Net Metering: Quantifying Benefits and Sharing Costs

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Agenda

- Company background
- Net metering landscape
- Net metering alternatives
- Examples
- Conclusions

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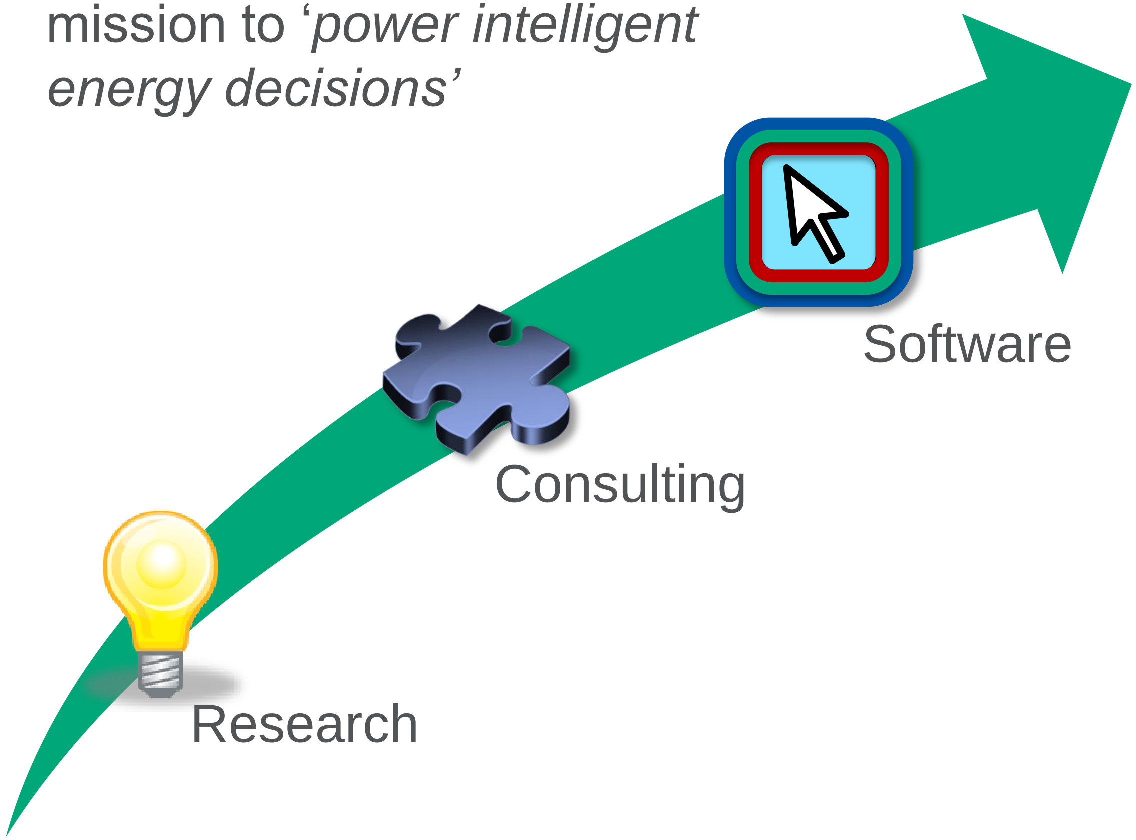
Founded in 1998 with the mission to '*power intelligent energy decisions*'



SOLAR PREDICTION

Most widely used solar resource database

ECONOMIC VALUATION

> 22 million solar estimations performed

PROGRAM OPTIMIZATION

2.75 GW of renewable incentives processed

Net Metering Landscape

Camp 1: Net metering is fine, don't change it

One Rate Structure

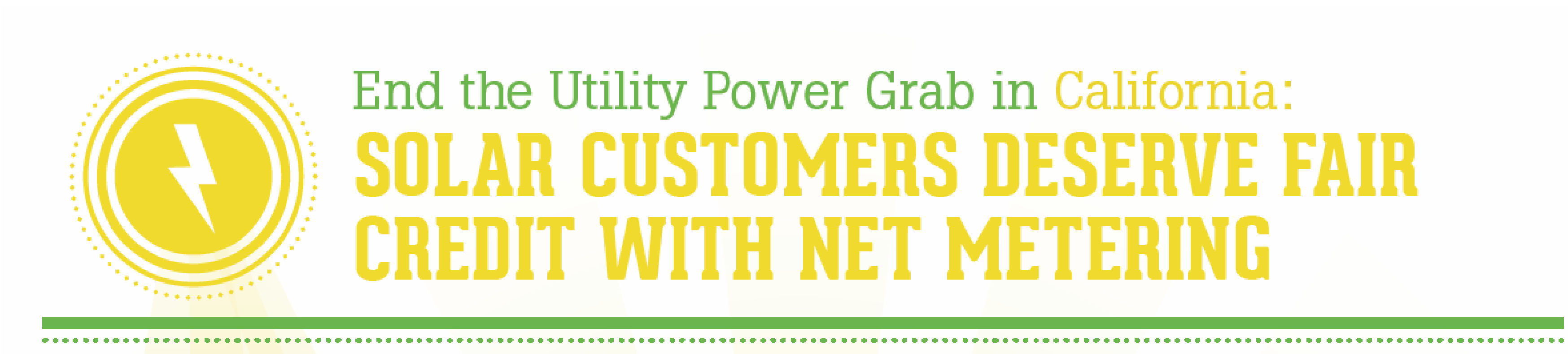
Camp 2: Net metering needs reevaluation

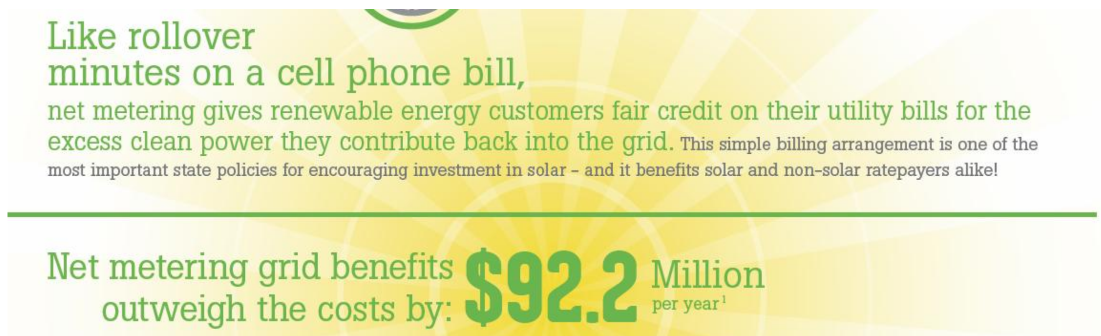
Cost of services

Value of Solar

Two Rate Structures

Camp 1: Net Metering is Fine – Don't Change It.





http://votesolar.org/resources-impacts-of-net-metering-in-california/

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Camp 2: Net Metering Needs Reevaluation

- Option 1: Value of Solar (aka Solar Rate or Smart FiT)
  - Treat consumption separately from production

- Option 2: Cost of Services
  - Retain single rate but redesign it based on the net cost for the utility to serve the PV customer

Cost of Services Approach

1. Identify utility services to PV customers
2. Identify PV customer services to utilities
3. Determine cost of each service
4. Bill charges & credits for each service

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Sample List of Services

Net Cost of Service = (Customer Cost) – (Utility Cost)

Service	Customer Cost	Utility Cost
Energy		
Resource Adequacy Capacity		
Ancillary Services		
Grid Management		
Transmission Capacity		
Transmission O&M		
Distribution Station Capacity		
Distribution Line Capacity		
Distribution Voltage Regulation and Reactive Supply		
Distribution O&M		
Interconnection		
Metering, Billing, and Customer Service		
Total		

Value of Solar Approach

1. Separately meter consumption & production
2. Calculate savings from PV production
3. Bill consumption using existing tariffs
4. Credit production using Value of Solar

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Value of Solar to the Utility (typical)

Value Component	Basis
Avoided Fuel Cost	Cost of natural gas fuel to operate a gas turbine (CCGT) plant operating on the margin to meet electric loads and T&D losses.
Avoided Plant O&M Cost	Costs associated with operations and maintenance of the CCGT plant.
Avoided Generation Capacity Cost	Capital cost of generation to meet peak load and planning margins.
Avoided T&D Capacity Cost	Cost of money savings resulting from deferring T&D capacity additions.
Avoided Environmental Compliance Cost	Cost to comply with environmental regulations and policy objectives.
Fuel Price Hedge Value	Cost to minimize natural gas fuel price uncertainty.
(Solar Penetration Cost)	Additional cost incurred to accept variable solar generation onto the grid.
Other Components	Utility specific considerations, as applicable.

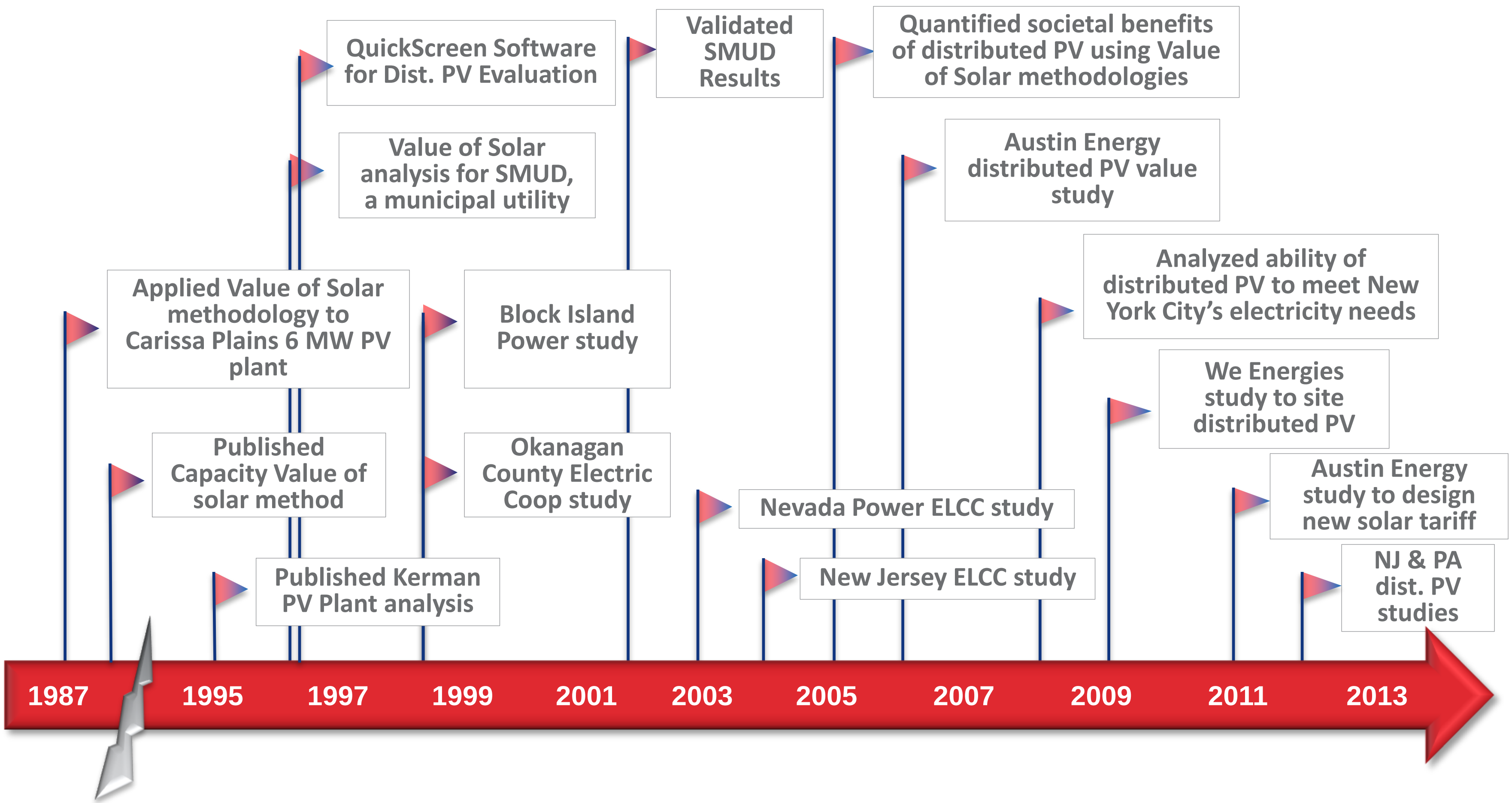
Value of Solar to Ratepayers and Taxpayers

Value Component	Basis
Market Price Reduction	Wholesale market costs incurred by all ratepayers associated with a shift in demand.
Environmental Value	Future cost of mitigating environmental impacts of coal, natural gas, nuclear, and other generation.
Economic Development Value	Enhanced tax revenues associated with net job creation for solar versus conventional power generation.
Security Enhancement Value	Avoided economic impacts of outages associated due to grid reliability of distributed generation.

Use dgVALUATOR™ to Perform Analysis

- Enable objective and transparent analysis
- Employ established methodologies
- Correlate solar data to utility loads
- Quickly evaluates alternate scenarios

Employ Established Methodologies



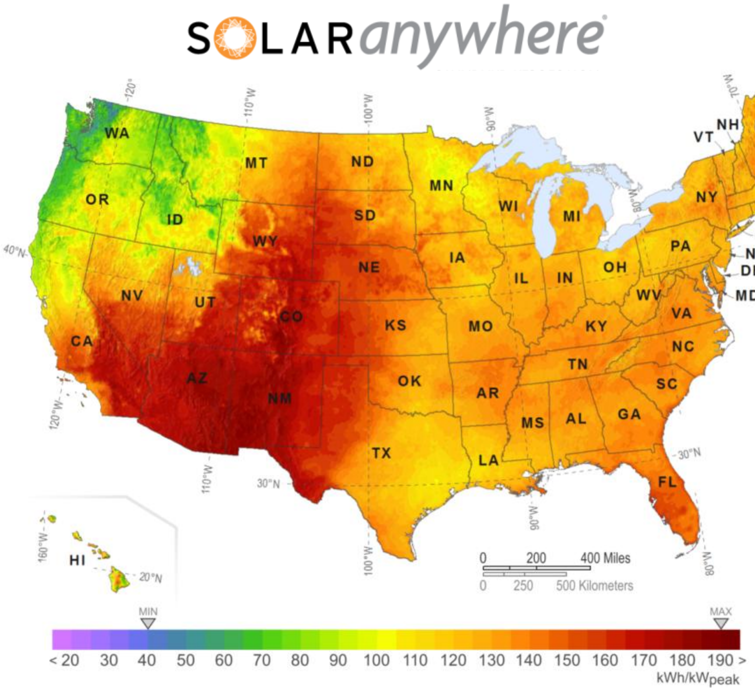
Correlate Solar Data to Utility Loads

SolarAnywhere® irradiance data

- Satellite-derived time-series data
- Historical values from 1998 through latest hour
- Forecasts up to 7-days in advance

SolarAnywhere® analytical tools

- PV system modeling (FleetView™)
- Benchmark to site data (DataCheck™)
- PV fleet variability



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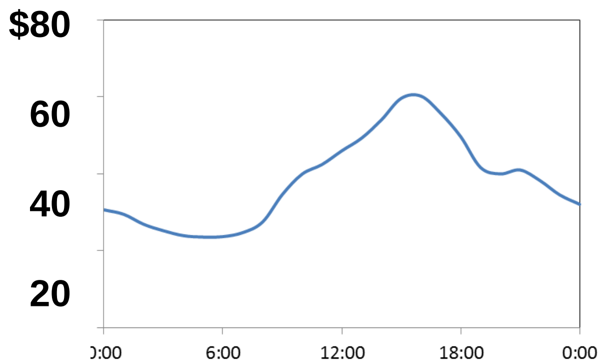
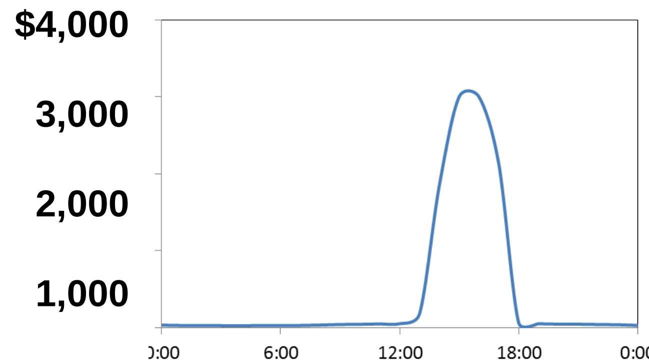
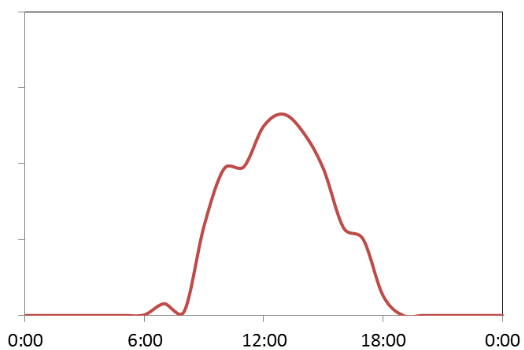
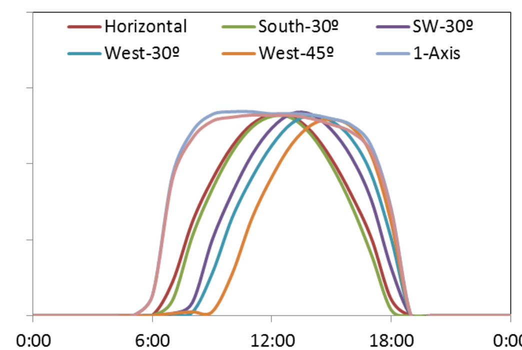
Example 1: Value of Solar at AUSTIN ENERGY

How does Austin Energy…

- Design a solar tariff representing utility value for customer-side distributed solar?
- Allow utility to collect and recover actual costs for serving customer loads?

Nodal Price Analysis (Energy Value)

	Typical Day	Transmission Constrained Day
Nodal Price ($/MWh)		
PV Output (kW)		
	Hour	Hour

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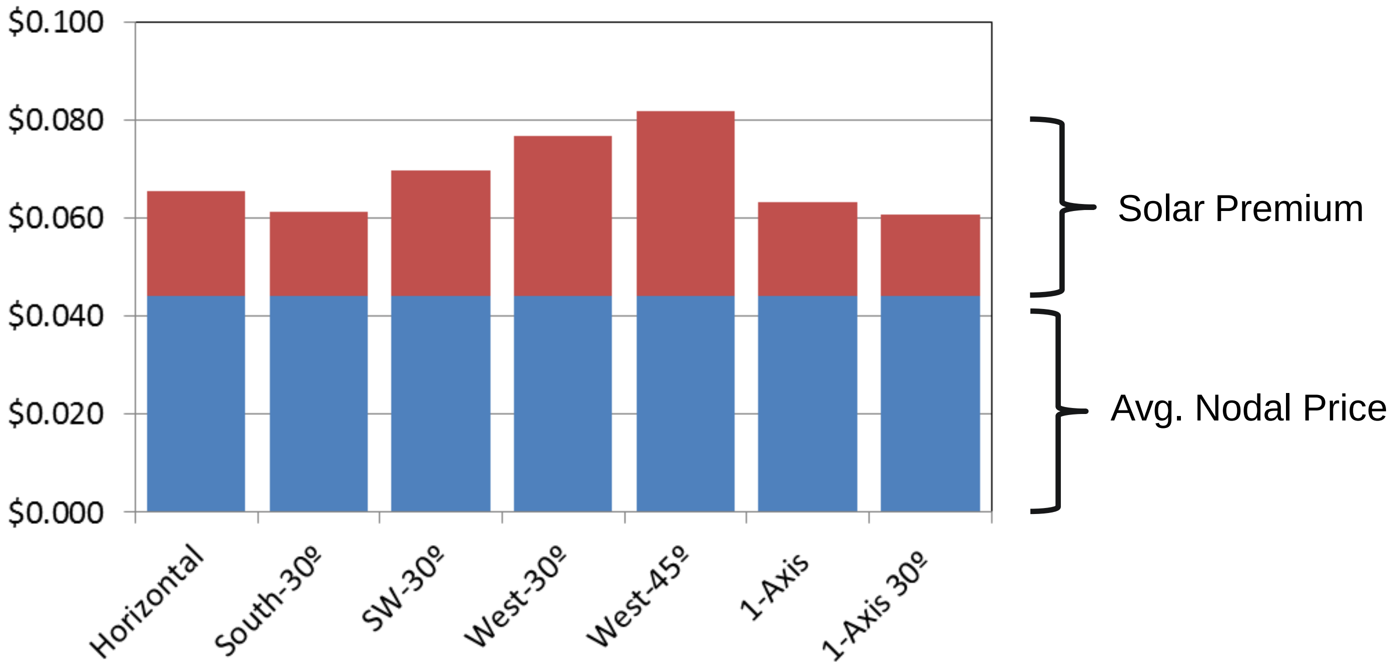
Nodal Price Analysis Results (Energy Value)



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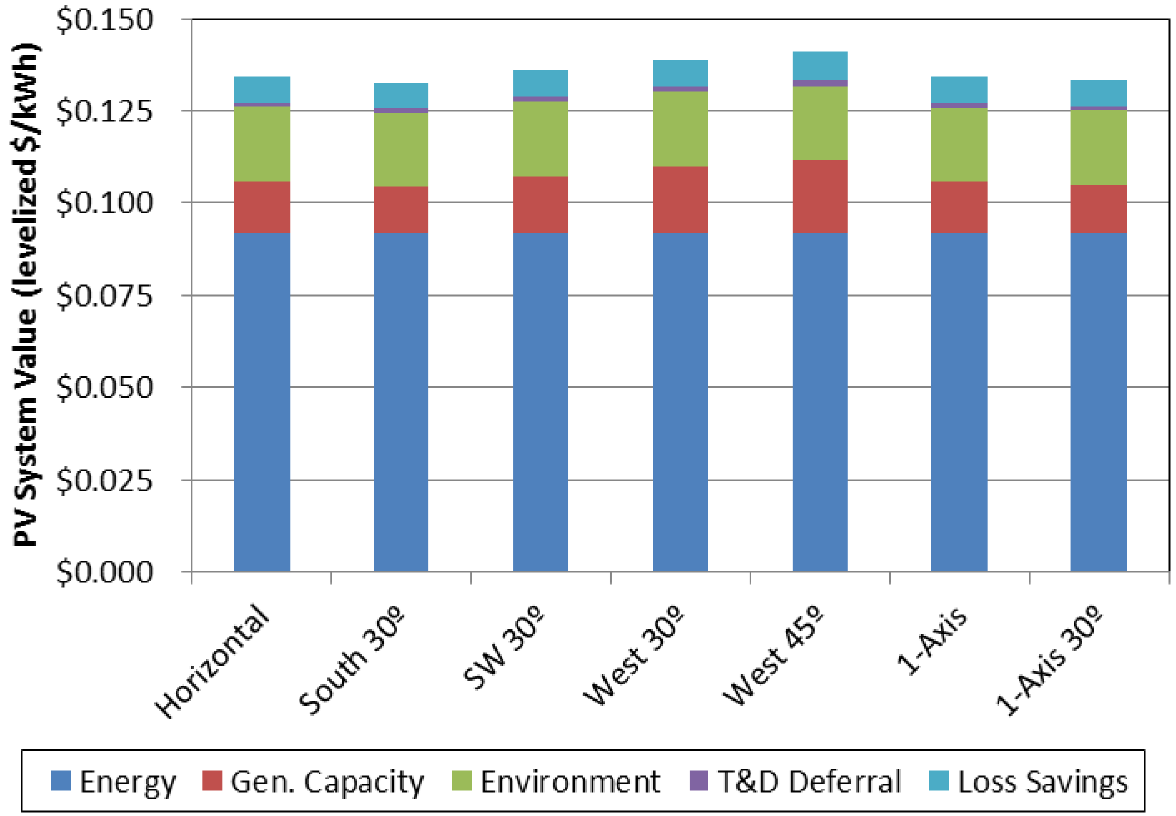
Update Value of Solar Based on Nodal Price Analysis



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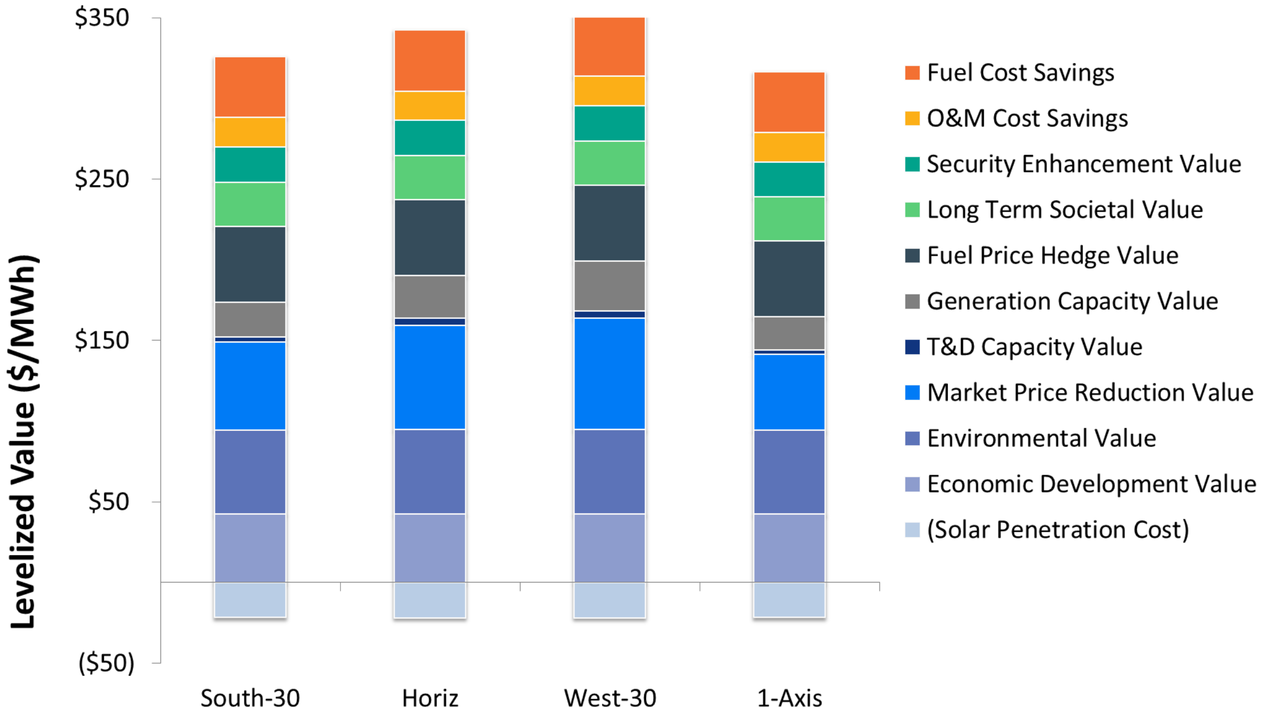
Example 2: MSEIA Value of Solar Study



Note: Results were developed for multiple locations. Figure presents results for Philadelphia, PA.

http://mseia.net/site/wp-content/uploads/2012/05/MSEIA-Final-Benefits-of-Solar-Report-2012-11-01.pdf

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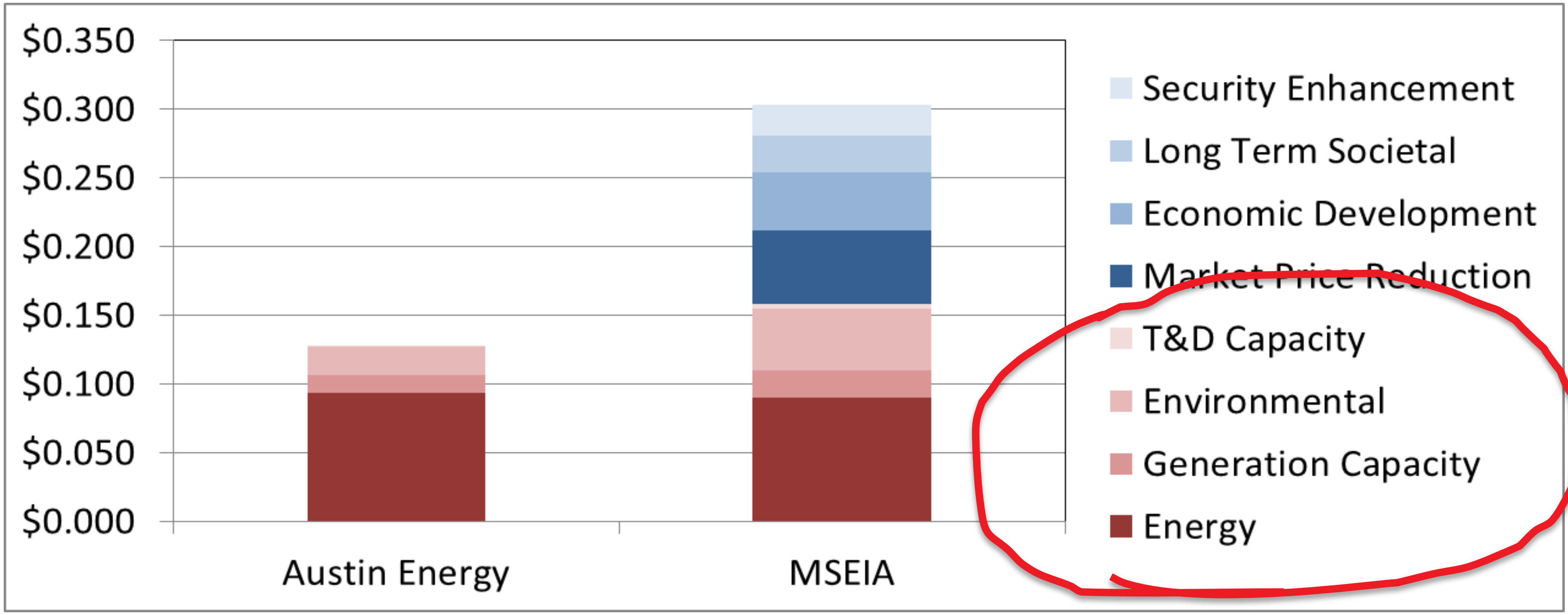
How Do Austin Energy and MSEIA Results Compare?



(1) Proportionately allocate Loss Savings across categories for Austin Energy.
(2) Group Fuel Cost Savings, O&M Cost Savings, and Fuel Price Hedge into Energy for MSEIA.
(3) Allocate Solar Penetration Cost to utility benefits for MSEIA.
(4) Location is Philadelphia for MSEIA.

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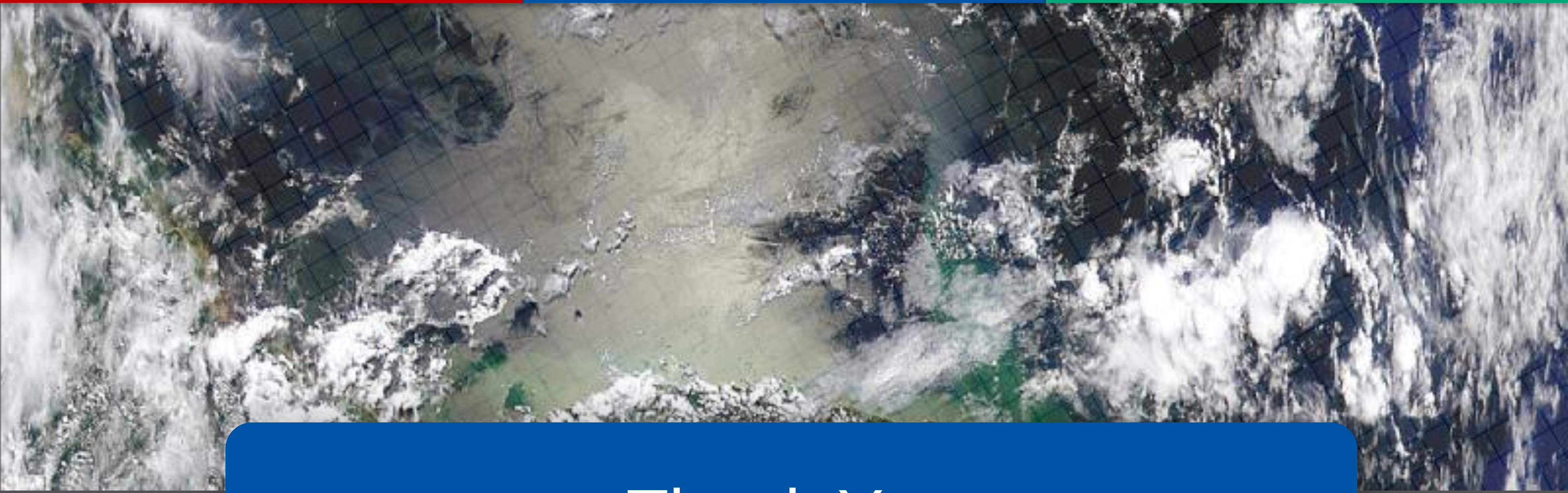
Conclusions

- Two camps
  1. Net metering is fine, don't change it
  2. Net metering needs to be reevaluated
- Alternatives under consideration
  1. Value of Solar
  2. Cost of Service
- Perspective is critical when using Value of Solar approach – it determines which values to include

Next Steps: Broadening the Discussion By Examining Soft-Cost Implications

- How do different transaction models impact the costs associated with:
  - Customer acquisition
  - Utility billing systems
  - Metering requirements
  - Finance risk

Source: Eran Mahrer, SEPA



Thank You

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