Principles of Data-Driven Rate Design: Comments to the Iowa Utilities Board on Utilities' Proposed Residential Price Structures for Distributed Generation Customers

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On Behalf of Joint Commenters

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Summary of Comments

1. The record and facts before you have not changed in any material way since the IUB order was issued in Docket NOI 2014-0001.
2. Utility proposals for a new customer-generator rate class are premature, and not adequately supported by data. Market penetrations are still too small:
   - MidAmerican at 0.05%; IPL at 0.37%; NV Power at 2.0%
3. This may be the time to launch a careful, objective, and public process to develop a benefit-cost assessment methodology (a methodology for "Value of Solar" analysis) in order to reduce unsubstantiated assertions about the system impacts of customer-generators.

Principles for Modern Rate Design

Principle 1: A customer should be able to connect to the grid for no more than the cost of connecting to the grid.

Principle 2: Customers should pay for grid services and power supply in proportion to how much they use these services and how much power they consume.

Principle 3: Customers who supply power to the grid should be fairly compensated for the full value of the power they supply.

Regulatory Assistance Project, “Smart Rate Design for a Smart Future,” available at: www.raponline.org/document/download/id/7680

Data Must Drive Rate Design

- Utilities have not yet presented adequate data.
- “Typical” data is not adequate to support a new rate class.
- Data must be robust and normalized – it should be based on several years’ worth of raw data.
- Data sets must reflect statistically valid sample sizes.
- A deliberate process will create time and allow collection of needed data.
- Developing the methodology first will reveal the necessary data sets.

“In God we trust; all others must bring data.”
– W. Edwards Deming

Data Requirements (to start)

- Five or ten-year forward price of natural gas, the most likely fuel for marginal generation, along with longer-term projections in line with the life of the DSG
- Hourly load shapes, by customer class to analyze the intra-class and inter-class impacts
- Hourly production profiles, including south- and west-facing arrays
- Hourly line loss data, to assess marginal avoided line losses
- Initial capital costs, and the fixed and variable O&M costs for the utility's marginal generation unit
- Distribution planning costs, including capital and O&M (fixed and variable) of constructing and operating distribution upgrades necessary to meet load, over the long term
- Hourly load data for individual distribution circuits, particularly those with current or expected higher than average penetrations of DSG, in order to capture the potential for avoiding or deferring circuit upgrades

Maine Value of Solar Study

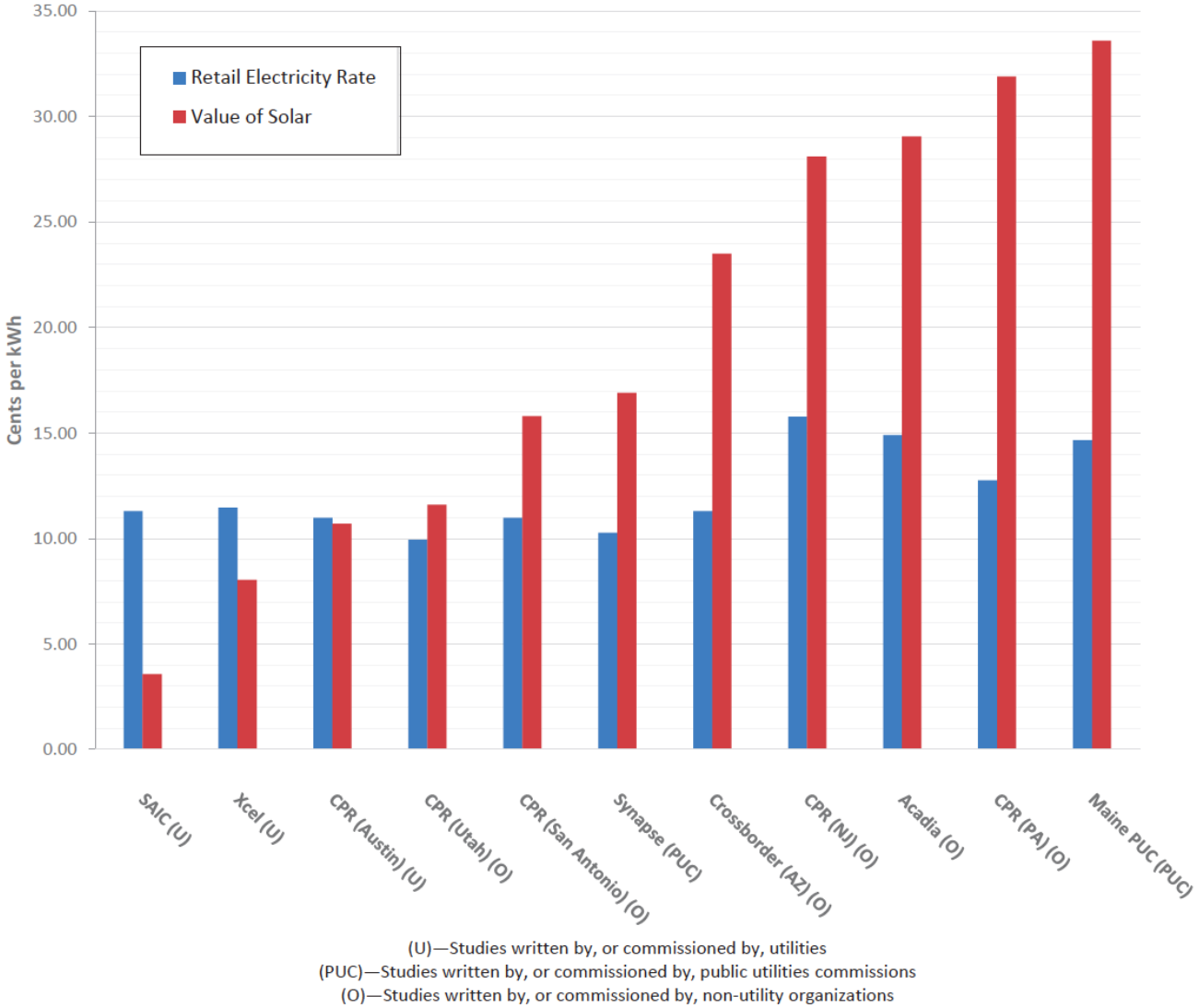
Figure ES- 2. CMP Distributed Value – 25 Year Levelized ($ per kWh)

25 Year Levelized		Gross Value A ($/kWh)	× Load Match Factor B (%)	× Loss Savings Factor (1+C) (%)	= Distr. PV Value D ($/kWh)	
Energy Supply	Avoided Energy Cost	$0.076		6.2%	$0.081	Avoided Market Costs $0.138
	Avoided Gen. Capacity Cost	$0.068	54.4%	9.3%	$0.040	
	Avoided Res. Gen. Capacity Cost	$0.009	54.4%	9.3%	$0.005	
	Avoided NG Pipeline Cost					
	Solar Integration Cost	($0.005)		6.2%	($0.005)	
Transmission Delivery Service	Avoided Trans. Capacity Cost	$0.063	23.9%	9.3%	$0.016	
Distribution Delivery Service	Avoided Dist. Capacity Cost	Placeholder, Utility Data Not Available, or No Planned System Investments				
	Voltage Regulation					
Environmental	Net Social Cost of Carbon	$0.020		6.2%	$0.021	Societal Benefits $0.199
	Net Social Cost of SO_2	$0.058		6.2%	$0.062	
	Net Social Cost of NO_x	$0.012		6.2%	$0.013	
Other	Market Price Response	$0.062		6.2%	$0.066	
	Avoided Fuel Price Uncertainty	$0.035		6.2%	$0.037	
					$0.337	

Gross Values represent the value of perfectly dispatchable, centralized resources. These are adjusted using

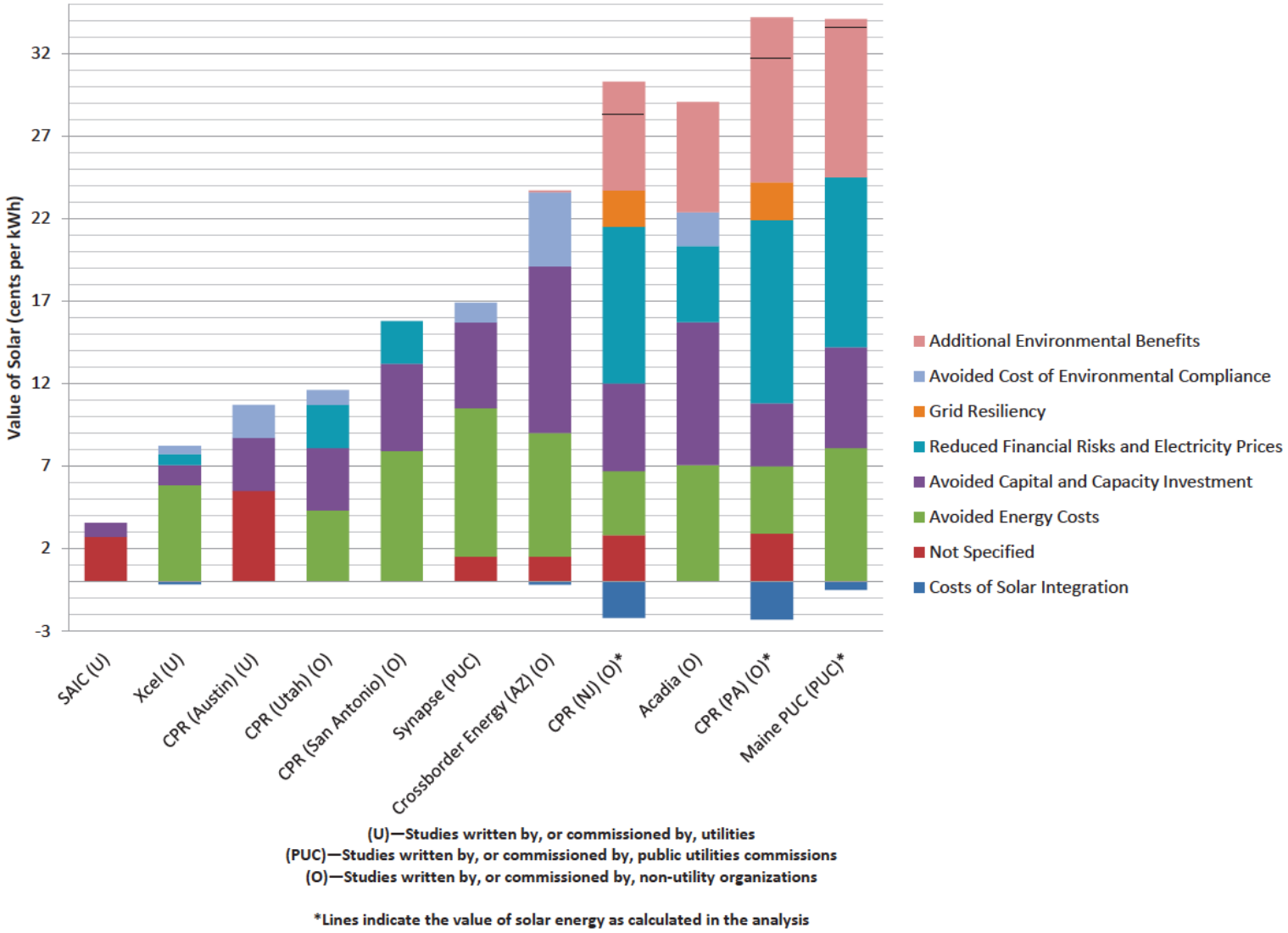
- Load Match Factors to account for the non-dispatchability of solar; and
- Loss Savings Factors to account for the benefit of avoiding energy losses in the transmission and distribution systems.

Figure ES-1: Retail Electricity Rates and the Values of Solar Energy in 11 Cost-Benefit Analyses.



Source: Environment America, “Shining Rewards,” Jun 24, 2015
http://www.environmentamerica.org/reports/amc/shining-rewards

Figure ES-2: A Comparison of Cost-Benefit Analyses of Solar Energy by Study and Category.



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Thank you!

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Solar Value: Data-Driven Principles for Rate Design

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Technical Analysis

- Marginal PV resource, derived from a PV fleet production profile
- Load analysis period (1 or more years)
- Economic study period (life or 1st yr)
- PV system rating convention
- System and distribution load data
- Effective load carrying capability (ELCC)
- Peak load reduction
- Loss savings analysis

** Source: Clean Power Research*

Economic Analysis

- Avoided energy costs
- Avoided cost of resource adequacy
- Voltage regulation
- Avoided transmission capacity cost
- Avoided distribution capacity cost
- “Out of market” benefits
  - Avoided residual environmental costs
  - Fuel price guarantee

** Source: Clean Power Research*

Implementation Options

- Evaluation of NEM rates
- Community shared solar issues
- Value of exported energy
- Application to other DER technologies
- Real time pricing with AMI
- Value of solar tariffs

* *Source: Clean Power Research*

Adjustments to Gross Value

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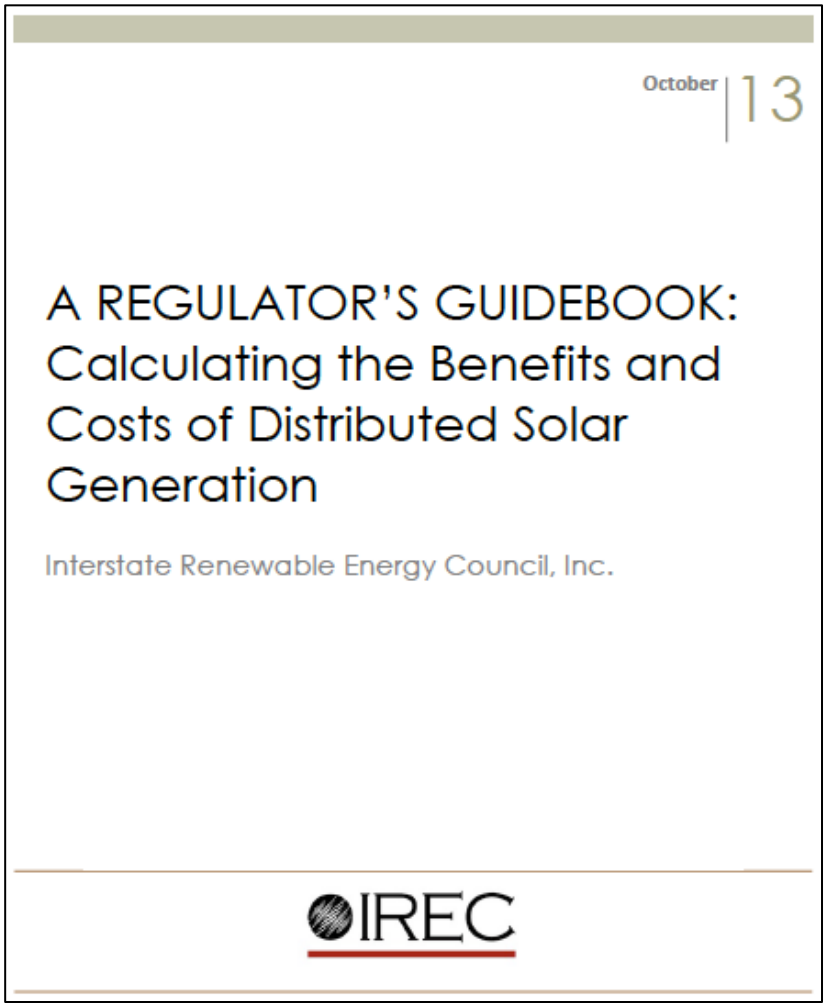
Distributed Solar Valuation: "A Regulator's Guidebook"

Available through:

http://irecusa.org



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