RAP Energy solutions for a changing world

Technical Conference: Alternative Utility Cost Recovery Mechanisms

Maryland Public Service Commission – October 20, 2015

Janine Migden-Ostrander
RAP Principal

The Regulatory Assistance Project
50 State Street, Suite 3
Montpelier, VT 05602
Phone: 802-223-8199
www.raponline.org

The Regulatory Assistance Project (RAP)

We are a global, non-profit team of experts focused on the long-term economic and environmental sustainability of the power sector. We provide assistance to government officials on a broad range of energy and environmental issues.

About RAP – US

RAP provides technical and policy support at the federal, state and regional levels, advising utility and air regulators and their staffs, legislators, governors, other officials and national organizations.

We help states achieve ambitious energy efficiency and renewable energy targets and we provide tailored analysis and recommendations on topics such as ratemaking, smart grid, decoupling and clean energy resources. RAP publishes papers on emerging regulatory issues and we conduct state-by-state research that tracks policy implementation.

What's On the Horizon?

Convergence of multiple events:

- Customer empowerment
- New Technologies and Competitive Service Offerings

This leads to (in absence of any policy or structural response):

- Reduction in utility sales and hence revenues
- Potential rate responsibility shifts and equity questions

This is pitted against:

- Public interest in low carbon energy solutions
- While grid resilience becomes increasingly important in the wake of *severe climate*

Rate Design Roadmap for the 21st Century Utility

Utilities face unprecedented changes in the way power is generated and delivered. With the ramp-up in distributed generation, energy efficiency and demand response, electric vehicles, smart appliances, and more, the industry must rethink its rate structures to accommodate and encourage these innovations. Progressive rate design can make the difference in cost-effectively meeting public policy objectives—to use electricity more efficiently, meet environmental goals, and minimize adverse social impacts—while ensuring adequate revenue for utilities.

The Principles

1. A customer should be able to connect to the grid for no more than the cost of connecting to the grid.
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.
3. Customers that supply power to the grid should be fairly compensated for the full value of the power they supply.

Ill-Advised Shortcut

Failing to apply the principles for modern rate design may lead to higher usage and higher bills for customers. Straight-fixed-variable rate designs with large fixed customer charges discriminate against low-usage customers and those with distributed generation, potentially leading customers to abandon the grid entirely.

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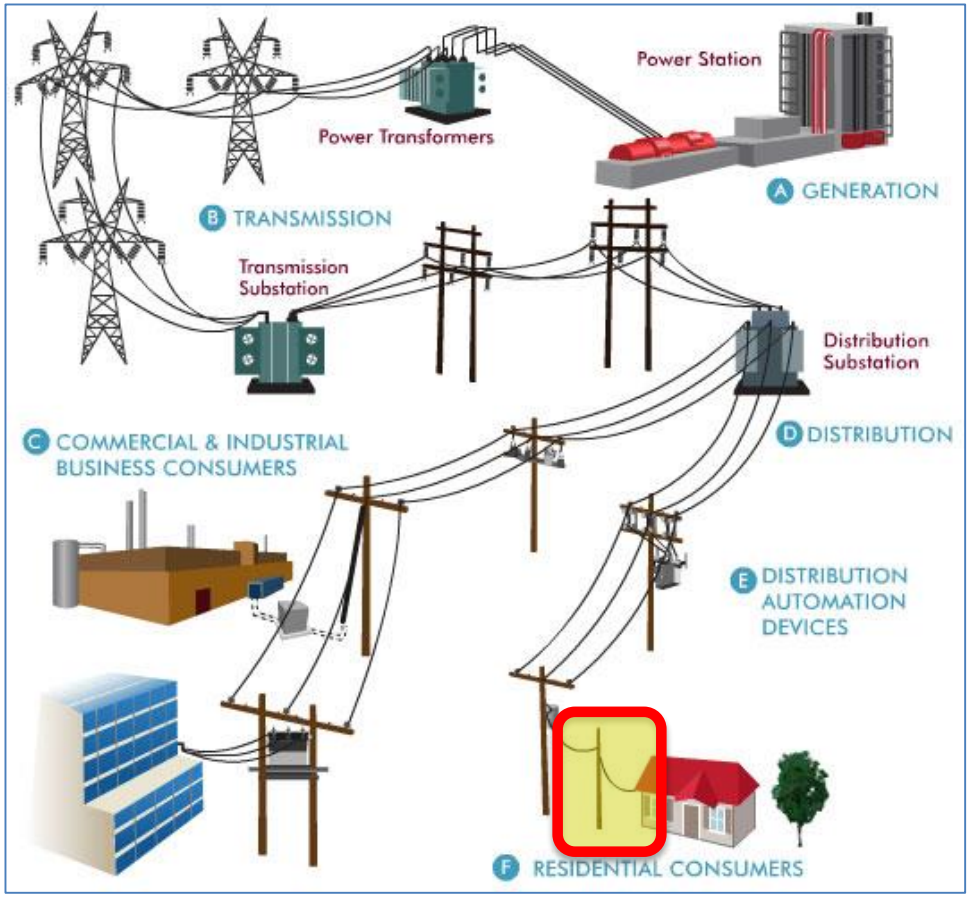
Principle #1

A customer should be allowed to connect to the grid for no more than the cost of connecting to the grid.



Principle #2

Customers should pay for the grid in proportion to how much they use the grid, and when they use the grid.

Principle #2 (cont'd)

Customers should pay for the grid in proportion to how much they use the grid, and when they use the grid.

Principle #3

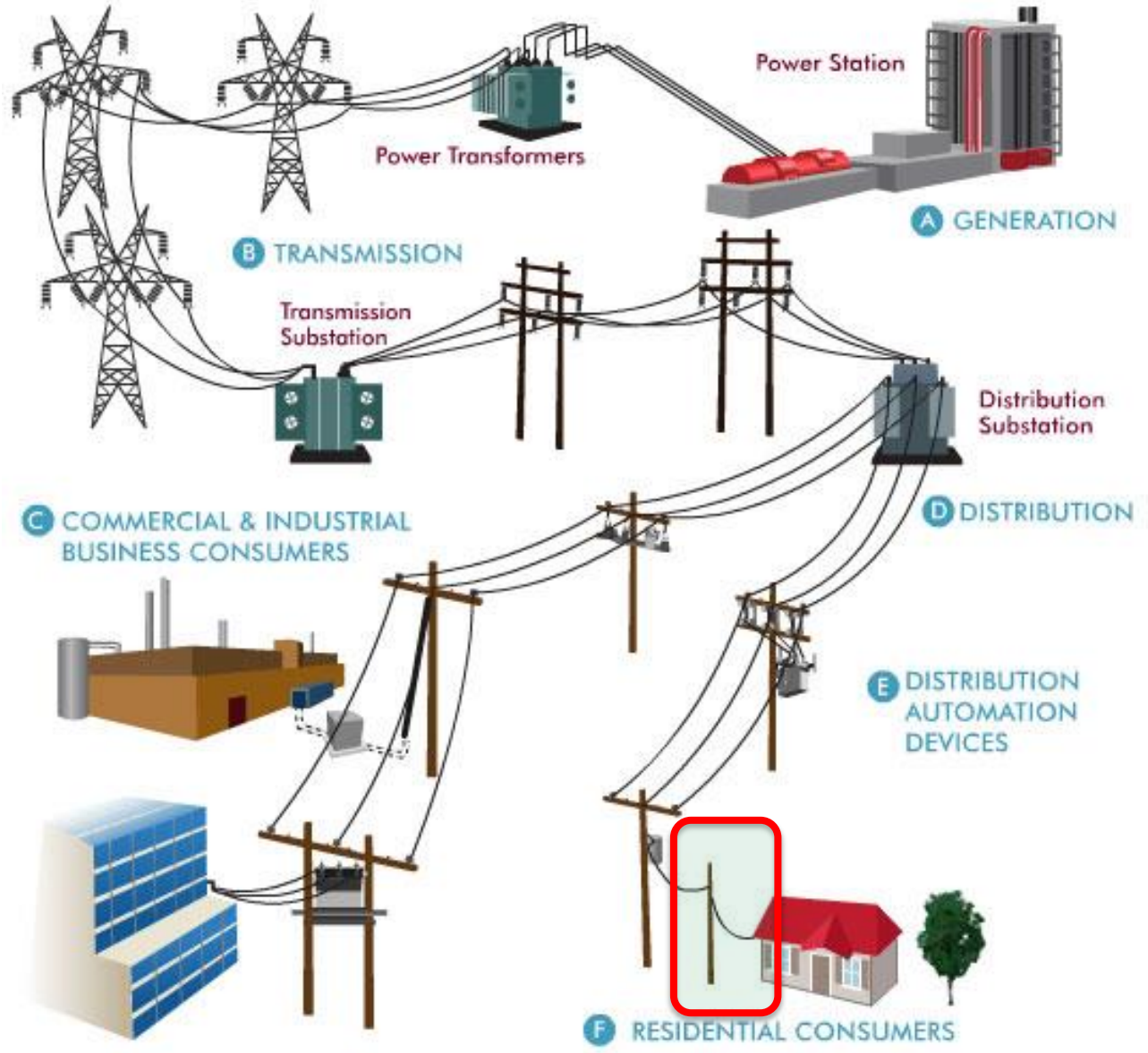
Customers delivering power to the grid should receive full and fair value – no more and no less.

Some Rate Design Options

- Conventional Rate Design
- High Fixed Charges
- Demand or Connected Load Charge
- Bi-Directional Time of Use Rates
- Minimum Bills

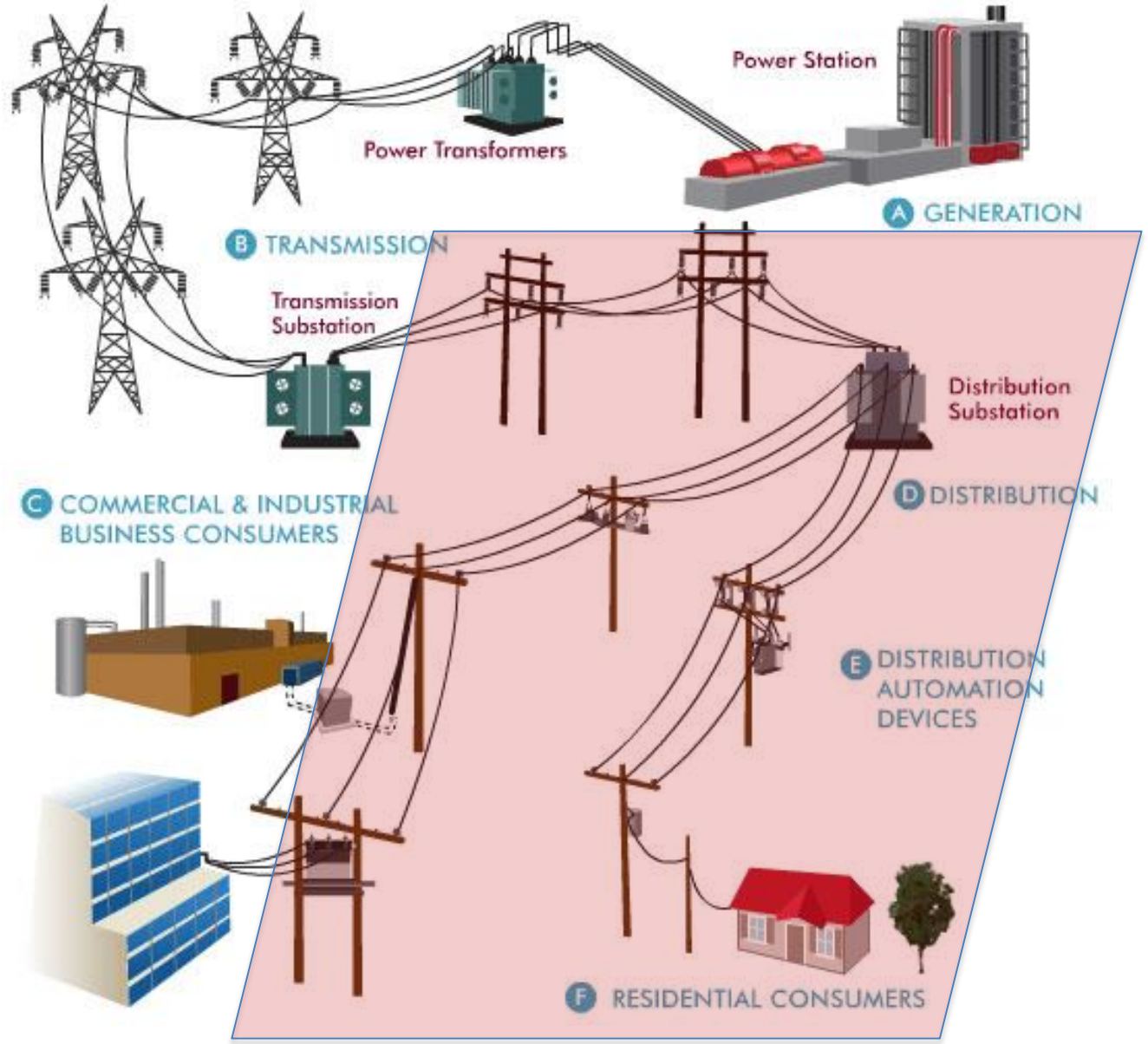
Basic Customer Method

ONLY customer-specific facilities classified as customer-related



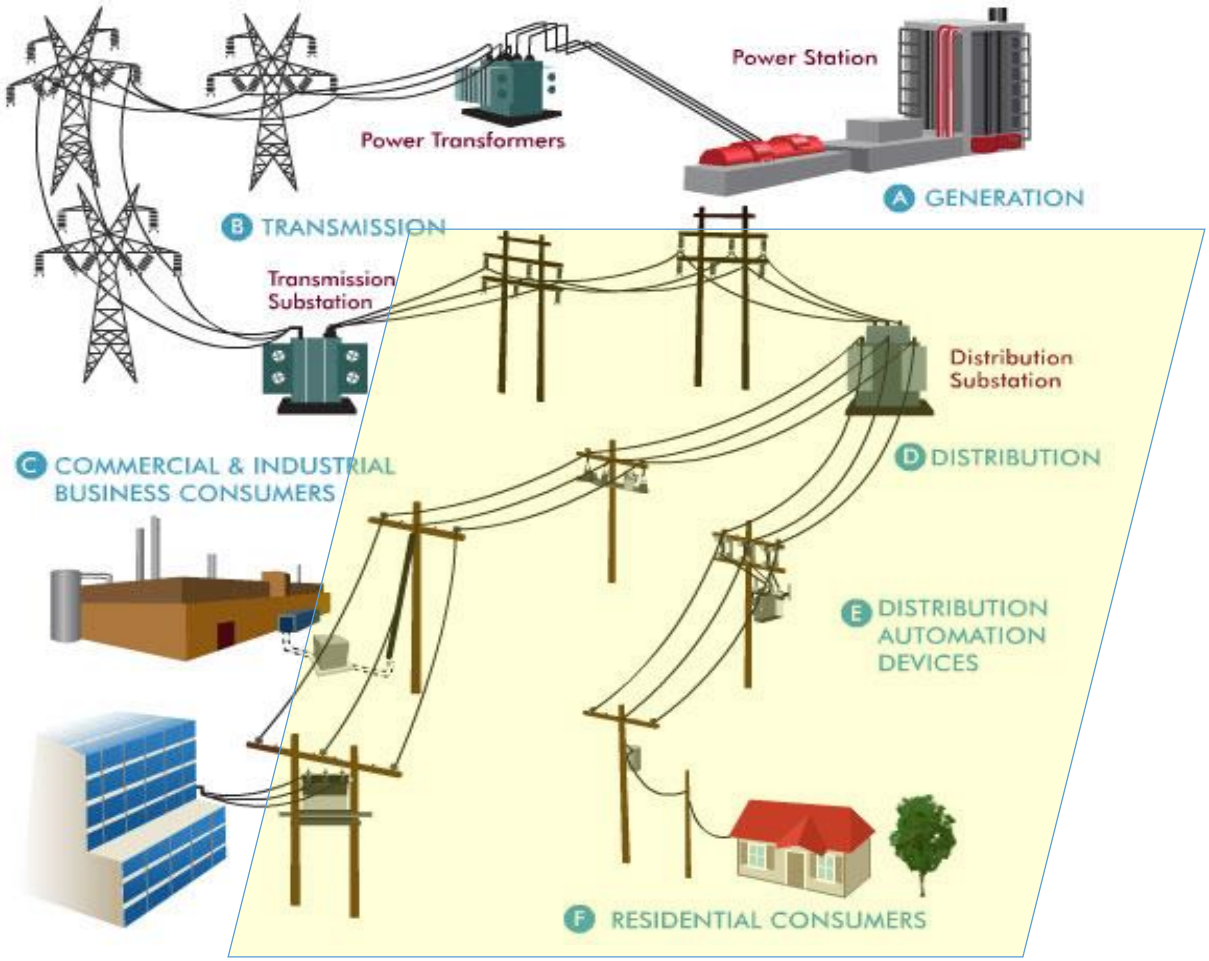
Straight Fixed/ Variable:

100% of Distribution System Classified as Customer-related



Minimum System Method:

~50% of Distribution System Classified as Customer-related



Comparison of High Fixed Charge to Minimum Bill Rate Form

	Conventional Rate Design	High Customer Charge	$20 Minimum Bill
Minimum Bill; Usage of 1,000 kwh			
Customer Charge	$5.00	$30.00	
Minimum Bill:			$ 20.00
Per-kWh Charge	$0.100	$0.075	$0.105
Total Bill (1000kWh)	$105.00	$105.00	$105.00
Elasticity Impact			
Rate Difference		($0.025)	$0.005
% Rate Difference		-25%	5%
Short Run Elasticity	-0.20	5%	-1%
Long-Run Elasticity	-0.70	18%	-3%

Maryland Ranks 9th in ACEEE Scorecard

"…the legislature enacted the EmPower Maryland Energy Efficiency Act of 2008, creating an EERS that sets a statewide goal of reducing per capita electricity use by 15% by 2015 with targeted reductions of 5% by 2011 (Order 82344). Since then, electric utilities have significantly expanded their energy efficiency program portfolios. More recent goals set by the PSC require utilities to ramp up savings by 0.2% per year to reach 2% incremental savings."

http://database.aceee.org/state/maryland#sthash.9Tk8YTIR.dpuf

Other Considerations with High Customer Charges

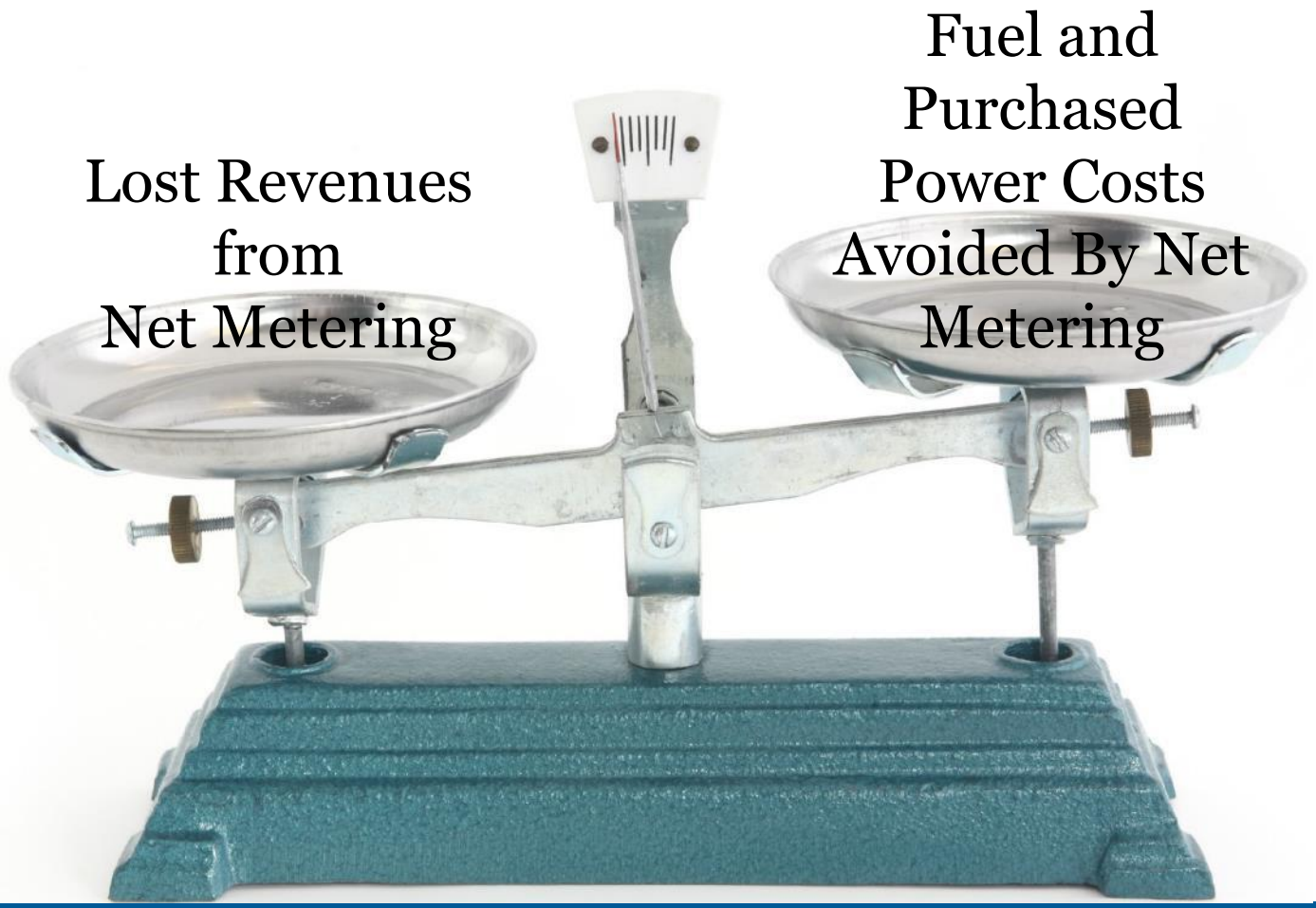
- Does not promote conservation
- Increases the payback on energy efficiency investments
- Results in low usage customers (often low-income) subsidizing high usage customers (often higher income)
- Impact on utility investments – If the Volumetric Charge is less than the Long Run Marginal Cost, then customers will behave as if their incremental usage has less of a cost effect than it does. This can result in greater customer usage which means utilities need to invest in more facilities, hence raising rates.
- High customer charges may hasten customers exiting the grid, rather than maintaining a connection to it, which further exacerbates the situation.

Boiling It Down To Rate Design

Rate Element	Amount
Costs to Connect to the Grid	
Billing and Collection	$4.00/month
Transformer Demand Charge	$1.00/kVA/month
Power Supply and Distribution (both directions)	
Off-Peak	$.07/kWh
Mid-Peak	$.10/kWh
On-Peak	$.15/kWh
Critical Periods	$.75/kWh

Traditional Ratemaking View

Utility View of Net Metering



Solar Advocate View of Net Metering

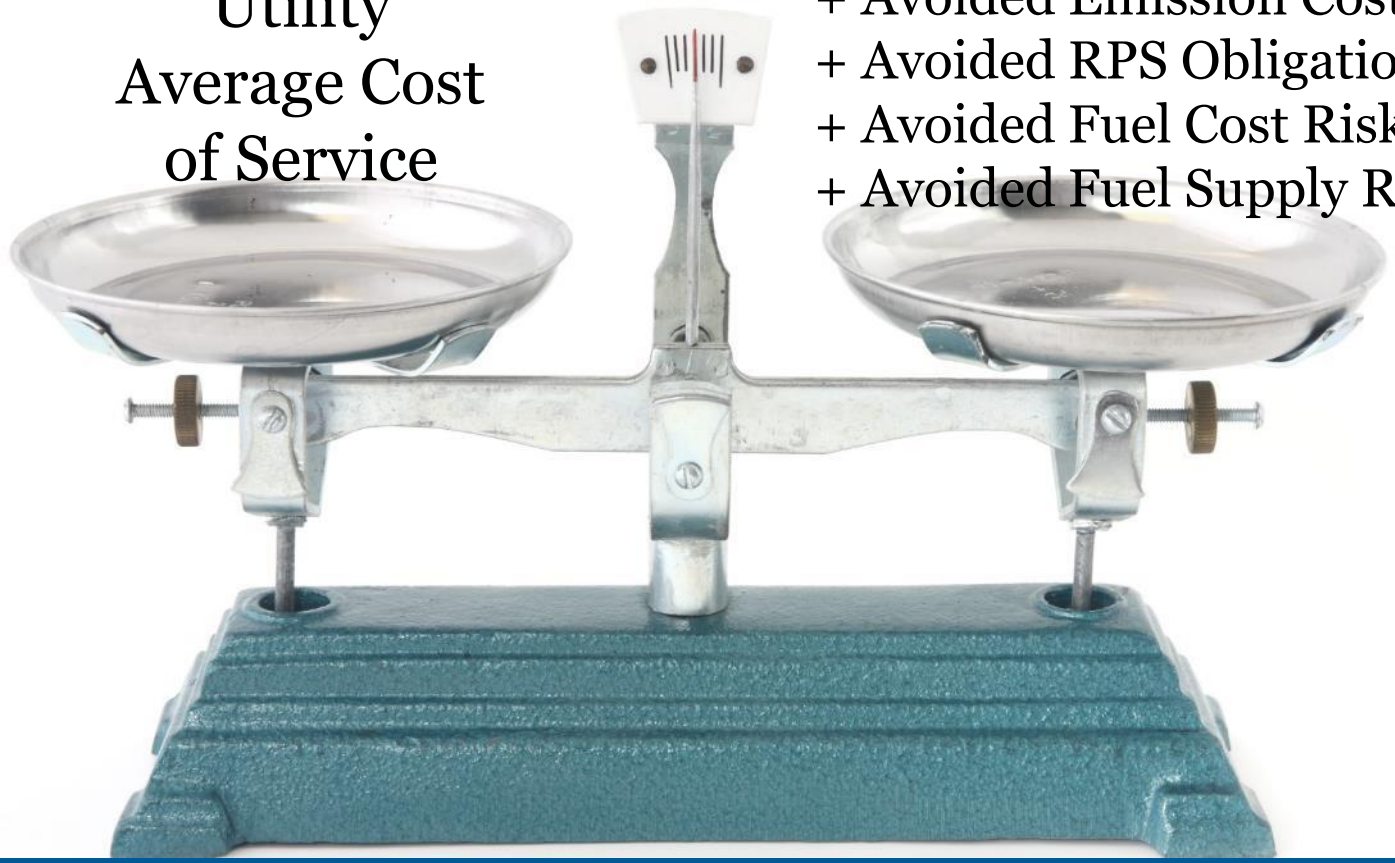
Lost Revenues From Net Metering

Long-Run Avoided Cost for Generation, Trans, Dist
+ Reduced Emissions
+ Avoided Fuel Cost Risk
+ Avoided Fuel Supply Risk
+ Local Economic Development
+ Future Carbon Costs
+ Shading Benefits on AC Load
+ Much, much more

Balanced Net Metering View

Utility
Average Cost
of Service

Long-Run Avoided Cost for
Generation, Trans, Dist
+ Avoided Emission Cost
+ Avoided RPS Obligation
+ Avoided Fuel Cost Risk
+ Avoided Fuel Supply Risk



Rate Design Resources

- Smart Rate Design for a Smart Future
- Designing Distributed Generation Tariffs Well
- Rate Design Where Advanced Metering Infrastructure Has Not Been Fully Deployed
- Revenue Regulation and Decoupling: A Guide to Theory and Application
- Time-Varying and Dynamic Rate Design

Go to www.raponline.org

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 sector. 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.raponline.org

jmigden@raponline.org

802-498-0740

The Regulatory Assistance Project™

Beijing, China • Berlin, Germany • Brussels, Belgium • **Montpelier, Vermont USA** • New Delhi, India

50 State Street, Suite 3 • Montpelier, VT 05602 • *phone:* +1 802-223-8199 • *fax:* +1 802-223-8172

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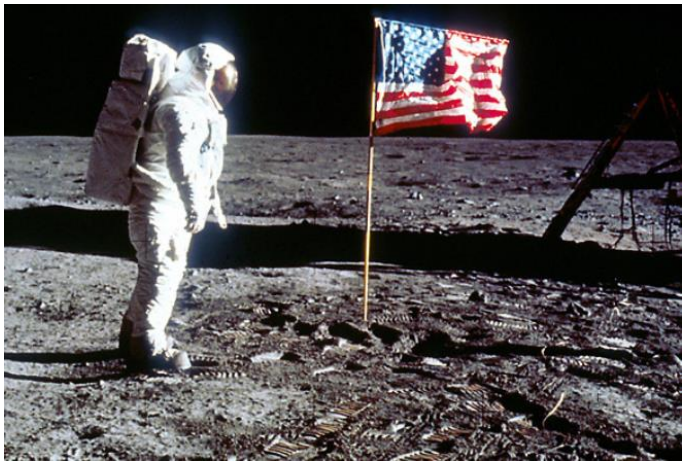
Appendix

Alternatives to Net Metering

- Infant Industry Subsidy - Is that still valid?
- Value of Solar Tariff (VOST)
- Higher customer charge
- Special charge for PV customers
- Demand Charge
- Directional Pricing

Infant Industry Subsidies



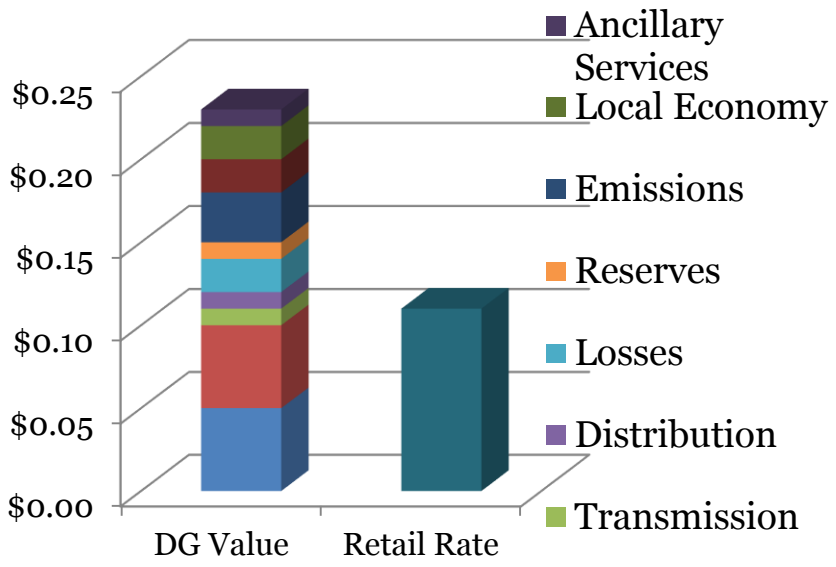
Are potential cross-subsidies a significant problem?

- Some level of cross-subsidy is normal and even desired
    - Customer classes, not individual rates
    - *Undue* discrimination is bad
- At low penetration levels, these lost revenues are extremely small compared to the revenue requirement
- But as deployment grows, at some point this could become a problem

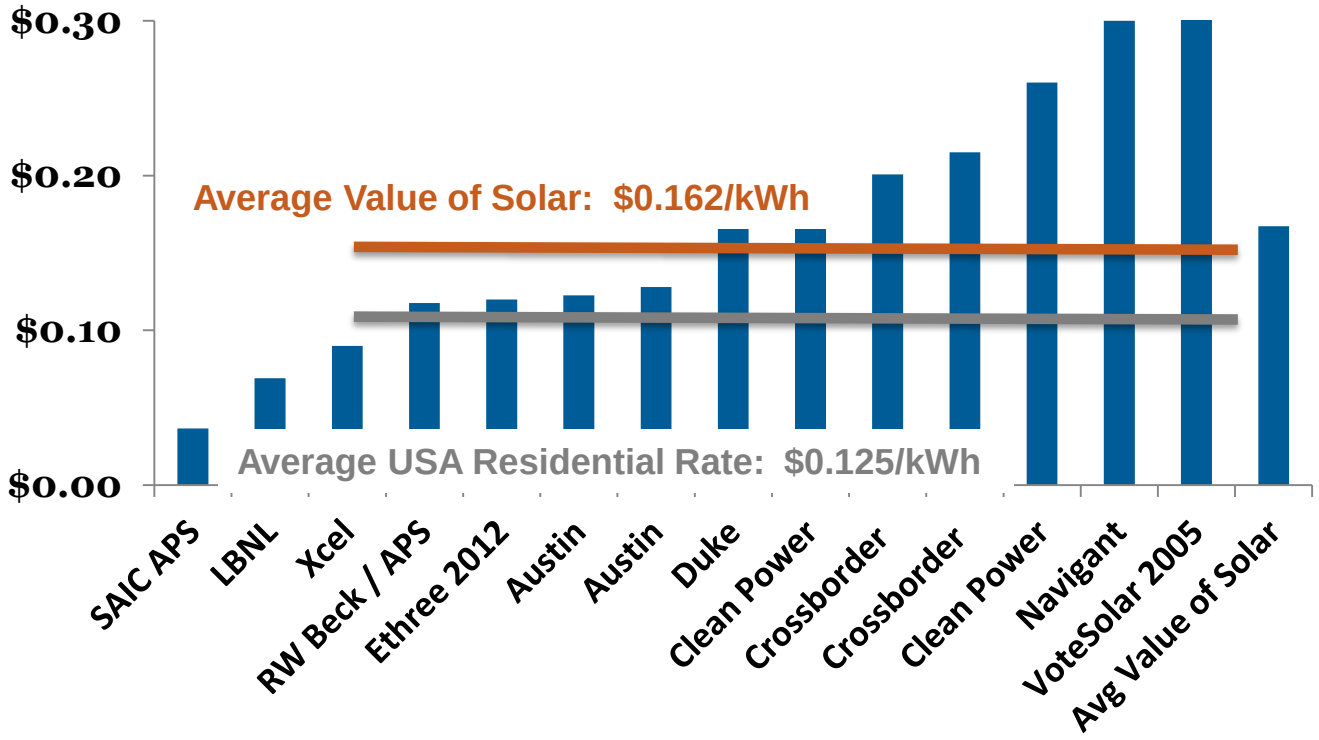
Value of Solar Tariff (VOST)

Recognize all values of solar:

- Renewable
- New Resource
- Delivered to System
- Environmental
- Fuel Cost Risk
- Price Suppression



Value of Solar Tariff – RMI Study



Potential Cross-Subsidies

- **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 from societal value
  - Utility effects may still require attention