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Cost-Based Rate Design Reforms for the Modern Grid

2022 Affordability Rulemaking En Banc Hearing

California Public Utilities Commission

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Why and How Do We Regulate Utilities?

- Public policy goals
  - Efficient competition and control of monopoly behavior
  - Environmental and public health requirements
  - Societal equity (e.g., universal access and affordability)
- Principles for setting utility prices
  - Effective recovery of the revenue requirement
  - Revenue and bill stability
  - Customer understanding and acceptance
  - Equitable allocation of costs
  - Efficient forward-looking price signals

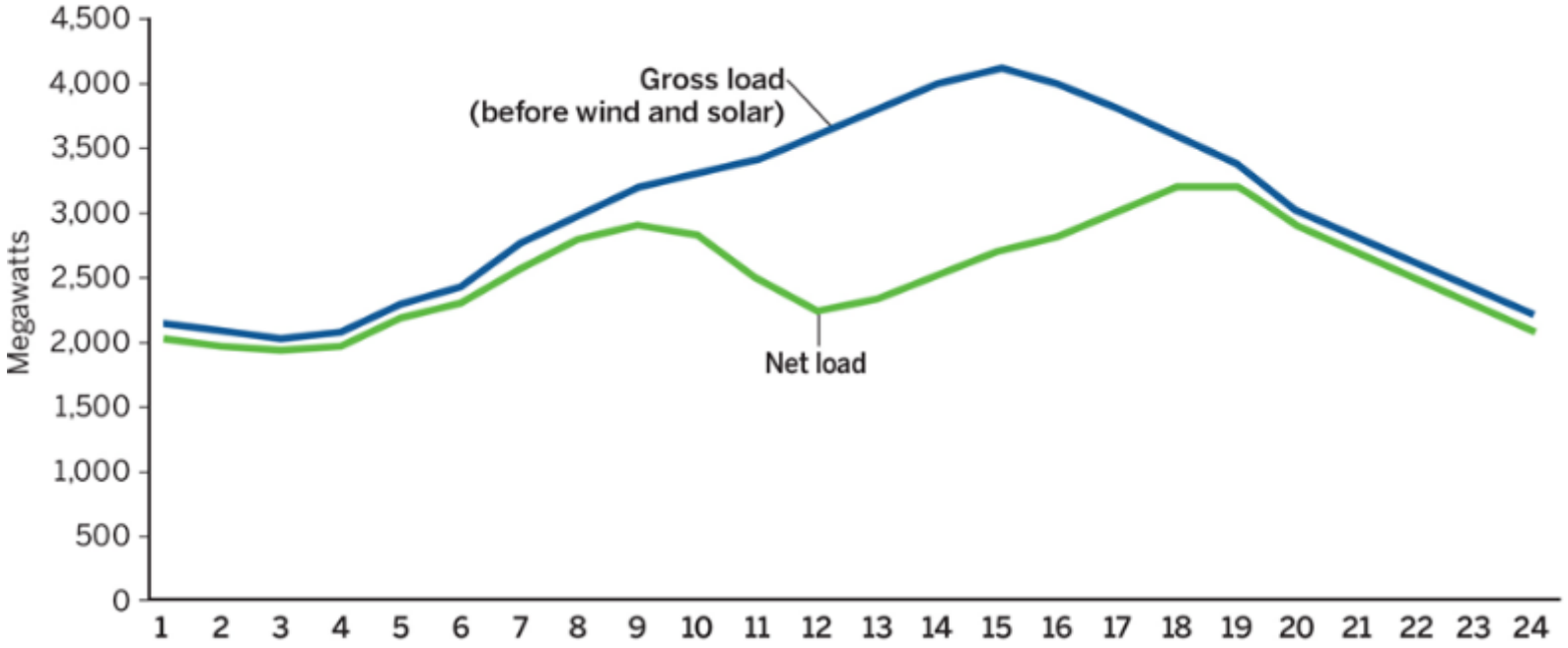
My Guiding Principles

- Long-run marginal costs are a key part of the picture
- Time-varying rates are important, but complicate comparisons
- A primary purpose of utility regulation is to protect customers from price discrimination based on lack of other choices
- Gradualism is helpful and necessary for all customers
- Every option involves tradeoffs

Technology Changes

- Wind, solar and storage
- Customer-sited generation
- Energy efficiency
- Demand response
- Smart grid with big data
- Electrification of transportation and heating

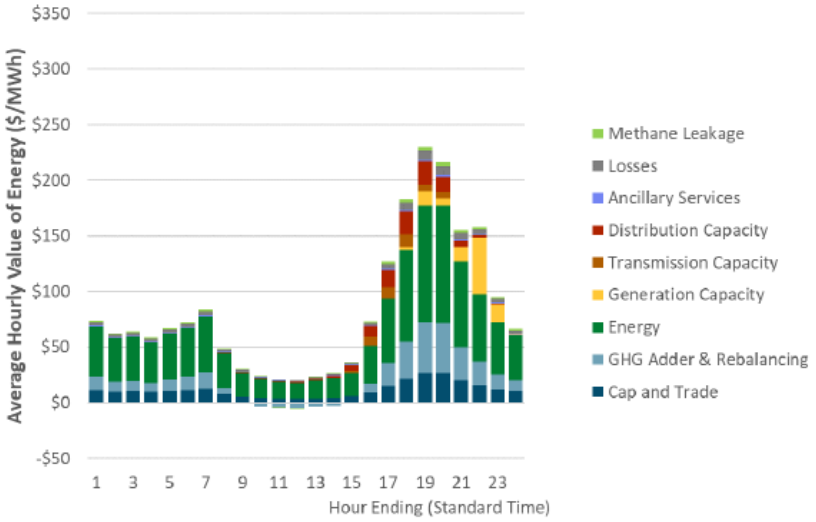
Illustrative Example of Gross vs. Net Load

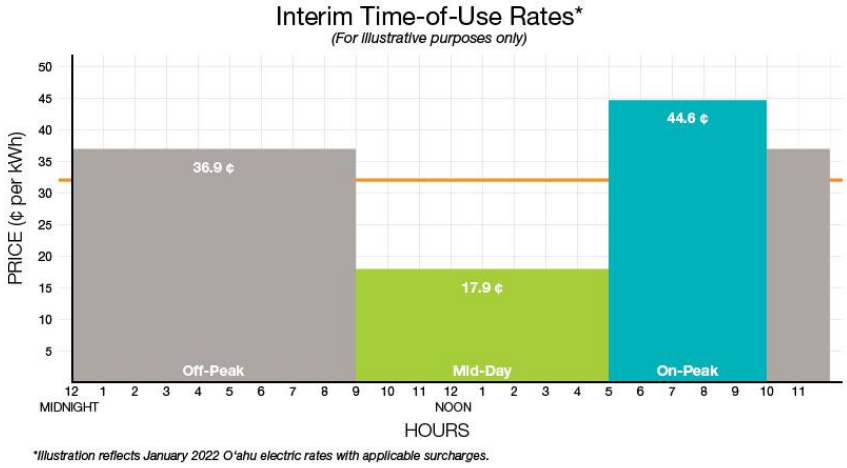


Three Cost-Based Reforms for California

- Daytime hours in TOU rates should be off-peak with lowest kWh prices
- Site infrastructure charge for line transformer and secondary voltage network costs
- Distribution flow charge to spread primary voltage distribution backbone costs over all imports and exports

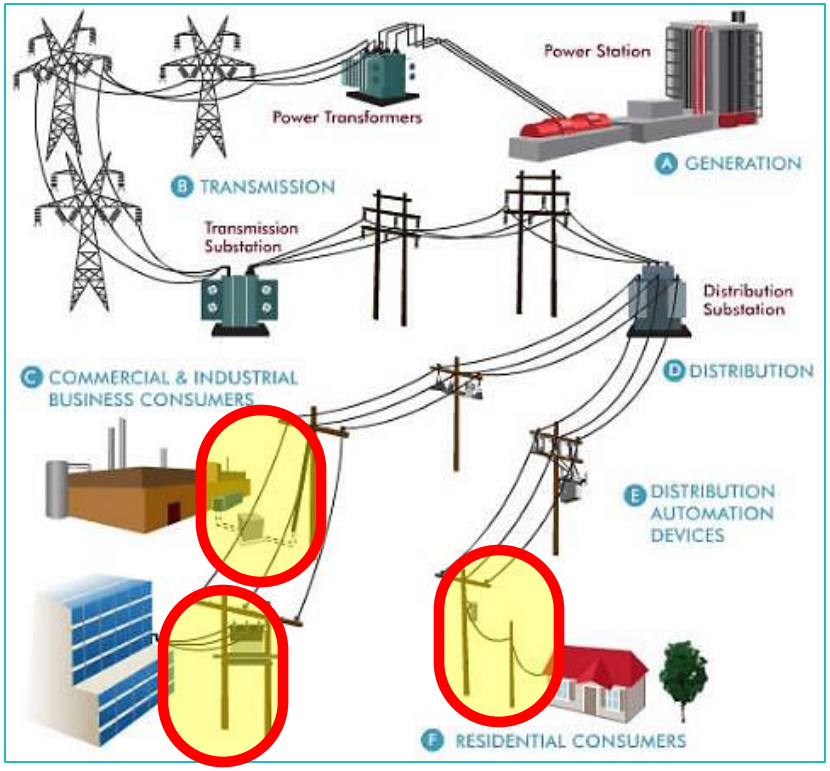
TVR Patterns Should Follow Forward-Looking Marginal Costs





Site Infrastructure Charge

- Much lower load diversity at customer end of distribution system



Burbank Service Size Charges

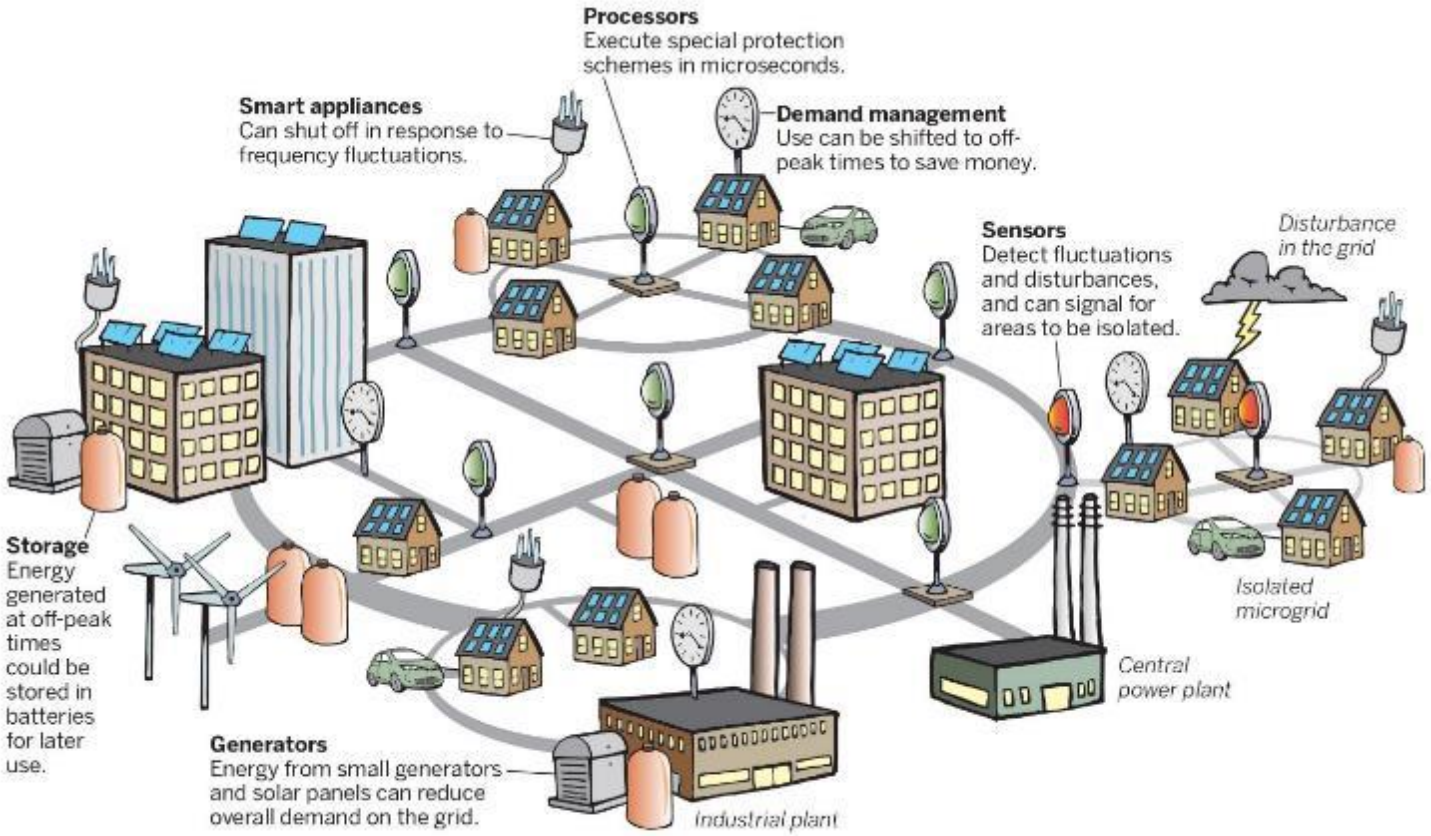
- Base customer charge: $9.21/month
- Tiered service size charges
  - Multifamily: $1.40/month
  - 200A panel or smaller: $2.83/month
  - Panel over 200A: $8.48/month

Électricité de France Tarif Bleu- kVA Subscription Charges

kVA Subscription Level	Euros per month
9	15.11 euros
12	18.27 euros
15	21.15 euros
18	23.31 euros
30	35.14 euros
36	41.16 euros

Approximately 1 euro per kVA with 6-euro base customer charge

Modern Grid is Built for Flows



Source: Adapted from U.S. Department of Energy. (2015). *United States Electricity Industry Primer*

Key Features of Distribution Flow Charge

- DER customers pay for primary voltage distribution backbone costs on both imports and exports in non-discriminatory manner
- Natural method to design pricing system with higher import kWh prices than export kWh credits
- Higher billing determinant for DER customers leads to a lower effective rate for all customers for the relevant costs

Advanced Residential Rate Design

Cost Recovery Only	
Basic Customer Charge ($/mo.)	$10
Site Infrastructure Charge ($/individual NCP kW)	$1
Distribution Flow Charge (Cents/kWh on imports and exports)	2 cents

Symmetric Charges and Credits	
Day-time (cents/kWh)	10 cents
Mid-peak (cents/kWh)	22 cents
On-peak (cents/kWh)	35 cents
Critical peak (cents/kWh)	75 cents

About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org

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