Panel One: Can We Afford the Future?

Moderator: Dorothy Duda, Manager, CPUC Energy Division

Panelists:

• Mike Campbell, Manager, Public Advocates Office
• Mad Stano, Senior Legal Counsel, Greenlining Institute
• Michael Colvin, Director of Reg. Affairs, Environmental Defense Fund
• David Rapson, UC Davis Professor of Economics, Director of Davis Energy Economics Program
• David Wells Roland-Holst, UC Berkeley Professor of Economics
Increasing Rates Threaten California’s Equity and Environmental Goals

Mike Campbell
Program Manager
Electricity Pricing & Customer Programs

CPUC Rates En Banc – February 24, 2021
SDG&E Residential Average Rates vs. Revenues

% Increase Since 2010

- 78%
- 44%


SDGE Residential Average Rate  SDGE Revenue

PUBLIC ADVOCATES OFFICE
SCE Residential Sales vs. Residential Rooftop Solar Production

SCE Sales (% Change) vs. SCE Solar PV Production (MWh)
PG&E Residential Sales vs. Residential Rooftop Solar Production

% Change Since 2010

-12% -10% -8% -6% -4% -2% 0% 2%


MWh

-  1,000  2,000  3,000  4,000  5,000  6,000

PGE Sales (% Change)  PGE Solar PV Producton (MWh)
Historic and Forecasted Residential Average Rates Based on Most Recent 5-Year Average Rate Increases

Average Rate Cents/kWh

- PGE
- SCE
- SDGE
- PGE*
- SCE*
- SDGE*
- Gasoline Equivalent


Average Rate Cents/kWh:
- PGE: 34.6, 31.9, 47.9
- SCE: 37.8, 34.6, 31.9
- SDGE: 44.5, 41.8, 48.2
- PGE*: 34.6, 31.9, 47.9
- SCE*: 37.8, 34.6, 31.9
- SDGE*: 44.5, 41.8, 48.2
- Gasoline Equivalent: 47.9
Low-income customers that are enrolled in the California Rates for Energy (CARE) program receive a 30-35 percent discount off their electricity bills. Participants qualify through income guidelines or if enrolled in certain public assistance programs.
Low-income customers that are enrolled in the California Rates for Energy (CARE) program receive a 30-35 percent discount off their electricity bills. Participants qualify through income guidelines or if enrolled in certain public assistance programs.
PG&E Forecasted Bill Increases

Average Monthly Bills (non-discounted bills) by Climate Zone (Constant Usage)

- **Cool (Zone T)**: 29% average bill increase from 2016 to 2021.
- **Moderate (Zone X)**: 33% average bill increase from 2021 to 2030.
- **Hot (Zone P)**: 33% average bill increase from 2021 to 2030.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cool (Zone T)</th>
<th>Moderate (Zone X)</th>
<th>Hot (Zone P)</th>
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<tbody>
<tr>
<td>2014</td>
<td>$114</td>
<td>$84</td>
<td>$87</td>
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<tr>
<td>2015</td>
<td>$118</td>
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<td>$103</td>
</tr>
<tr>
<td>2020</td>
<td>$135</td>
<td>$128</td>
<td>$112</td>
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<tr>
<td>2021</td>
<td>$155</td>
<td>$133</td>
<td>$124</td>
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<tr>
<td>2022</td>
<td>$166</td>
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<td>2023</td>
<td>$172</td>
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<td>2025</td>
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<td>$152</td>
</tr>
<tr>
<td>2028</td>
<td>$204</td>
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<tr>
<td>2029</td>
<td>$207</td>
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<td>$218</td>
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<tr>
<td>2030</td>
<td>$216</td>
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<td>$275</td>
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</tbody>
</table>
SCE Forecasted Bill Increases
Average Monthly Bills (non-discounted bills) by Climate Zone (Constant Usage)

- Cool (Zone 8)
- Moderate (Zone 9)
- Hot (Zone 14)

45% average bill increase
From 2016 to 2021

45% average bill increase
From 2021 to 2030

Electic Bill ($/Month)

Year


$77 $85 $87 $96 $100 $99 $106 $128 $133 $139 $145 $151 $157 $164 $171 $178 $186 $196 $204 $212 $221 $231 $240 $250 $261 $272 $283 $294
SDG&E Forecasted Bill Increases
Average Monthly Bills (non discounted bills) by Climate Zone (Constant Usage)

- **Coastal**
  - 58% average bill increase from 2016 to 2021
- **Inland**
  - 50% average bill increase from 2021 over 2030

<table>
<thead>
<tr>
<th>Year</th>
<th>Coastal (Average Monthly Bill)</th>
<th>Inland (Average Monthly Bill)</th>
<th>Mountain (Average Monthly Bill)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>$72</td>
<td>$84</td>
<td>$87</td>
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<tr>
<td>2015</td>
<td>$87</td>
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<td>2019</td>
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<td>2022</td>
<td>$172</td>
<td>$178</td>
<td>$170</td>
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<td>2023</td>
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<td>2024</td>
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<td></td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ROAD MAP

• The rate crisis is now with existing + disproportionate + devastating impacts.

  ○ There is an inequitable distribution of costs + benefits: rates, non-energy benefits, social costs (e.g. pollution), access to services/programs/technologies.

• The promise, the benefits, and the material shifts required for energy decarbonization will not occur under inequitable financing + rate schemes.
More Than 1 in 2 Renters and More Than 1 in 3 Homeowners With Mortgages Were Cost-Burdened Before COVID-19

Percentage of California Households With Housing Cost Burden, 2018

<table>
<thead>
<tr>
<th></th>
<th>Cost Burdened: Shelter Costs Exceeded 50% of Household Income</th>
<th>Severely Cost Burdened: Shelter Costs Exceeded 50% of Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renters</td>
<td>63.1%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Homeowners With Mortgages</td>
<td>39.4%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Homeowners Without Mortgages</td>
<td>16.7%</td>
<td>6.1%</td>
</tr>
</tbody>
</table>

About 3 in 5 Latinx and Black Households in California Lost Earnings During the Pandemic

Percentage of Households That Have Lost Employment Income Since March 13, 2020

<table>
<thead>
<tr>
<th>Race</th>
<th>Asian</th>
<th>Black</th>
<th>Latinx</th>
<th>Other California of Color</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost Earnings</td>
<td>41%</td>
<td>47%</td>
<td>49%</td>
<td>54%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Black and Latinx Californians Were Most Likely to Have Unaffordable Housing Costs Before COVID-19

Percentage of Individuals With Housing Cost Burden by Race/Ethnicity, 2018

<table>
<thead>
<tr>
<th>Race</th>
<th>Costs Burdened: Shelter Costs Exceeded 30% of Household Income</th>
<th>Severely Cost Burdened: Shelter Costs Exceeded 50% of Household Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>47.4%</td>
<td>43.0%</td>
</tr>
<tr>
<td>Latinx</td>
<td>47.3%</td>
<td>32.0%</td>
</tr>
<tr>
<td>White</td>
<td>32.0%</td>
<td>33.7%</td>
</tr>
<tr>
<td>Asian</td>
<td>33.1%</td>
<td>32.0%</td>
</tr>
<tr>
<td>Other California of Color</td>
<td>22.3%</td>
<td>16.9%</td>
</tr>
<tr>
<td>Native</td>
<td>10.6%</td>
<td>10.6%</td>
</tr>
</tbody>
</table>

Most Latinx and Black Households With Children Are Having Difficulty Paying for Basic Expenses

Percentage of California Households With Children Reporting Any Difficulty

<table>
<thead>
<tr>
<th>Race</th>
<th>Asian</th>
<th>Black</th>
<th>Latinx</th>
<th>Other California of Color</th>
<th>White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty</td>
<td>4%</td>
<td>21%</td>
<td>25%</td>
<td>46%</td>
<td>3%</td>
</tr>
</tbody>
</table>

California Budget & Policy Center
COVID-19 Impacts on Customers in the Energy Sector

Table 1. Increases in Residential Arrears by Utility and Customer Class, February-December 2020

<table>
<thead>
<tr>
<th></th>
<th>PG&amp;E</th>
<th>SCE</th>
<th>SDG&amp;E</th>
<th>SoCalGas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-CARE</td>
<td>$123,407,137</td>
<td>$137,569,182</td>
<td>$37,505,532</td>
<td>$28,730,414</td>
<td>$327,212,265</td>
</tr>
<tr>
<td>CARE/FEA</td>
<td>$151,237,389</td>
<td>$107,510,068</td>
<td>$36,048,779</td>
<td>$29,178,390</td>
<td>$324,015,626</td>
</tr>
<tr>
<td>Total</td>
<td>$274,644,526</td>
<td>$245,120,251</td>
<td>$73,554,311</td>
<td>$57,908,500</td>
<td>$651,227,888</td>
</tr>
<tr>
<td>Per Customer (Non-CARE)</td>
<td>$32.85</td>
<td>$32.07</td>
<td>$32.97</td>
<td>$7.82</td>
<td>$24.71</td>
</tr>
</tbody>
</table>
Policy Barriers:
- Market Delivery
- Program Integration
- Data Limitations
- Unrecognized Non-Energy Benefits (NEBs)

Additional Burdens:
- Energy Burden
- Disconnections
- Access to Services + Technologies

Structural Barriers Limiting Access to Clean Energy for Low-Income Customers
Structural barriers limiting access to clean energy for low-income customers include:
- Low home ownership rates
- Complex needs, ownership, and financial arrangements for low-income multifamily housing
- Insufficient access to capital
- Building age
- Remote or underserved communities
Thank you!

Mad Stano
Charging forward with good rates
Ensuring access to an affordable, clean and safe energy system

Michael Colvin
Director, Regulatory and Legislative Affairs
California Energy Program
mcolvin@edf.org | (415) 293-6122
EDF: How we work

To forge the most effective solutions, EDF approaches the biggest environmental challenges from these angles:

Science
Rigorous science is our bedrock. It drives everything we do.

Economics
We examine every environmental problem through an economic lens.

Partnerships
With our partners, we achieve what no environmental group can do alone.

Advocacy
With our allies, we shape strong, bipartisan policy and fight for great environmental laws.

In California, EDF has approximately 65,000 members across each utility service territory.
Different solutions for different scales

Buildings

Vehicles
Air pollution’s impacts vary dramatically across the region

Childhood Asthma
% of new cases from air pollution

10 20 30 40 50
ZEV charging could be planned for as a solution to reduce emissions
Adopting a new vehicle has multiple financial factors.

Lower electric costs will yield more operational savings (and faster payback).

ZEV goals requires attention on all aspects
Need for Targeted Marketing Education and Outreach

We need to rethink about how we communicate infrastructure and rates to different commercial customers.

Size of the fleet and operational use is very different.

We can determine that the public interest means that we could prioritize early adoption where it will provide the most good – target vulnerable communities and accommodate a variety of charging models.
Can we start putting the pieces together?

We need to prioritize (and potentially subsidize) charging where it would be cost-effective for the grid AND yield larger health benefits.
Strategic Investments

- Use clean generation assets more frequently.
- MD/HD vehicles can provide grid support services but we need to adequately compensate them based on operational profile – predictability should be rewarded.
- Connect that with environmental benefits means a more affordable grid
- Include non-energy benefits such as reduced air pollution in cost effectiveness determinations
ELECTRIC VEHICLES: DEMAND AND USAGE

CPUC EN BANC
FEBRUARY 24, 2021

DAVID S. RAPSON
UNIVERSITY OF CALIFORNIA, DAVIS
ECONOMICS DEPARTMENT
DAVIS ENERGY ECONOMICS PROGRAM
Understanding EV demand and the role of energy prices

• How effective are EV subsidies?
  • And what do we learn from this?

• Do energy prices affect EV demand?

• How much electricity do EVs consume?
Increasing EV adoption requires large subsidies

- CA required $15,000-$25,000 in CA + federal subsidies for each incremental EV purchased
- It will likely cost at least $12-18 billion dollars in CA + federal subsidies to reach the 2025 CA target of 1.5 million EVs

Muehlegger & Rapson (2018, 2021)
Energy prices affect EV demand

- High electricity prices inhibit EV demand
  
  Each $0.10/kWh increase in electricity prices → 15% decrease in EV demand

- High gasoline prices encourage EV demand
  
  Each $0.50/gallon increase in gasoline prices → 30% increase in EV demand

Bushnell, Muehlegger & Rapson (2021)
**EVs are charging less than we thought**

**Change in Household Load from EV (kWh/hr)**

**Estimates of home EV charging (kWh/day)**

- Burlig, Bushnell, Rapson, Wolfram (2021): 2.9 kWh/day
- Dedicated EV meters (Joint IOU Report 2019): 7.2 kWh/day

Burlig, Bushnell, Rapson & Wolfram (2021)
There are many potential explanations for low EV load

- Battery range was lower during our sample period (2014-2017)
- Drivers may prefer other attributes of conventional cars
- Early adopters drive less than future adopters
- EVs may (in some cases) be complements to gasoline cars, not substitutes
There is still much to learn

- Effect of charging station proximity/density on adoption decision
- Effect of electricity prices on EV usage decisions
- Potential for vehicle-to-grid services
- Risks of relying on the same energy source for transportation and other electricity services
- ...

Questions and comments

David Rapson
CPUC En Banc Session on Energy Rates and Costs: Panel 1

David Wells Roland-Holst
UC Berkeley

Prepared for the California Public Utilities Commission
February 24, 2021
Contents

1. Affordability/Equity Issues
2. Policy Coherence
3. Investing in Assessment Capacity
• California’s diversity is a great asset, but it poses challenges for policy makers
• In times of dynamic change, it is essential to identify detailed patterns of incidence on both sides of energy/climate policy balance sheets (costs as well as benefits).
• Otherwise, we risk missing many benefits of complementary policies and anticipating adjustment needs for underrepresented groups.

Source: http://bearecon.com/portfolio-item/cec-ltes/
• Energy equity and efficiency are both laudable policy goals, but rate structure is a relatively inefficient instrument to advance either of them.
• From the equity perspective, energy affordability is part of a larger agenda of social protection.
• The CARE program, would in many advanced economies be an incomes policy managed by fiscal authorities, not sector price regulation.
• The Food Stamp, program, for example, is not administered by USDA, nor is it financed directly by food sector consumers or producers.
• Energy price subsidies also risk being capitalized into rents, effectively being captured by landlords.
• The residential community is divided between property owners and tenants.
• For the owners, higher rates might promote efficiency investment, for tenants it is more likely to ration energy services.
• Among lower income groups, this rationing may also extend to other necessities.
• Standards and ownership incentives are more effective ways to promote technology adoption for welfare-neutral energy savings.
The CPUC’s regulatory mission is clearly defined, but inevitably linked to actions and goals of other state agencies. These linkages can be complementary or competing, yielding opportunities and challenges for coherent state policy. Agencies can help each other achieve their individual and collective goals. Both the executive and legislative branches can play essential roles to facilitate this.

Examples:
1. Wildfire poses risks for electricity costs and rates, yet these are significantly linked to other policies (policies toward forestry, insurance, etc.).
2. Timing of low carbon energy deployment affects not only electric power costs, but many, widespread anticipated co-benefits of renewable and EV deployment.
3. Fiscal intervention can smooth system costs and accelerate benefits from complementary policy trends (e.g. EV deployment). Multi-agency dialog can facilitate this.
1. Objectives
- Decision support
- Policy dialog
- Effective stakeholder engagement and policy targeting

2. Immediate Capacity Challenges
- Time Horizon
  - Reconcile short, medium, and long-term planning
- Uncertainty
  - More numerous and diverse data sources
  - Expanded risk, scenario, and sensitivity analysis
  - Historical and cross sector assessment
Thank you