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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

Interim Time-of-Use Rates*
(For illustrative purposes only)

*Illustration reflects January 2022 Oahu electric rates with applicable surcharges.
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

<table>
<thead>
<tr>
<th>kVA Subscription Level</th>
<th>Euros per month</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>15.11 euros</td>
</tr>
<tr>
<td>12</td>
<td>18.27 euros</td>
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<tr>
<td>15</td>
<td>21.15 euros</td>
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<tr>
<td>18</td>
<td>23.31 euros</td>
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<tr>
<td>30</td>
<td>35.14 euros</td>
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<tr>
<td>36</td>
<td>41.16 euros</td>
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</tbody>
</table>

Approximately 1 euro per kVA with 6-euro base customer charge
Modern Grid is Built for Flows

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

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Basic Customer Charge ($/mo.)</td>
<td>$10</td>
</tr>
<tr>
<td>Site Infrastructure Charge ($/individual NCP kW)</td>
<td>$1</td>
</tr>
<tr>
<td>Distribution Flow Charge (Cents/kWh on imports and exports)</td>
<td>2 cents</td>
</tr>
</tbody>
</table>

### Symmetric Charges and Credits

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Rate</th>
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</thead>
<tbody>
<tr>
<td>Day-time (cents/kWh)</td>
<td>10 cents</td>
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<tr>
<td>Mid-peak (cents/kWh)</td>
<td>22 cents</td>
</tr>
<tr>
<td>On-peak (cents/kWh)</td>
<td>35 cents</td>
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<tr>
<td>Critical peak (cents/kWh)</td>
<td>75 cents</td>
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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.

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