We're All in This Together: Progressive Rate Structures Can Balance Signals for Energy Efficiency, Electrification, and Load Flexibility

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ABSTRACT

The clean energy transition requires new forms of efficient electricity use as sectors phase out fossil fuels. For an affordable and equitable shift to a clean economy, energy expenditures should decrease upon electrification, particularly for low-income households. Customers should realize operational savings from running vehicles and appliances on clean electricity relative to polluting alternatives, and households should not be penalized for essential electricity use. Today, residential electricity rates in California are the highest in the continental United States, with rates in SDG&E territory as high as 60 cents per kWh at peak times. These rising retail rates result in anti-environment and regressive outcomes. Californians don't save from electrifying home appliances and low-income households pay a disproportionately high share of their income on energy bills, with more than 25% of such customers in arrears.

One rate design element that can address both problems is an income-graduated fixed charge (IGFC). The IGFC can lower volumetric rates by collecting a portion of the electric grid's fixed costs via a monthly fee on customer bills. Income graduating this charge also makes bills more equitable by progressively collecting shared system costs. The authors developed an IGFC proposal that reduces rates about 20% while maintaining a time-of-use structure that encourages efficiency and load flexibility. The modelled IGFC produces significant cost savings upon electrification and saves low-income customers hundreds of dollars annually. This paper explains why and how they developed this proposal for California, the state's ongoing rate reform process, and lessons for the future.

Introduction

I. Background

Californians pay the highest electricity rates in the continental United States (Johnson 2024). Over the next decade, rates are expected to increase further due to rising wildfire mitigation and utility infrastructure costs, even as cheap renewables like solar and wind make up a growing share of the energy resource mix. These higher rates will make it harder for lower income residents to pay their energy bills at a time when natural gas prices are increasingly volatile. Nearly a fifth of investor-owned utility customers in California, and more than a quarter of households in low-income energy discount programs, are behind on paying their energy bills ("Monthly Disconnection"). High electricity prices also discourage customers from electrifying their homes and vehicles, threatening California's ability to meet its climate targets. Customers will only see 'payback' on electric investments if they have lower operating costs than polluting alternatives, which is not the case for electric heating and other crucial technologies in California

today.[1] Reducing payback periods, through government policies and new technologies, is critical to spur market transformation. In a transformed market, electric options are so cost-competitive that they become the norm, ensuring that the roughly 45% of Californians who rent, and do not make appliance purchasing decisions, also benefit from electric technologies (E3 2019).

Under Assembly Bill 205, passed in June 2022, the California Public Utilities Commission (CPUC) launched a process to better align the electric rates offered by California's investor-owned utilities with the state's climate and equity goals ("AB 205"). In May 2024, the CPUC approved a new design for default residential rates that includes an "income-graduated fixed charge," or IGFC (CPUC 2024b). The IGFC has the potential to make electric bills more equitable by reducing overall bills for low-income customers and collecting the shared costs of the grid more fairly. This corrects a structural deficiency of status quo rates. Lower income customers today pay a disproportionately high share of their income on household utilities, and the inclusion of fixed costs in rates results in an effective 'electricity tax' that is far more regressive than income or even sales taxes (Borenstein, Fowlie, and Sallee 2021). The IGFC will also lower volumetric (usage) rates for all customers, which encourages beneficial electrification, such as switching from fossil fuel technologies to an electric car or efficient electric space heater.

In this paper, we introduce the concept of the IGFC as one tool to help achieve California's climate and affordability goals and make status quo electric rates more progressive. Next, we describe the IGFC proposal that we submitted to the CPUC, the ensuing regulatory decision, and the impacts of these changes on bills for different customer groups. We conclude with a discussion of obstacles in the multi-stakeholder rate design process and future application of these lessons beyond California.

II. Introducing the Income-Graduated Fixed Charge (IGFC)

Electric bills generally have two main components. Volumetric rates are charges for each unit of energy used, while fixed charges are the same each month and cover fixed costs of maintaining the grid. Fixed costs refer to all costs that don't vary with customer usage, which can include the costs to build and maintain infrastructure like poles and wires, as well as costs to implement policies like wildfire mitigation activities and low-income discount programs. Many utilities around the country and public utilities in California offer fixed charges. For example, the Sacramento Municipal Utility District (SMUD) charges residential customers between 11 and 32 cents per kilowatt hour (kWh) of energy use, depending on the time of day, and also collects a $24 "System Infrastructure Fixed Charge" each month (SMUD 2024). Most customers at investor-owned utilities like Southern California Edison (SCE) or Pacific Gas & Electric (PG&E) pay very low fixed charges of $0 or $1. As a result, virtually all of residents' monthly bills come from increasingly high volumetric rates with limited choice of rate schedule (Johnson 2024). These options include time-of-use rates which moderately incentivize electricity use at off-peak times when power is cheaper to provide.

[1] For example, for a typical PG&E customer, gas heating and electric air-source heat pump operating costs are roughly equivalent. Assuming the heat pump consumes 1,163 kWh annually (CEC 2019), with a heat pump co-efficient of performance of 3.0, gas efficiency of 0.8, and an average gas rate of $2.5/therm (PG&E 2024), annual operating costs for the gas and electric options are $372 and $371 respectively.

Many environmental and consumer advocates have historically opposed fixed charges and supported higher volumetric charges to incentivize energy efficiency. First, back when the grid was mostly powered by polluting resources, encouraging conservation was a primary goal of rate design. But California's grid today is increasingly powered by renewables that produce cheap and clean electricity (Newsom 2024). Using this clean energy instead of polluting alternatives is necessary to decarbonize the economy, and the state has committed to electrifying millions of homes and vehicles to reach net zero carbon emissions by 2045 (Newsom 2020). Further, California's rates are more than sufficient to incentivize conservation. As of February 2024, the three major investor-owned utilities had average rates for non-discount residential customers above 30 or 40 cents per kWh (Johnson 2024). Summer peak rates in San Diego Gas & Electric (SDG&E) territory have gone as high as 60 cents per kWh (SDG&E 2024). This compares to a national average of just 17 cents per kWh (BLS 2024). Volumetric electric rates must be low enough to encourage building and transportation electrification, while still covering the costs of generating electricity, operating the grid, and maintaining signals for distributed generation and energy efficiency. Second, fixed charges have been criticized as inequitable because they can increase bills for lower-usage customers, who are thought to be lower income, though this is not always the case. Graduating the level of the charge based on customer income addresses this concern. In addition, fixed charges can make bills more geographically equitable. Inland households today contribute far more toward shared grid costs through 50 to 100% higher bills than coastal households in California, because of the significant variation in usage between customers with different air conditioning needs.[2]

Thus, income-graduated fixed charges have the potential to make bills fairer and send the right behavioral signals. Customers will pay a fixed charge each month based on their income, which will be broken down by three or more tiers, as instructed by Assembly Bill 205 in 2022. The law requires that lower-income residents realize average bill savings under the new rate structure. The resulting rate design lowers volumetric rates for all customers by shifting some fixed costs of the grid into a monthly fee, making the operating costs of electric vehicles and appliances more competitive with polluting gas alternatives. Over the past two years, the CPUC engaged with stakeholders, including the consumer and environmental advocacy organizations The Utility Reform Network (TURN) and the Natural Resources Defense Council (NRDC), to determine what these tiers and income cutoffs should be, as well as the amount of the fixed charge at each income level. The joint TURN/NRDC proposal developed by the authors would lower volumetric rates by 20% and deliver $10-40 in monthly average bill savings for low-income customers of the three investor-owned utilities. Middle-income customers would see minimal bill impacts, and high-income customers would see average bill increases between $7-35. Bill savings are also significant for Californians who live in warm inland areas as they tend to use more electricity than those in temperate coastal regions, due to air conditioning needs during the hottest summer months.

In May 2024, the CPUC approved a modest IGFC design for implementation by early 2026 (CPUC 2024b). Sharing many elements with the authors' proposal, the new charges are expected to lower volumetric electric rates and progressively distribute system costs to higher-income customers.

[2] Based on baseline territory usage estimates in the CPUC's public fixed charge modelling tool (CPUC 2024c).

The TURN/NRDC IGFC Proposal

III. Designing the IGFC for California

The process of designing the TURN/NRDC joint fixed charge proposal began with identifying fixed cost categories eligible for collection via a fixed charge. The economic rationale for sorting cost categories between fixed and variable is straightforward. All cost categories that don't meet the strict economic definition of short run social marginal costs (SRSMC) are candidates for fixed charges. In other words, eligible costs are those that are not the short run costs of generating and delivering electricity and their externalities. We did not attempt to analyze the economic efficiency tradeoffs and distributional impacts of different levels of fixed charges. Instead, to develop our fixed charge recommendation, we started by including all feasible cost categories for each utility until we achieved our desired fixed charge amount. Fixed charges rarely cover the full set of utility fixed costs. We solved for an average fixed charge that results in approximately $60 for the high-income tier, $40 for the middle, and $5 for low-income customers. This approach yields an average fixed charge across all three utilities of approximately $36. We also increased the charge by $10 for each tier on optional pro-electrification rates,[3] to further decrease volumetric rates on those schedules. This recommended level ensures moderate bill impacts for coastal customers who tend to have lower usage than inland customers. Table 1 presents all cost categories for each utility. Highlighted categories are those that meet the strict definition of SRSMC; all other categories are thus candidates for inclusion in a fixed charge. Most of the charge recovers the costs of customer connections and public purpose programs; this charge level is too low to recover significant portions of other fixed distribution categories like grid hardening and wildfire mitigation, the primary rate drivers in recent years.

[3] These optional rates, such as EV tariffs, already include fixed charges of around $10-15 today.

Table 1. Electric Rate Cost Components in the TURN/NRDC IGFC

Cost Category	Cost Component	Percent to Include in Customer Charge		
		PG&E	SCE	SDG&E
Generation	PCIA	100%	100%	100%
Generation	Marginal Energy Cost	0%	0%	0%
Generation	Marginal Generation Capacity Cost	0%	0%	0%
Generation	Non-Marginal Generation	0%	0%	0%
Distribution	Marginal Customer/ Customer Access	100%	100%	100%
Distribution	Marginal Distribution Capacity Cost - Primary	0%		
Distribution	Marginal Distribution Capacity Cost - New Business	100%		
Distribution	Marginal Distribution Capacity Cost - Secondary	0%		
Distribution	Marginal - Grid		0%	
Distribution	Marginal - Peak		0%	
Distribution	Marginal Demand - Non-Coincident Peak			0%
Distribution	Marginal Demand - Coincident Peak			0%
Distribution	Non-Marginal Distribution	20%	45%	7%
Transmission	All Transmission Categories	0%	0%	0%
Line Items	Public Purpose Programs - SGIP	100%	100%	100%
Line Items	Wildfire Fund Charge	0%	0%	0%
Line Items	Wildfire Hardening Charge	100%	100%	
Line Items	Recovery Bond Charge	0%	0%	
Line Items	Recovery Bond Credit	0%	0%	
Line Items	Public Purpose Programs - Not CARE Exempt	100%	100%	100%
Line Items	Nuclear Decommissioning	100%	100%	100%
Line Items	New System Generation Charge	100%	100%	100%
Line Items	Competition Transition Charge	0%		0%
Line Items	Energy Cost Recovery Account	0%		
Line Items	Total Rate Adjustment Component - Baseline adjustment component			0%
Line Items	Residential CARE Contribution	100%	100%	100%
Average Default Fixed Charge Per Customer Per Month		$36	$36	$36
Modifications for Electrification Rates				
Distribution	Non-Marginal Distribution	55%	76%	43%
Average Electrification Fixed Charge Per Customer Per Month		$47	$47	$47

We proposed three income tiers as a starting point to fulfill the requirements of Assembly Bill 205 and realize significant progressive impacts on customer bills. Under our proposal, the lowest income tier would capture customers currently enrolled in the California Alternative Rates for Energy (CARE) and Family Electric Rate Assistance Program (FERA) low-income energy discount programs, with household income up to 200 and 250 percent of the Federal Poverty Level (FPL), respectively, as well as households living in deed-restricted affordable housing. This would provide consistent support for protected low-income households, about 30% of the state's population, based on a well-established metric of household earnings relative to size. We modelled our charge with a highest income tier of household incomes over $150,000, using the proceeding's public modelling tool (CPUC 2024c). This tier exceeds 400 percent of the FPL ($120,000), the average California household income ($119,149), and the median California household income for a family of four in most California counties. The middle-income tier would then capture non-CARE, non-FERA customers with annual household income above 250 percent of the FPL, and below $150,000. Unfortunately, the modelling tool and existing utility data did not enable us to model tiers with income graduation based on household size or other characteristics outside of the low-income energy programs.

The ratio of fixed charges for middle- and high-income customers (1 to 1.5) represents a palatable degree of differentiation that balances the desire for low-income customer savings with a goal of keeping the highest tier fixed charge reasonable. Even under our proposed fixed charge,

volumetric rates would remain much higher than SRSMC and remain unreflective of low costs during off-peak hours.[4] Moreover, on- and off-peak variations in current rates do not fully reflect the variations in SRSMC. Until the CPUC updates time-of-use rates to make them more reflective of SRSMC, we propose retaining opt-in electrification rates, such as EV-specific rates, that maintain a slightly higher fixed charge. The combination of a higher fixed charge and a more time-differentiated volumetric rate structure brings off-peak volumetric charges in electrification rates closer to SRSMC than in default rates. To this end, we proposed that electrification rates have a $10 higher fixed charge than default and tiered rates.

Midway through the proceeding, the CPUC requested that parties submit 'first version' IGFC proposals that did not involve any new income verification methods beyond those that enrolled customers in low-income energy discount programs. This stemmed from concerns that the CPUC could not establish a new income verification system by the legislative deadline. Without the ability to income graduate the charge above the CARE and FERA low-income thresholds, we developed a more modest proposal to avoid adverse impacts on middle-income customers. We presented a version 1 (V1) fixed charge with an average fixed charge of $23.50, benchmarked to the fixed charge offered by SMUD in Sacramento.

Table 2. TURN/NRDC Proposed Version 1 and Version 2 IGFC (Tiered Rates)

	PG&E		SCE		SDG&E	
	Version 1	Version 2	Version 1	Version 2	Version 1	Version 2
CARE FERA and Affordable Housing	$5	$5	$5	$5	$5	$5
Household Income < $150,000	$30.64	$41.47	$29.97	$41.20	$29.70	$41.37
Household Income > $150,000		$62.20		$61.80		$62.05
Average	$23.29	$36.22	$23.52	$36.00	$23.23	$36.14

Customers would be assigned to income tiers by a third-party administrator. For the first version proposal, all customers currently enrolled in the CARE and FERA programs, or with an address in a public database of affordable housing, would be eligible for the low-income tiers, while all other customers would be in the remaining tier, with no needed customer action. For the second version, we proposed that the administrator use a combination of methods including previous program eligibility, a third-party income verification service, and self-attestation. In the long-term, it will be valuable to develop a new verification platform with direct access to government databases, such as the California Franchise Tax Board, for more robust implementation, although this will likely require new legislation. In any verification scheme, the utilities should not handle customers' direct income information, and data sharing can be limited to categorical tier eligibility, as with the existing discount programs.

Additional income tiers should be considered as the implementation and income verification process improves in order to recover fixed costs as progressively as possible. With more room for future precision, rationale for tier cutoffs could be developed based on household size, median income relative to geographic regions, or home ownership status. The charge should still be set at a level that guarantees savings for low-income households and minimizes adverse

[4] For further discussion of electricity pricing and social costs, see 'Chhabra, 2024.'

impacts for middle-income households. One possible criteria to determine the charge limit for upper income customers may be the point at which grid defection becomes feasible.

IV. Modelled Impacts of the IGFC

Implementing the IGFC reduces volumetric rates by 21-24% across the three investor-owned utilities under the TURN/NRDC second version proposal, and by 13-15% under the first version proposal (Table 3). We do not believe this rate reduction yields negative outcomes for demand flexibility or energy efficiency. First, the charge does not change the structure of time-of-use rates, maintaining the incentive to use electricity at off-peak times and when the grid is cleanest. Second, over the past three years alone, PG&E has increased its residential rates 81% and SCE 67% (PAO 2024). A 15 or 20% reduction from the IGFC would only return rates to their level one or two years prior to implementation, with prices well exceeding the national average and the incentive for conservation undeniably strong.

Table 3. Volumetric Rate Impacts of the TURN/NRDC Proposal (Tiered Rates)

	$/kWh (Existing)	TURN/NRDC Proposal	$/kWh (New)	$ Change	% Change
PG&E	$0.31	v1	$0.26	($0.048)	-15%
		v2	$0.24	($0.074)	-24%
SCE	$0.32	v1	$0.27	($0.046)	-15%
		v2	$0.25	($0.070)	-22%
SDG&E	$0.46	v1	$0.40	($0.062)	-13%
		v2	$0.37	($0.098)	-21%

Low-income customers, who tend to pay a disproportionately high share of their income on household utilities, would benefit the most from our proposal. As a result of the new income-based fixed charges and lower volumetric rates, low-income customers would realize savings between $10-40 per month on average across geographic regions, an average of $15 under each utility, assuming no changes in usage. Middle-income customers would see minimal bill impacts, and high-income customers would see average bill increases between $7-35. Bill savings are also highest for Californians who live in warm inland areas as they tend to use more electricity than those in temperate coastal regions. On standard time-of-use rates, for example, we found that low-income customers in SDG&E's coastal region would save an average of $14 each month; however, savings average $40 a month for low-income customers in SDG&E’s warmer inland desert region. Even from the first version, more moderate proposal, with the lower average fixed charge, CARE customers save nearly $10 each month on average:

Table 4. CARE Monthly Bill Impacts from TURN/NRDC Proposal (Time-of-Use Rates)

	PG&E			SCE			SDG&E		
	Average	Coastal	Inland	Average	Coastal	Inland	Average	Coastal	Desert
CARE (v1)	($10.05)	($4.53)	($13.20)	($10.43)	($4.88)	($16.48)	($8.46)	($6.59)	($24.24)
CARE (v2)	($18.47)	($10.18)	($22.96)	($17.70)	($10.52)	($27.18)	($16.84)	($13.85)	($40.82)

Distributional impacts for non-CARE customers relate to usage, which tracks closely to utility baseline territory or climate zone. Table 5 shows that roughly 97 percent of PG&E CARE customers, 46 percent of middle tier customers, and 25 percent of high-income tier customers would see bill savings or bill increases of less than 5%. In other words, nearly every low-income customer, half of the middle tier, and a quarter of the high tier would experience savings or relatively small increases. Given that the low-income tier includes about 30% of customers, and the middle tier includes about 50% of customers, the TURN/NRDC proposal would bring savings or very small bill increases to most California households. “NEM Status” refers to whether or not customers are served by behind the meter solar and storage technologies which are subject to Net Energy Metering rules. The other columns denote baseline territories, with more customers saving in inland areas (e.g. zone “W”), than coastal (e.g. zone “T”). Due to the constraints of the modelling tool, the percentage of the full TURN/NRDC low tier that would realize savings is not displayed, but FERA and affordable housing customer impacts should closely mirror those of CARE customers.

Table 5. PG&E Customer Impacts from the TURN/NRDC Proposed Version 2 IGFC

PG&E	% of Customers with Bill Savings or Small Bill Increase											
Income	**ALL**	**NEM Status**	**P**	**Q**	**R**	**S**	**T**	**V**	**W**	**X**	**Y**	**Z**
CARE	95-97	Non-NEM	98-99	89-100	99-99	98-99	93-98	94-99	99-99	97-99	97-98	
		NEM	68-77		64-71	61-67	50-60	50-74	59-65	56-65		

PG&E	% of Customers with Bill Savings or Small Bill Increase											
Income	**ALL**	**NEM Status**	**P**	**Q**	**R**	**S**	**T**	**V**	**W**	**X**	**Y**	**Z**
< $150,000	40-46	Non-NEM	59-65	56-62	63-69	60-66	20-25	32-38	66-71	39-46	38-43	18-21
		NEM	30-33	39-52	29-33	27-31	18-22	15-20	26-30	30-34	28-36	

PG&E	% of Customers with Bill Savings or Small Bill Increase											
Income	**ALL**	**NEM Status**	**P**	**Q**	**R**	**S**	**T**	**V**	**W**	**X**	**Y**	**Z**
> $150,000	21-25	Non-NEM	38-43	34-39	42-47	36-42	20-25	18-22	44-49	18-22	22-26	8-12
		NEM	19-21	16-27	20-22	18-21	9-11	9-15	20-23	14-17	20-28	

Middle tier customers would see average bill increases of about $5-7, and high-income customers would see average increases of about $20, from the second version proposal (Table 6). From the first version, the combined middle and high tier would see about a $5-7 increase (Table 7). Relatively wealthy coastal customers see the highest increase in bills since coastal customers tend to have lower consumption, so a higher fixed charge impacts them the most. However, if such customers electrify their home appliances or purchase electric vehicles, operating cost savings could outweigh these adverse impacts. As the income-based fixed charge more equitably recovers fixed costs of the grid, non-NEM customers end up relatively better off than the average customer across categories. This also implies that, on average, non-CARE NEM customers will likely pay more in monthly bills than they currently do due to fairer fixed cost recovery. Under the status quo, as NEM customers generate more solar and use fewer kWh of electricity from the grid, rising utility fixed costs are shifted onto customers without solar; this 'cost shift' is responsible for up to 15% of the costs in rates today (Borenstein 2024).

Table 6. Bill Impacts from TURN/NRDC Proposed Version 2 IGFC

	PG&E		SCE		SDG&E	
	Coastal	Inland	Coastal	Inland	Coastal	Desert
CARE	($10.12)	($21.48)	($10.49)	($26.39)	($13.69)	($41.23)
Household Income < $150,000	$13.24	($7.65)	$8.33	($16.27)	$3.52	$0.77
Household Income > $150,000	$34.29	$21.57	$29.40	$7.18	$25.92	$28.47

Table 7. Bill Impacts from TURN/NRDC Proposed Version 1 IGFC

	PG&E		SCE		SDG&E	
	Coastal	Inland	Coastal	Inland	Coastal	Desert
CARE	($4.53)	($13.20)	($4.88)	($16.48)	($6.59)	($24.24)
Non-CARE/FERA	$12.71	($0.12)	$6.07	($12.58)	$5.34	$4.09

Investment decisions are made on the margins, while bill impacts are felt in the aggregate. Understanding the impacts of our proposed rate design on whether electrification makes financial sense for customers requires an evaluation of how much a customer saves on operating costs of electrified space heating and water heating equipment under our new rate proposal compared to existing rates. Customers will save on operating costs based on the size of the fixed charge and the commensurate reduction in rates. Our proposed fixed charge reduces volumetric rates about 15% (first version) to 25% (second version), thus electric operating costs are reduced by the same measure.

Annual household energy expenditure before and after electrification is the right metric to understand the aggregate economic impact our proposed rates will have on customers that decide to electrify. Table 8 presents the annual energy expenditure on space and water heating equipment, cooking, clothes drying, and an electric vehicle, for a mixed fuel customer under current rates, and for the same customer if they were to electrify after our second version rate design proposal is adopted. These savings account for the addition of the IGFC itself, which is why savings are reduced for customers in the high-income tier.

Table 8. Whole Home Electric Appliance and Vehicle Operating Savings from Proposed Second Version Fixed Charge

			Annual Household Energy Expenditure (including vehicles)		Savings
			Mixed Fuel Bill and Fueling (Existing TOU Rate)	Electrified Bill and Fueling (New Elec. Rate)	
PG&E	Coastal	CARE	$ 3,070	$ 1,846	$ 1,224
		$150,000+	$ 3,775	$ 3,506	$ 270
	Inland	CARE	$ 4,601	$ 2,747	$ 1,854
		$150,000+	$ 6,228	$ 4,908	$ 1,321
SCE	Coastal	CARE	$ 3,055	$ 1,962	$ 1,093
		$150,000+	$ 3,702	$ 3,589	$ 113
	Inland	CARE	$ 4,952	$ 3,005	$ 1,947
		$150,000+	$ 6,550	$ 5,154	$ 1,396
SDG&E	Coastal	CARE	$ 3,645	$ 2,718	$ 927
		$150,000+	$ 4,587	$ 4,818	$ (231)
	Inland	CARE	$ 5,702	$ 3,972	$ 1,730
		$150,000+	$ 7,788	$ 6,741	$ 1,047

A view of operating cost savings for transportation electrification alone also shows these benefits. This modelling likely understates electrification savings, as it assumes a low $4/gallon for gas and a real-world internal combustion engine vehicle efficiency of 35 miles per gallon:

Table 9. Electric Vehicle Operating Savings from Proposed Second Version Fixed Charge

Transportation Annual Operating Expenses						
		ICE Fuel Costs	EV Fuel Costs (Existing Electrification Rate)	Savings, switch from ICE to EV (Existing Electrification Rate)	EV Fuel Costs (New Electrification Rate)	Savings, switch from ICE to EV (New Electrification Rate)
PG&E	CARE	$1,589	$730	$859	$568	$1,021
	$150,000+	$1,589	$1,219	$370	$887	$702
SCE	CARE	$1,589	$717	$872	$535	$1,054
	$150,000+	$1,589	$1,129	$460	$807	$782
SDG&E	CARE	$1,589	$1,057	$532	$837	$752
	$150,000+	$1,589	$1,682	($93)	$1,291	$298

Lessons Learned

V. Outcomes of California's Regulatory Process

In May 2024, the CPUC approved an IGFC design for the investor-owned utilities to implement by early 2026 (CPUC 2024b). The rate change, constrained by existing income verification processes, closely reflects the first version proposal submitted by TURN/NRDC. Adopting our benchmark to the SMUD charge, the CPUC authorized a charge of $6 for CARE households, $12 for FERA and deed-restricted affordable housing customers, and $24.15 for remaining households, for default as well as optional electrification rates. This smaller average

charge than the TURN/NRDC proposal results in a volumetric rate reduction of roughly 10%, with savings closer to $5-10 monthly for low-income households, and bill increases averaging around $5 for remaining households. Electrification savings are also more modest than under the TURN/NRDC proposal, with a homeowner seeing up to $30 or $40 monthly in operating cost savings from whole home and vehicle electrification. As this change would reduce rates even less than PG&E has increased rates in 2024 alone (Johnson 2024), we expect no adverse impact on energy efficiency and conservation. Along with this design, the CPUC established stakeholder working groups to develop a second, more progressive version of the charge that uses additional income verification methods.

This modest decision followed significant controversy in the public discourse and the legislature. After parties submitted their initial proposals, a flurry of media pieces described the IGFC as a new fee on customer's bills, rather than a reshuffling of costs into a different bill line item, causing widespread confusion. At a time of massive rate increases, customers are understandably not receptive to utility revenue requirement or profit increases (which the IGFC is not). Getting in front of the messaging on a complex electric rate design issue is a challenge. Articles in major publications incorrectly framed the fixed charge as a utility revenue grab, and a source of rate increases. Non-starter proposals from the investor-owned utilities, with fixed charges as high as $128, were also misrepresented in the media as the only proposals in play. As a result of this confusion, one legislator told the authors that the IGFC was the "number one issue" that constituents called to protest. A bill was introduced to roll back Assembly Bill 205, preventing the CPUC's IGFC from coming into existence and capping fixed charges at just $5 and $10 for low-income and other customers respectively with an intent to prevent utility manipulation ("AB 1999"). But such legislation would only have served to limit the tools available to the CPUC to manage rate increases and send signals for positive energy behaviors. After an amendment and multiple rounds of legislative discussion, this bill failed, as legislators on both sides of the aisle struggled to understand whether adding or repealing the fixed charge would constructively address the affordability crisis. The release of the CPUC's decision, with a fixed charge of just $24.50, also dispelled fears about the high charges proposed by the utilities.

In addition to these communication challenges, the other major obstacle to the development of an IGFC was income verification and implementation. The major investor-owned utilities do not have data on customer income, household size, or ownership status. To enable progressive income graduation beyond the TURN/NRDC proposal or the CPUC decision, a new income verification system must be established. But data sharing with the Franchise Tax Board, for example, will require new legislation. Properly enrolling customers will also require extensive marketing, education, and outreach campaigns, so that they understand the different components of their bills and adjust their energy use accordingly. There are also costs and implementation delays associated with a third-party administrator, as well as the process of updating utility billing systems to assign new charges to different customer groups.

With an understanding of these political and bureaucratic constraints, other states and municipalities should consider implementing an IGFC if they face the same structural barriers to affordability and electrification as California. If electricity rates are high relative to polluting alternatives, so that customers will not see sufficient paybacks on their new vehicles and appliances, the IGFC may be helpful to improve the status quo. As the grid gets cleaner and utility rates see similar upward trends around the country, this may be relevant for an increasing number of localities. Chhabra (2024) finds that around the country, gas and electric pricing is

increasingly distortionary, fails to reflect relative social costs, and often discourages beneficial electrification. That paper further establishes the criteria for determining the applicability of an IGFC or other rate design changes state-by-state. While the IGFC is needed in California today, the IGFC would not be appropriate for places where electricity rates are low, and instead, other policy interventions are needed to send the right signals.

VI. Conclusion

The IGFC will help soften the pain of unaffordable bills for low-income and inland households in California and make it marginally cheaper to operate electric technologies in the near-term. Future iterations of the IGFC, once additional income verification capability is established, could increase the share of costs collected in the IGFC and reduce volumetric rates further. But while the IGFC promises multiple benefits, it is not a 'silver bullet' solution to California's affordability crisis or expensive electrification by any means. High rates are driven primarily by wildfire mitigation costs, such as tree trimming and burying powerlines underground, which are approved during utility general rate cases and other cost applications. The CPUC must disapprove unnecessary, gold-plated utility requests, and strive to keep rate increases in line with inflation, to bring Californians meaningful relief. The IGFC proposal discussed above will only bring rates back to levels as of a few years ago.

Furthermore, reducing volumetric rates is not enough to ensure California reaches its beneficial electrification goals. While it is relevant for the purchasing decisions of vehicle- and home-owners who will see the operating cost benefits of their investments, more is needed to achieve market transformation. True market transformation, which can be spurred by government policies and new technologies, will make electric options so cost-competitive that they become the norm and deliver benefits to the more than one third of Californians who rent, and the front-line communities that breathe in polluted air along major transportation corridors.

References

AB 205. California State Assembly, June 2022. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB205

AB 1999. California State Assembly, accessed May 31, 2024. https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240AB1999

BLS (Bureau of Labor Statistics). 2024. "Average Energy Prices." https://www.bls.gov/regions/midwest/data/averageenergyprices_selectedareas_table.htm

Borenstein, S. 2024. "California's Exploding Rooftop Solar Cost Shift." Energy Institute at Haas, April 22, 2024. https://energyathaas.wordpress.com/2024/04/22/californias-exploding-rooftop-solar-cost-shift/#:~:text=In%202024%2C%20residential%20PV%20will,now%20about%20rising%20electricity%20prices.

Borenstein, S., Fowlie, M., and Sallee, J. 2021. "Paying for Electricity in California: How Residential Rate Design Impacts Equity and Electrification." Next 10 and the Energy

Institute at Haas, University of California, September 2021, p. 4. https://www.next10.org/sites/default/files/2022-09/Next10-paying-for-electricity-final-comp.pdf

CEC (California Energy Commission). 2021. "2019 Residential Appliance Application Survey (RASS)." California Energy Commission, July 2021. https://www.energy.ca.gov/sites/default/files/2021-08/CEC-200-2021-005-RSLTS.pdf

Chhabra, M. 2024. "Doing The Right Thing Now Will Eventually Pay Off: Cost-Effective & Equitable Building Decarbonization Requires (More) Proactive Planning and (Completely) Rethinking Rate Design." American Council for an Energy-Efficient Economy, 2024 Summer Study on Energy Efficiency in Buildings, August 2024.

CPUC (California Public Utilities Commission), 2024. "CARE/FERA Program." accessed May 31, 2024. https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/care-fera-program

———.2024. "CPUC Approves A New Billing Structure That Will Cut Residential Electricity Prices And Accelerate Electrification." CPUC, May 9, 2024. https://www.cpuc.ca.gov/news-and-updates/all-news/cut-residential-electricity-prices

———.2024. "Demand Flexibility Rulemaking." California Public Utilities Commission, accessed May 23, 2024. https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/demand-response-dr/demand-flexibility-rulemaking

E3 (Energy and Environmental Economics). 2019. "Residential Building Electrification in California." Energy and Environmental Economics, April 2019. https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf

Johnson, J. 2024. "California electricity prices now second-highest in U.S.: 'Everyone is getting squeezed.'" San Francisco Chronicle, May 2, 2024. https://www.sfchronicle.com/california/article/electricity-price-rate-pge-19429422.php

Monthly Disconnection Data Reports of PG&E, Southern California Edison, and SDG&E (R.18-07-005), May 2024. Available at: https://apps.cpuc.ca.gov/apex/f?p=401:57::::::

Newsom, G. 2024. "California's Grid Keeps Setting New Clean Energy Records." Office of Governor Gavin Newsom, April 19, 2024. https://www.gov.ca.gov/2024/04/19/californias-grid-keeps-setting-new-clean-energy-records/

———. 2020. "Governor Newsom Announces California Will Phase Out Gasoline-Powered Cars & Drastically Reduce Demand for Fossil Fuel in California's Fight Against Climate Change." Office of Governor Gavin Newsom, September 23, 2020. https://www.gov.ca.gov/2020/09/23/governor-newsom-announces-california-will-phase-out-gasoline-powered-cars-drastically-reduce-demand-for-fossil-fuel-in-californias-fight-against-climate-change/

PAO (Public Advocates Office). 2024. “Public Advocates Office, Natural Resources Defense Council, and The Utility Reform Network Letter to the Legislature.” January 18, 2024. https://www.publicadvocates.cpuc.ca.gov/-/media/cal-advocates-website/files/letters-to-the-legislature/240118-caladvocates-nrdc-turn-fixed-charge-letter-to-legislature.pdf

PG&E (Pacific Gas & Electric). 2024. “PG&E Residential Average Gas Rate and Residential Average Gas Bill.” May 2024. https://www.pge.com/assets/rates/tariffs/Residential.pdf

SDG&E (San Diego Gas & Electric). 2024. “Schedule TOU-ELEC.” San Diego Gas & Electric, March 1, 2024. https://www.sdge.com/sites/default/files/regulatory/3-1-24%20Schedule%20TOU-ELEC%20Total%20Rates%20Table.pdf

SMUD (Sacramento Municipal Utility District). 2024. “Residential Rates.” Sacramento Municipal Utility District, accessed March 2, 2024. https://www.smud.org/en/Rate-Information/Residential-rates