

Net-Metering and Rate Design Trends

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Regulatory Assistance Project (RAP)

RAP is 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.

Jim Lazar



Jim Lazar, Senior Advisor

- Economist
 - Consulting practice in rate design and resource planning.
 - Based in Olympia
 - Washington Senate staff 1977-82
 - RAP since 1998

Overview

- Some Rate Design Essentials
- The Utility Pursuit of Fixed Charges and Residential Demand Charges
- Specific State Examples
 - Hawaii
 - California
 - Arizona
 - Nevada
 - Connecticut
- Some suggested guidelines for legislators

A Few Highlights From the RAP Publication Collection

Available for Free Download
www.raponline.org

The basics of regulation.

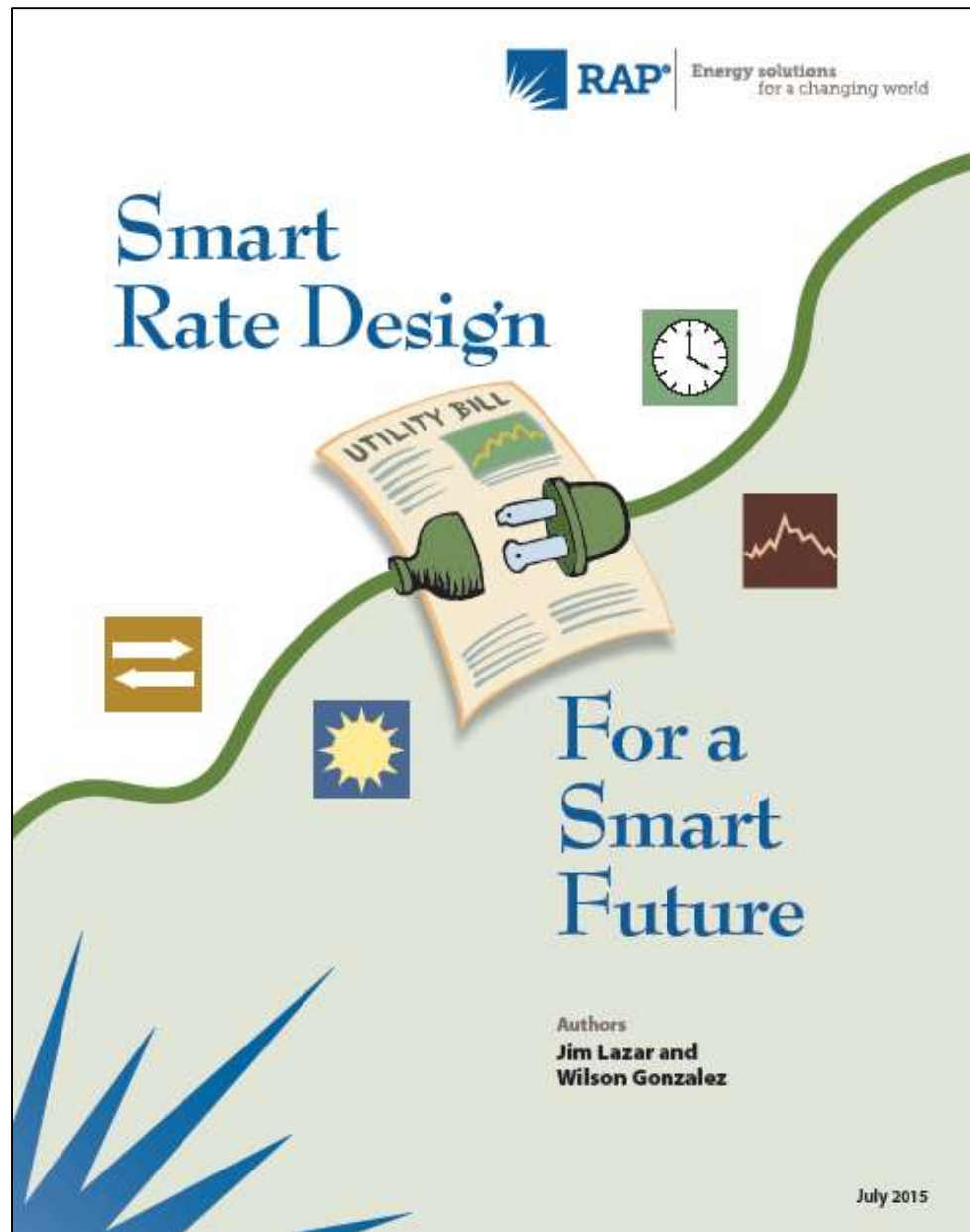
Electricity Regulation In the US: A Guide

SECOND EDITION

Author
Jim Lazar, with RAP staff

Smart Rate Design:

Rate design as though the future is important.



Pricing for Distributed Resources:

Net-Metering and Feed-In Tariffs

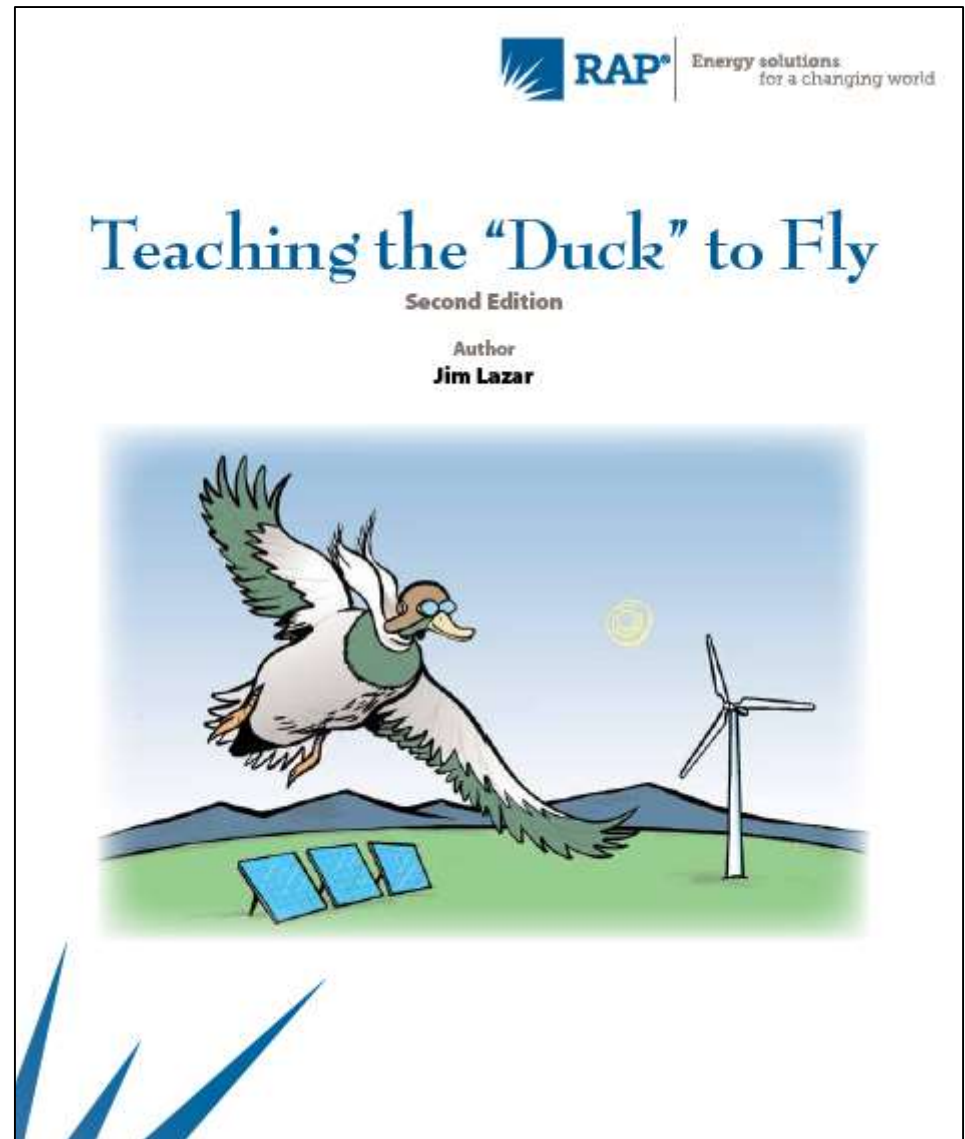
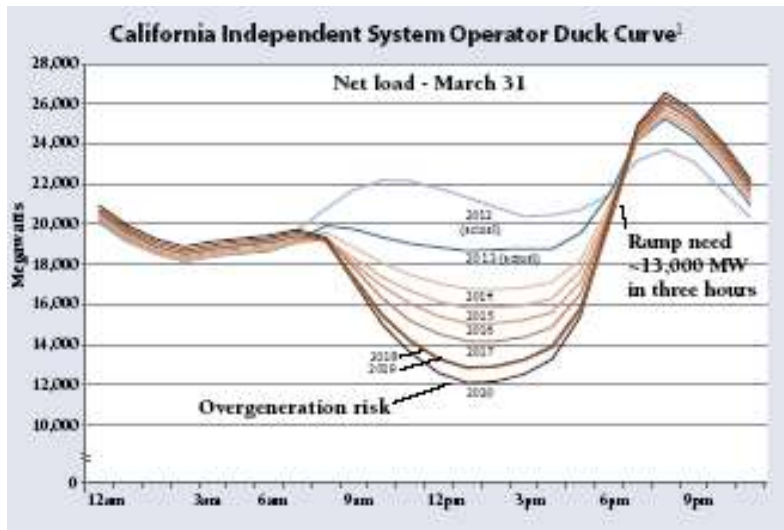
Designing Distributed Generation Tariffs Well

Fair Compensation in a Time of Transition

Authors
Carl Linvill, John Shenot, Jim Lazar

November 2013

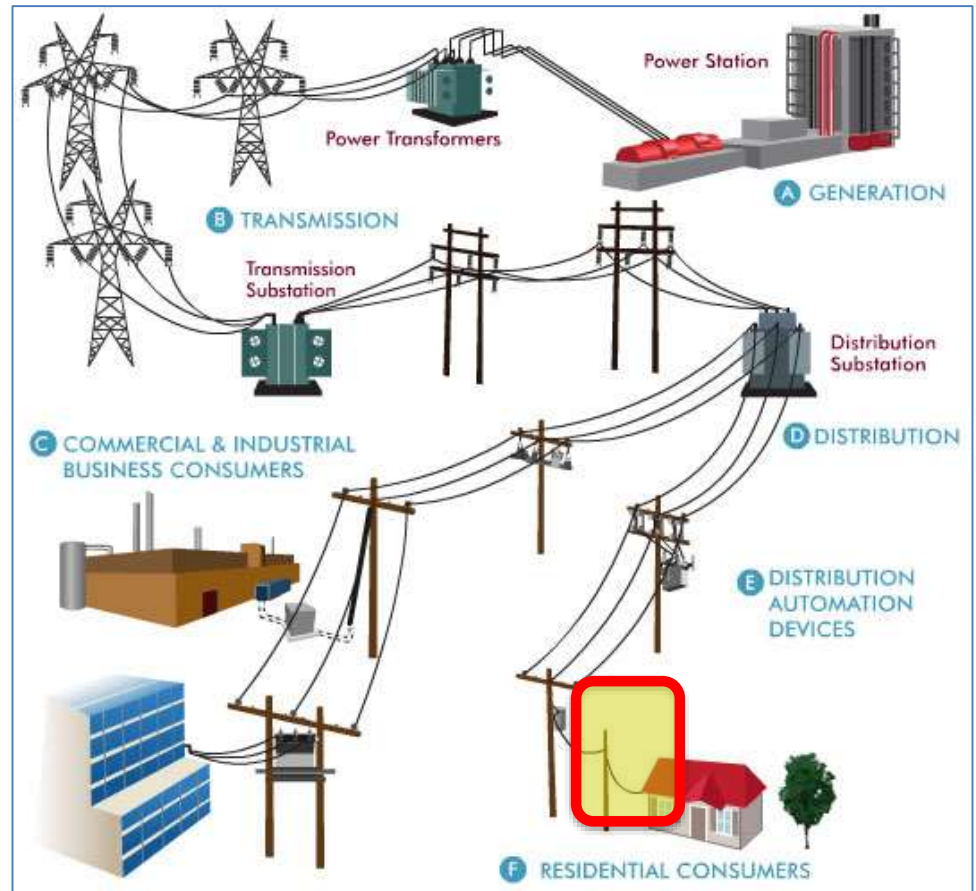
Strategies to adapt to high levels of renewable energy



Three Guiding Principles for Rate Design

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 and power supply in proportion to **how much they use**, and when they use it.



Principle #2

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



Principle #3

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



Rate Design Essentials

Fixed Charges

Demand Charges

Time-of-Use (TOU) Energy Charges

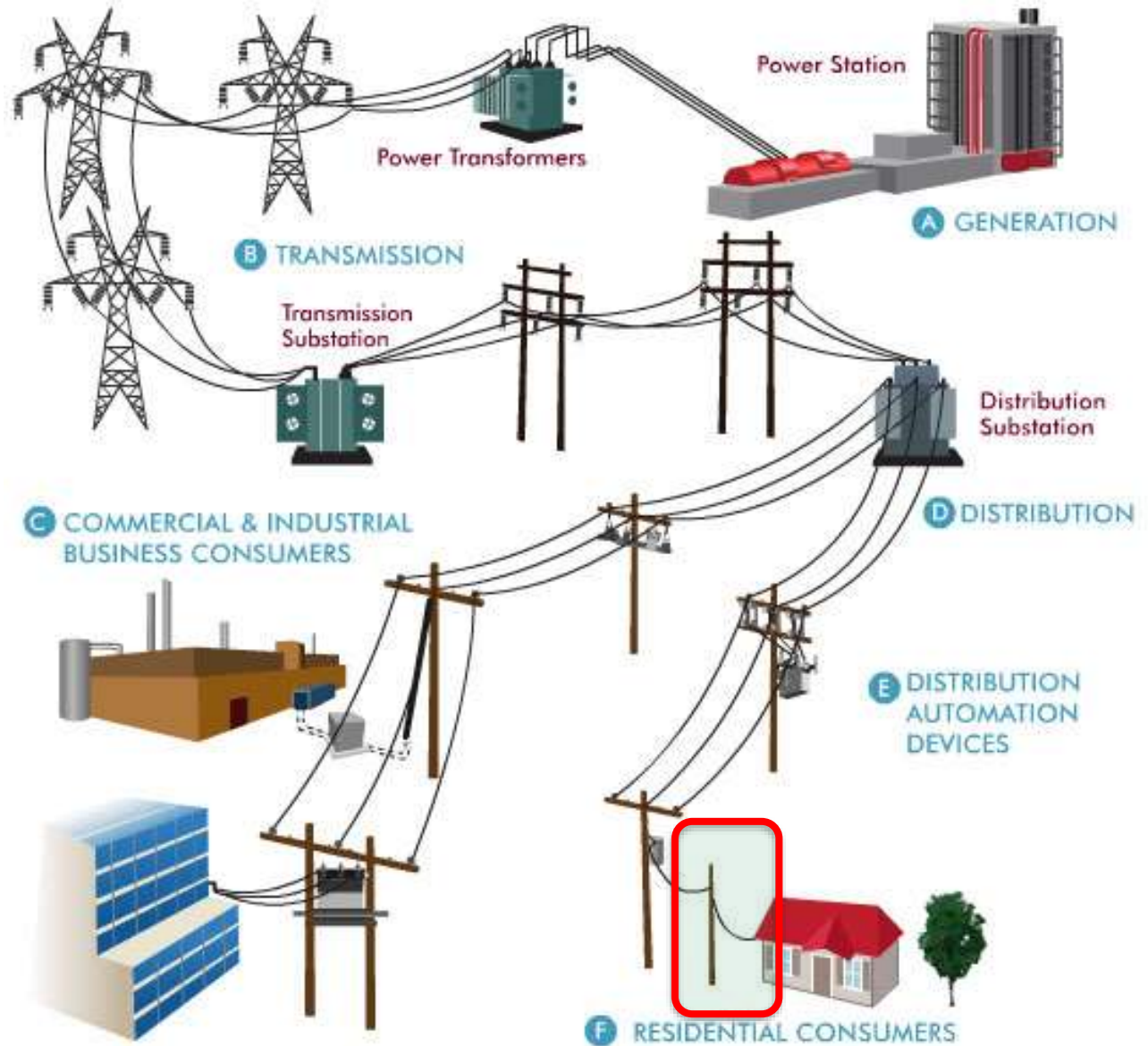
Impact of rate design

Fixed Customer Charges

- Monthly Fee to “be a customer.”
- Typically \$5 - \$10/month,
- Utilities often seeking to include distribution system infrastructure costs in the fixed charge. \$15 - \$50/month.

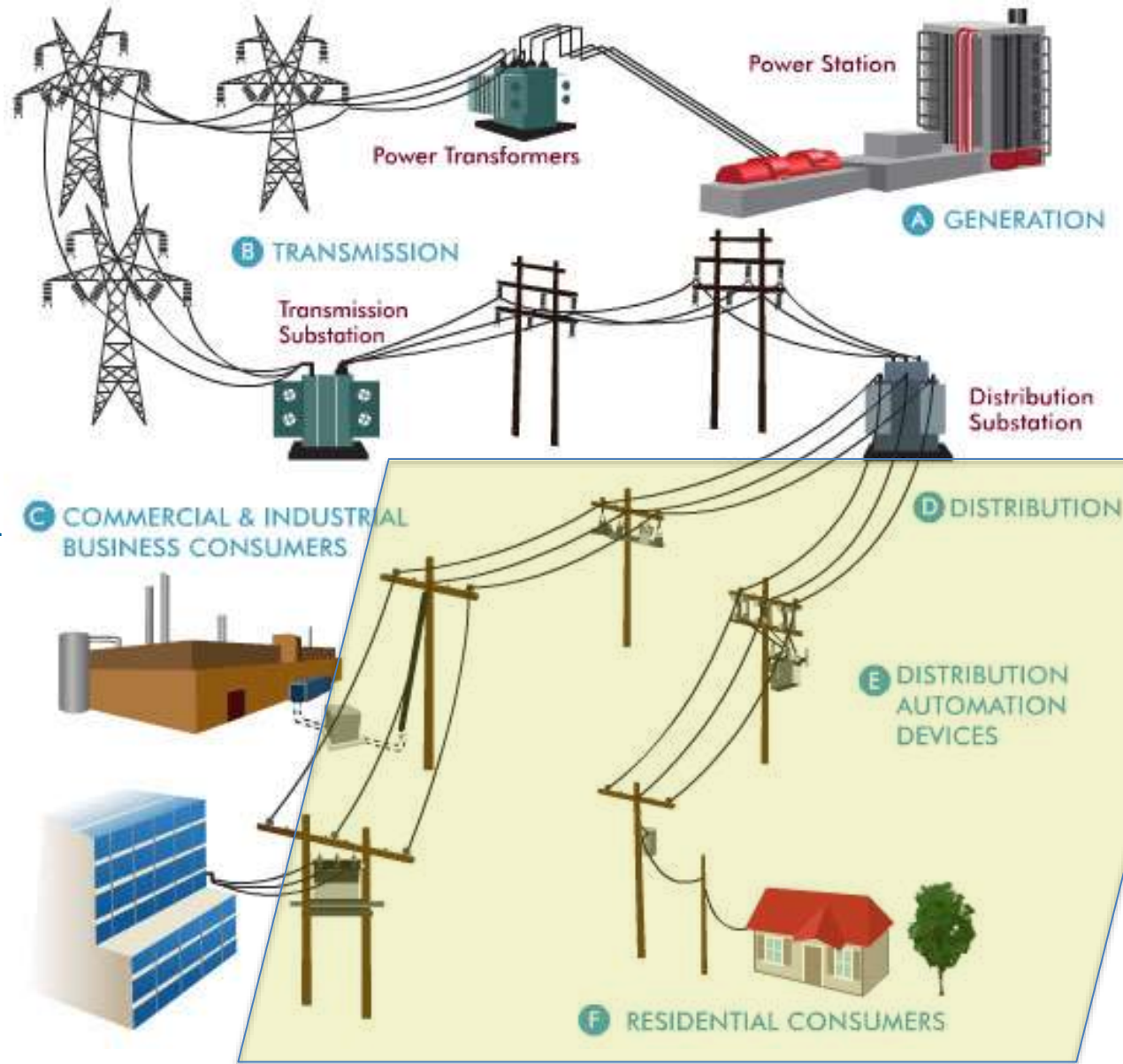
Basic Customer Method

ONLY customer-specific facilities classified as customer-related



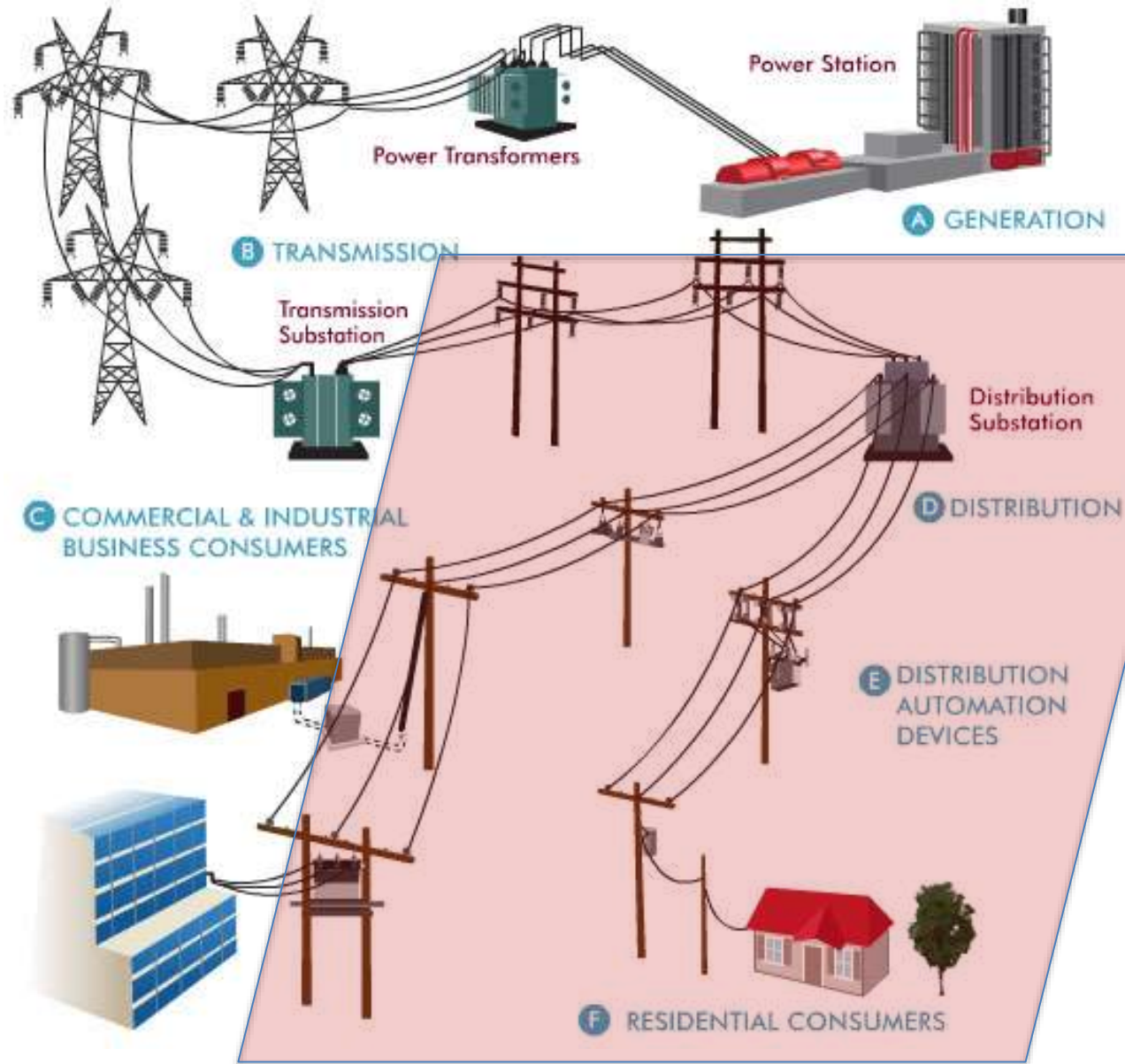
Minimum System Method:

~50% of Distribution System Classified as Customer-related



Straight Fixed / Variable:

100% of
Distribution
System
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	\$14	\$7	\$ -
Services	\$1	\$1	\$1
Meters	\$1	\$1	\$1
Billing	\$3	\$3	\$3
Customer Service	\$3	\$3	\$3
Total	\$52	\$30	\$8

Demand Charges

Monthly fee based on the single highest rate of usage (1 hour or even 15 minutes) in a month.

Simple Small Commercial Tariff	
Rate Element	Price
Customer Charge \$/month	\$10.00
Energy Charge \$/kWh	\$0.11

Basic Tariff For Large Commercial Customer	
Rate Element	Price
Customer Charge \$/month	\$20.00
Demand Charge \$/kW/month	\$10.00
Energy Charge \$/kWh	\$0.08

Time of Use Energy Charges

Differential rates by different hours of the day.

“On-Peak” has historically been mid-day, but with solar is shifting to early evening.

Simple Residential Tariff

Rate Element	Price
Customer Charge \$/month	\$5.00
Energy Charge \$/kWh	\$0.10

Residential TOU Rate

Customer Charge	\$5.00/month
On-Peak Noon – 6 PM	\$0.15/kWh
Mid-Peak All Other Hours	\$0.10/kWh
Off-Peak 10 PM – 7 AM	\$0.07/kWh

People DO Understand Rate Design



\$1.50

\$2.25

\$2.75

The argument:

Fixed **costs**
should be recovered in fixed **charges**.

How Do Other Industries Recover Fixed Costs?



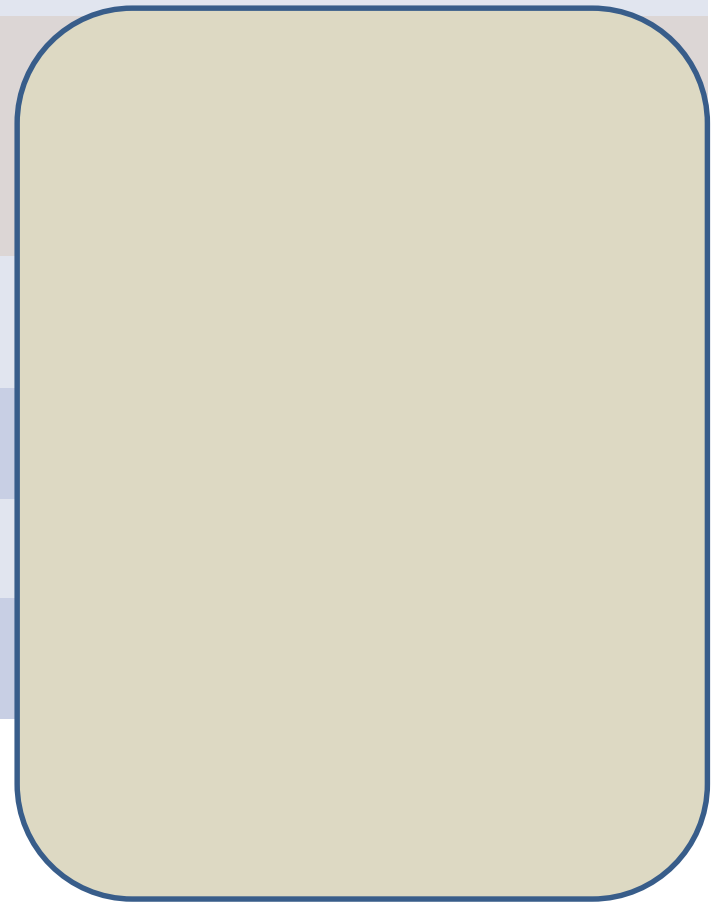
We Pay For Other “Grids” In Volumetric Prices



Impact of Rate Design

Three Basic Rate Designs

Rate Designs	Flat Rate
Customer Charge \$/month	\$5.00
First 500 kWh/month	\$0.085
Next 500 kWh/month	\$0.085
Over 1000 kWh/month	\$0.085



Impact of Rate Design

Three Basic Rate Designs

Rate Designs	Flat Rate	Inclining Block Rate
Customer Charge \$/month	\$5.00	\$5.00
First 500 kWh/month	\$0.085	\$0.070
Next 500 kWh/month	\$0.085	\$0.100
Over 1000 kWh/month	\$0.085	\$0.140

(9%)

Impact of Rate Design

Three Basic Rate Designs

Rate Designs	Flat Rate	Inclining Block Rate	Straight Fixed/ Variable Rate
Customer Charge \$/month	\$5.00	\$5.00	\$30.00
First 500 kWh/month	\$0.085	\$0.070	\$0.060
Next 500 kWh/month	\$0.085	\$0.100	\$0.060
Over 1000 kWh/month	\$0.085	\$0.140	\$0.060

(9%)

+7%

Cost Shifting

Urban vs. Rural

Multi-family vs. Single Family

Overhead vs. Underground

And now,

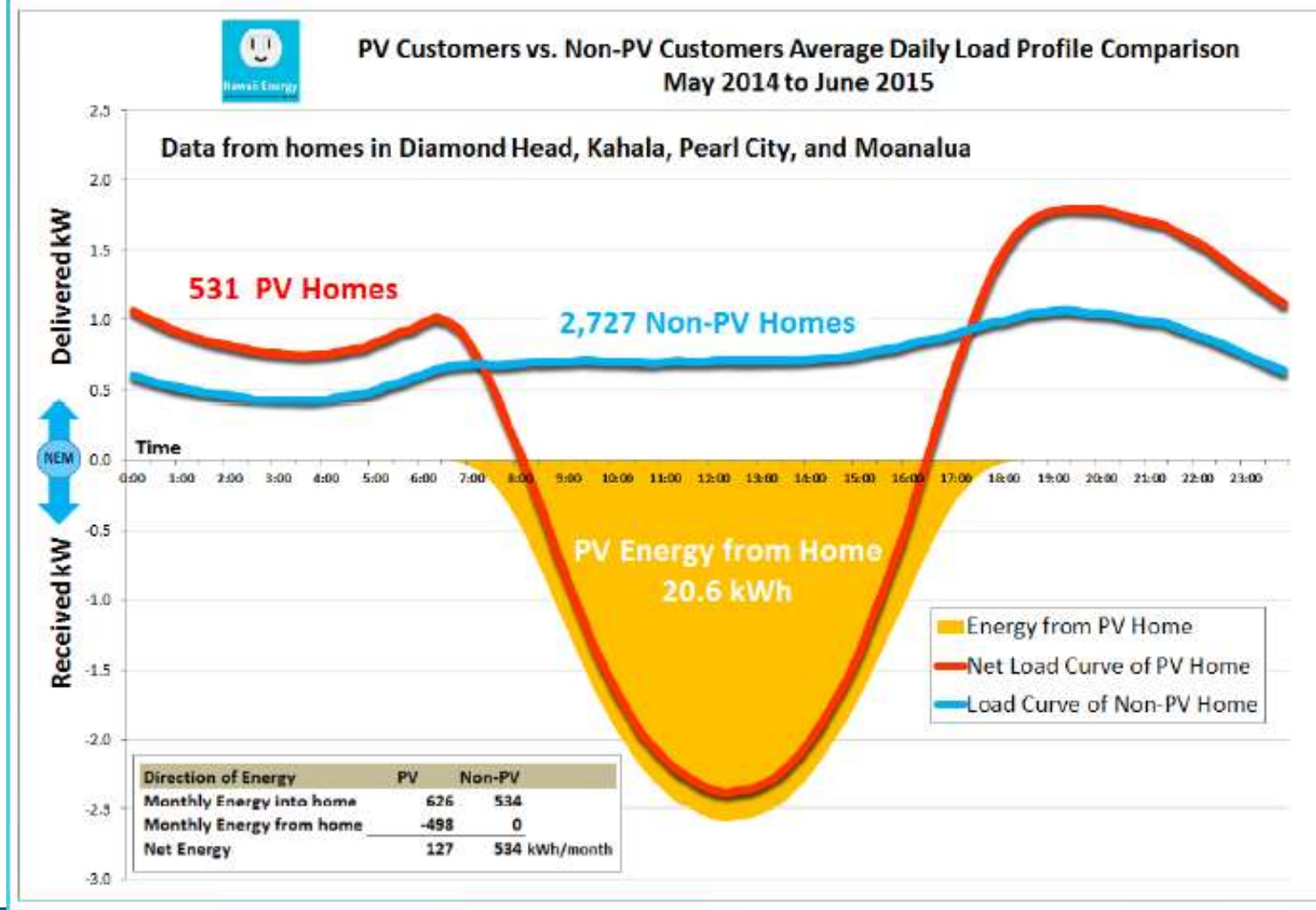
Non-solar vs. Solar



Hawaii

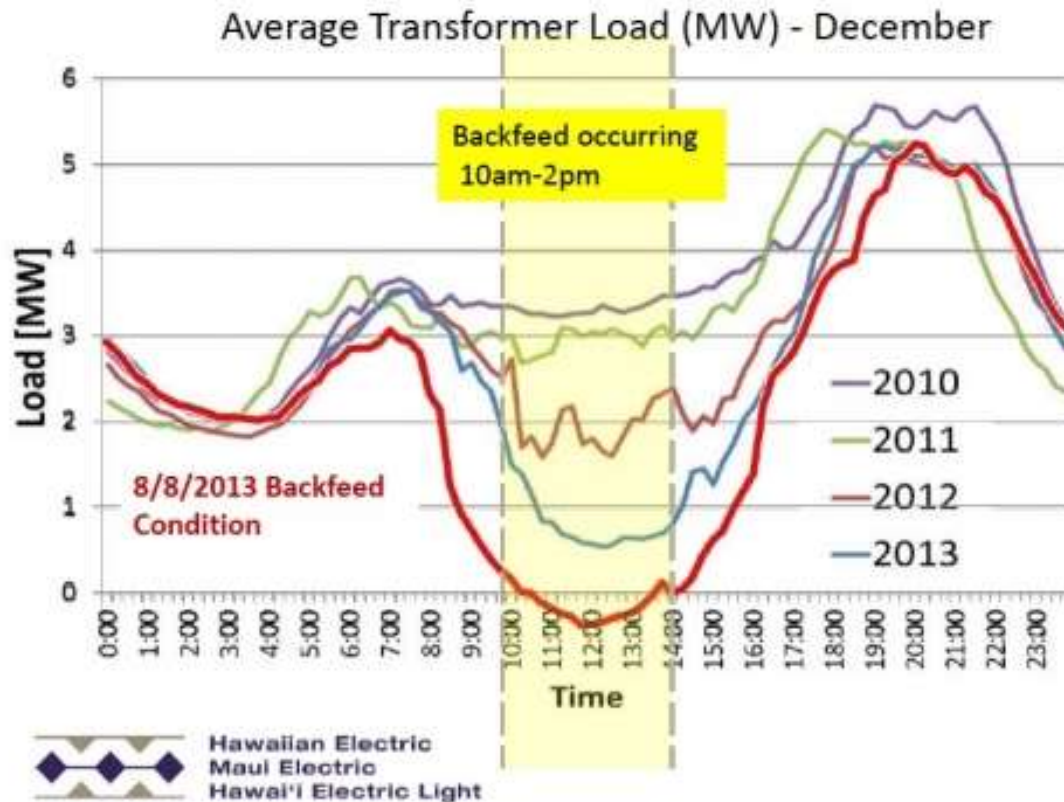


Sharply Different from Non-Solar Customers



Substations Running Backwards

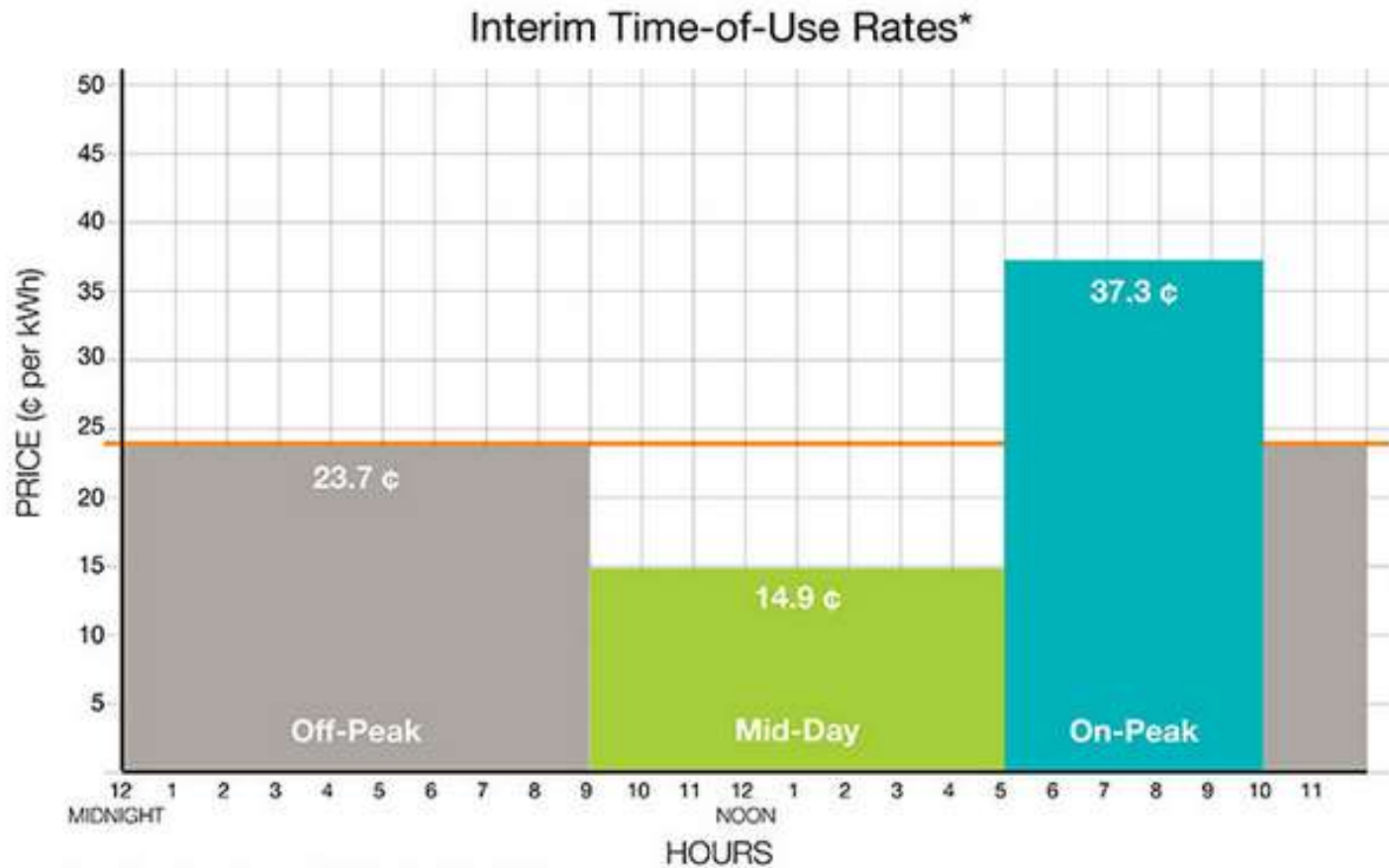
Tracking Change – 46kV Level



Hawaii PUC Actions

- Ended net-metering for new customers
- Only “self-supply” allowed
 - Commercial solar is OK
 - Residential solar installers hurting
- Smart Inverters
- Flexible generation
- Storage becoming a major issue and cost.

Hawaii TOU Rates (Optional)



*Illustration reflects October 2016 Interim Time-of-Use rates.

California



- Major rate design case in 2014
 - Keep Fixed Charges at Zero
 - TOU by 2019
- Modified net-metering in 2015
 - +\$.02/kWh for solar
- Legislative:
 - \$10 cap on monthly fixed charges.

Nevada



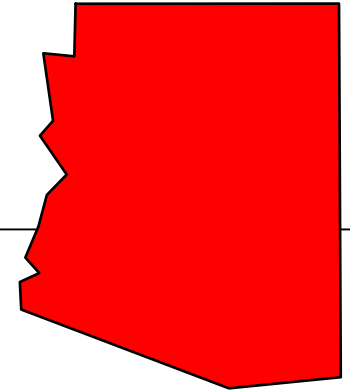
2015: Commission approved sharply higher rates for solar customers.

2016: Existing customers grandfathered.

2017: Legislation passed in June to restore nearly full (75% - 95%) net metering.

Arizona

Salt River Project



Without Solar

(Summer)

Basic Charge: \$20.00

First 700 kWh: \$.10

Next 1300 kWh: \$.11

Over 2,000 kWh \$.12

With Solar

(Summer)

Basic Charge: \$32.44

Demand Charge:

First 3 kW \$7.81/kW

4 – 10 kW \$14.23/kW

Energy:

On-Peak \$.048

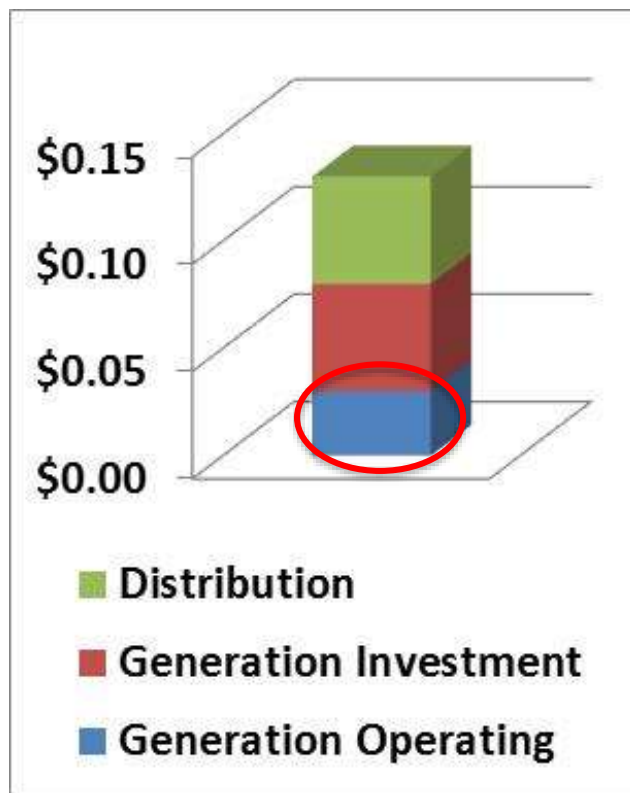
Off Peak: \$.036

Solar Credit = **Energy Charge**

Two Views of Cost Recovery

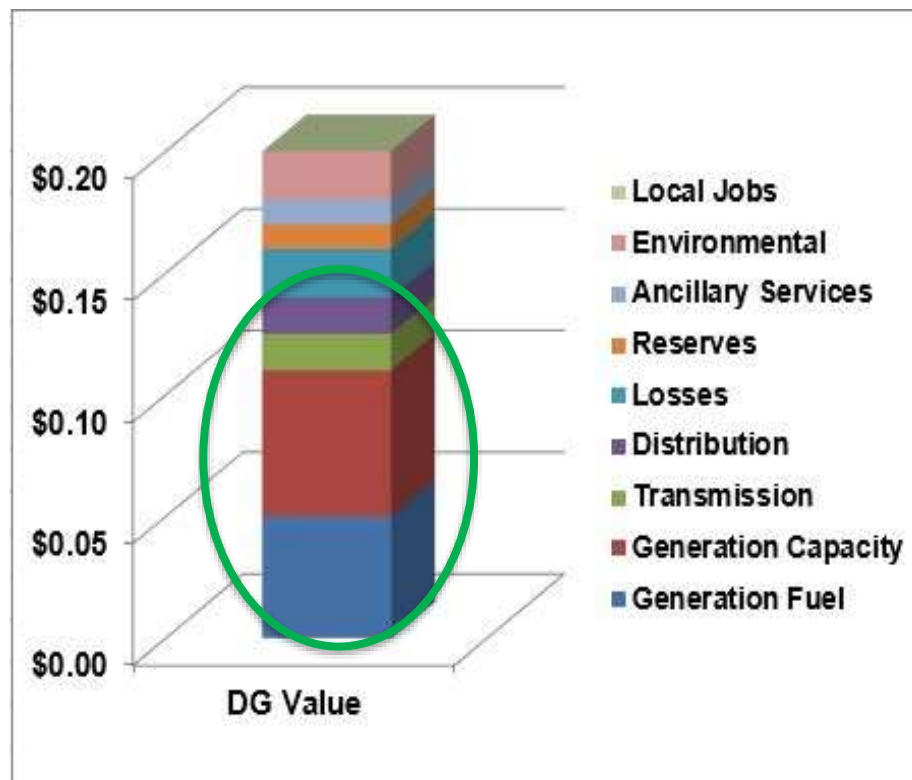
Traditional Utility View

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

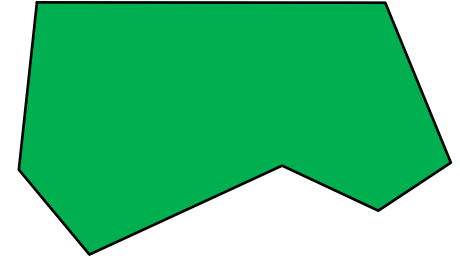


Solar Advocate View

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



Connecticut



- Rate Design
 - Commission approved ~\$19/month fixed charge.
 - Legislature capped monthly fixed charges at \$10/month.

Suggested Options for Legislators

- 1) Cap on Fixed Charges
- 2) Require Value of Solar analysis
- 3) Grandfathering

About RAP

that power 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.raonline.org

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