



RAP

Energy solutions
for a changing world

Beyond Net Metering Issues for Washington State

Washington Solar Summit
Bellevue, WA

Jim Lazar, RAP Senior Advisor

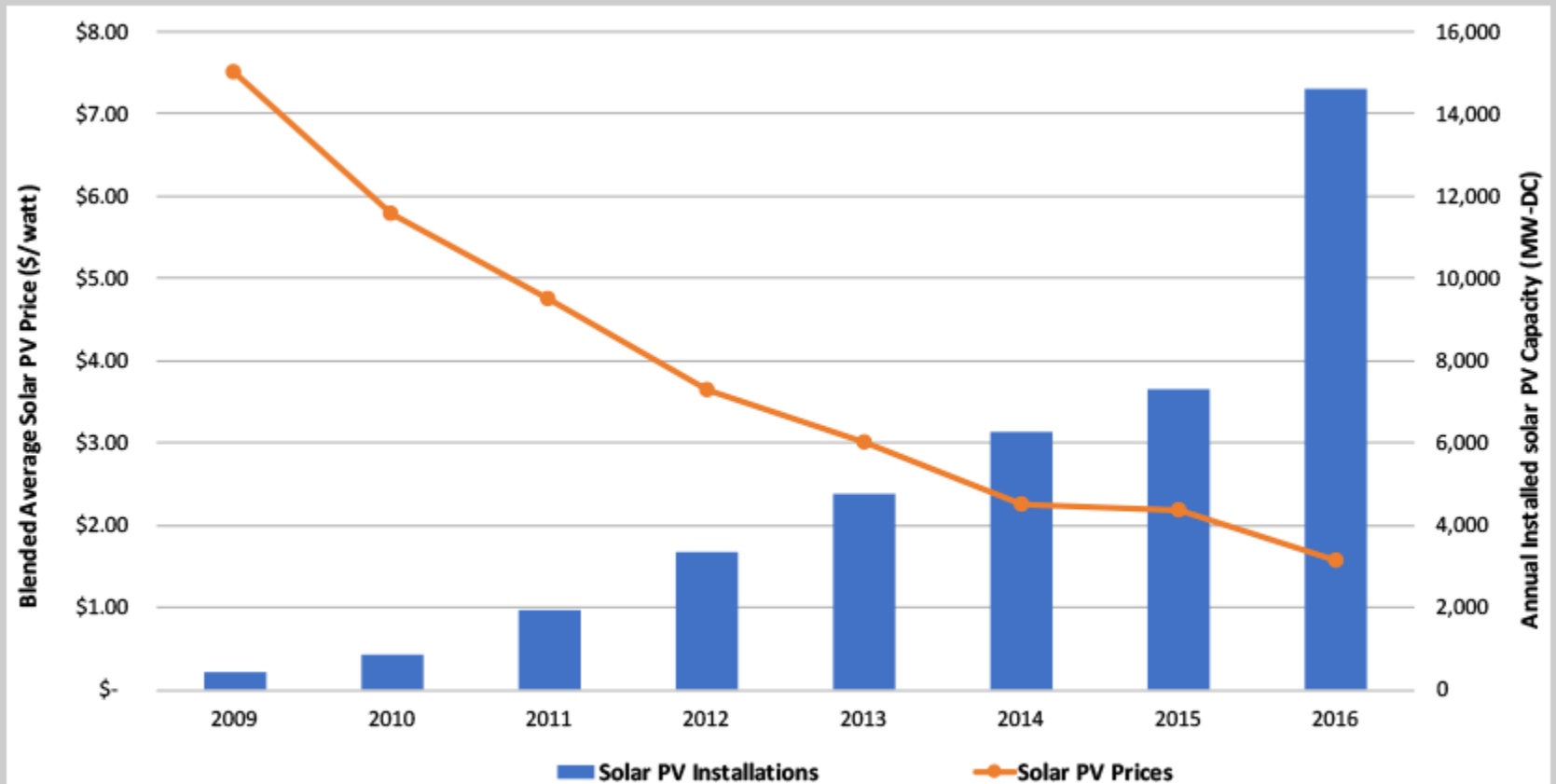
October 13, 2007

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Solar is Soaring – Costs Declining



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Solar Energy
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Perspectives AND Issues

PERSPECTIVES

- Utility
- Consumer
- Societal
- Solar Industry

ISSUES

- Incentives
- Rate Design
- Net-Metering

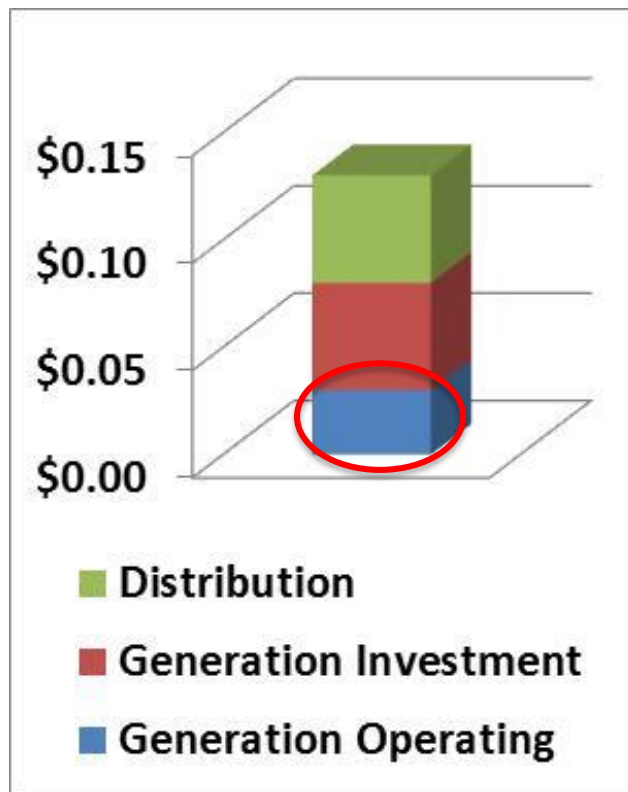
Overview of Net Metering and Value of Solar Ratemaking

- Net-Metering:
 - Simple
 - No new metering required
 - Typically not TOU based
 - Considered an infant-industry subsidy by many
- Value of Solar Analysis
 - Can be narrow (short-run) or broad in scope

Two Views of Cost Recovery

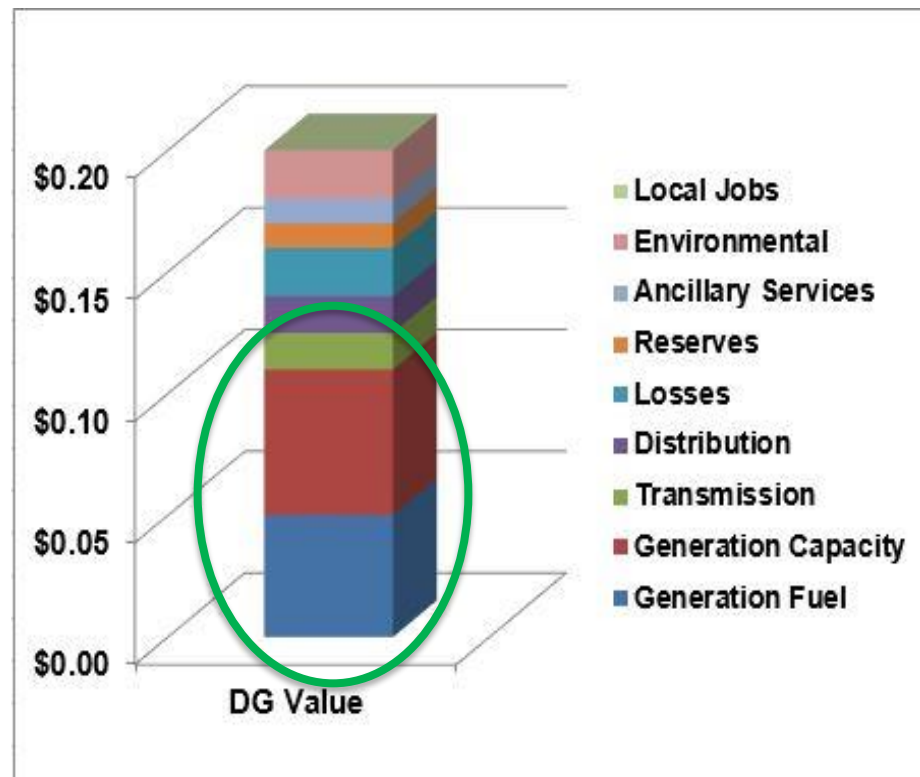
Traditional Utility View

- DG customer “uses” the grid and should pay for it;



Solar Advocate View

- Value of distributed resource is greater than the retail rate;



Range of Solar Valuation Studies

- Narrow studies
 - Short-run cost savings from solar additions
- Long-Run studies
 - Generation capacity and energy value
- Broad Utility Sector Studies
 - Generation, transmission, distribution, and other utility system values.
- Extensive Societal Studies
 - Utility system and societal benefits

Categories of Costs Considered

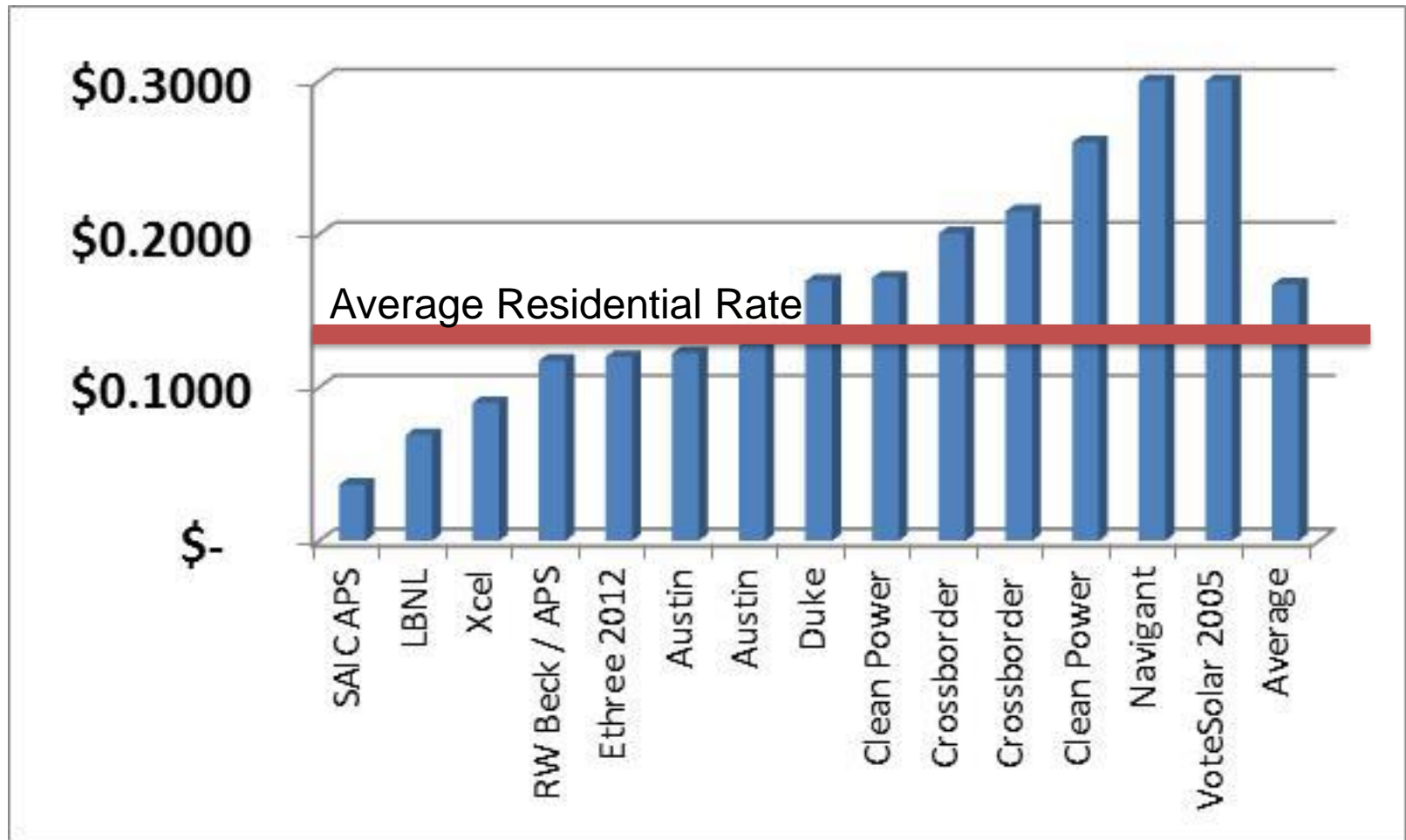
Type	Variable	Capital	Externalities	Societal
Narrow	X			
Long-Run	X	X		
Broad Utility	X	X	x	
Extensive	X	X	X	X

Some Costs Treated Very Differently

- Production Capital Costs
- Transmission Capital Costs
- Distribution Capacity Credit
- Marginal or Average Line Losses
- Current or Future Environmental Costs
- Fuel Cost and Fuel Supply Risk
- Macroeconomic Effects

RMI Survey Of Multiple Studies:

Average: \$.1672/kWh



Traditional Ratemaking

**Utility
Average Cost
of Service**

Retail Rates



Critical View of Net Metering

**Lost Revenues
from
Net Metering**

**Short-run Fuel and
Purchased Power
Costs Avoided By 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**

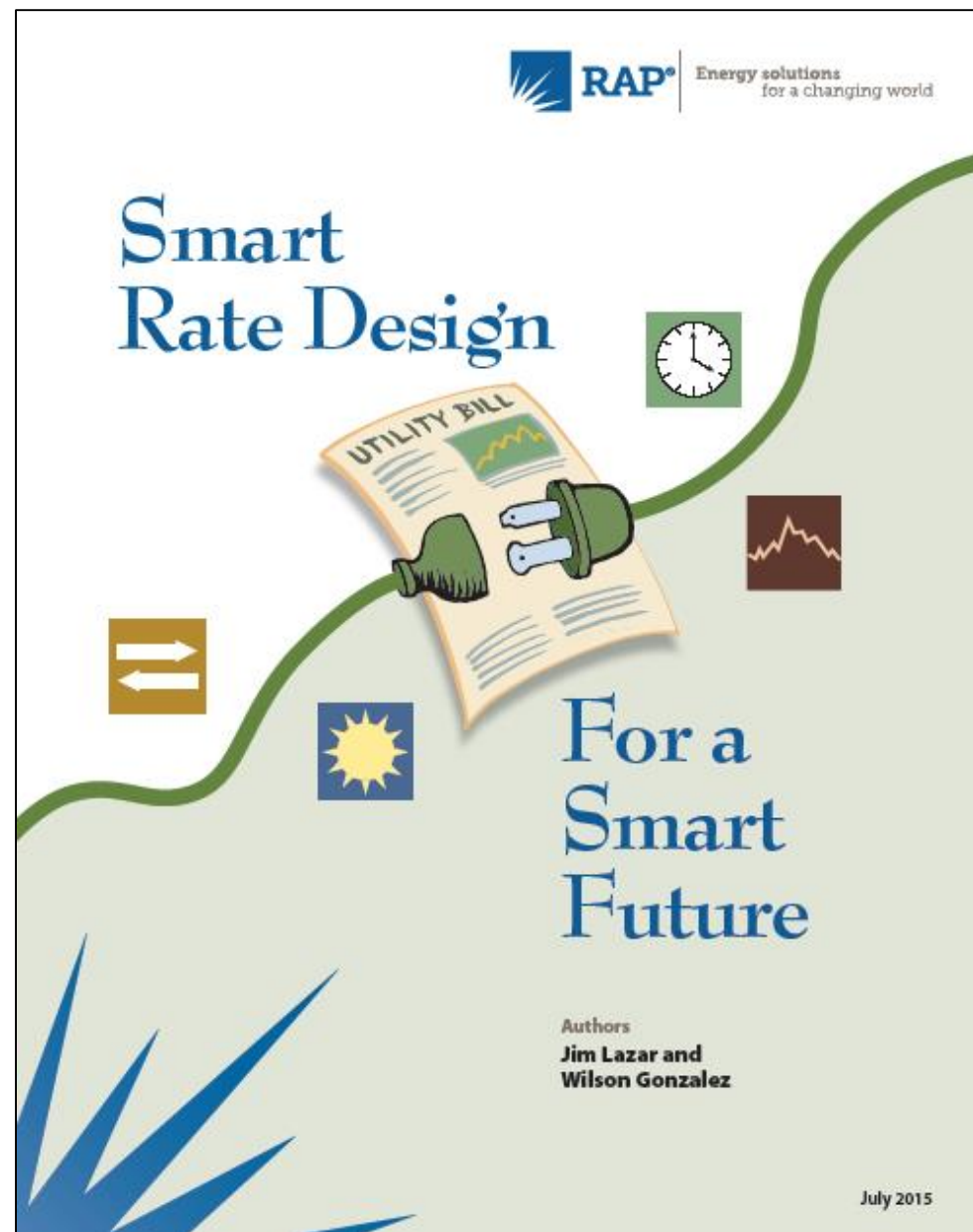


Observations

- The answer you get depends on the question you ask.
 - Long-run vs. Short-run
 - Utility direct effects only?
 - Utility direct and future effects?
 - All societal effects
- Valuation of risk and environmental costs have a significant impact.

Smart Rate Design:

Rate design as though the future is important.

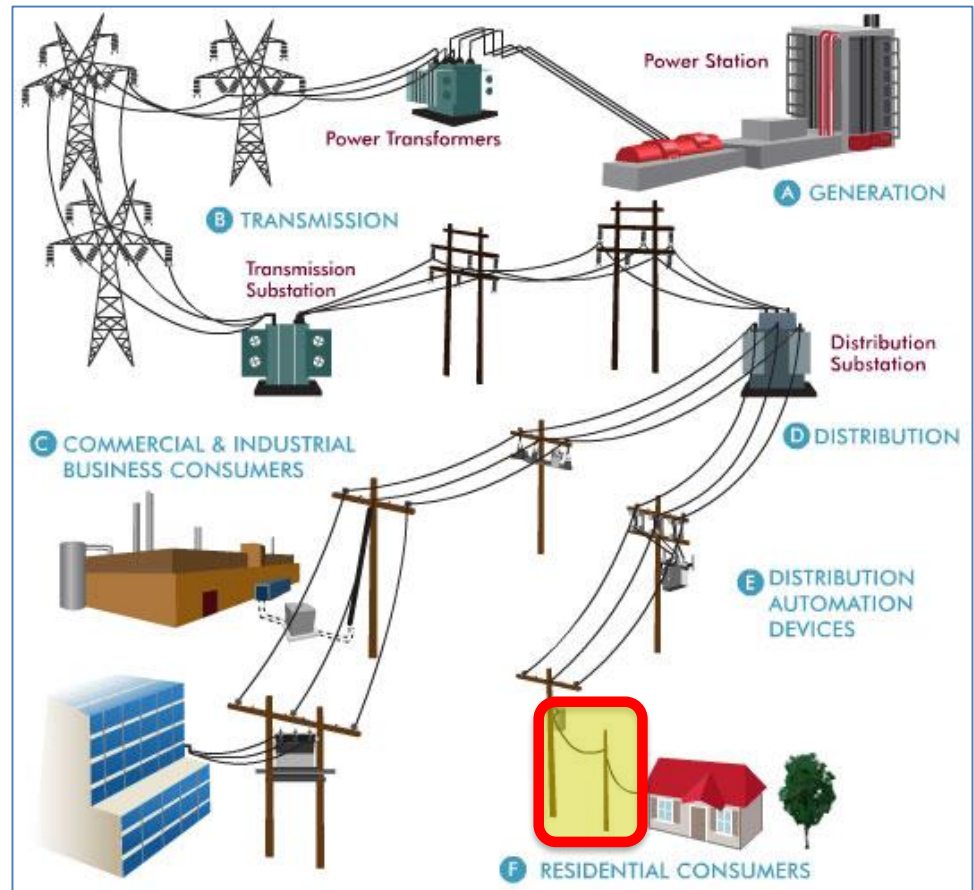


Three Guiding Principles

- A customer should be able to connect to the grid for no more than the cost of connecting to the grid.
- Customers should pay for power supply and grid services based on how much they use and when they use it.
- Customers supplying power to the grid should receive full and fair compensation – no more and no less.

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

Customers should pay for power supply in proportion to how much they use and when they use it.

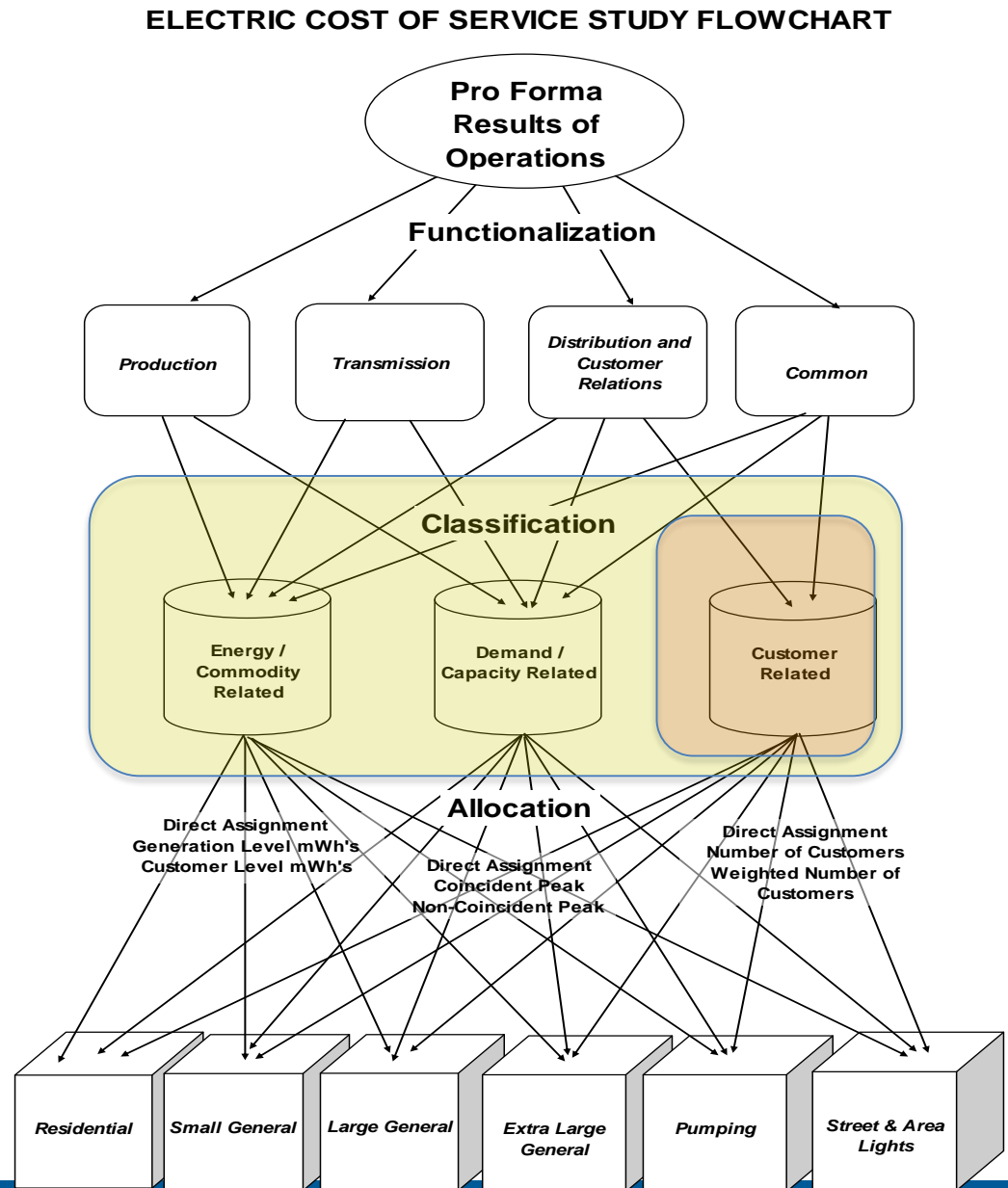


Principle #3

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

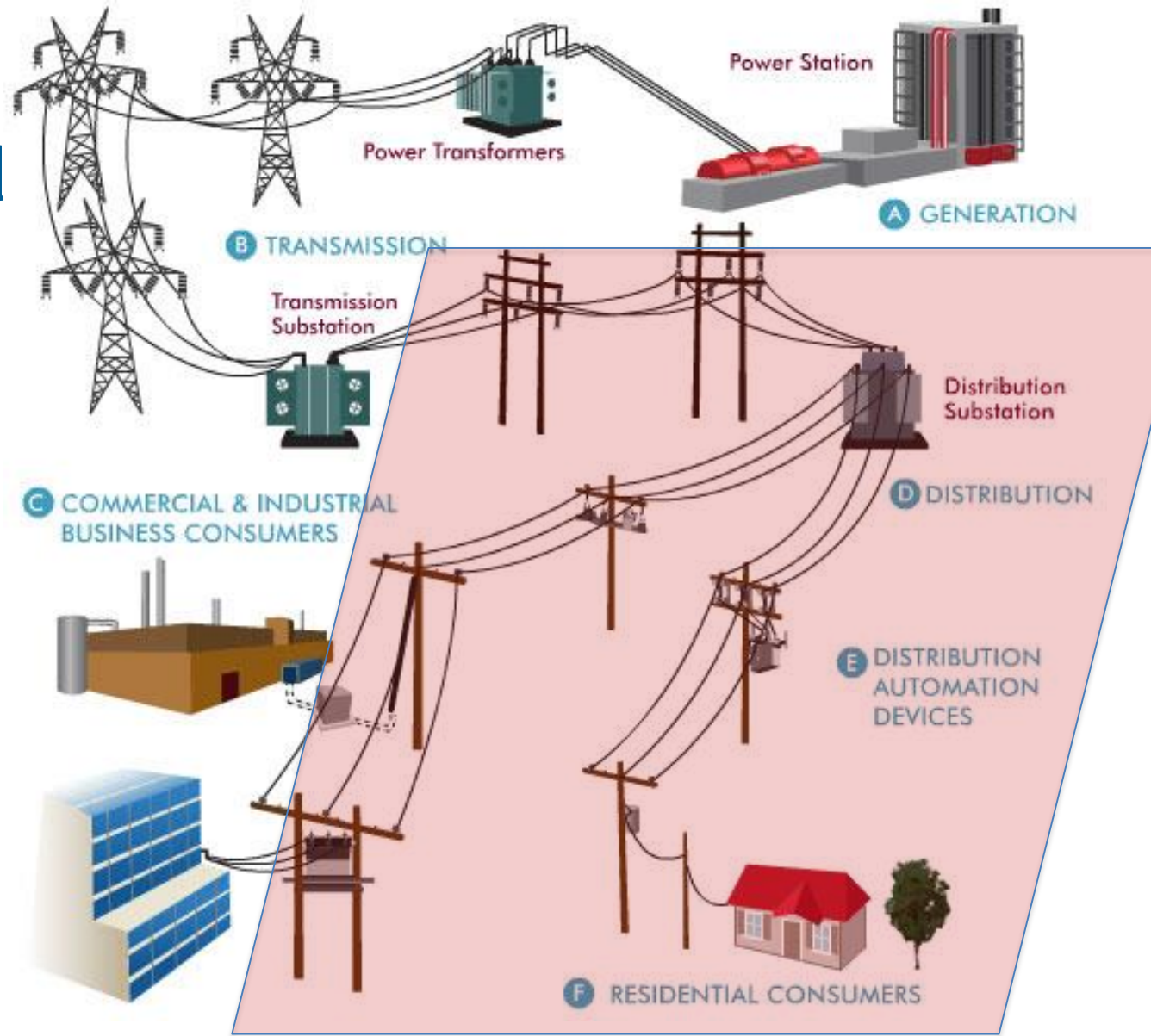


Where Did The
Idea that High
Fixed Charges are
Appropriate Come
From?

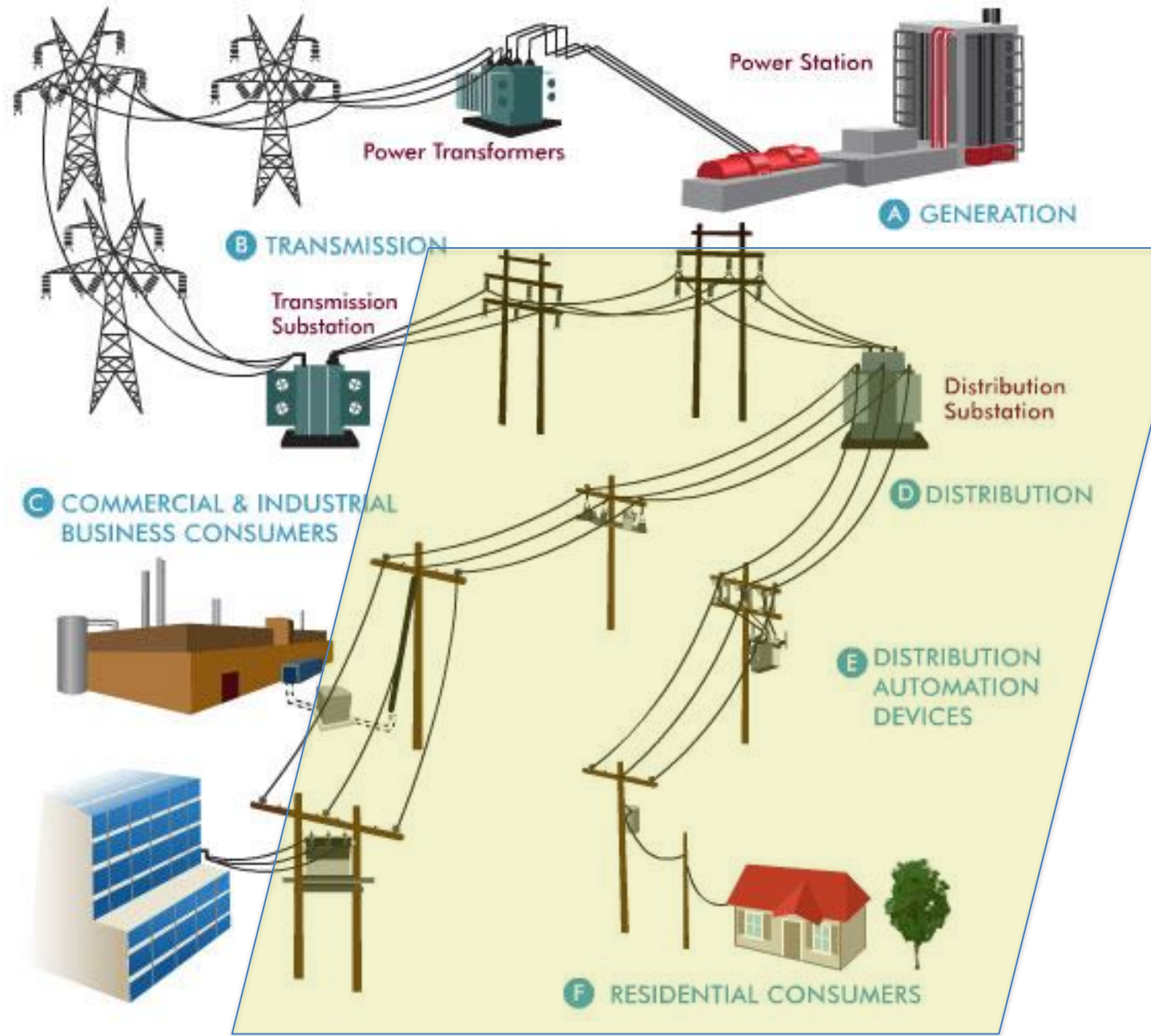


Straight Fixed
/ Variable:

100% of
Distribution
System
Classified as
Customer-
related

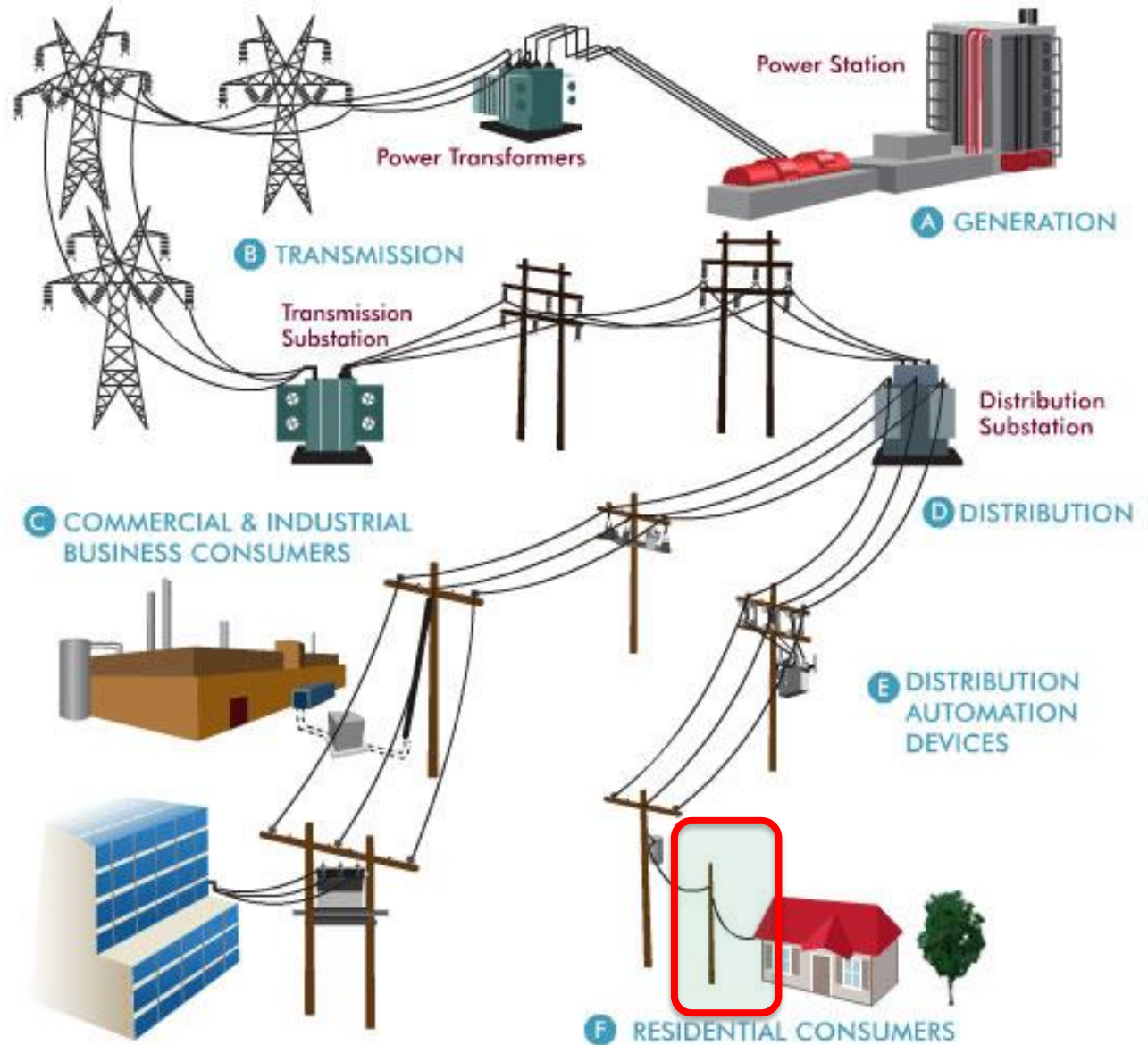


Minimum System Method: ~50% of Distribution System Classified as Customer- related



Basic Customer Method

ONLY customer- specific facilities classified as customer- related

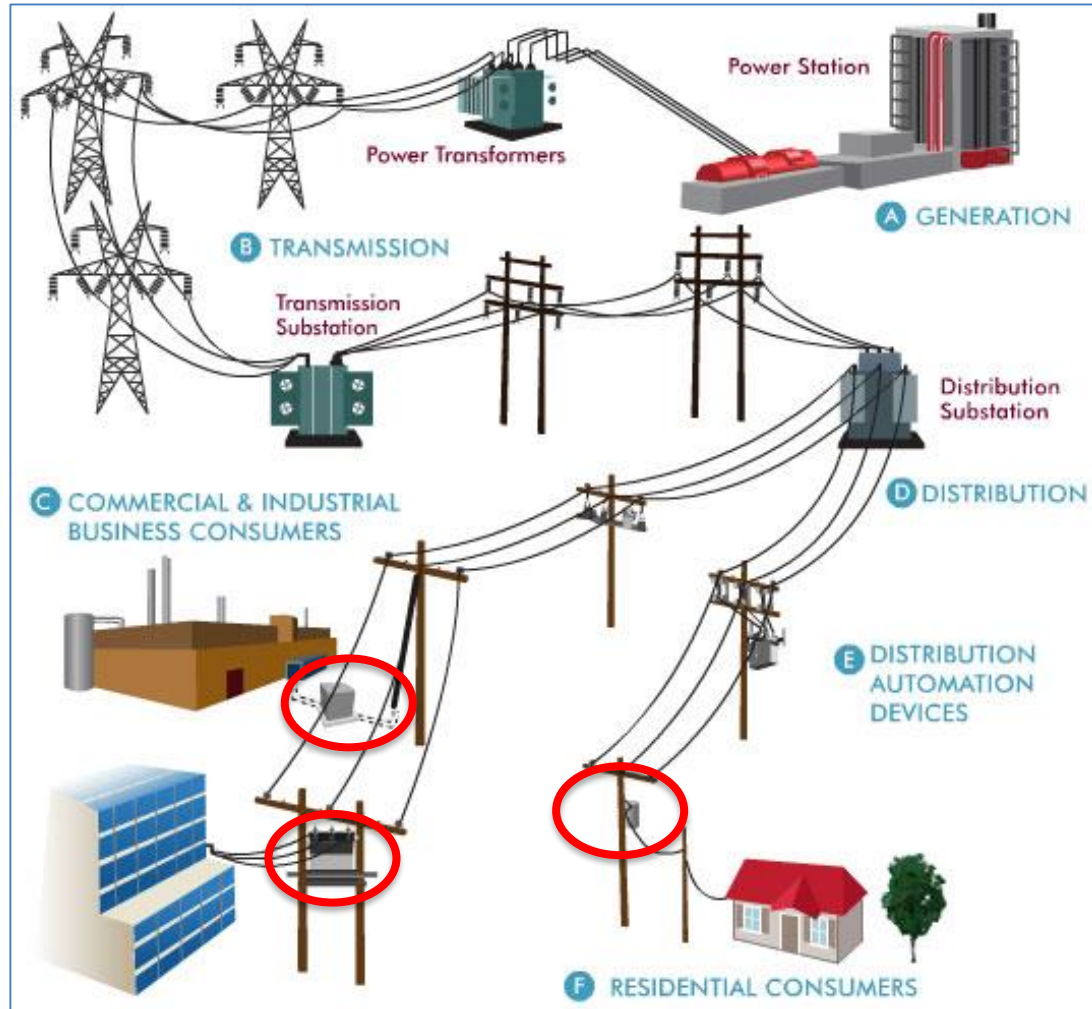


Comparing Methods

Cost Category		Straight Fixed / Variable		Minimum System Method		Basic Customer Method
		\$ /month/customer				
Poles		\$10		\$5		\$ -
Wires		\$20		\$10		\$ -
Transformers		\$10		\$5		\$ -
Services		\$1		\$1		\$1
Meters		\$1		\$1		\$1
Billing		\$2		\$2		\$1
Customer Service		\$2		\$2		\$1
Total		\$46		\$26		\$4

Only Component Sized To Customer Demand

Final Line Transformer



Bottom Line: Smart Rates

Customer-Specific Charges

Customer Charge	\$/Month	\$ 3.00
Transformer:	\$/kVA/Mo	\$ 1.00

Energy Charges

Off-Peak	\$/kWh	\$ 0.08
Mid-Peak	\$/kWh	\$ 0.12
On-Peak	\$/kWh	\$ 0.18
Critical Peak	\$/kWh	\$ 0.75

Example Residential Rate:

	Pacific Power	Franklin PUD
Customer Charge	\$7.75	\$34.00
First 600 kWh	\$.067	\$.067
Over 600 kWh	\$.106	\$.067

WUTC Ruling

“We reject the Company’s and Staff’s proposals to increase significantly the basic charge to residential customers. The Commission is not prepared to move away from the long-accepted principle that basic charges should reflect only “direct customer costs” such as meter reading and billing. Including distribution costs in the basic charge and increasing it 81 percent, as the Company proposes in this case, does not promote, and may be antithetical to, the realization of conservation goals.” Pacific Power, Docket UE-140762 (2015)

Some Approaches For Solar Treatment Being Tried Around the County

Full net-metering (PSE)

High Fixed Charges (Franklin PUD)

Partial net-metering (Texas)

Residential demand charges (Arizona)

Buy-all / Sell-all (Austin)

Self-Supply (Hawaii)

Full Net Metering (PSE)

Customer Charge	\$7.87/month
First 600 kWh	\$0.10/kWh
Over 600 kWh	\$0.12/kWh

Only net consumption is billed.

Credit for solar backfeed is \$.10 - \$.12/kWh

High Fixed Charge (Franklin PUD)

Customer Charge	\$34.00/month
All kWh	\$0.67/kWh

Only net consumption is billed

Credit for solar backfeed is \$.067/kWh

Partial Net Metering

Pedernales Electric Cooperative, Texas

Customer Charge:	\$20.00/month
Power Charge:	\$.06/kWh
Delivery Charge:	\$.033/kWh

All power delivered pays delivery charge

Credit for solar backfeed is \$.06/kWh

Residential Demand Charge Salt River Project (Arizona)

Customer Charge: \$20.00

Demand Charge:

Winter: \$3.47 - \$9.54/kW

Summer: \$7.81 - \$33.27/kW

Energy Charge

Winter: \$.04/kWh

Summer: \$.06/kWh

Credit for solar backfeed is \$.04 - \$.06/kWh

Buy-All / Sell-All

Value of Solar Rate: Austin, Texas

Austin Energy (Texas)

Key Features:

- Inclining block/seasonal rate
- Value of solar credit for PV exceeds initial block rate

		Summer	Winter
Customer Charge	\$/month	\$10.00	\$10.00
Usage Charges	\$/kWh		
0 - 500 kWh		\$0.087	\$0.072
500 - 1,000 kWh		\$0.134	\$0.110
1,000 - 1,500 kWh		\$0.145	\$0.126
1,500 - 2,500 kWh		\$0.164	\$0.138
Over 2,500 kWh		\$0.168	\$0.150
Value of Solar Credit	\$/kWh	(\$0.107)	(\$0.107)

Self Supply (Hawaii)

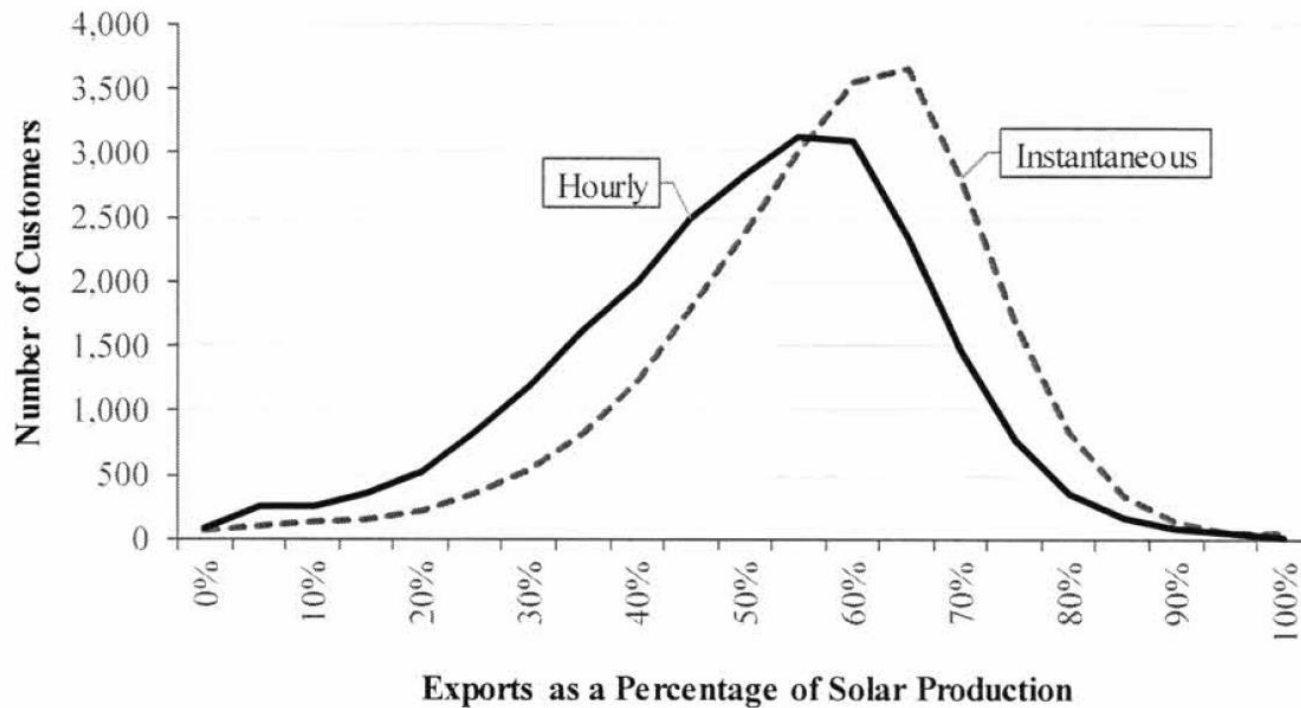
Customer Charge:	\$9.00/month
Energy Charge:	\$0.27/kWh
Minimum bill:	\$17.00/month

Solar backfeed is **not permitted** for new solar customers. Full net metering applies to solar customers connected before 2015.

Net Metering Over What Period of Time?

Annual
Hourly

Monthly
Instantaneous



Example Large Commercial Rate: PSE

Customer Charge \$104.46

Demand Charge

Summer \$/kW \$7.76

Winter \$/kW \$11.65

Energy Charge

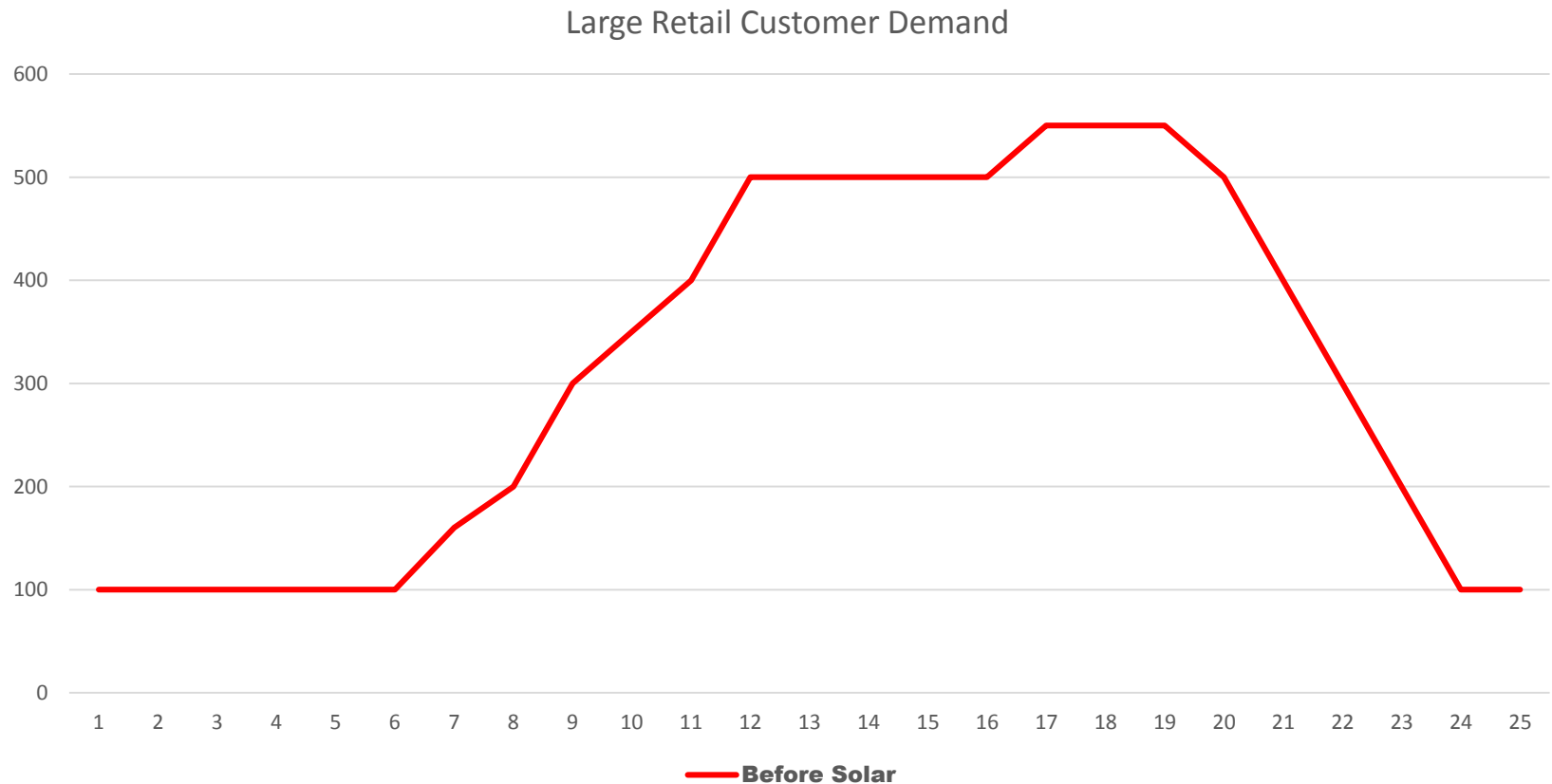
\$/kWh \$.0567



What Happens When Large Commercial Customers Go Solar?

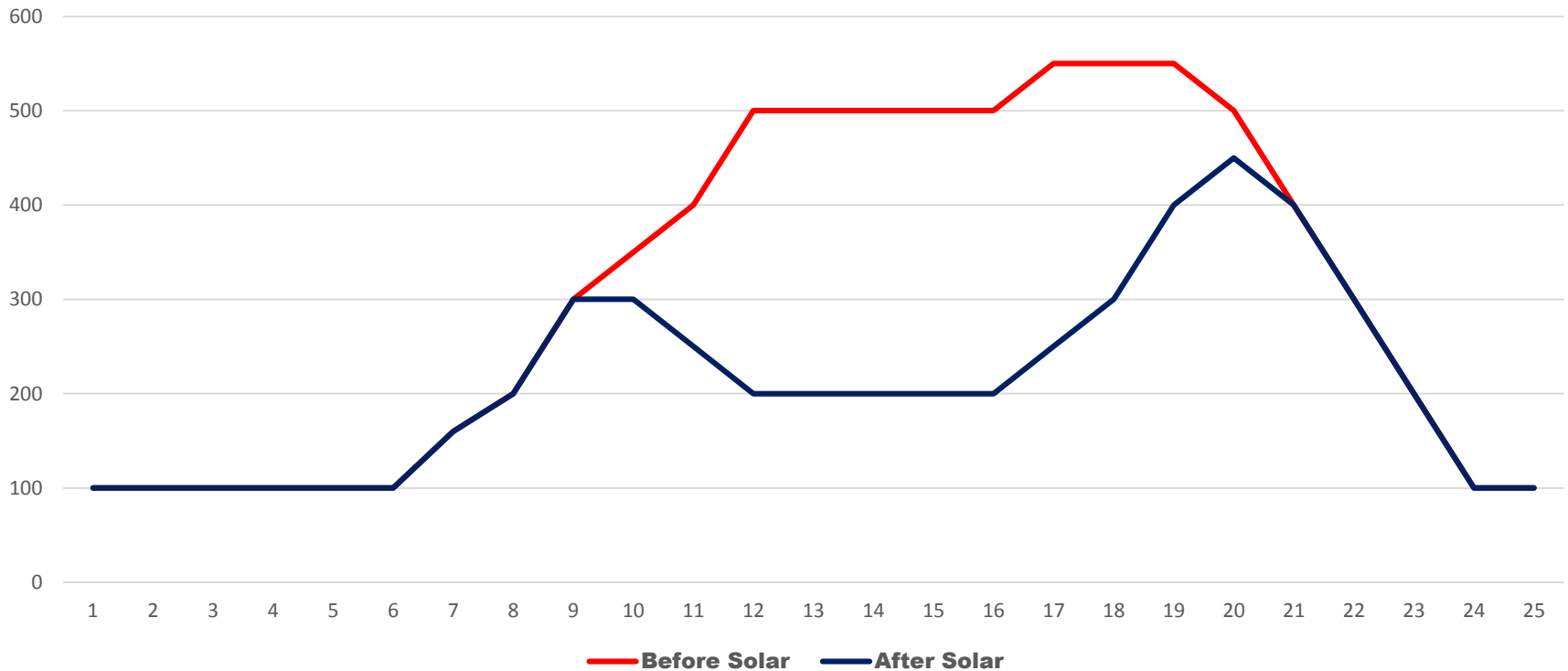


Big Box Without Solar: Demand Charge at 550 kW

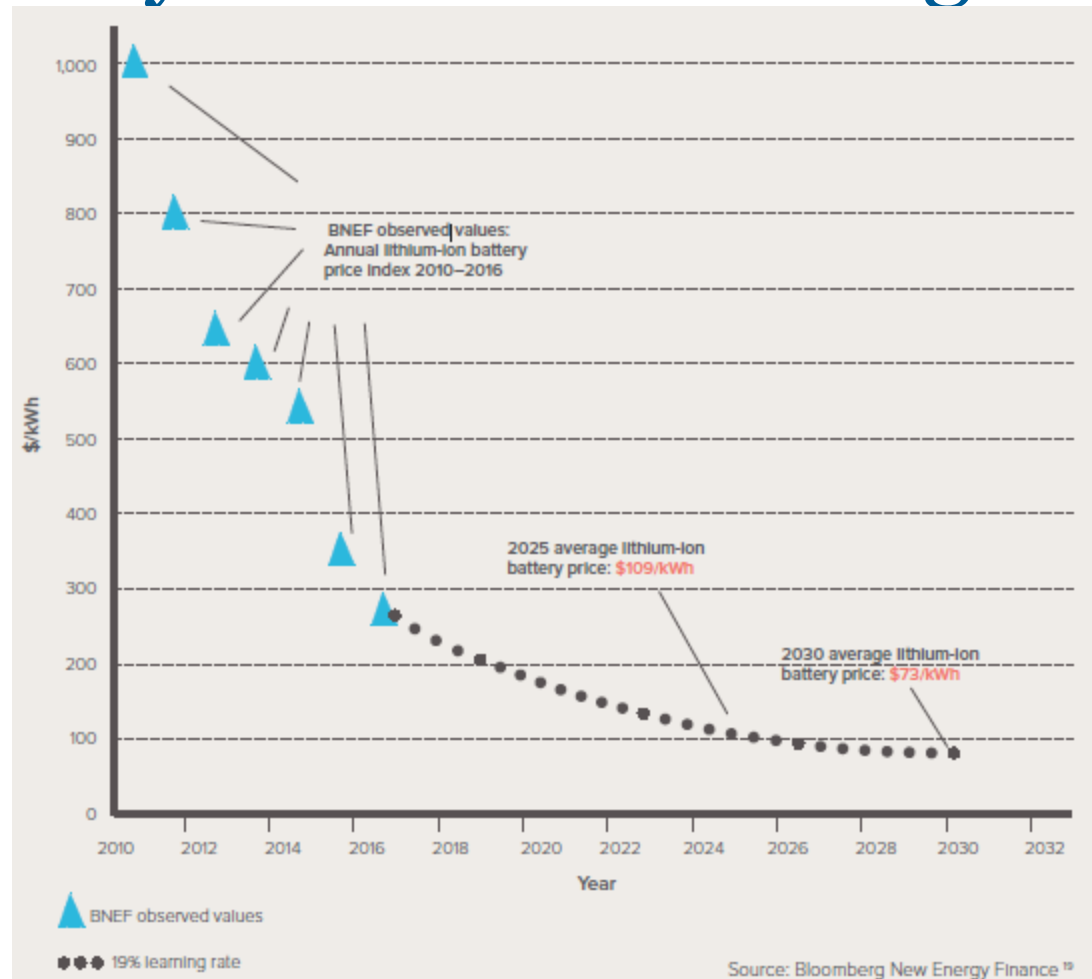


Big Box WITH Solar: Demand Charge at 450 kW

Large Retail Customer Demand
with Solar

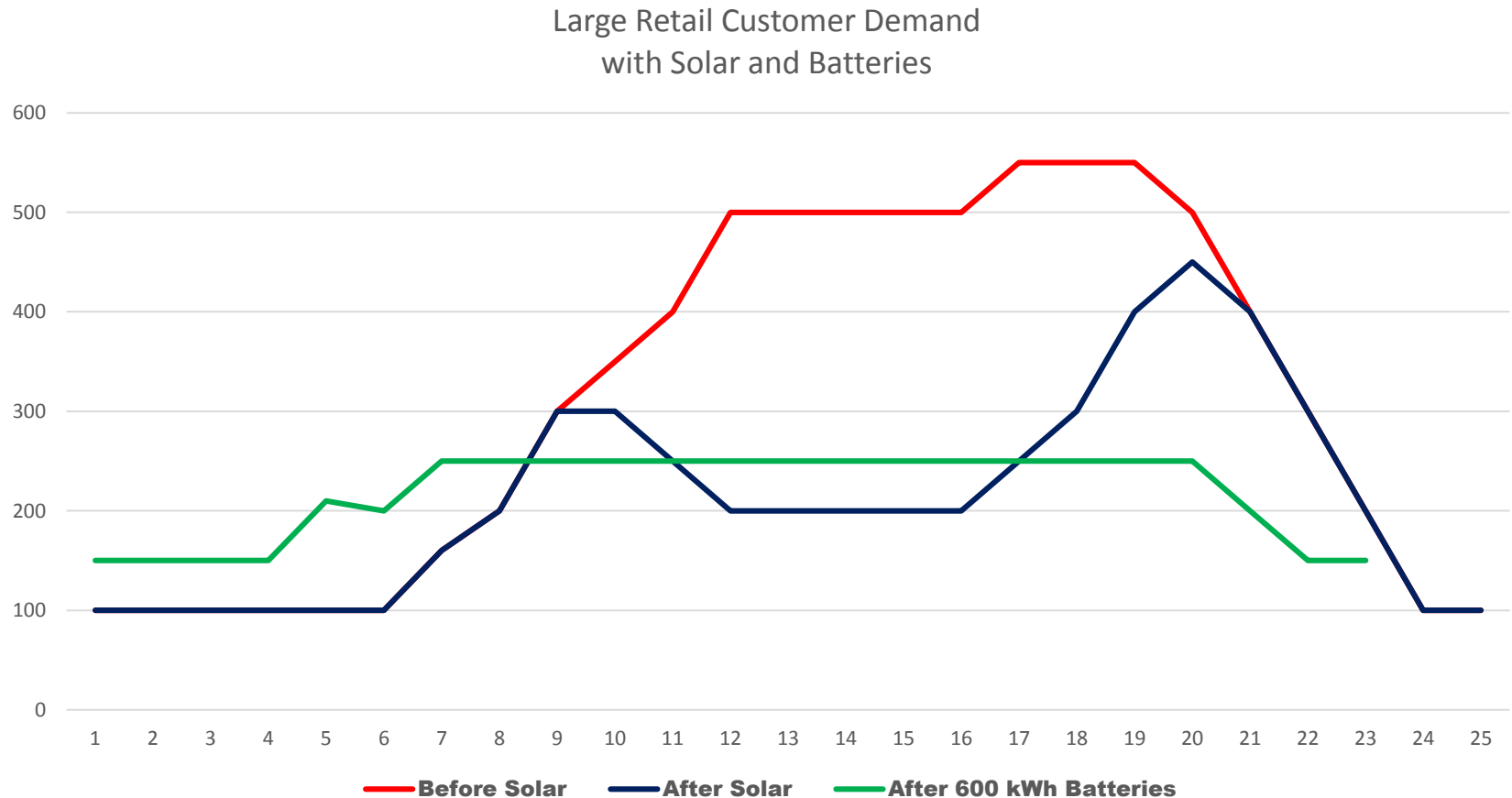


Battery Costs Are Coming Down



Big Box Store With Solar And Batteries

Demand Charge at 250 kW



Summary

Residential Issues:

- Size of Fixed Charge

- Full or Partial Net-Metering

- Period over which “Net” is Calculated

Commercial Issues

- Demand Charges provide utilities a buffer

- Batteries are on the horizon.

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.raponline.org

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