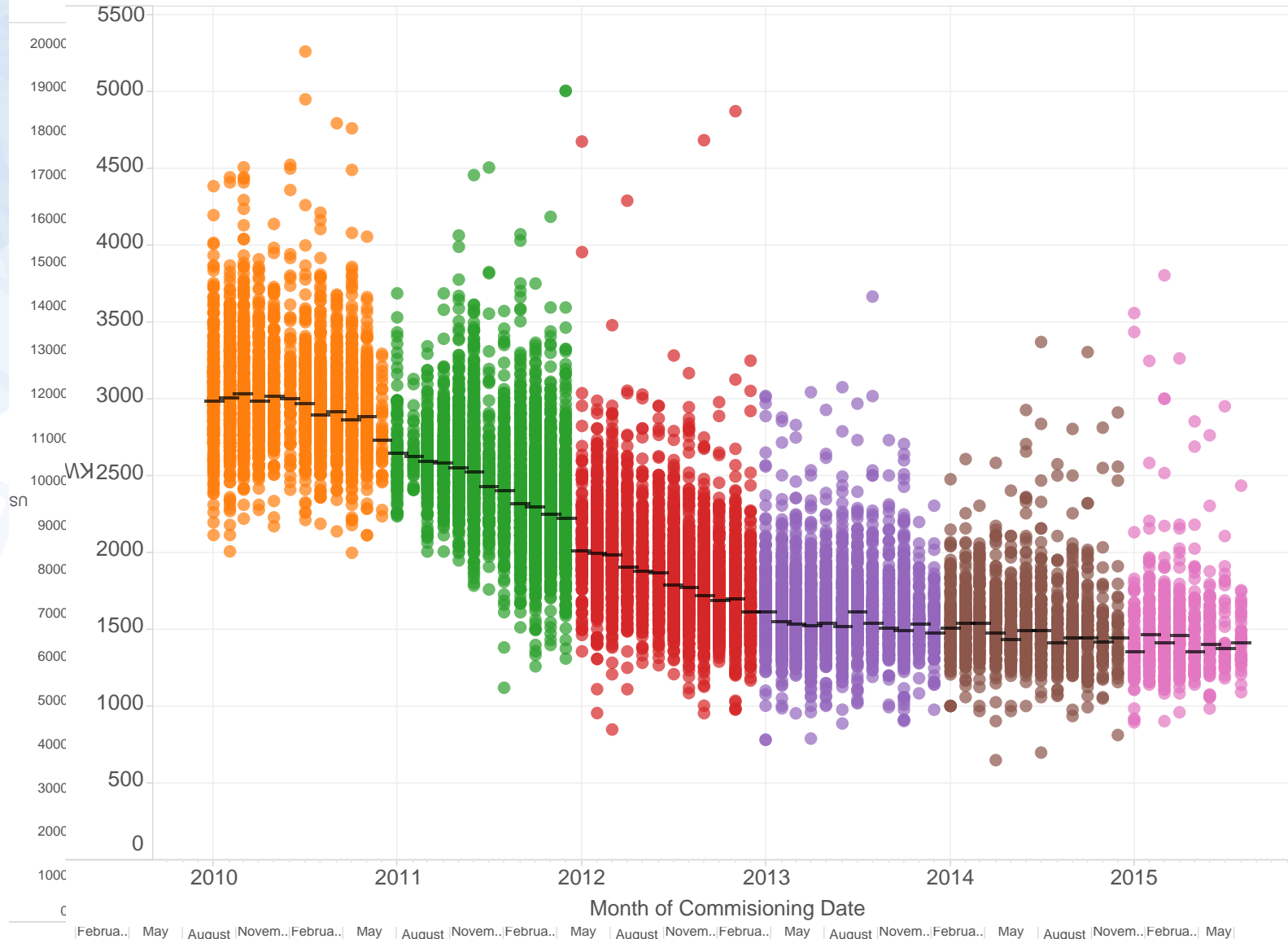
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Falling LCOEs

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Residential installed costs continue to edge lower

California
Germany

German residential PV system costs (2010 to 2015) source: EuPD

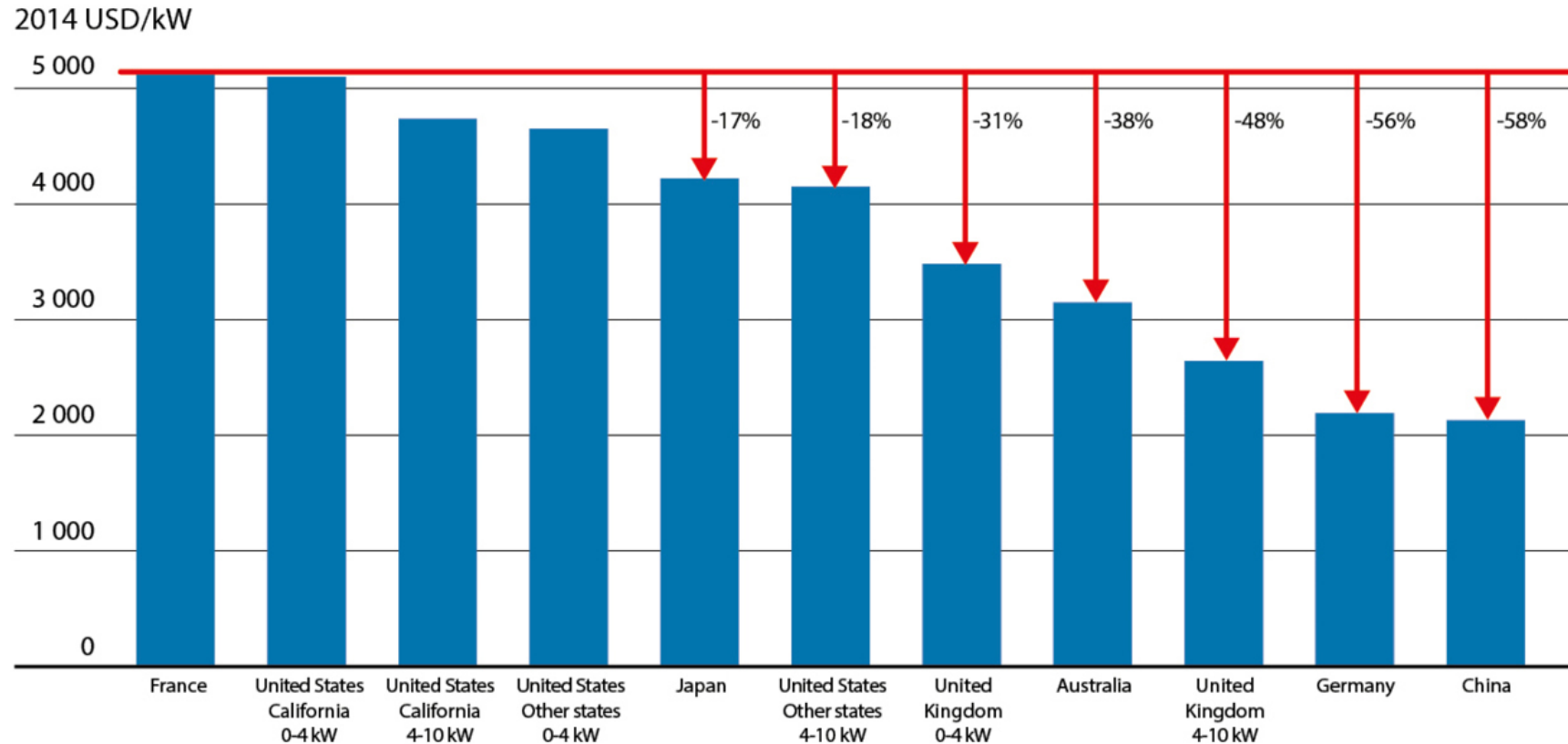


Residential solar PV: Average cost differentials

RENEWABLE POWER GENERATION COSTS IN 2014



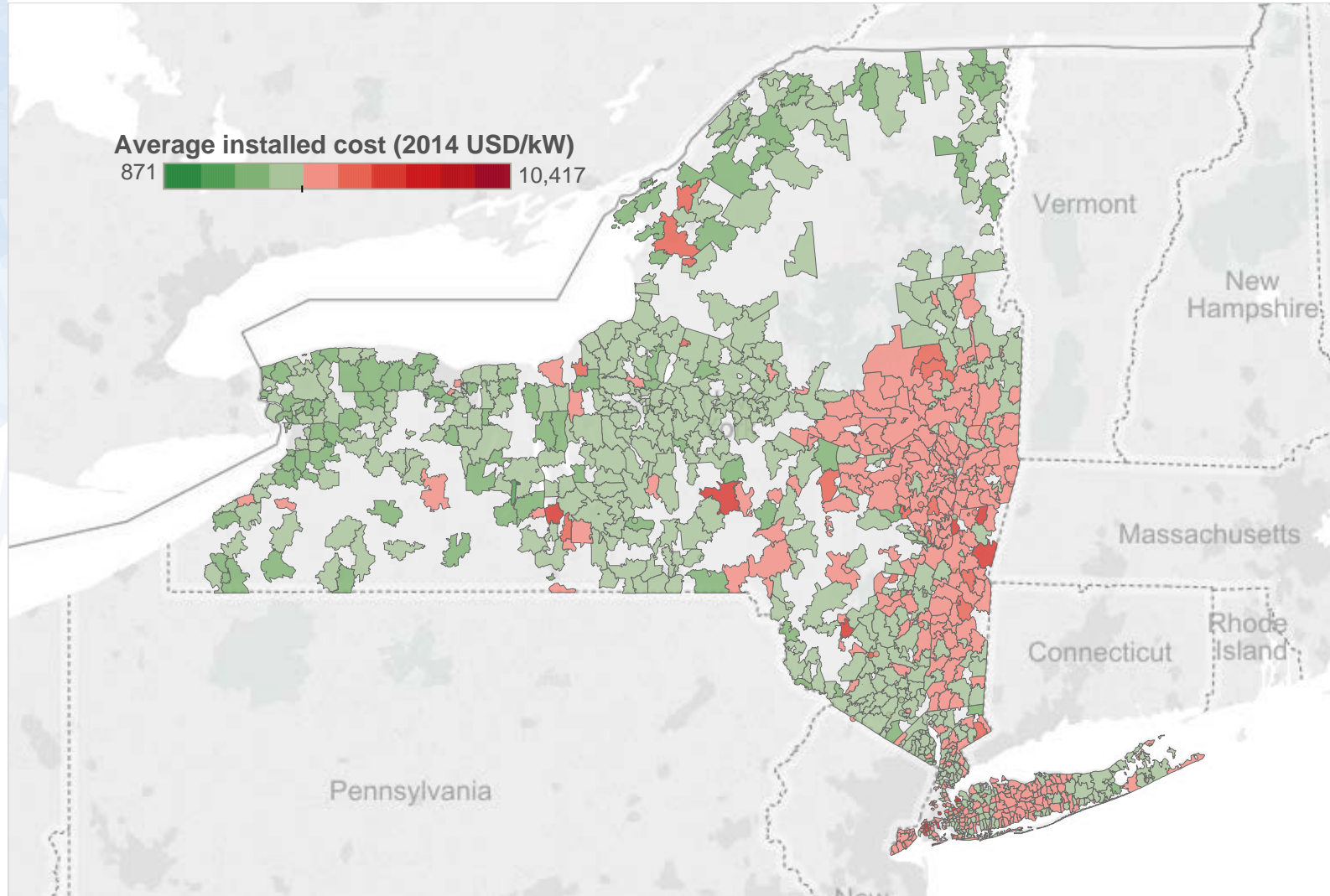
FIGURE 5.11: ESTIMATED AVERAGE TOTAL INSTALLED PV SYSTEM COSTS IN THE RESIDENTIAL SECTOR BY COUNTRY, 2014



Source: IRENA Renewable Cost Database; DECC, 2014; GSE, 2014; IEA PVPS, 2014; and Photon Consulting, 2014.

Where do costs differ? Why?

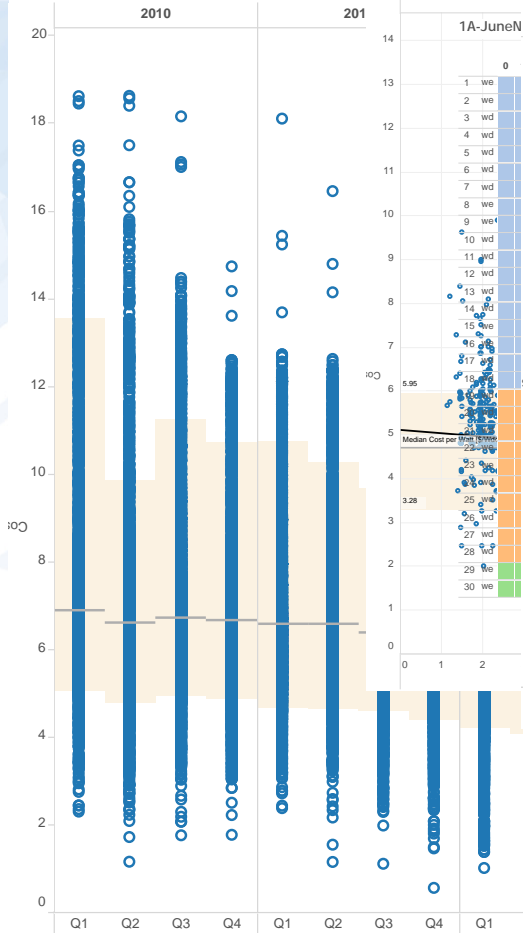
Average residential PV system cost (relative to 2014 median)



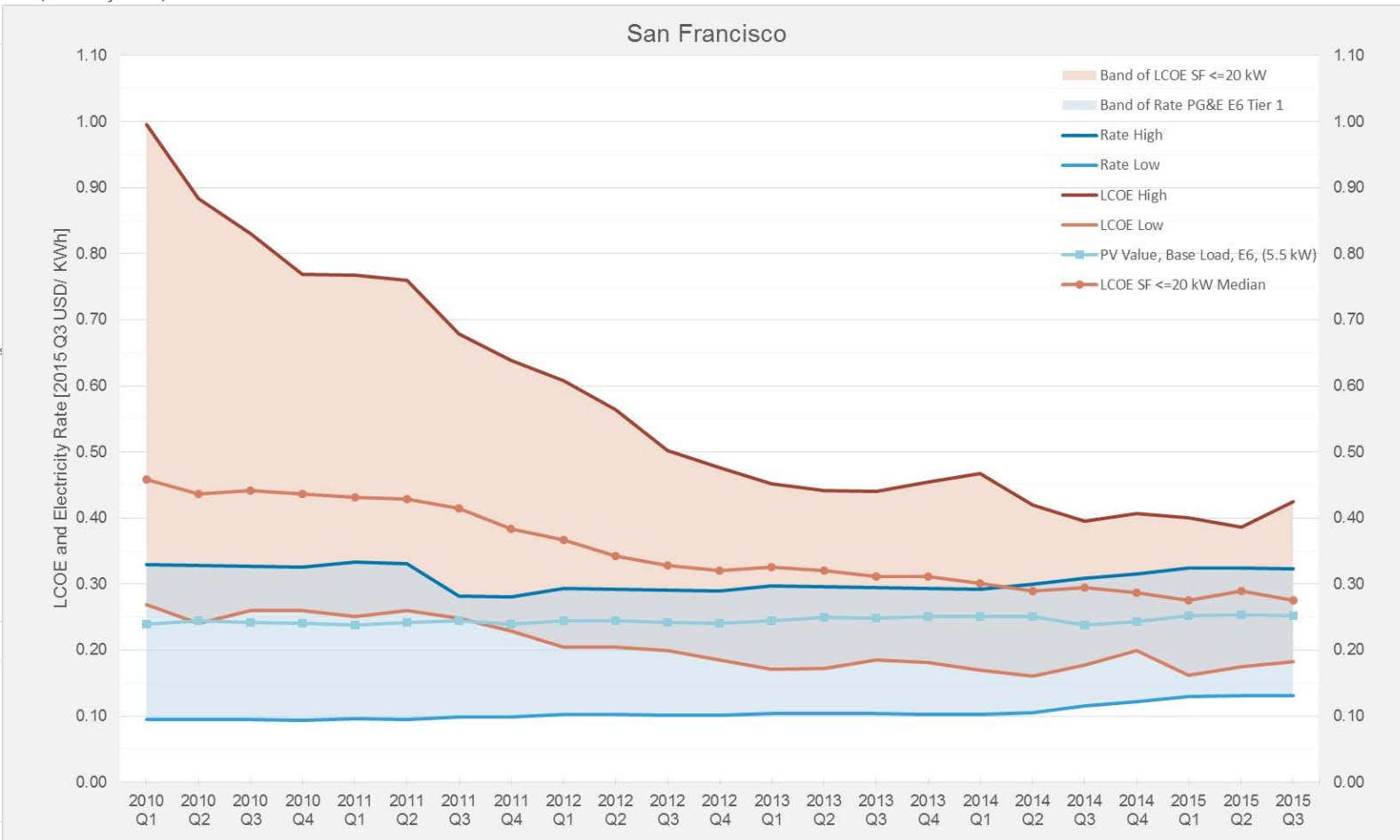
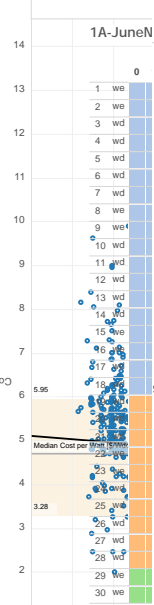
PV Parity Indicators (Preview)

Real Conventional Electricity Rates Analysis

Evolution of Costs per Quarter (Preliminary)



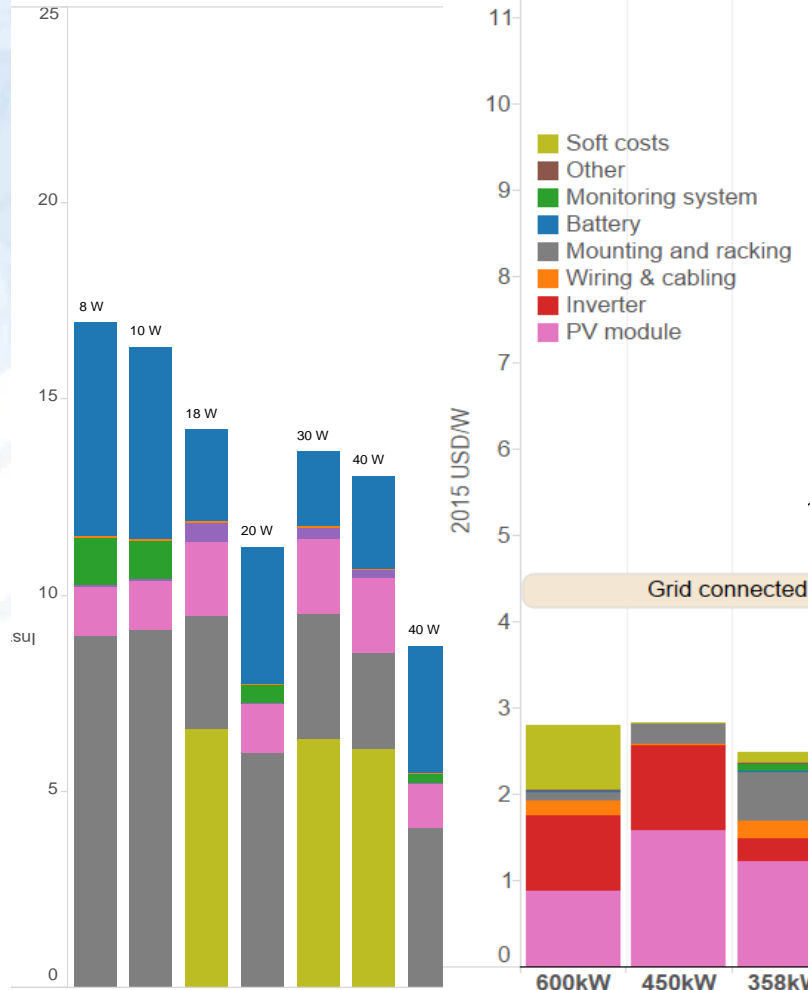
Costs in 2014 vs System Size (Preliminary Results)



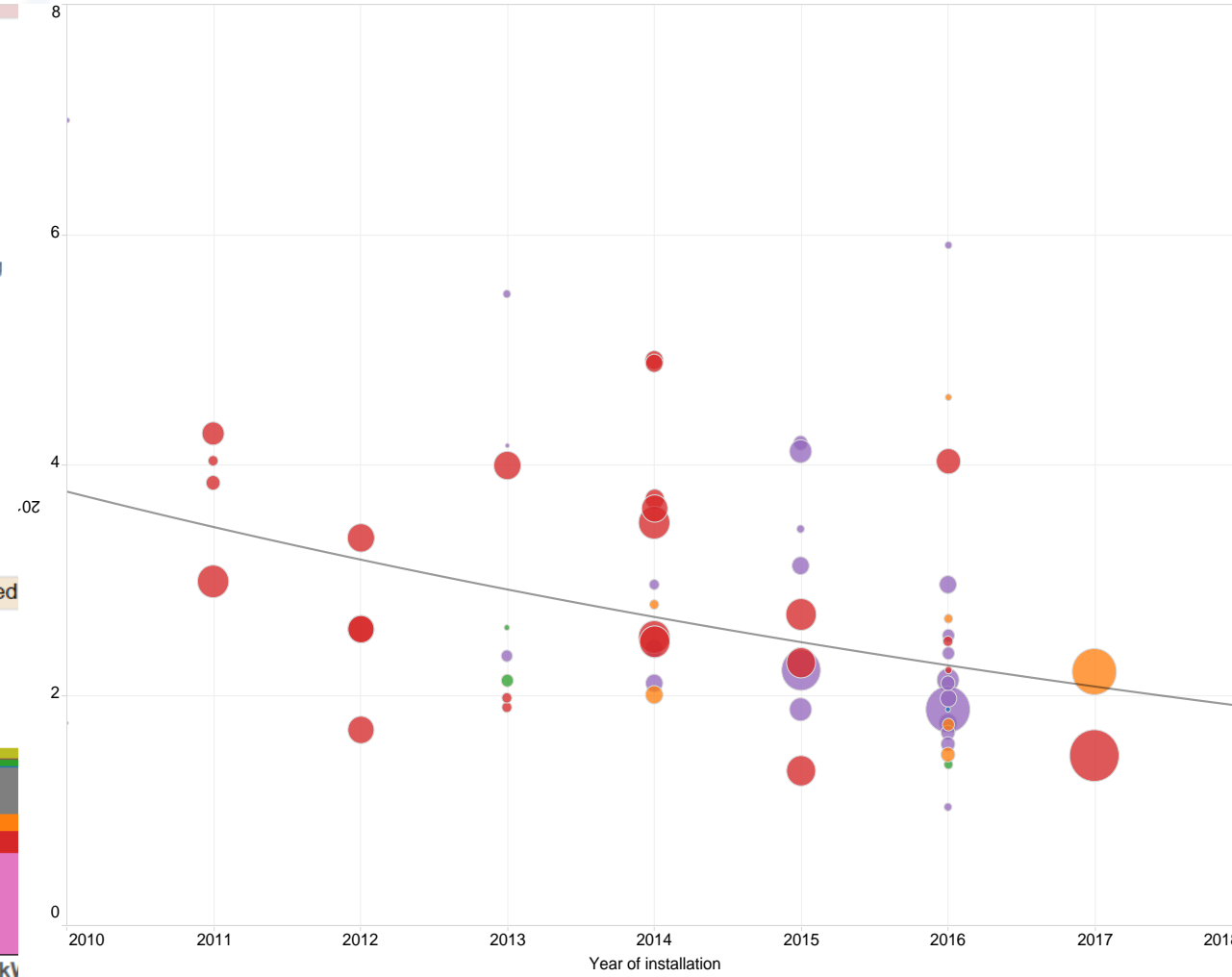
Solar PV Costs in Africa

Solar home systems

SHS < 1kW non-institutional



Mini-grids



Mini-grid project

COST REDUCTION POTENTIALS

Cost reduction drivers are changing

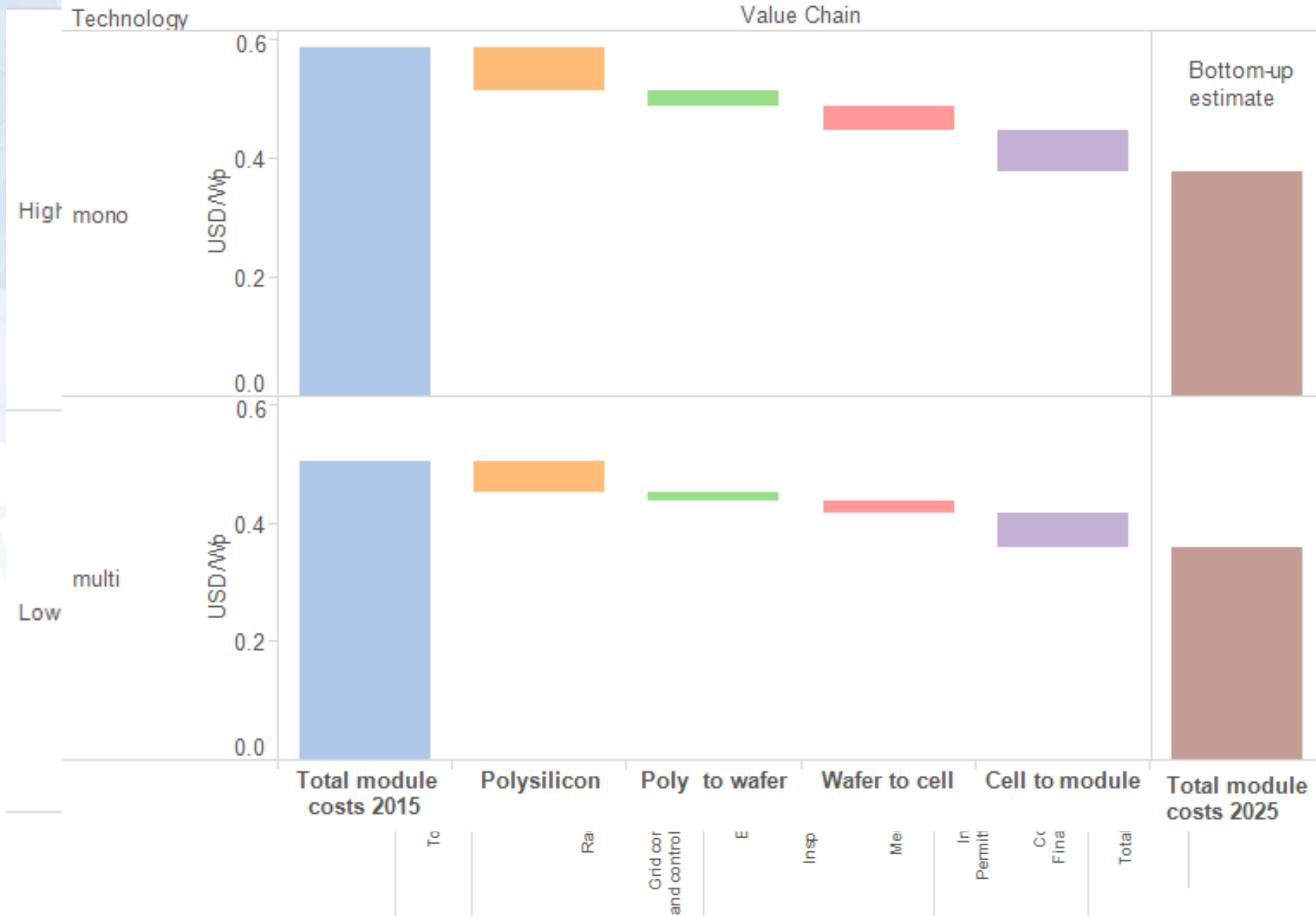
Low equipment costs change the dynamics

Balance of project costs, O&M, financing
will grow in importance

In some cases more challenging to unlock

But cost differentials are large and the
policy levers exist

Solar PV cost reduction potentials



Large average cost reduction potential

BoS to dominate

Upcoming cost analysis: Firm

PV parity indicators

Global wind learning curve

Stationary applications

Energy security

RE power cost reduction potentials

RE financing costs

Solar PV costs in Africa



IRENA's Cost Analysis

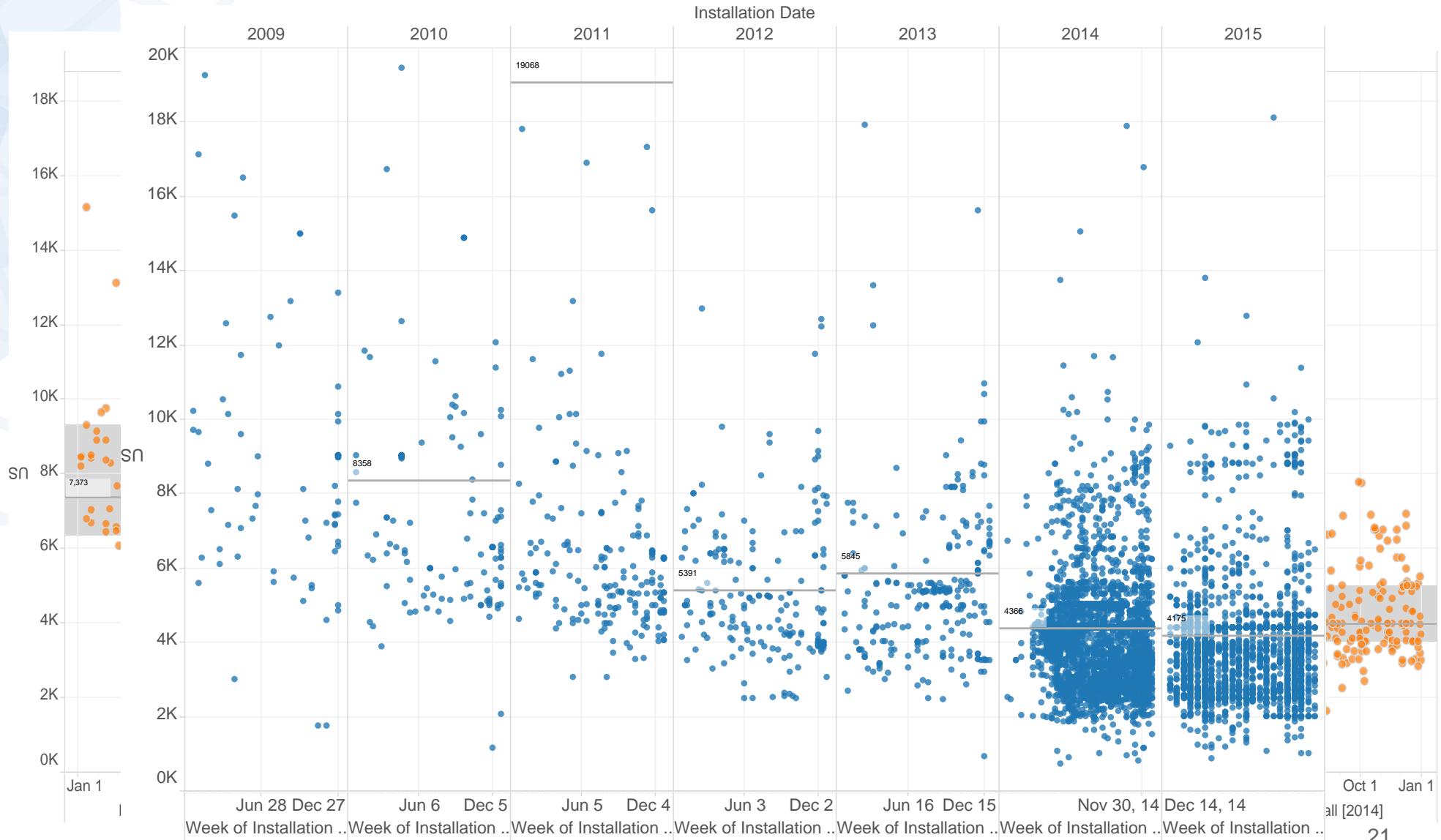


Bringing Our Future Forward

Thank you!
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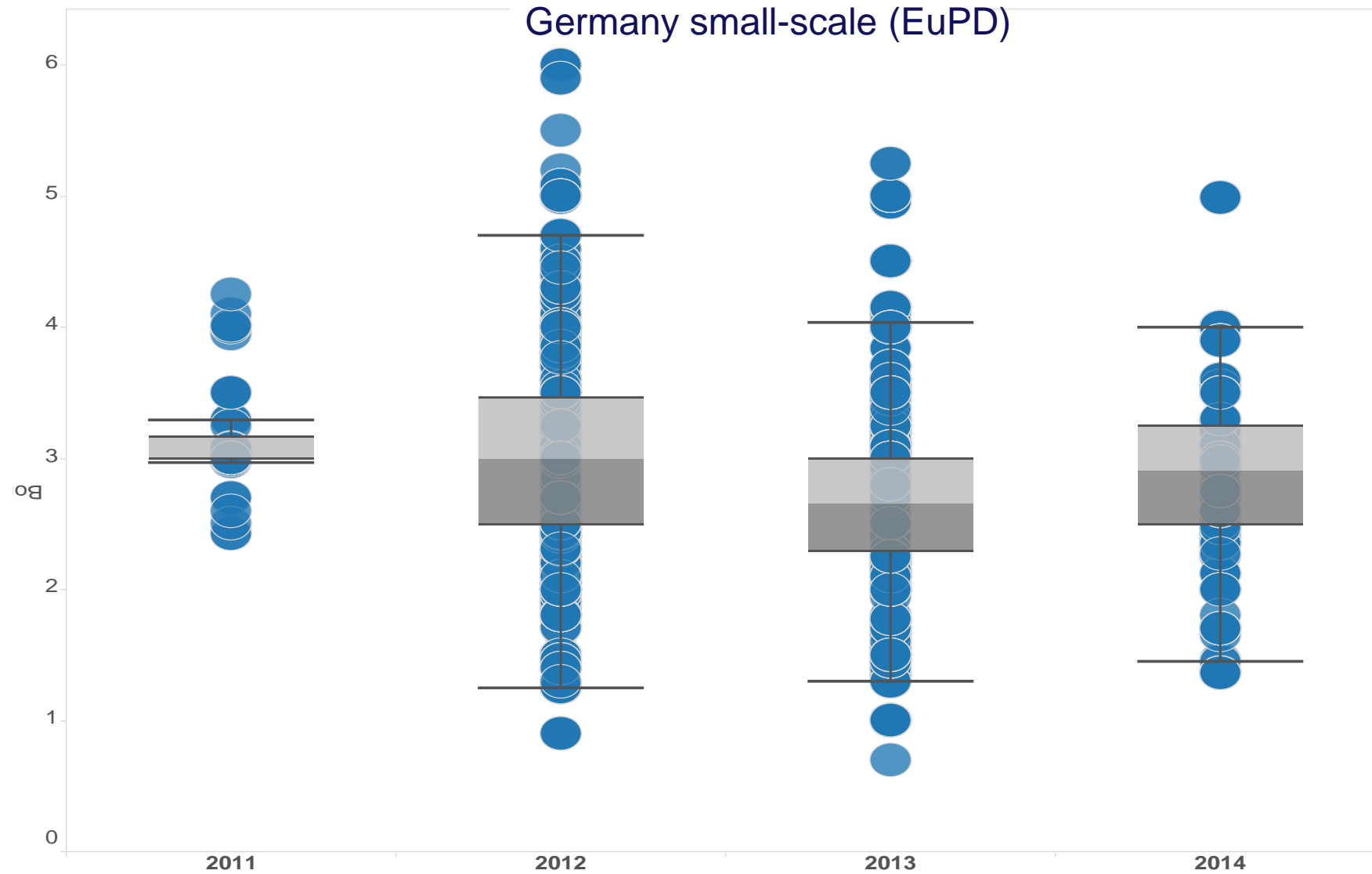
COMMERCIAL SOLAR PV COSTS

Arizona
New York State



The cost of finance

16%

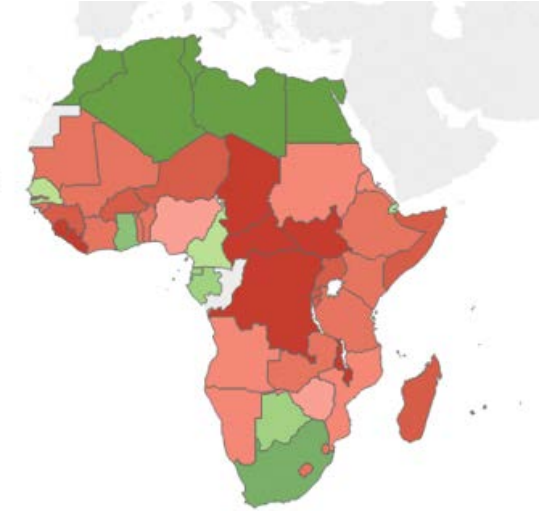


Source: Renewable Energy Finance Tracking Initiative

Solar PV Costs in Africa

Data collection challenging, but encouraging results

- Some markets relatively competitive
- Significant cost reductions appear possible for hardware and soft costs
- Very small SHS cost structures are challenging
- Government bodies should be aware of the “reasonable” cost range for their procurement process
- Regional deep-dives necessary for greater clarity



National electrification rate
0.0 1.0

