Residential Solar Valuation Rates

Karl R. Rábago

Rábago Energy LLC

The Ideal Residential Solar Tariff

- Fair to the utility and non-solar customers
- Fair compensation to the solar customer
- Decouple compensation from incentives
- Align public policy goals (decouple compensation from consumption)
- Intuitively sound and administratively simple

Historical Antecedents

- Externalities
- Price ≠ Cost
- Green Power
- *Small Is Profitable* (*http://www.smallisprofitable.org/*)
- Local Integrated Resource Planning

Solar Value Components

	Developer/Investor	Utility/Ratepayer	Society/Taxpayer
Distributed solar* system Cost	20-30 ¢/kWh		
Transmission Energy Value		6 to 11 ¢/kWh	
Transmission Capacity Value		0 to 5 ¢/kWh	
Distribution Energy Value		0 to 1 ¢/kWh	
Distribution Capacity Value		0 to 3 ¢/kWh	
Fuel Price Mitigation		3 to 5 ¢/kWh	
Solar Penetration Cost		0 to 5 ¢/kWh	
Grid Security Enhancement Value			2 to 3 ¢/kWh
Environment/health Value			3 to 6 ¢/kWh
Long-term Societal Value			3 to 4 ¢/kWh
Economic Growth Value			3+ ¢/kWh
TOTAL COST / VALUE	20-30 ¢/kWh	15 to 41 ¢/kWh	

** Centralized solar has achievd a cost of 15-20 cents per kWh today. However less of the above value items would apply. The distribution value items would not apply. Transmission capacity, and grid security items would generally be towards the bottom of the above ranges, while penetration cost would be towards the top of the ranges because of the burden placed on transmission and the possible need for new transmission lines -- nevertheless, a value of 14-30 cents per kWh could be claimed.*

http://www.cleanpower.com/resources/solar-power-generation-in-the-us-too-expensive-or-a-bargain/

Issues with Traditional Net Metering

- PURPA legacy
- Correlation between retail rates and solar value
- Cost of service recovery for the utility
- Low payments for excess energy

- Reduces optimal investment size
- Encourages consumption during periods of solar production
- Solar value "changes" based on customer consumption under tiered rates

Two Simple Changes

- Change compensation from “retail up to consumption, then avoided cost/fuel” to “annually updated value of solar”
- Calculate bill by charging for total consumption as if the customer had no solar, then credit solar production at the value of solar rate

*Note: It may be fair to allow the utility to recover the **difference** between VOS and retail rate in the fuel factor*

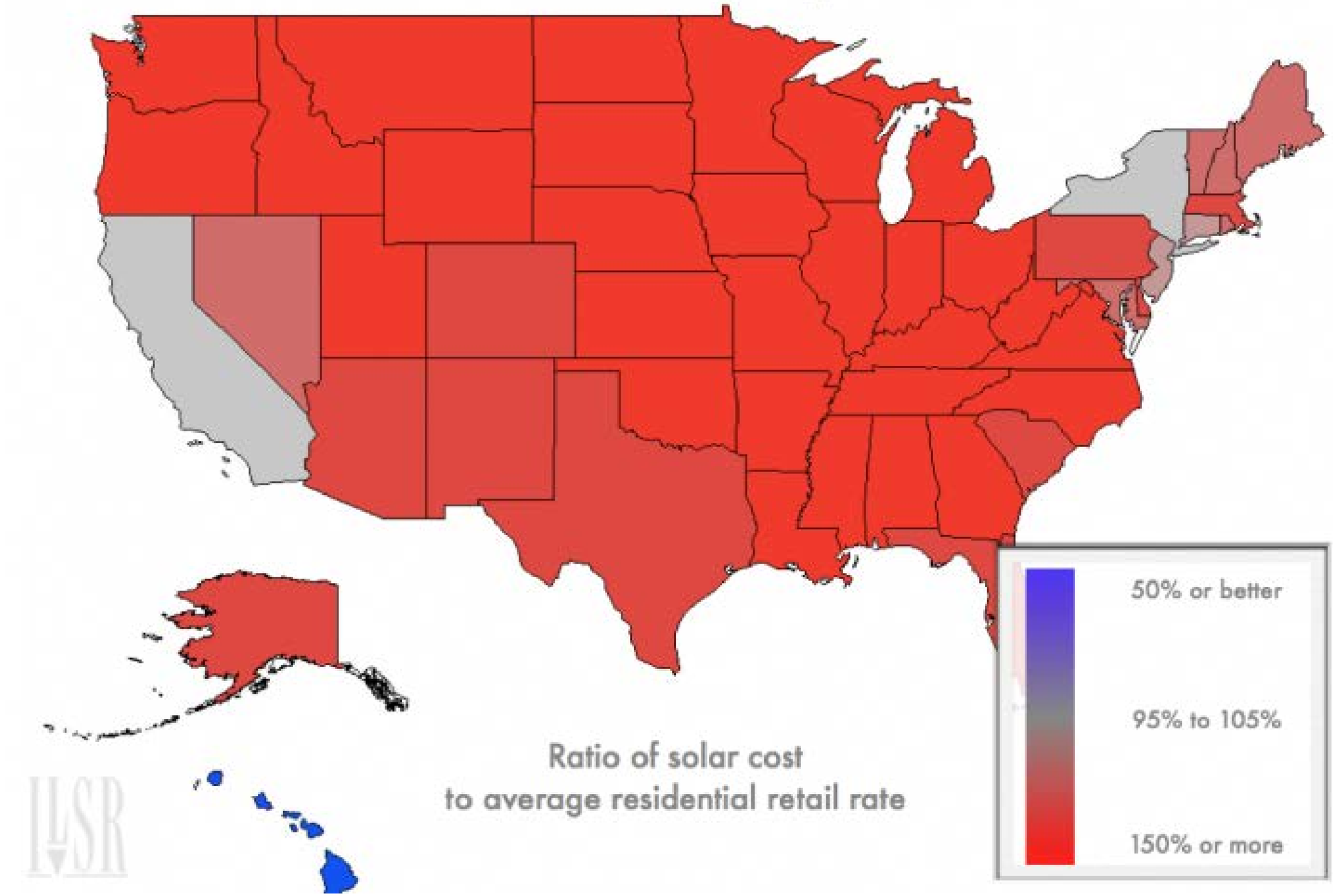
Major Benefits of VOS Approach

- Reduces or eliminates class subsidies
- Keeps utility whole on cost of service (some utility upside due to conservative calculation approach)
- Incentive for efficiency
- Annual adjustment prevents over- or under-payment as utility costs change
- Applicable to Solar, Savings, Storage, and Ancillary Services

Next Steps

- Characterize components of solar valuation
- Compare valuation approaches and options
- Apply valuation model(s) across regions
- Develop valuation tools for screening that rely on publicly available data
- Review & address ratemaking & tariff design issues
- Engage with key stakeholders
- Analyze and report on experience from early adopters

Solar Grid Parity (2016)



http://cleantechnica.com/2012/01/12/solar-grid-parity-101/solar-grid-parity-2016-map-002_0/

Thanks!

Karl R. Rábago

karl@rabagoenergy.com

512.968.7543