Analyzing (some) Policy Levers for Affordable Decarbonization

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Managing Rates and Bills for Affordable Decarbonization

- Electricity bills impact total household budget, particular concern for LI households;
  - as customers electrify, electricity bills = energy bills

- Rates should provide correct signals on how much to consume, when to consume, and what fuel to choose

Examine Efficacy of Three Types of Policy Options

1. Reduce total revenue requirement

2. Modify rate design
   - Recover revenue progressively, better align rates with policy goals

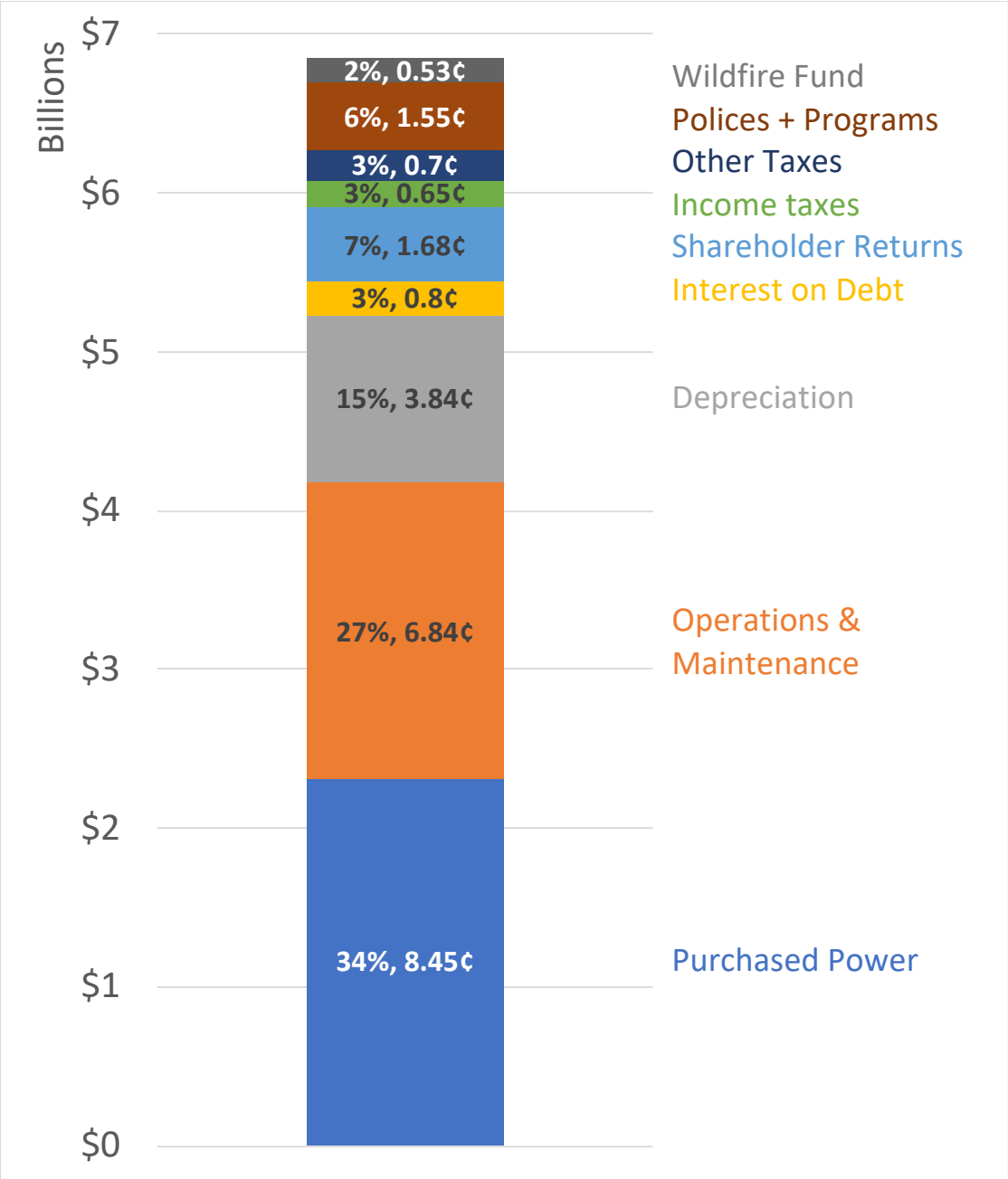
3. Increase grid utilization

- This presentation aims to describe each approach and estimate its impact; not prescribe recommendations for adoption

Scope, Caveats, Etc.

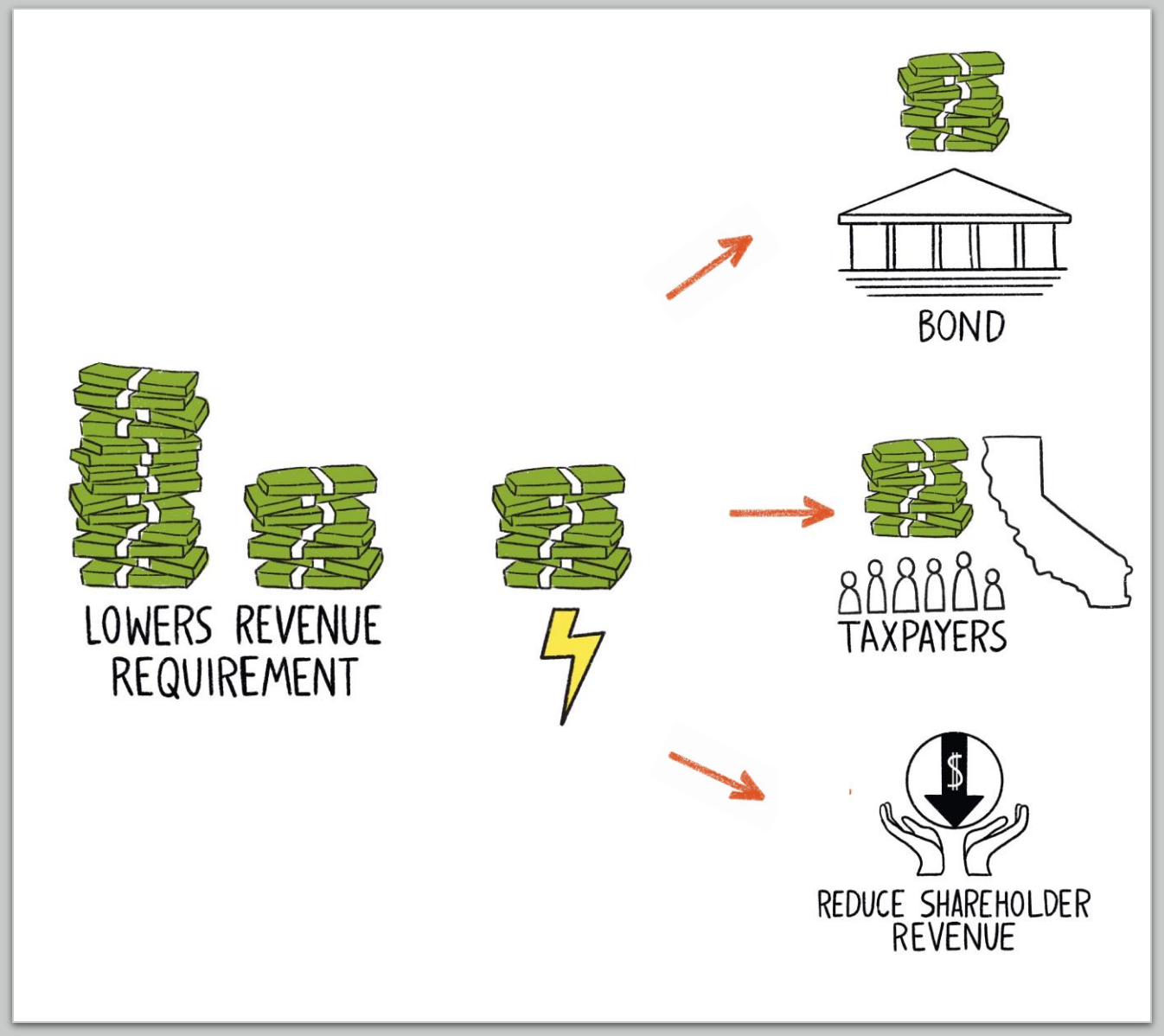
- Limited to Pacific Gas and Electric (PG&E)
- Screening level analysis to understand order of magnitude impact
- Analysis conducted by Synapse Energy Economics
  - Prime sources: FERC Form 1 filings (2020 and earlier); 2022 Annual Electric True-Up; 2020 GRC Cost of Service
    - Used best available data, made necessary assumptions

PG&E's Bundled Revenue Requirements Today



- Bundled service revenue requirement ~$6.8 billion
- Bundled sales of 27.3 TWh
- Average IOU bundled rate 25¢/kWh
  - Bundled residential only ~ 27¢/kWh
    - E1 (not low-income): 30.9¢/kWh
    - CARE (low-income): 19.4¢/kWh

1. Reduce revenue requirement



Fund social policy costs from outside rate-base

- Some costs on electric bills are not (directly) caused by electric consumption, economically efficient to pay for them through other means

- Options for costs to transfer:
  - Wildfire Fund charge
  - CARE and FERA programs (including program admin costs)
  - All other costs that are not directly delivery related (i.e., all but transmission, distribution, generation)

Fund Social Policy Costs from Outside Rate-base: Cumulative Impacts

	E-1				D-CARE			
	Bills ($)	Bills (% Δ)	Rates ($)	Rates (% Δ)	Bills ($)	Bills (% Δ)	Rates ($)	Rates (%Δ)
Current	$1,947		$0.31		$1,161		$0.19	
Wildfire Fund	**Δ** $(39)	-2%	**Δ** $(0.006)	-2%	**Δ** $0	0%	**Δ** $0	0%
CARE/FERA	**Δ** $(77)	-4%	**Δ** $(0.012)	-4%	**Δ** $0	0%	**Δ** $0	0%
CARE & Wildfire Fund	**Δ** $(116)	-6%	**Δ** $(0.018)	-6%	**Δ** $0	0%	**Δ** $0	0%
All non-delivery	**Δ** $(139)	-7%	**Δ** $(0.022)	-7%	**Δ** $(17)	-1%	**Δ** $(0.003)	-1%

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Public Ownership of Transmission System

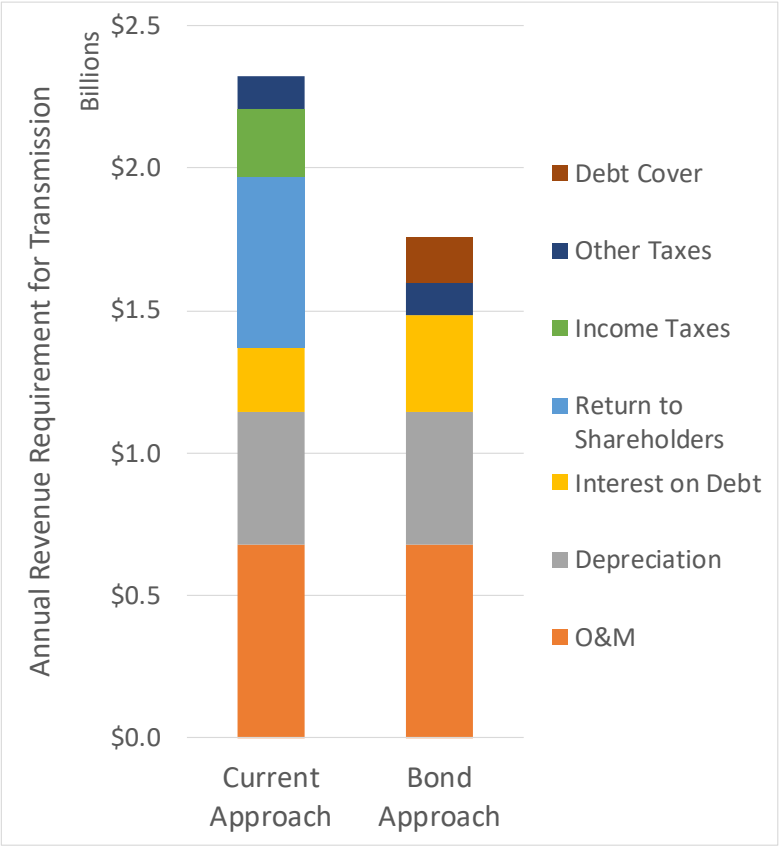
- Reduce cost in exchange for risk transferred from shareholders to the public

- Change capital structure of PG&E's transmission system to 100% debt at a bond rate for a long-term state bond, estimated at 3%
  - Buy out/refinance about $11.3 billion in rate base
  - Doesn't consider benefits from public ownership of future transmission build

- We assume the bonded entity is nonprofit or governmental, and therefore pays no income tax

Public Ownership of Transmission System: Impacts

	E-1				D-CARE			
	Bills ($)	Bills (% Δ)	Rates ($)	Rates (% Δ)	Bills ($)	Bills (% Δ)	Rates ($)	Rates (% Δ)
Current	$1,947		$0.31		$1,161		$0.19	
Public Tx Own	**Δ** $(71)	-4%	**Δ** $(0.011)	-4%	**Δ** $(67)	-6%	**Δ** $(0.011)	-6%



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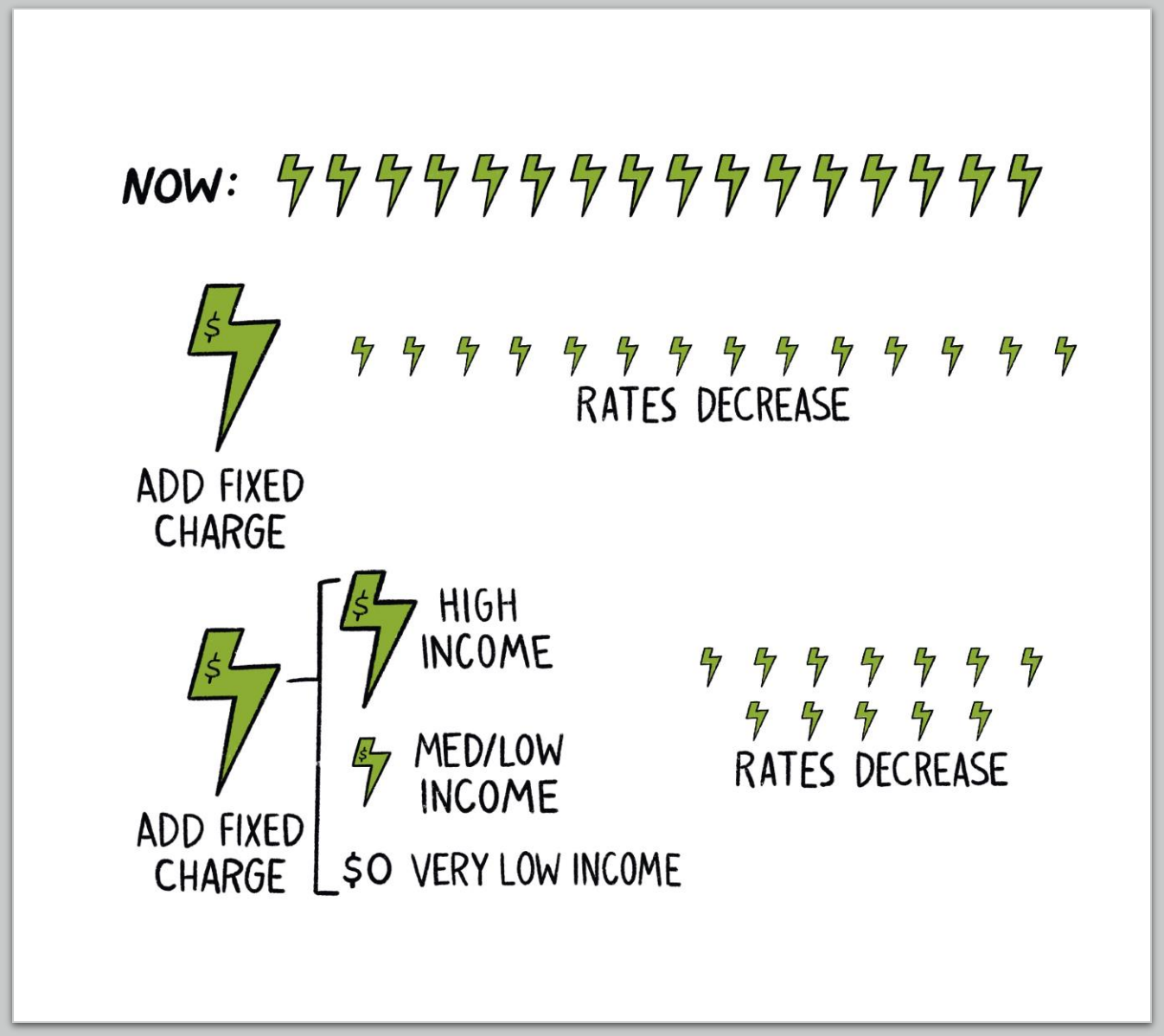
Reduce Return on Equity

- PG&E shareholders ROE exceeds national average, percentage equity they own is average or higher.
- A lower rate of return reduces both profits and income tax costs.
- Current ROE is 10.25%, equity is 52% of total rate-base.
- Reduce ROE to 9.5%, maintain 52% equity
- Reduce ROE to 7%, increase equity to 55.5%
  - This keeps the same leverage ratio (a measure of creditworthiness) as today

Reduce Return on Equity: Impacts

	E-1				D-CARE			
ROE, % Equity	Bills ($)	Bills (% Δ)	Rates ($)	Rates (% Δ)	Bills ($)	Bills (% Δ)	Rates ($)	Rates (% Δ)
Current	$1,947		$0.31		$1,161		$0.19	
9.5%, 52%	**Δ** $(22)	-1%	**Δ** $(0.004)	-1%	**Δ** $(21)	-2%	**Δ** $(0.004)	-2%
7%, 55.5%	**Δ** $(89)	-5%	**Δ** $(0.014)	-5%	**Δ** $(84)	-7%	**Δ** $(0.014)	-7%

2. Modify rate design



Add a Residential Fixed Charge

- If revenue is raised through such a charge, then less needs to come from the variable charge, so the variable charge can be lower
- Lower volumetric charges more in line with social marginal costs to consume electricity and encourage managed electrification
- Doesn’t change the total revenue a utility collects, changes how this revenue is collected
- Need to make fixed charges progressive

Three Possible Approaches to Fixed Charges

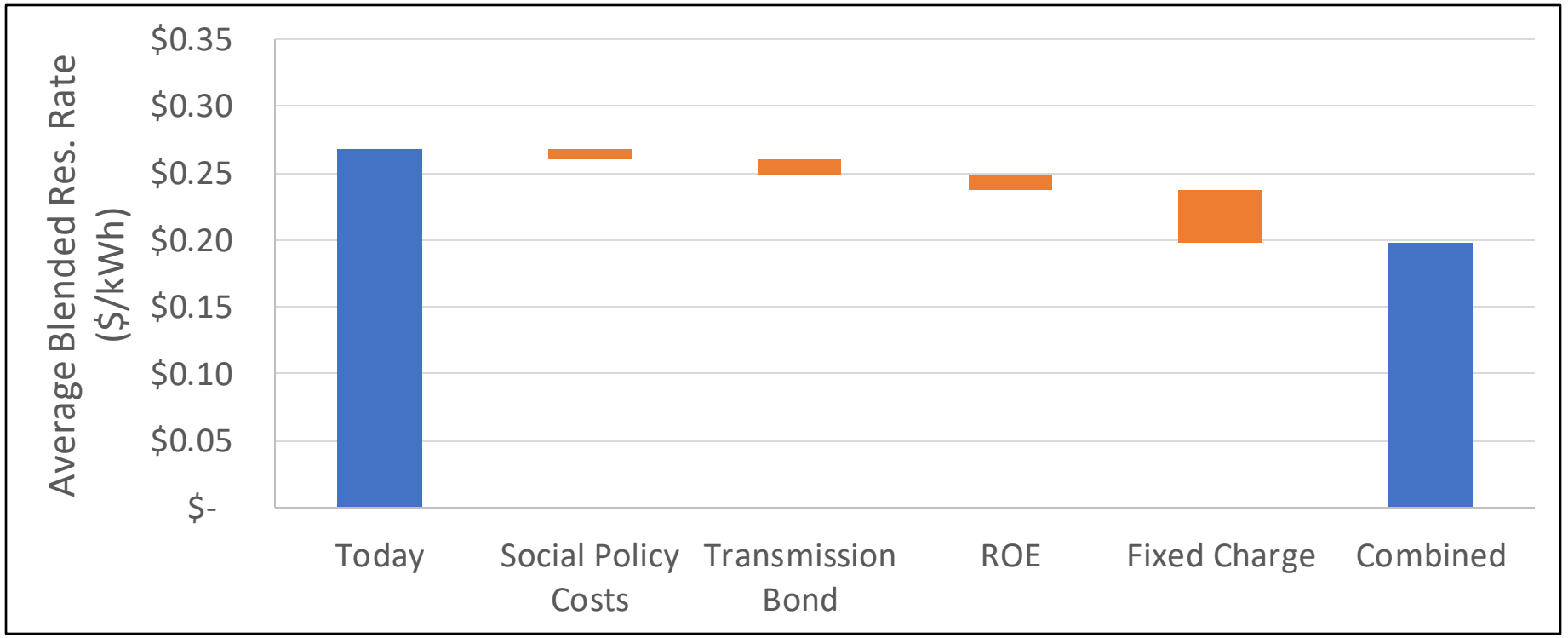
- Low: PG&E estimates of marginal customer cost
  - $11.34/month (*from 2020 GRC Cost of Service*)
    - (1) Marginal connection equipment costs (transformer, service drop, and meter), and (2) marginal revenue cycle services (meter reading, meter services, account setup, billing and payments, credit and collections)
- Mid: PG&E estimates of marginal customer modified
  - $20.33/month (*from 2020 GRC Cost of Service & FERC Form 1*)
    - (1) Marginal connection equipment costs and (2*) average ~~marginal~~ revenue cycle service costs
- High: Limit variable costs to societal marginal cost and shifts all the rest to customer charge
  - $74.02/month
    - *From "Designing Electricity Rates for An Equitable Energy Transition" from Next 10 and Haas*

Fixed Charges: Rate Impacts

Monthly Fixed	E-1		D-CARE	
	Rates ($)	Rates (% Δ)	Rates ($)	Rates (% Δ)
Current	$0.31		$0.19	
$11.34/mo.	Δ $(0.025)	-7%	Δ $(0.016)	-8%
$20.33/mo.	Δ $(0.045)	-13%	Δ $(0.029)	-15%
$74.02/mo.	Δ $(0.163)	-46%	Δ $(0.107)	-55%

Cumulative Impacts of Policy Stacking

- Policies can be combined
  - Remove CARE and Wildfire Fund costs
  - Use a bond approach to transmission
  - Change capital structure to 7%/55.5% for distribution and generation
  - Mid-level ($20.33/mo.) fixed charge



Make the Fixed Charge Progressive

- Fixed charges can be regressive as they increase bills for low-consumption customers; overcome this by adjusting the fixed charge based on income.

- Vary fixed charge across 5 quintiles of household income, adjust to make it as progressive as income tax

Income Tier	Income Tax Based Scalar	Household Income Range
Tier 1	0%	$0 - $29,000
Tier 2	100%	$29,000 - $53,500
Tier 3	177%	$53,500 - $86,400
Tier 4	288%	$86,400 - $147,300
Tier 5	641%	Over $147,300

Income Based Fixed Charge: Average Annual Impacts

Case	Monthly Fix Charge	Income Quintile	Annual Bill Change ($)	Change (%)
$11.34/ mo.	$0	1	$ (101)	-8%
	$5	2	$ (65)	-4%
	$8	3	$ (30)	-2%
	$14	4	$ 8	0%
	$30	5	$ 190	9%
$20.33/ mo.	$0	1	$ (181)	-15%
	$8	2	$ (116)	-8%
	$15	3	$ (54)	-3%
	$24	4	$ 14	1%
	$54	5	$ 340	16%
$74.02/ mo.	$0	1	$ (660)	-55%
	$31	2	$ (423)	-29%
	$54	3	$ (198)	-12%
	$88	4	$ 51	3%
	$197	5	$ 1,237	58%

Set Electricity Burden Limit at 5% of Income for CARE Customers

- The lowest-income households will see reduced energy burden
- CARE customers pay CARE rate until they reach their 5% energy burden limit; then they don't pay for additional consumption
- This would require about $300 million in additional support
  - Increase CARE budget from $800 million to $1.1 billion, or 35-40% increase

Average 5% Electricity Burden Impacts

	E-1				D-CARE			
	Bills ($)	**Bills (% Δ)**	**Rates ($)**	**Rates (% Δ)**	**Bills ($)**	**Bills (% Δ)**	**Rates ($)**	**Rates (% Δ)**
Current	$1,947		$0.31		$1,161		$0.19	
5% limit	**Δ** $100	5%	**Δ** $0.014	5%	**Δ** ($259)	-22%	**Δ** $(0.194)	-100%

If collected only via *residential* electric rates, this would require additional 1.45¢/kWh from residential non-CARE customers (bundled and unbundled)

Rate impact reduced to 0.44¢/kWh if collected from *all* non-CARE customers (residential and non-residential)

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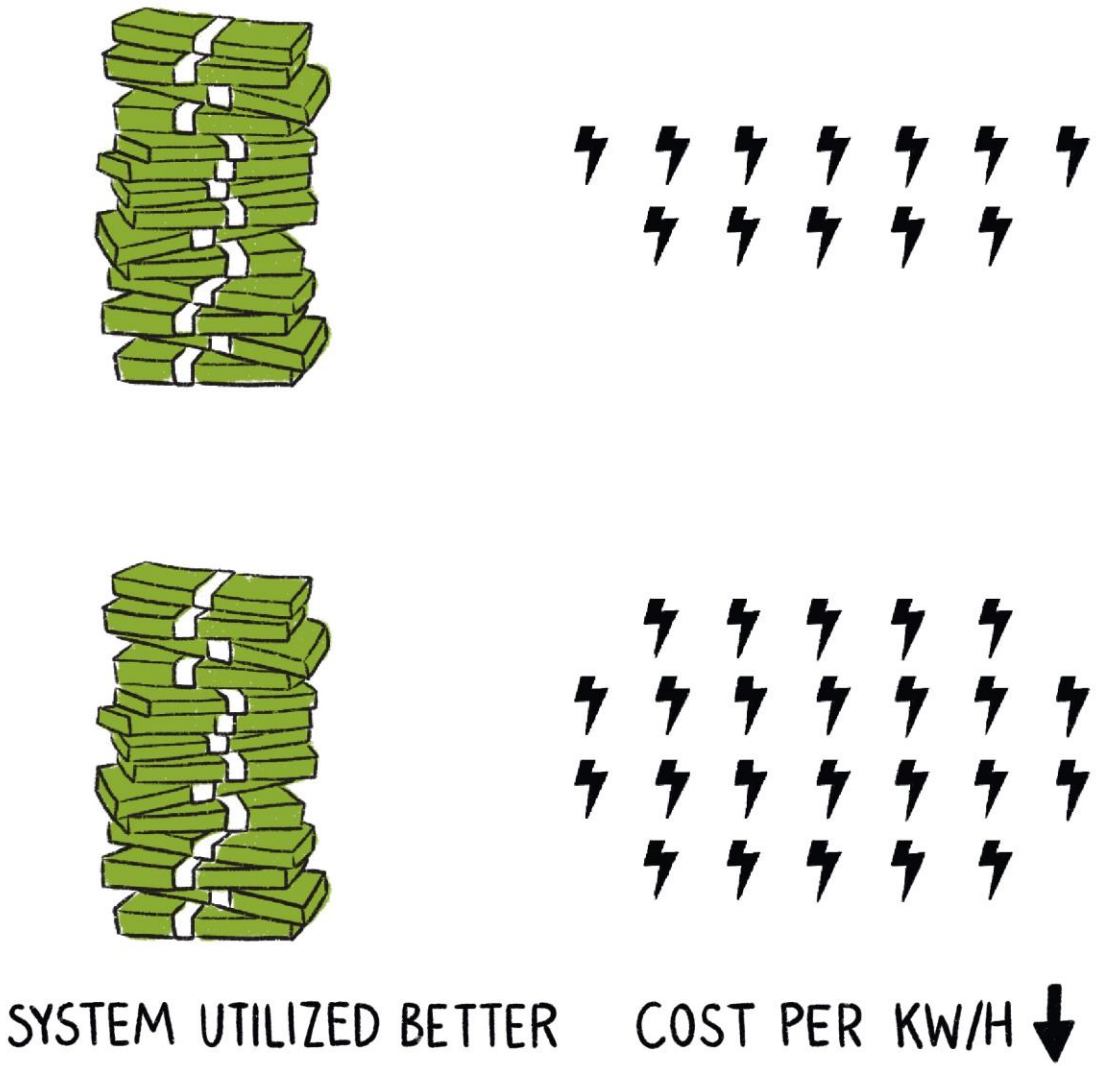
3. Increase infrastructure utilization



Spread Costs Through Electrification

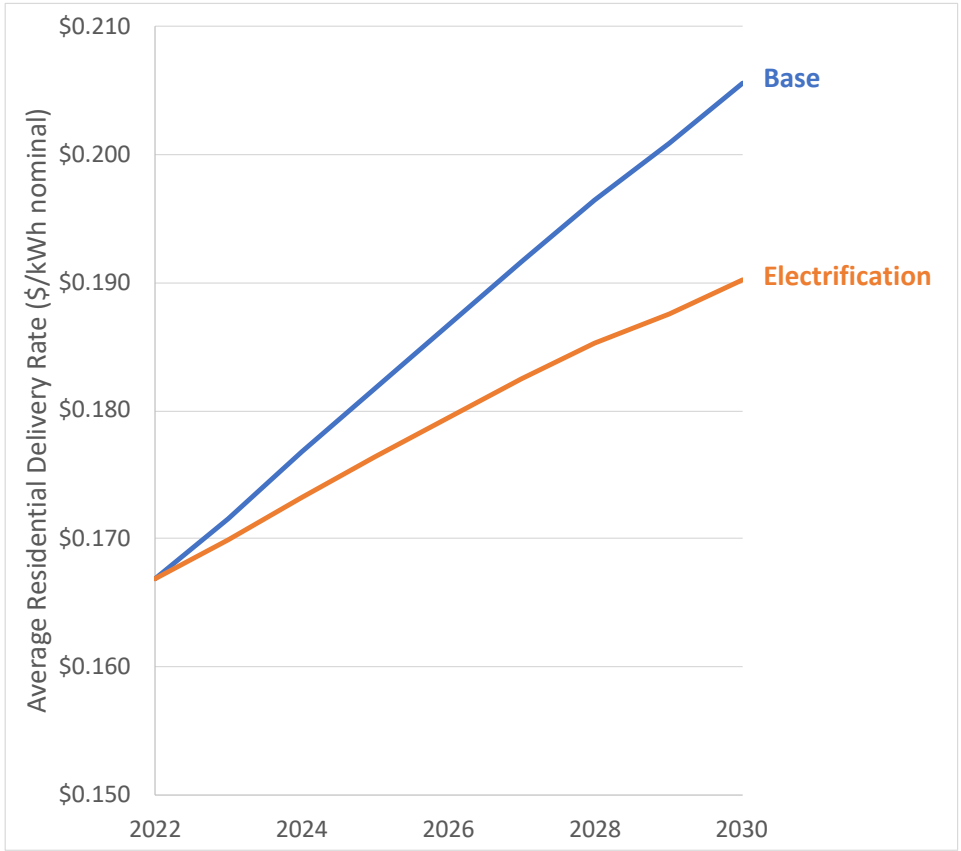
- T&D system is built to meet peak loads, most of the time load is lower. Spread costs of T&D system over more units (kWh) without proportional increase in peak costs to reduce $/kWh

- Compare the utility revenue requirement per kWh in a low-electricity use case vs. high electricity use case from CEC demand forecast

- Model non-generation portion of rates and bills

Spread Costs Through Electrification

- By 2030, average residential non-generation-related rates could be lower by about 1.5¢/kWh
- $90-100/year savings in 2030, *if* usage is the same



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Most Strategies Requires Both Legislative and Regulatory Action

- Legislative action to raise money and fund social policy goals from outside the rate-base
- Legislative change to allow higher fixed charges; regulatory action to change rate design, structure fixed charges progressively
- Spreading costs through electrification would require regulatory action, LSE and customer responsiveness

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