



RAP

Energy solutions
for a changing world

Designing Distributed Generation Tariffs Well: Fair Compensation in a Time of Transition

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We Have Visited Lands Proximate ...



Now We Prepare to Head Out to Sea ...



Our Main Points ...

- Value is a two way street
- Defining value and cost is important
- Subsidies only occur if cost exceeds value
- Extrapolating from extreme situations is misleading
- Transitioning to a transactive paradigm
- In the mean time: Net Energy Metering and Feed-in Tariffs work well if ...

Tariffs Designed Well if ...

- Valuation aligned with the Public Interest
- Fair value paid for DG services and Grid services
- Tail block rates set at LRMC (most places)
- Set other tariff and rate design parameters accordingly
- Administrative simplicity matters
- Consider incentives and decoupling separately

Consider: Valuation is your compass



Major Categories of Value

Benefits

Energy

Line loss savings

Generation capacity

T&D capacity

Fuel price hedge

Risk reduction

Environmental

Grid security & reliability

Costs

Direct

Administrative

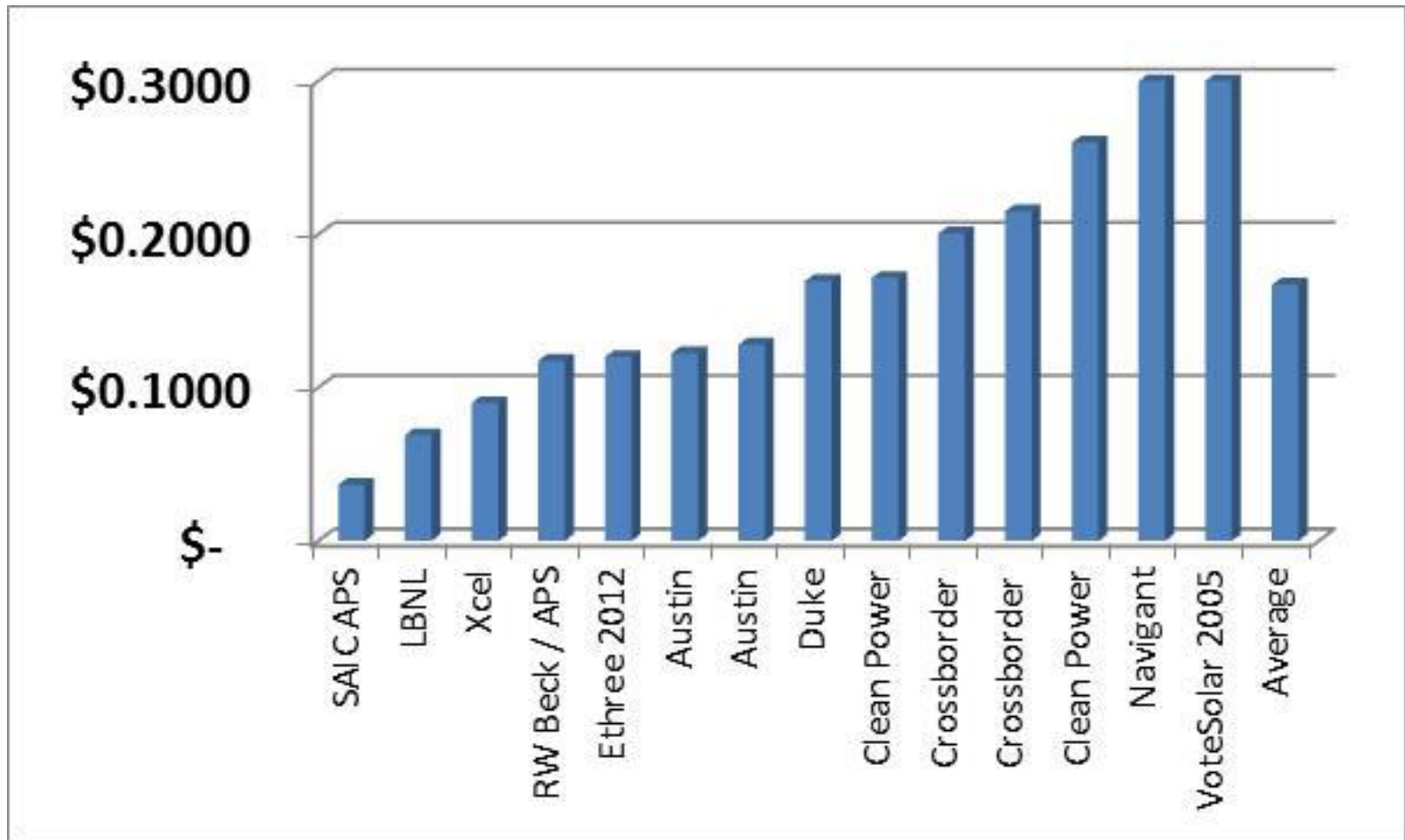
Interconnection

Integration

Risk/opportunity cost

**Terminology
differs from study
to study**

RMI Survey Of Multiple VOS Studies: Average Value of Solar: **\$.1672/kWh**



Helpful Reference Documents

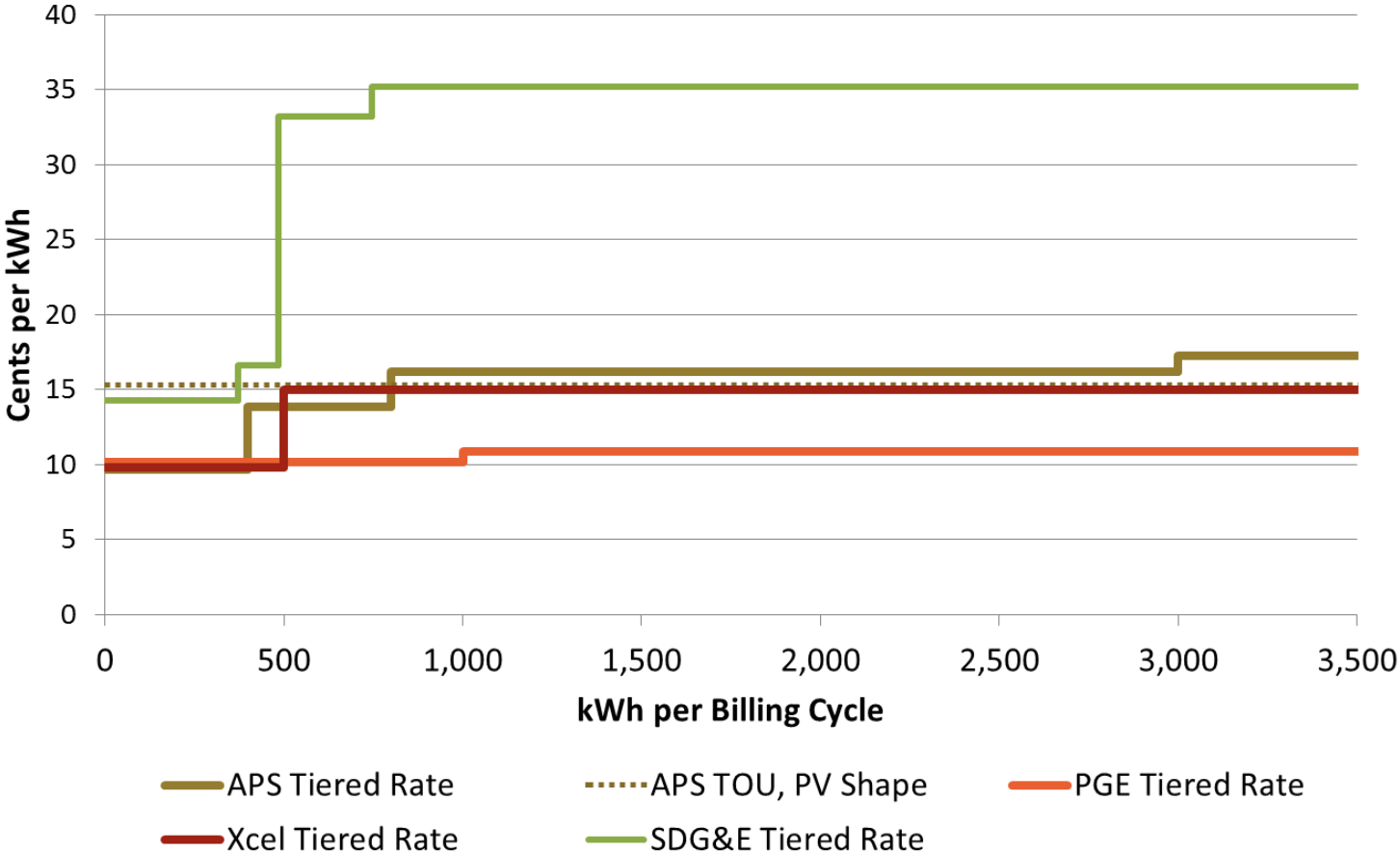
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Consider: Cross-Subsidies run both ways

- If value of PV $<$ volumetric charges:
 - Other customers subsidize PV customers
 - Under-recovery of utility's fixed costs
 - Upward pressure on rates (cross subsidy)
 - Reduced utility shareholder returns
- If value of PV $>$ volumetric charges:
 - PV customers subsidize other customers
 - Suppresses PV deployment

Consider: Don't Extrapolate from Extremes

Tail Block Rates Vary (E3, 2013)



Consider: Many Possible Alternative or Supplemental Tariff Policies

- Fixed charges
- Demand charges
- Minimum monthly bills
- Time-based rates
- Stand-by rates
- Two-way rates (i.e., value of solar)
- Separate PV customer class

Illustration of Alternative Rate Designs

Type of Charge	Unit / Usage	Typical Current Residential Tariff	Option 1 Fixed Monthly Charge	Option 2: Demand Charge	Option 3: Bidirectional Distribution Charge
Monthly Fixed Charge:	\$/Month	\$ 5.00	\$ 35.00	\$ 5.00	\$ 5.00
Demand Charge	\$/kW/Month		\$ -	\$ 3.00	\$ -
Distribution Charge	\$/kWh		\$ -	\$ -	\$ 0.03
Off-Peak Energy	\$/kWh	\$ 0.145	\$ 0.08	\$ 0.08	\$ 0.08
On-Peak Energy	\$/kWh	\$ 0.145	\$ 0.15	\$ 0.15	\$ 0.15
Average Customer Bill					
Fixed Charge	Per Customer	\$ 5.00	\$ 35.00	\$ 5.00	\$ 5.00
Demand Charge	10 kW Demand	\$ -	\$ -	\$ 30.00	\$ -
Distribution Charge	1,000 kwh total energy	\$ -	\$ -	\$ -	\$ 30.00
Off-Peak Energy	500 kWh on-peak	\$ 72.50	\$ 40.00	\$ 40.00	\$ 40.00
On-Peak Energy	500 kWh off-peak	\$ 72.50	\$ 75.00	\$ 75.00	\$ 75.00
		\$ 150.00	\$ 150.00	\$ 150.00	\$ 150.00

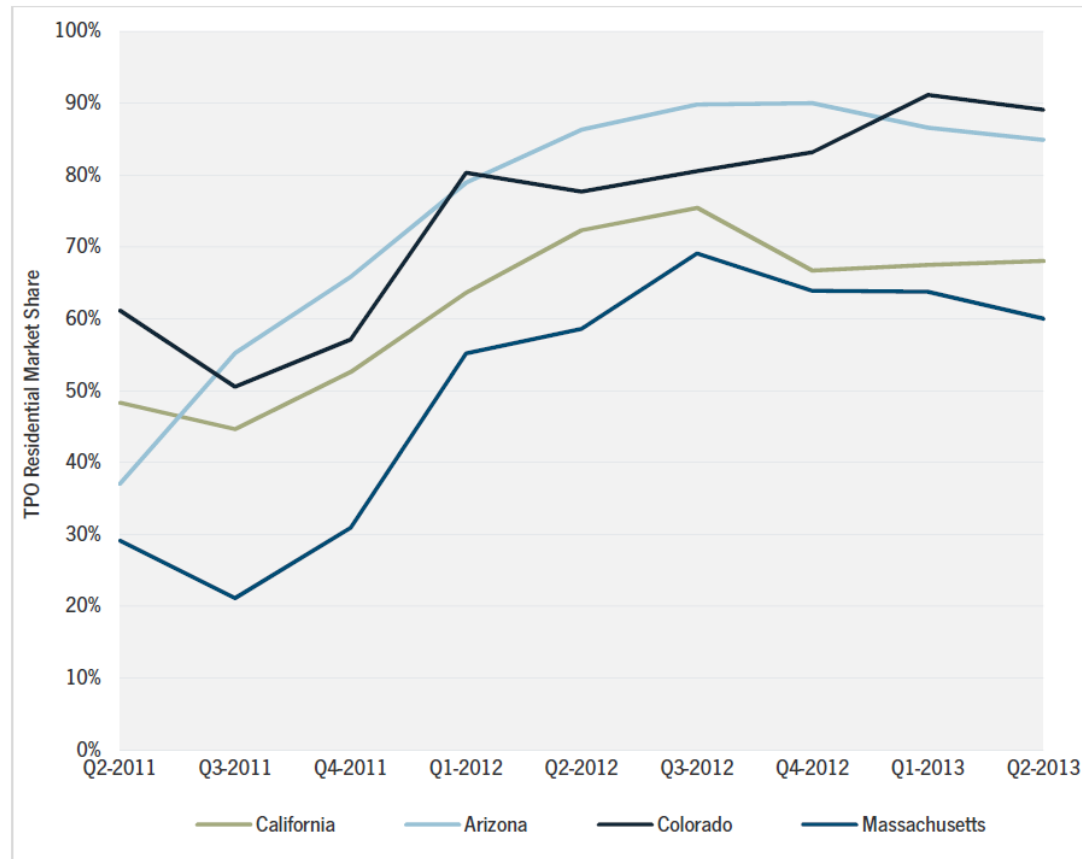
Each alternative produces \$150/month from a customer using 1,000 kWh/month

Breakdown of Hypothetical PV Customer Bill

Rate Element	Typical Current Residential Tariff	Option 1 Fixed Monthly Charge	Option 2: Demand Charge	Option 3: Bidirectional Distribution Charge
Fixed Charge	\$ 5.00	\$ 35.00	\$ 5.00	\$ 5.00
Demand Charge	\$ -	\$ -	\$ 30.00	\$ -
Distribution Charge	\$ -	\$ -	\$ -	\$ 30.00
Off-Peak Energy	\$ 72.50	\$ 40.00	\$ 40.00	\$ 40.00
On-Peak Energy	\$ (72.50)	\$ (75.00)	\$ (75.00)	\$ (75.00)
Total Bill:	\$ 5.00			
Total Distribution Service:	\$ 5.00	\$ 35.00	\$ 35.00	\$ 35.00

Assumptions: 10 kW maximum demand; 1,000 kWh total consumption, 50% on-peak; 1,000 kWh total on-site production. 500 kWh imported from grid off-peak; 500 kwh exported to grid on-peak

Consider: Financing Matters (3rd Party Ownership Models)



Source: SEIA/GTM Research: U.S. Solar Market Insight® (Q2 2013)

Consider: Sound Decision-making benefits all

- For consumers: Keep more \$\$, Quality
- For utilities: Corporate health, purpose
- For investors: Safety, value, expectations
- For employees: safety and welfare, pride
- For the regulatory process: confidence
- For society: key role for power in society

A process that promotes shifting risk rather than minimizing risk is inherently unstable

In Fact, though often not in appearance,

- Consumer, Utility, Third Party and Investor interests are intertwined
- All are served by strategies that limit risk
- **But who advocates for this societal perspective?**

About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raonline.org

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Designing DG Tariffs Well:

<http://www.raonline.org/document/download/id/6898>



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