



Energy solutions
for a changing world

Minimum Bills: An Alternative to High Customer Charges

Colorado PUC Workshop
April 23, 2015

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Rate Design Principles

- **Universal Service:** A customer should be able to connect to the grid for no more than the cost of connecting to the grid.
- **Time-Varying:** Customers should pay for grid services and power supply in proportion to how much they use and when they use it.
- **Fair Compensation:** Customers that supply power to the grid should be fairly compensated for the value of the power they supply.

Rate Design Options

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

Conventional Rate Design

Public Service Colorado

Customer Charge		\$ 7.63
Winter Energy	All kWh	\$0.099
Summer	0 - 500 kWh	\$0.099
Summer Tier 2	501 + kWh	\$0.149

High Fixed Charges for Distribution Costs

- Recover distribution costs in fixed charges.
- Utility is indifferent to sales volumes.
- Prices fall short of marginal cost

Grays Harbor PUD	
Washington	
Customer Charge	\$ 39.55
First 360 kWh	\$ 0.012
Over 360 kWh	\$ 0.085

Demand or Connected Load Charge

Electricité de France

Power Rating kVA	Fixed Charge \$/ Month	Energy \$/kWh
3	\$ 4.66	\$ 0.147
6	\$ 7.56	\$ 0.147
9	\$ 10.01	\$ 0.147
12	\$ 15.44	\$ 0.147
15	\$ 17.71	\$ 0.147
18	\$ 20.37	\$ 0.147

TOU
and CPP
Options
Available

Bi-Directional TOU Rates

- TOU rates to align time periods to long-run marginal costs
- PV customers “net-meter” by time period.

Hydro One Ontario	
Off-Peak	\$ 0.077
Mid-Peak	\$ 0.114
On-Peak	\$ 0.140

Separate Rate For Distribution Costs

- Recover basic infrastructure in fixed charges.
- Distribution capacity in mono-directional energy.
- Prices fall short of marginal cost

Pedernales Coop	
Texas	
Customer Charge	\$ 22.50
Delivery /kWh	\$ 0.027
Power Supply	\$ 0.072

Customer Charges are like an
“admission fee” to the fair.



Minimum Bills are more like a 2-Drink Minimum



Goals of a Minimum Bill Rate Design

- Align usage rates with long-run marginal costs of **\$.12 - \$.18/kWh**
- Protect conservation incentive
- Protect universal service
- Assure some collection from customers with very low (net) usage without distorting prices.
 - Vacation homes
 - Customers with on-site generation
 - Vacant properties

1915 Missouri Case: \$.05/kWh, but 50¢ Minimum

MISSOURI PUBLIC SERVICE COMMISSION.

RICHARD H. KRAMER et al.

v.

**ST. JOSEPH RAILWAY, LIGHT, HEAT, & POWER
COMPANY.**

[Case No. 629.]

Rates — Electricity — Minimum bill — Reasonableness.

1. A **minimum bill** of 50 cents per month for **electricity** is not excessive where the cost of serving **minimum** consumers is 82 cents per consumer per month.

Los Angeles

Department of Water and Power

	Summer	Winter
Customer Charge	None	None
First 350 kWh	\$ 0.146	\$ 0.146
Next 700 kWh	\$ 0.175	\$ 0.175
Over 1,150 kWh	\$ 0.216	\$ 0.175
Minimum Bill:	\$ 10.00	\$ 10.00
kWh in Minimum Bill:	68	68

San Diego Gas and Electric

Rate Element	kwh	Price
Customer Charge		None
0 - 100% of Baseline	0 - 300	\$ 0.172
100% - 130% of Baseline	300 - 400	\$ 0.202
131% - 200% of Baseline	400 - 600	\$ 0.401
Over 200% of Baseline	Over 600 kWh	\$ 0.421
Minimum Bill	\$.17/day	\$5.00/mo
kWh in Minimum Bill		30

Hawaiian Electric

Combined Customer Charge and Minimum Bill

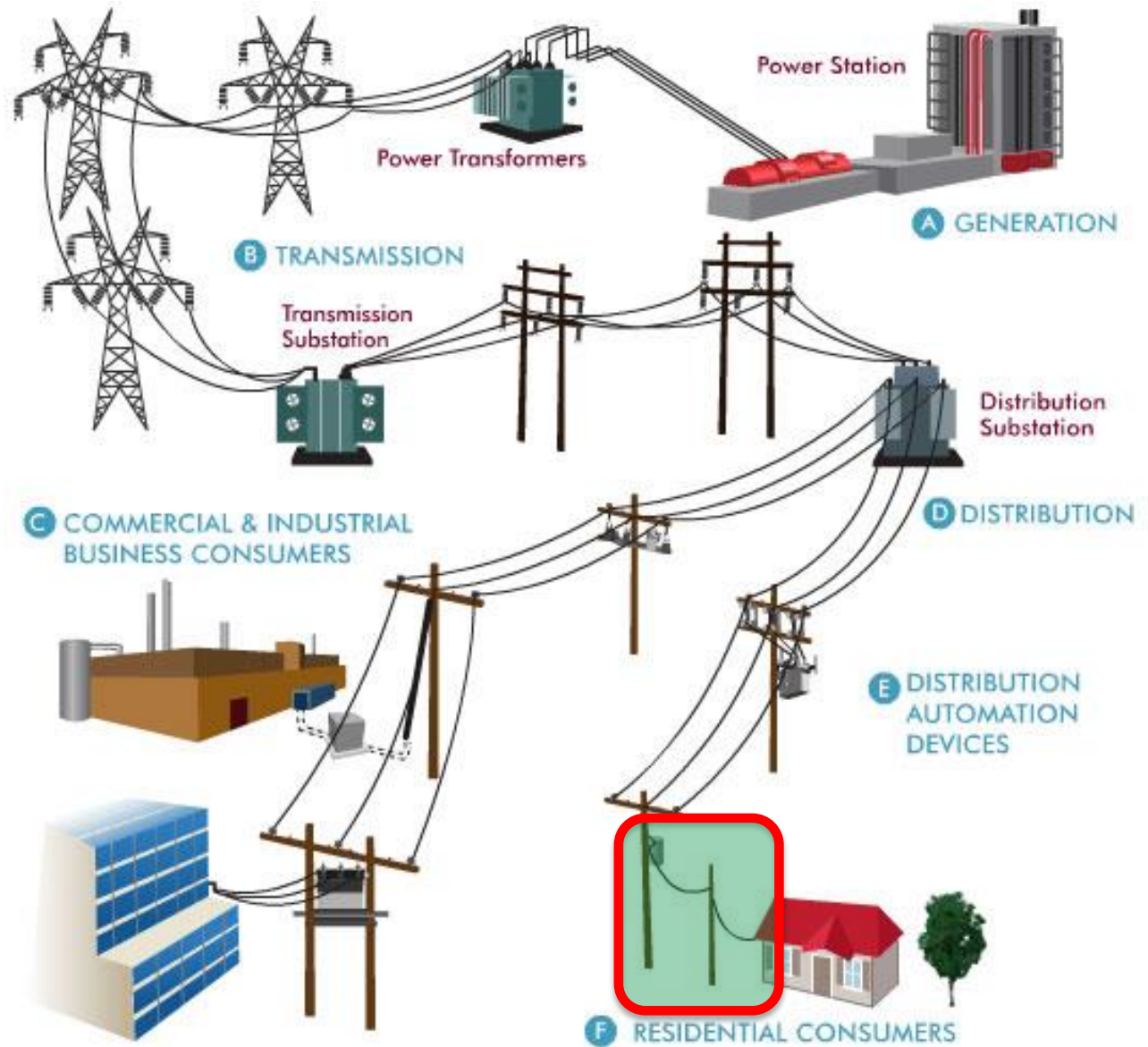
Customer Charge		\$ 9.00
First 350 kWh		\$ 0.262
Next 850 kWh		\$ 0.273
Over 1,200 kWh		\$ 0.292
Minimum Bill		\$ 17.00
kWh in Minimum Bill		31

Designing a Minimum Bill Rate

- Determine customer-specific costs
 - Line Transformers
 - Service Drops
 - Metering (net of smart grid benefits)
 - Billing and Collection
- Set minimum bill amount to ensure recovery of a minimum amount of revenue per customer to cover these costs.

Customer Specific Costs

- Billing
- Collection
- Share of Transformer



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%

Impact on Usage

- Minimum Bill rate form avoids collection of revenue requirement in fixed charges.
- Preserves end-block (or TOU) rate levels to more accurately reflect long-run incremental cost.
- Only 1-2% of usage affected by minimum.
- Avoids elasticity impacts of high fixed charges.

Minimum Bills Common in Competitive Businesses



About Free Shipping by Amazon

You receive **free shipping** if your order includes **at least \$35** of qualifying merchandise, excluding gift-wrap and taxes.

An “Ideal” Cost-Based Rate Design

Element	Illustrative Charge	Utility Costs	Alternative Customer Resource
Customer Charge	\$7.00	Customer-Specific Costs	
Off-Peak	\$0.09	Baseload	Renewables
On-Peak	\$0.15	Intermediate / peakers	PV, EE, DR, Storage
Critical Peak	\$0.75	Seldom-used Peakers	DR / Storage

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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Additional Slides If Questions

Electricity de France: Heures (TOU) Tariff

Typical Dwelling Units	Contract power-rating (kVA)	Subscription Including Tax \$/month	Peak Hours Price per kWh incl. tax \$/kWh	Off-Peak Hours Price per kWh incl. tax \$/kWh
Apartments	6	\$ 8.27	\$ 0.169	\$ 0.117
Small SF Home	9	\$ 11.07	\$ 0.169	\$ 0.117
	12	\$ 17.93	\$ 0.169	\$ 0.117
	15	\$ 20.77	\$ 0.169	\$ 0.117
Large SF Home	18	\$ 23.37	\$ 0.169	\$ 0.117
	24	\$ 49.08	\$ 0.169	\$ 0.117
	30	\$ 58.00	\$ 0.169	\$ 0.117
	36	\$ 66.72	\$ 0.169	\$ 0.117

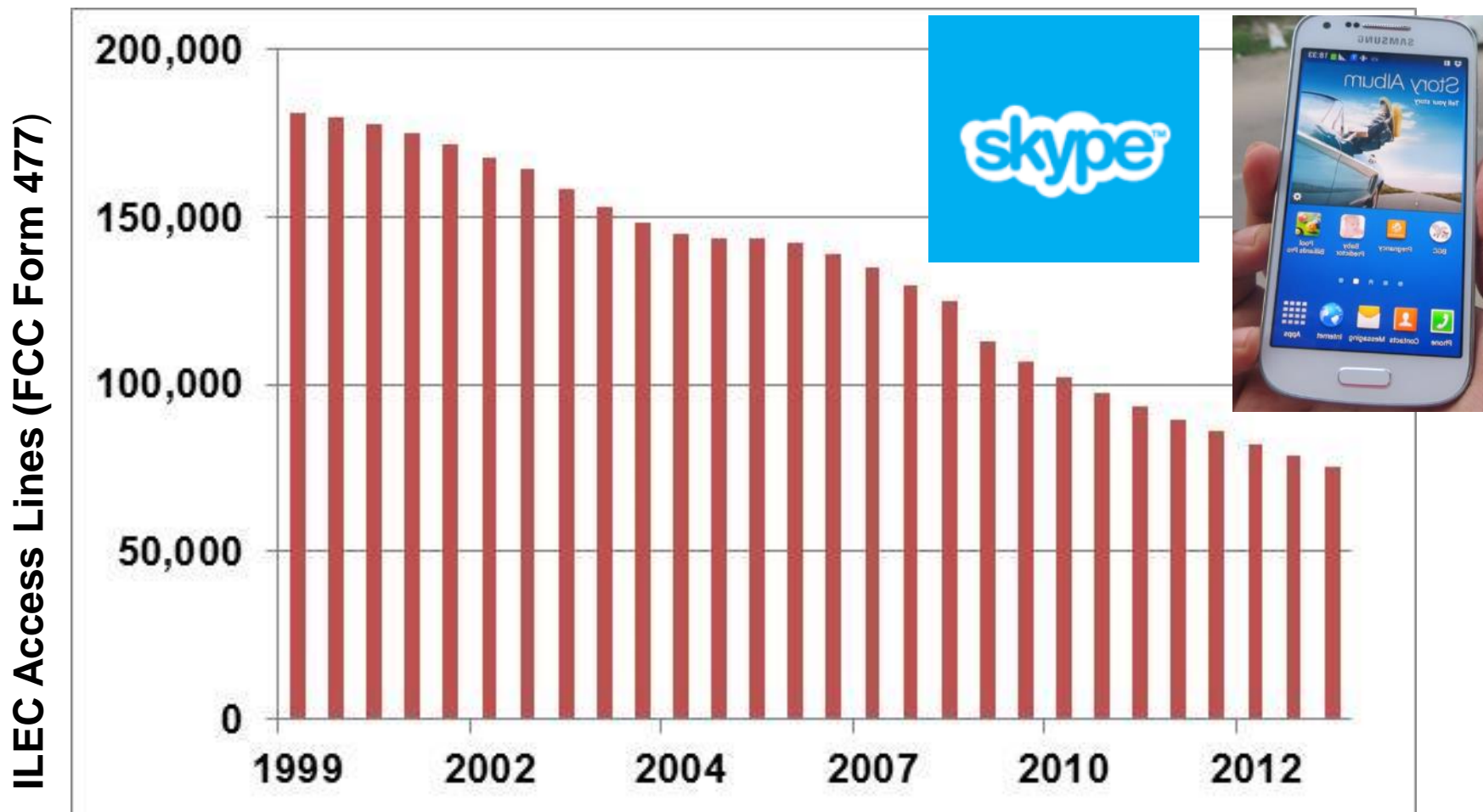
EDF Critical Peak Pricing Rate

Electricity de France: Tempo (Critical Peak Pricing) Tariff									
Typical Dwelling Units	Contract power-rating (kVA)	Subscription Including Tax \$/month	Off-Peak Hours / Off-Peak Days	On-Peak Hours / Off-Peak Days	Off-Peak Hours / Mid-Peak Days	On-Peak Hours / Mid-Peak Days	Off-Peak Hours / Critical Peak Day	On-Peak Hours / Critical Peak Day	
Small SF Home	9	\$ 11.25	\$ 0.097	\$ 0.115	\$ 0.135	\$ 0.160	\$ 0.243	\$ 0.632	
	12	\$ 18.03	\$ 0.097	\$ 0.115	\$ 0.135	\$ 0.160	\$ 0.243	\$ 0.632	
	15	\$ 20.88	\$ 0.097	\$ 0.115	\$ 0.135	\$ 0.160	\$ 0.243	\$ 0.632	
Large SF Home	18	\$ 22.91	\$ 0.097	\$ 0.115	\$ 0.135	\$ 0.160	\$ 0.243	\$ 0.632	
	30	\$ 57.32	\$ 0.097	\$ 0.115	\$ 0.135	\$ 0.160	\$ 0.243	\$ 0.632	
	36	\$ 70.33	\$ 0.097	\$ 0.115	\$ 0.135	\$ 0.160	\$ 0.243	\$ 0.632	

Palo Alto, California

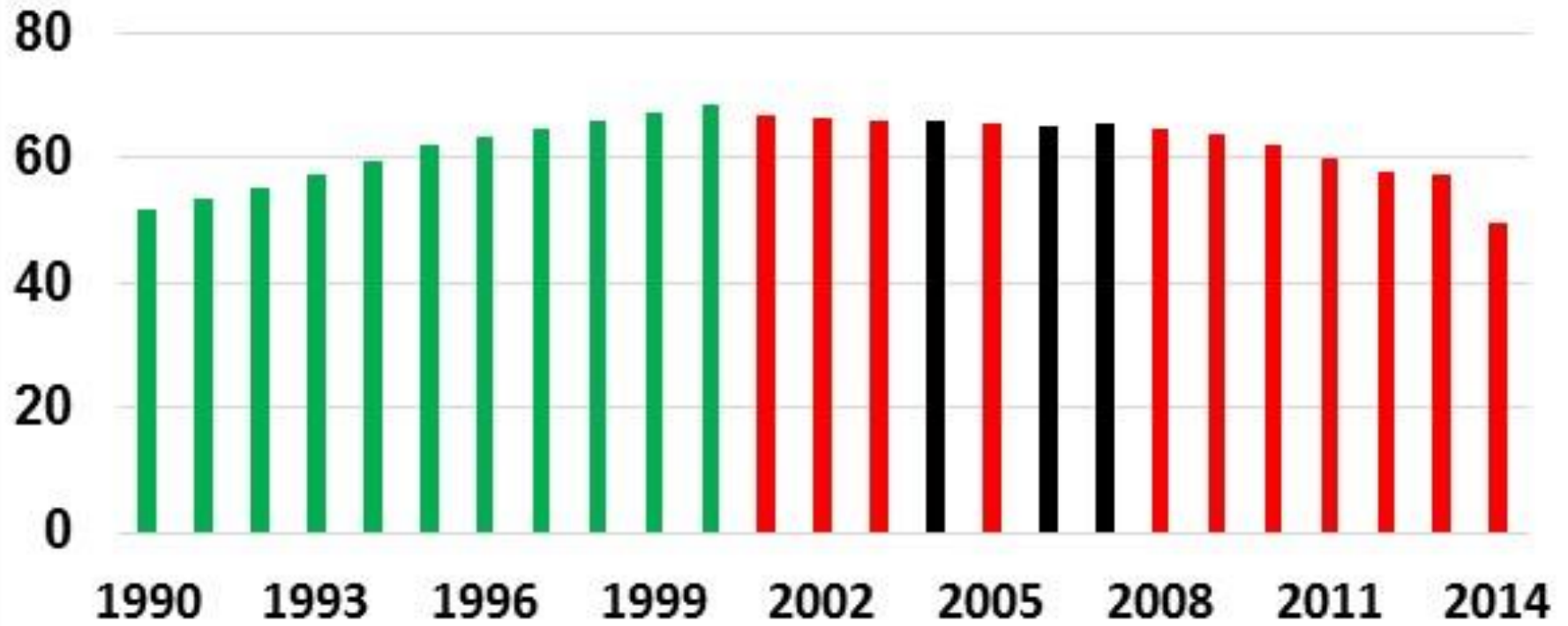
Element	Rate
Customer Charge	None
First 300 kWh	\$0.095
301 - 600 kWh	\$0.130
Over 600 kWh	\$0.174
Minimum Bill:	None

How Did High Fixed Charges Work Out for the Landline Phone Companies?

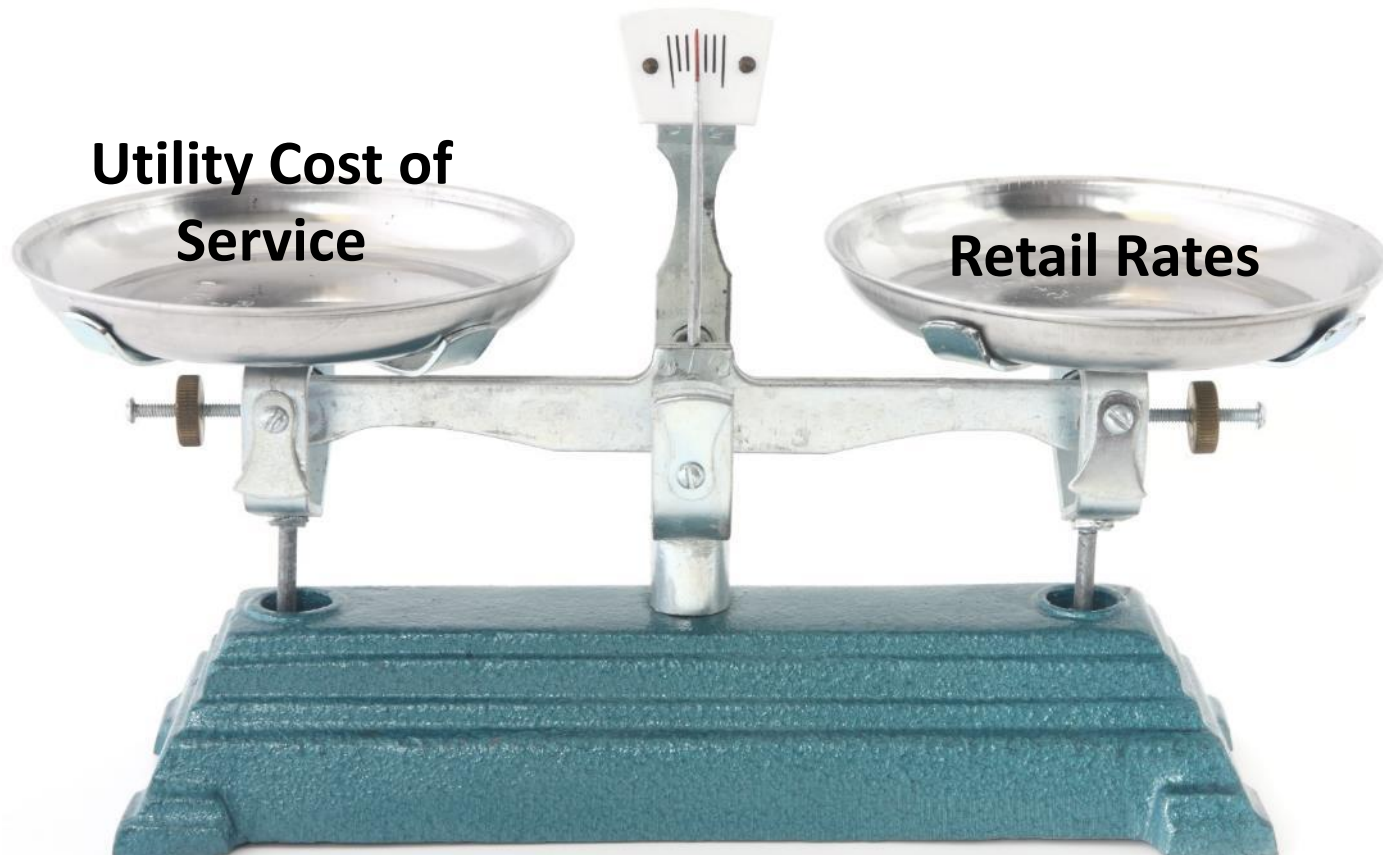


How About Cable TV?

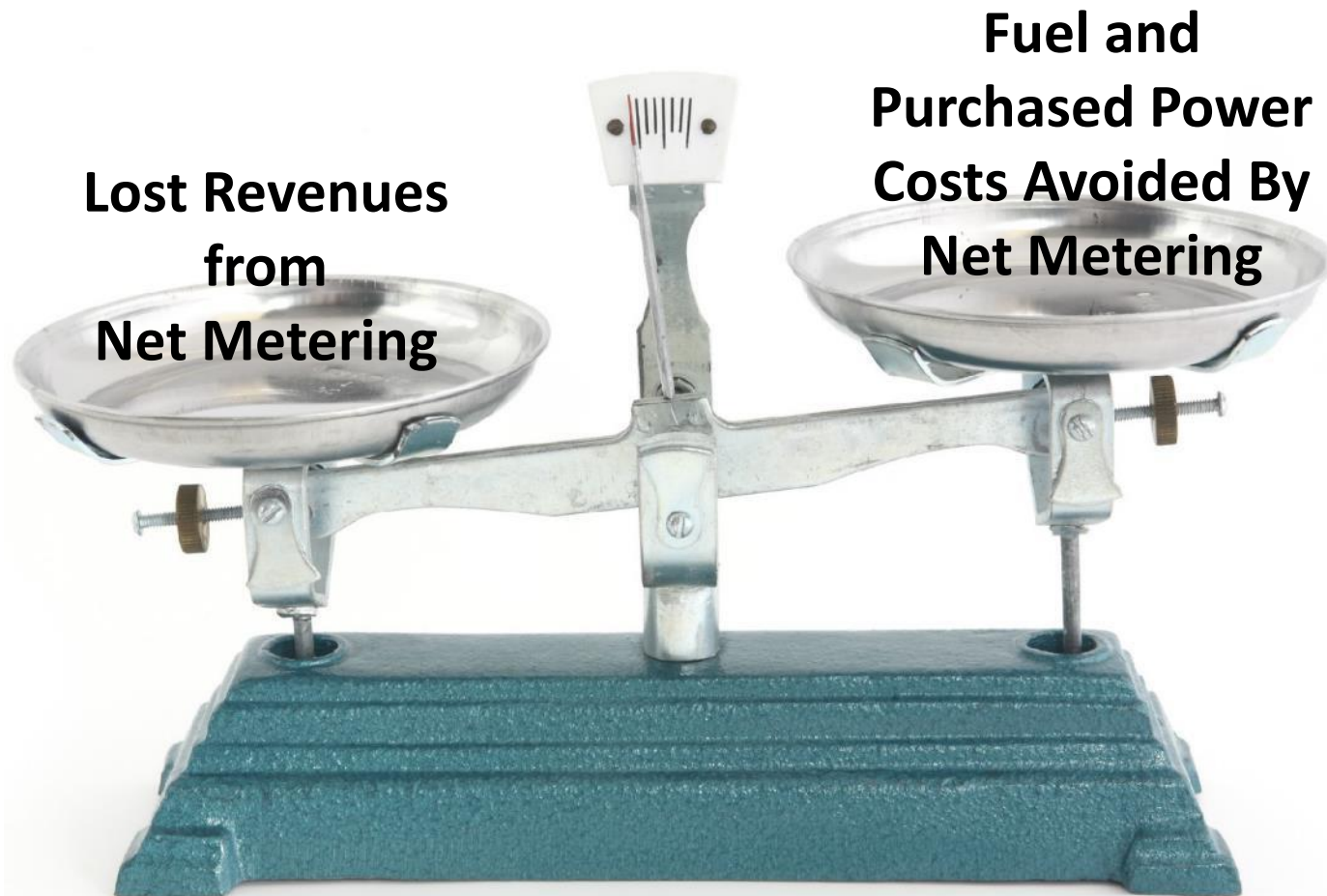
Cable TV Subscribers in the United States



Traditional Ratemaking View



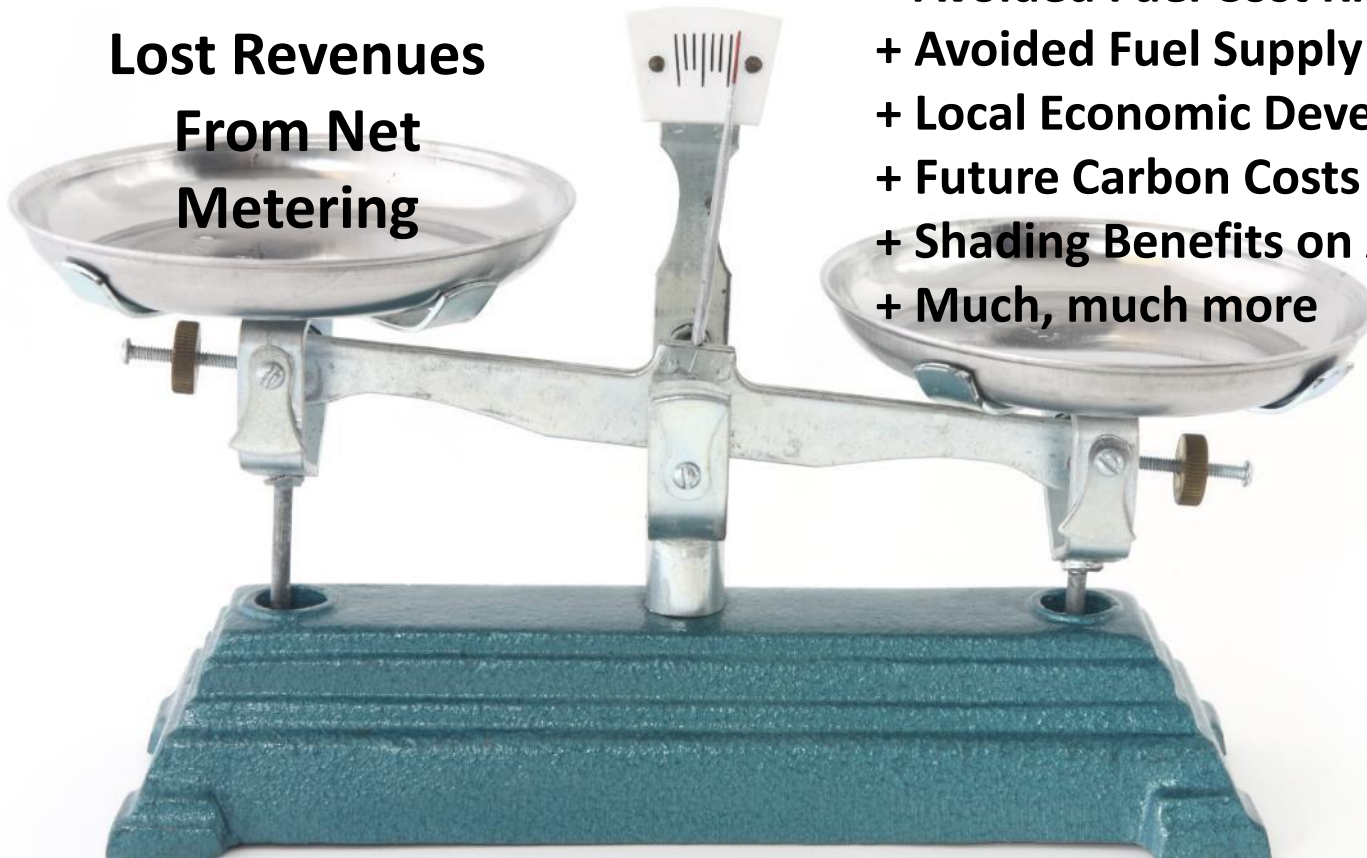
Utility View of Net Metering



Solar Advocate View of Net Metering

**Lost Revenues
From Net
Metering**

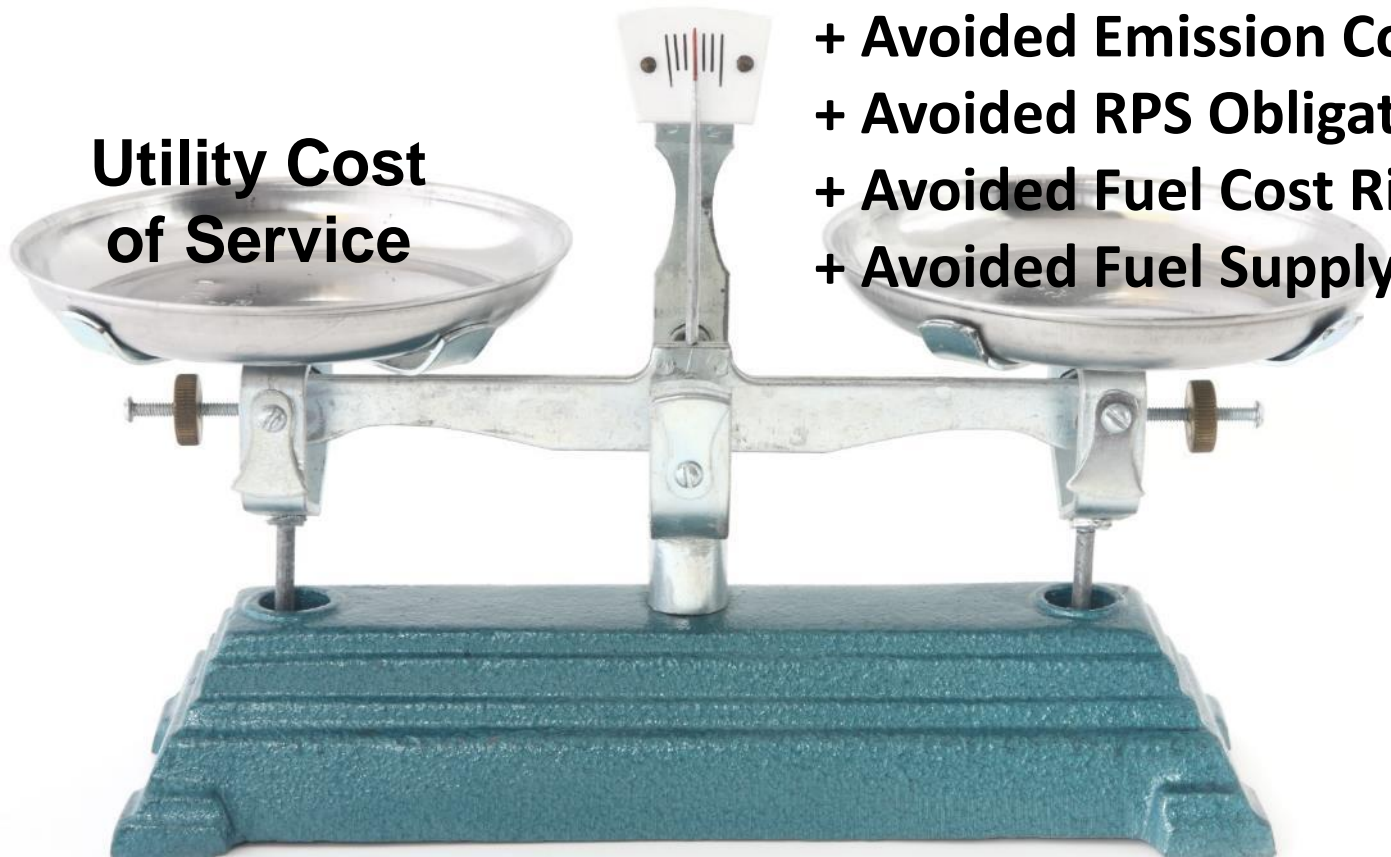
**Long-Run Avoided Cost for
Generation, Trans, Dist
+ Reduced Emissions
+ Avoided Fuel Cost Risk
+ Avoided Fuel Supply Risk
+ Local Economic Development
+ Future Carbon Costs
+ Shading Benefits on AC Load
+ Much, much more**



Balanced Net Metering View

**Utility 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 Principles

Fixed Costs



Fixed Charges

Real Businesses Value Their Small Customers

