



BUILDING
DECARBONIZATION
COALITION

BDC PRESENTS

**Equitable & Affordable
Rate Reform**

Approaches to creating more equitable
and affordable rates for households.



BDC Presents: Equitable & Affordable Rate Reform

February 29, 2024

About the BDC

The Building Decarbonization Coalition (BDC) aligns critical stakeholders on a path to transform the nation's buildings through clean energy, using policy, research, market development and public engagement.

The BDC and its members are charting the course to eliminate fossil fuels in buildings to improve people's health, cut climate and air pollution, prioritize high-road jobs, and ensure that our communities are more resilient to the impacts of climate change.

- **Sign up for our newsletter!**
<https://buildingdecarb.org/newsletter>
- **Membership is free!** Join us! buildingdecarb.org/join



Thank you to our Trailblazer Members!



Upcoming Events



Policy Calls

California
March 19 at 10 am PT



BDC Presents

March TBA
Stay tuned!



NY Thermal Energy Networks Summit

March 6th, 8:30am ET in person
Albany Capital Center

Webinar Logistics

- Everyone is muted
- Ask **questions** for our panelists in the **Q&A**.
- Drop **comments** for the whole group in the **chat**.
- This webinar is being recorded and will be placed in our website's Resource Library.
- All registrants will be emailed with a link and additional resources early next week



Today's Panelists



Theo Caretto
*Communities For A Better
Environment (CBE)*



Alexis Sutterman
*California Environmental
Justice Alliance (CEJA)*



Akhilesh Ramakrishnan
Brattle Group



Dr. Sanem Sergici
Brattle Group



Sarah Moskowitz
Citizens Utility Board

Heat Pump Friendly Cost Based Rate Design

PRESENTED BY

SANEM SERGICI

AKHILESH RAMAKRISHNAN

PRESENTED TO

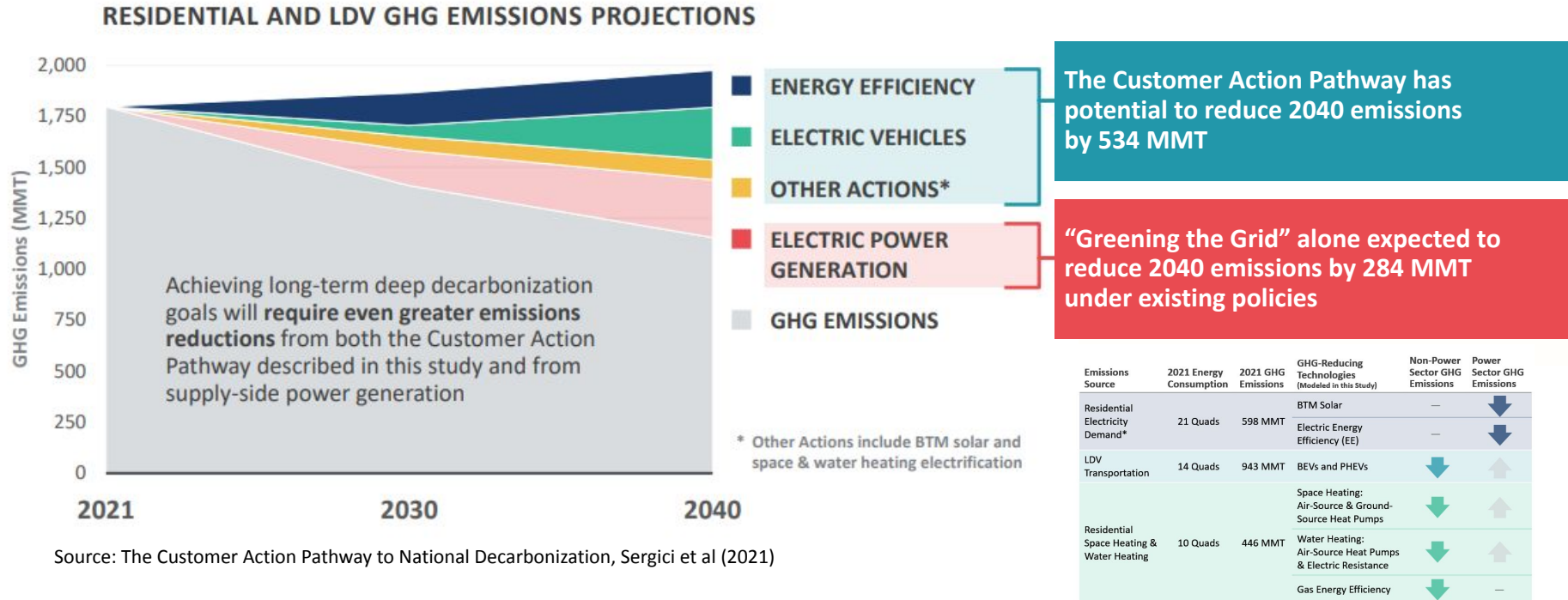
BUILDING
DECARBONIZATION
COALITION

FEBRUARY 29, 2024



A Customer Action Pathway is essential for meeting decarbonization targets

The Customer Action Pathway has the potential to **reduce GHG emissions by nearly twice as much as supply-side reductions alone** will contribute under existing policies



Source: The Customer Action Pathway to National Decarbonization, Sergici et al (2021)

Heat pump economics are not great for everyone – yet.

Electrification of space and water heating using heat pumps is a key component of state and city climate action plans. The economics of heat pumps relative to natural gas will be an important driver of customer adoption.

- Heat pump installation costs are typically higher than gas furnaces/boilers
- Heat pump operating costs vary by region depending on climate, equipment efficiency, utility rates, and rate structures
- Even in regions where heat pump operating costs are lower than gas costs, the gap will need to be significant to offset the upfront cost premium

There is a scarcity of rate options that are explicitly designed to address the operating cost gap for heat pumps. In this nascent space, non-rate operating cost incentives also do not yet common.

- Aligning the design of the rate with operational characteristics of heat pumps, it is possible to address/reduce the operating cost gap
- We identified several categories of existing rate structures that may be favorable for heat pump operating costs
- *These rates are cost-based and are not subsidized*

Primary Mission of Retail Pricing

The first and foremost function of retail rates is to recover utility's revenue requirement in the most economically efficient and equitable fashion

At the same time, rates should reflect the structure of the costs incurred to serve them and lead to **efficient price signals** to:

- Encourage optimal consumption decisions;
- Lead to bill stability for customers and revenue stability for utilities; and
- Be easily understandable by customers

When the rate construct is laden with other objectives, such as incentivizing new technologies and subsidizing certain customer groups, rates start to **fall short of delivering on their primary mission**, may lead to inter- and intra-class cost shifts, and convey inefficient price signals that lead to over- or under-consumption of electricity

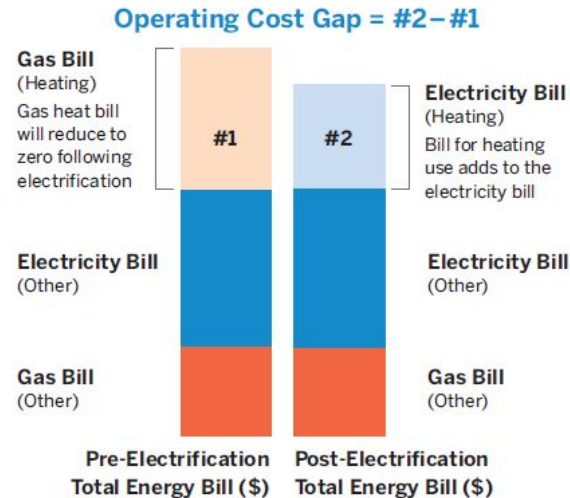
It is important to **maintain cost-reflectivity when designing rates that are favorable for heat pump operating characteristics** This is not equal to subsidized rates for HPs

There are various alternatives to standard volumetric rates, most of which are enabled by AMI

Rate	Definition
1- Time-of-Use (TOU)	The day is divided into peak and off-peak time periods. Prices are higher during the peak period hours to reflect the higher cost of supplying energy during that period
2- Critical Peak Pricing (CPP)	Customers pay higher prices during critical events when system costs are highest or when the power grid is severely stressed
3- Peak Time Rebates (PTR)	Customers are paid for load reductions on critical days, estimated relative to a forecast of what the customer would have otherwise consumed (their “baseline”)
4- Variable Peak Pricing (VPP)	During alternative peak days, customers pay a rate that varies by day to reflect dynamic variations in the cost of electricity
5- Real-Time Pricing (RTP)	Customers pay prices that vary by the hour to reflect the actual cost of electricity
6- Two-part Real-Time Pricing (2-part RTP)	Customer’s current rate applies to a baseline level of consumption. A second, marginal cost based, price applies to deviations from the baseline consumption
7- Three-part Rates (3-part Rates)	In addition to volumetric energy charge and fixed charge, customers are also charged based on peak demand, typically measured over a span of 15, 30, or 60 minutes
8- Fixed Bill with Incentives	Customers pay a fixed monthly bill accompanied with tools for lowering the bill (such as incentives for lowering peak usage)

High heat pump operating costs relative to natural gas are a roadblock to electrification

Illustration Of The Goal: A Negative Operating Cost Gap

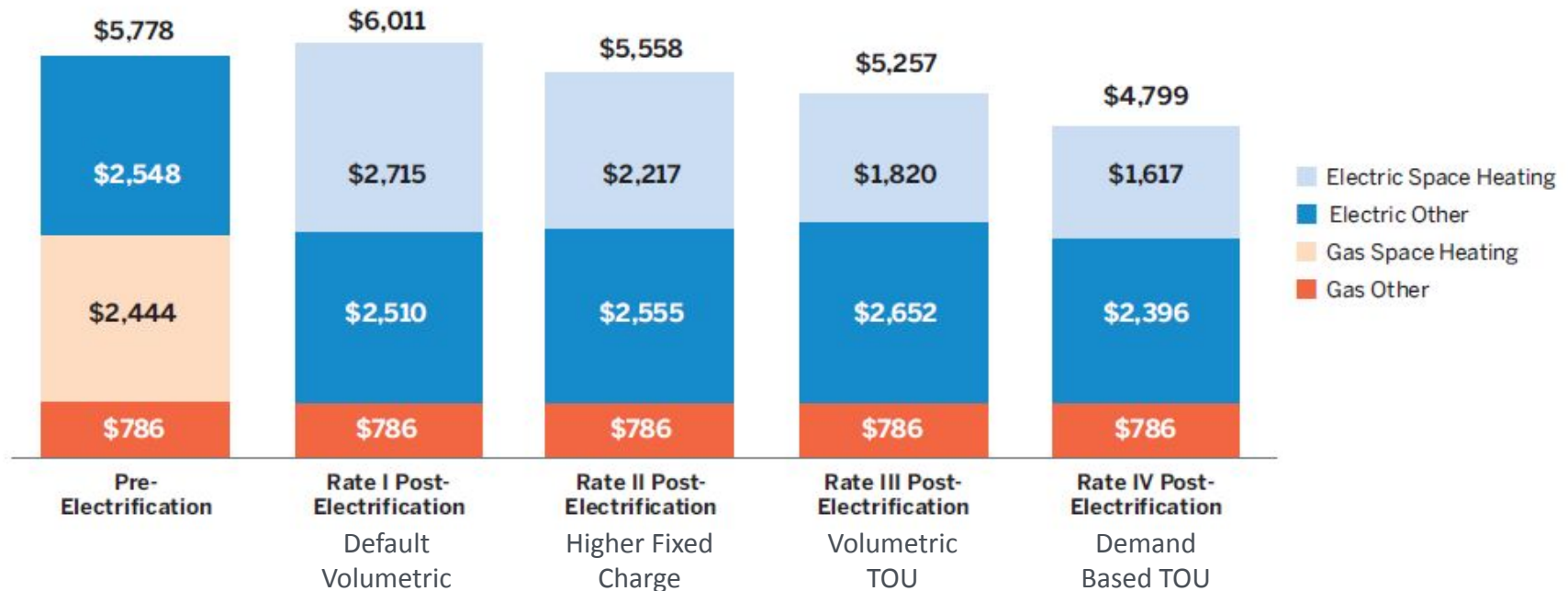


The operating cost gap is the difference between #2 the heating portion of the electric bill (post-electrification) and #1 the heating portion of the gas bill (pre-electrification).

Can this be achieved through cost-based (i.e., non-subsidized) rate designs?

The operating cost gap can be reversed with one of several more cost reflective rate designs

Average Annual Energy Costs Before and After Electrification



How is this “cost-reflective”/not a subsidy?

Average Monthly Billing Determinants Pre- and Post-Electrification

	Total Usage	Rate III Peak Usage	Rate III Off-Peak Usage	Rate IV Peak Period Demand	Rate IV Off-Peak Period Demand
Pre-electrification	740 kWh	544 kWh	196 kWh	3.2 kW	3.4 kW
Post-electrification	1,613 kWh	1,075 kWh	539 kWh	4.8 kW	5.5 kW
Percentage change	118%	98%	174%	53%	65%

Heat pump demand impacts are heavily weighted toward off-peak periods, which have lower marginal costs.

Takeaways

Our analysis shows that selecting the most beneficial electric rate can result in significant cost savings for heat pump customers.

- Rate design is a powerful tool in addressing the operating cost gap between heat pumps and gas furnaces. A change in electric rate structure is shown to flip all 80 customers from a positive cost gap to a negative cost gap
- Most importantly, these impacts are possible to achieve with alternative rates that are cost-based, and revenue neutral to the default rate.

Rate migration can create costs or savings independent of heating electrification, due to non-heating loads. This must be an important consideration when marketing alternative rates to customers.

- Customers who only partially electrify would remain gas customers and pay fixed gas charges. This implies that fully electrifying a customer would create additional savings by allowing them to avoid all gas charges (additional \$350/yr for a single family customer).

Information barriers could be addressed through utility programs targeting customers and pairing them with most favorable rates

Rate Reform in Illinois

BDC, Leap Day 2024



Sarah Moskowitz
Executive Director, Citizens Utility Board



Illinois CUB

- Nonprofit, nonpartisan ratepayer advocate
- Created by the IL General Assembly in 1984
- Gets involved at ICC, General Assembly, Courts
- Helps individuals (hotline, website)
- Conducts consumer education
 - Grassroots outreach, media & publications
- Research
 - Anonymized AMI Data
- Member & Grant-Supported

The Illinois Story

1997
Electric Service
Customer Choice
& Rate Relief Law

- Restructured electric market
- Split ComEd from Exelon
- Froze supply rates for 10 years

2007
Illinois Power
Agency Act

- Created the IPA & put it in charge of electric procurement
- Established EEPS, RPS, and net metering

2011
Energy
Infrastructure
Modernization Act

- Grid modernization
- Formula rate

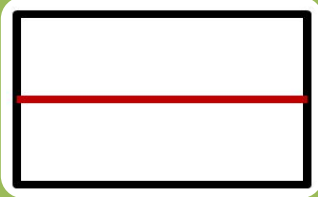
2016
Future Energy
Jobs Act

- Fixed RPS
- Increased EE
- Enabled Community Solar
- Solar for All

2021
Climate &
Equitable Jobs
Act

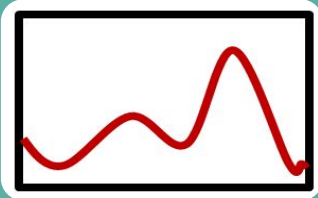
- Electric decarb by 2045
- More renewables
- Workforce
- Transp. Elec.
- Ethics reforms
- LIDR

Residential Electric Rate Options Currently Available



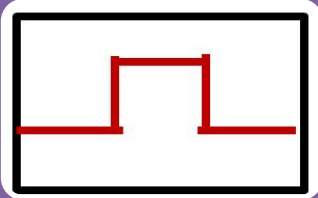
Default Residential Rate

- ComEd: per kWh rate is flat. Electric heat customers have slightly higher fixed monthly charge, but a lower per-kWh distribution charge
- Ameren: one per-kWh rate for the first 800 kWh used, slightly lower rate for usage over 800 kWh



Residential Real-Time Pricing

- ComEd: Hourly Pricing
- Ameren: Power Smart Pricing

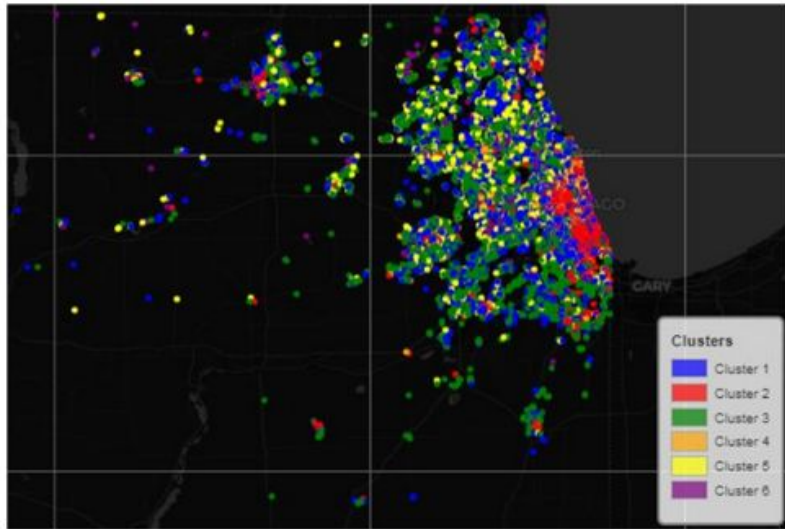


Time-of-Use (TOU)

- ComEd "Time of Day" pilot
- Ameren EV Rate
- Limited alternative supplier options

CUB's Segmentation Analysis of IL Residential Electricity Consumers

Jeff Zethmayr, Ramandeep Singh Makhija, Six unique load shapes: A segmentation analysis of Illinois residential electricity consumers, The Electricity Journal, Volume 32, Issue 9, 2019.



Using ComEd interval usage data, we ran a cluster analysis to uncover six load profiles.

When we matched these clusters with demographic data, we found that flatter load shapes were more likely in urban and low-income areas, with peakier load shapes in high-income/suburban areas... illustrating the inequitable cross-subsidization intrinsic to common electric rate designs.

Climate & Equitable Jobs Act “CEJA”

Did a lot, including:

- **Creating a process for state regulators to consider a new low-income discount rates**
 - **Workshops**
 - **Report to the IL General Assembly**
- **Also codified a COVID-era stipulated agreement in which the utilities have to submit credit & collections reports to regulators each month**

AutoSave Off | Calibri | 10 | 349001 • Saved to thi... | Search | Sarah Moskowitz | Comments | Share

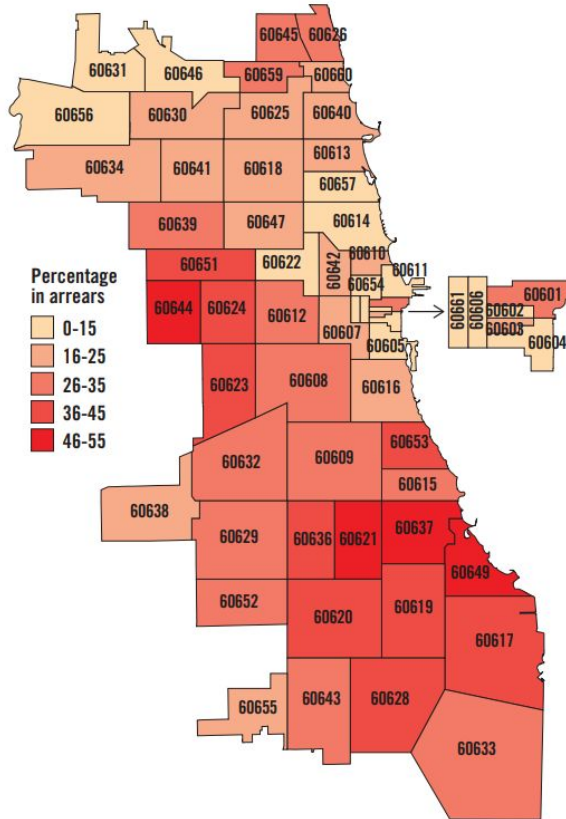
File Home Insert Draw Page Layout Formulas Data Review View Automate Help Acrobat

Paste Copy Format Painter | Clipboard | Font | Alignment | Number | Styles | Cells | Editing | Analysis | Sensitivity | Add-ins

A1 Company Name

Company Name	Date	Zip Code	Utility Service Type	1) RES'L Number of Customers -TOTAL	2) RES'L Number of Customers that Received Disconnection Notices -TOTAL	3) RES'L Number of Customers Disconnected for Non-Payment -TOTAL	4) RES'L Number of Reconnected Customers -TOTAL	5) RES'L Number of New DPAs -TOTAL	6) RES'L Number of Existing DPAs -TOTAL (beginning of month)	7) RES'L Number of Customers Completing DPAs -TOTAL	8) RES'L Number of Payment Agreements that Failed -TOTAL	9) RES'L Number of Customers Renegotiating DPAs -TOTAL	10) RES'L Number with Assessed Late Payment Fees or Charges -TOTAL	11) RES'L Number with Existing MPAs -TOTAL (beginning of month)	12) RES'L Number of Customers Completing MPAs -TOTAL	13) RES'L Number of New MPAs -TOTAL	14) RES'L Number of Customers Renegotiating MPAs -TOTAL	15) RES'L Number with Required Deposits -TOTAL (beginning of month)	16) RES'L Number Required to Submit New or Increased Deposits -TOTAL	17) RES'L Number with Reduced or Forgone Deposits -TOTAL	18) RES'L Number whose Deposits were Returned in Full -TOTAL	19) RES'L No. of PD>30 Accts. Taking Service under DPA -TOTAL (beginning of month)	20) RES'L Dollar Volume of PD>30 Accts. Taking Service under DPA -TOTAL (beginning of month)	21) RES'L No. of PD>30 Accts. Not Taking Service under DPA -TOTAL (beginning of month)	22) RES'L Dollar Volume of PD>30 Accts. Not Taking Service under DPA -TOTAL (beginning of month)	1) RES'L Number of Customers -LOW INCOME	2) RES'L Number of Customers that Received Disconnection Notices -LOW INCOME
PGL	7/31/2023	00001	Gas	6,242	336	2	4	123	395	5	107	1	1,644	5	-	-	-	243	-	-	5	361	\$ 260,524	874	\$ 455,560	541	64
PGL	7/31/2023	60601	Gas	71	3	-	-	-	-	-	-	-	19	-	-	-	-	-	-	-	-	-	-	7	\$ 11,833	9	1
PGL	7/31/2023	60602	Gas	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PGL	7/31/2023	60603	Gas	11	-	-	-	-	-	-	-	-	4	-	-	-	-	1	-	-	-	-	-	2	\$ 470	-	-
PGL	7/31/2023	60604	Gas	73	-	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-	4	\$ 538	-	-
PGL	7/31/2023	60605	Gas	3,302	63	2	1	10	31	-	9	-	482	-	-	-	-	45	-	-	-	28	\$ 16,491	183	\$ 84,987	18	2
PGL	7/31/2023	60606	Gas	551	4	-	-	1	3	-	-	-	62	-	-	-	-	9	-	-	-	1	\$ 687	20	\$ 4,728	-	-
PGL	7/31/2023	60607	Gas	9,783	189	2	4	32	81	2	26	1	1,590	-	-	1	-	107	-	-	3	67	\$ 35,588	565	\$ 272,237	101	12
PGL	7/31/2023	60608	Gas	25,141	724	71	17	270	852	11	132	2	3,973	10	-	4	-	647	-	-	6	763	\$ 462,204	3,740	\$ 2,841,364	2,288	88
11 PGL	7/31/2023	60609	Gas	19,126	1,321	192	29	343	1,118	22	305	2	6,342	6	-	5	-	771	-	-	28	1,024	\$ 641,129	3,673	\$ 2,742,867	2,504	216
12 PGL	7/31/2023	60610	Gas	5,647	122	3	5	38	69	1	20	-	945	1	-	1	-	61	-	-	2	60	\$ 28,019	383	\$ 179,319	240	12
13 PGL	7/31/2023	60611	Gas	597	9	-	-	3	2	-	1	-	72	-	-	-	-	-	-	-	-	1	\$ 374	32	\$ 12,525	-	-
14 PGL	7/31/2023	60612	Gas	11,908	816	124	29	294	737	17	218	2	3,766	18	-	6	-	306	-	-	5	688	\$ 454,621	2,316	\$ 1,397,385	1,793	186
15 PGL	7/31/2023	60613	Gas	15,443	215	5	-	48	152	7	39	-	2,247	2	-	1	-	117	-	-	2	120	\$ 70,082	993	\$ 488,719	85	4
16 PGL	7/31/2023	60614	Gas	21,324	244	-	-	47	123	2	27	1	2,921	1	-	-	-	162	-	-	2	104	\$ 63,134	928	\$ 491,833	71	4
17 PGL	7/31/2023	60615	Gas	10,973	726	57	18	167	456	11	152	3	3,684	3	-	2	-	297	-	-	4	424	\$ 277,448	2,441	\$ 1,807,691	694	92
18 PGL	7/31/2023	60616	Gas	13,224	340	29	10	69	257	7	65	1	2,429	4	-	1	-	215	-	-	3	230	\$ 142,204	1,160	\$ 679,754	1,875	34
19 PGL	7/31/2023	60617	Gas	26,223	2,617	213	35	755	2,517	54	635	2	9,425	34	-	9	-	1,202	-	-	19	2,378	\$ 1,822,972	5,598	\$ 5,105,002	4,186	528
20 PGL	7/31/2023	60618	Gas	34,759	558	62	17	270	746	14	121	1	4,439	4	-	4	-	635	-	-	11	649	\$ 373,376	3,006	\$ 1,406,783	957	39
21 PGL	7/31/2023	60619	Gas	23,683	2,658	221	53	752	2,297	40	499	7	9,195	52	-	21	-	1,048	-	-	26	2,169	\$ 1,727,364	6,719	\$ 6,233,119	3,199	446
22 PGL	7/31/2023	60620	Gas	23,202	2,257	282	54	827	2,652	49	600	4	9,306	44	-	11	-	1,002	-	-	17	2,529	\$ 1,979,678	6,248	\$ 5,301,332	3,964	463
23 PGL	7/31/2023	60621	Gas	8,180	1,119	180	15	331	916	12	262	4	4,141	9	-	7	1	275	-	-	7	886	\$ 698,822	3,041	\$ 3,264,536	1,635	247
24 PGL	7/31/2023	60622	Gas	25,639	416	33	10	146	391	10	53	1	3,472	3	-	2	-	359	-	-	2	344	\$ 199,430	2,201	\$ 1,426,312	884	22
25 PGL	7/31/2023	60623	Gas	23,446	1,664	306	35	602	1,564	12	285	4	5,518	23	-	18	-	954	-	-	16	1,438	\$ 981,558	5,703	\$ 3,837,285	3,419	388
26 PGL	7/31/2023	60624	Gas	10,601	1,301	147	37	360	1,091	14	290	7	4,760	21	-	9	-	449	-	-	12	1,036	\$ 723,793	3,363	\$ 2,494,193	2,298	310
27 PGL	7/31/2023	60625	Gas	26,015	581	29	10	146	479	15	114	4	5,246	2	-	3	-	462	-	-	11	409	\$ 235,457	2,209	\$ 1,056,483	626	27
28 PGL	7/31/2023	60626	Gas	13,490	513	11	8	103	290	4	65	2	3,703	3	-	1	-	267	-	-	1	250	\$ 144,545	1,712	\$ 993,670	210	20

Figure 1: Percentage of residential Peoples Gas customers assessed late fees in October 2022, by ZIP code.



Example: Peoples Gas in Chicago

- In January, over 29% of the utility's residential customers were charged late fees
- In 5 ZIPs, the percentage was over 50%
- At the end of January, total residential arrearages totaled \$83,745,416

Illinois Gas Rate Case Final Orders, November 2023

- The Illinois Commerce Commission approved tiered low-income discount rates for the state's 4 main gas utilities.
- To be in place by October 2024.
- 5 tiers, ranging from 5% discount for customers w/ household income up to 3x FPL, up to 83% for those below half the level for PGL customers. (75% is highest discount for Ameren and Nicor, 79% is the highest discount for North Shore).
- Will apply to the whole bill (being contested)
- Recovery will be via a rider (line item charge on everybody's bills)



Other Considerations

Electric low-income discount rates

- Soon to be filed at the ICC
- Modeled after the gas LIDRs?
- Issues with making it apply to the whole bill

Triennial Electric Utility Rate Design Dockets

- Happening this year
- Historically not particularly significant, but may include more of a look at a dynamic rates and/or electric heat rates this year?

Illinois financial assistance programs

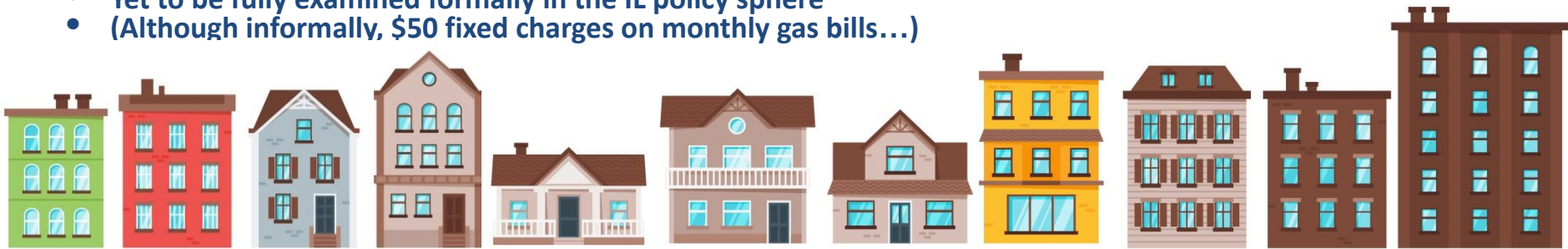
- Traditional LIHEAP
- Percentage of Income Payment Plan (PIPP)

Community Solar

- Income-qualified community solar

Rate designs to incentivize electrification?

- Yet to be fully examined formally in the IL policy sphere
- (Although informally, \$50 fixed charges on monthly gas bills...)



Thank you



Sarah Moskowitz

Executive Director

smoskowitz@citizensutilityboard.org





CALIFORNIA
ENVIRONMENTAL
JUSTICE ALLIANCE



Designing Equitable Income-Graduated Fixed Charges

February 29th, 2024

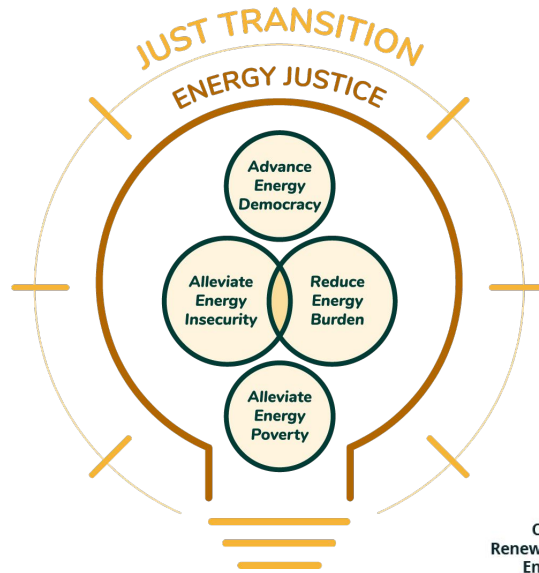
Presenters:
Alexis Sutterman (CEJA) & Theo Caretto (CBE)



WHO IS THE CALIFORNIA ENVIRONMENTAL JUSTICE ALLIANCE?



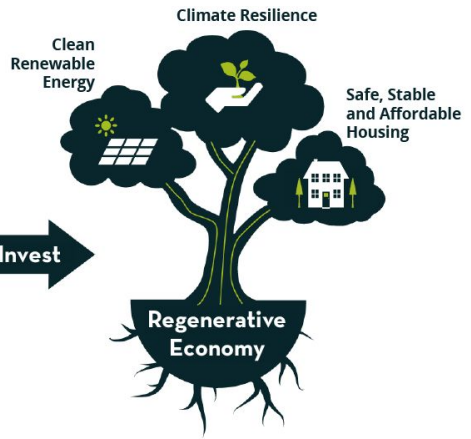
Source: CEJA



Divest



Invest

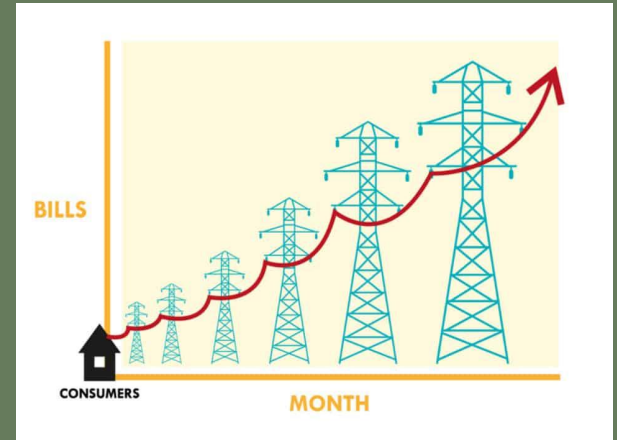


Background

Californians are facing a utility bill affordability crisis.

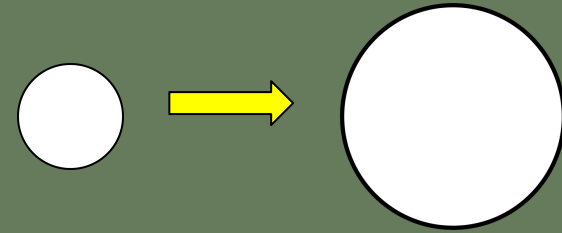
In just three years, residential rates have spiked 63% for PGE, 52% for SCE, and 13% for SDG&E.

One in five households served by the state's IOUs are now behind on their bills.



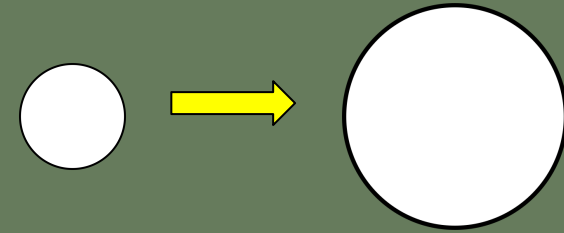
Source: Baker Home Energy

A lead driver of this crisis is California's **failure to hold utilities accountable** and plan for a transition to clean energy that **prioritizes communities above profit.**



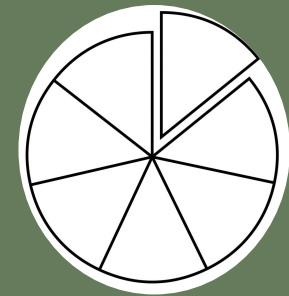
Leading to the pie (aka rate base) growing.

A lead driver of this crisis is California's **failure to hold utilities accountable** and plan for a transition to clean energy that **prioritizes communities above profit**.



Leading to the pie (aka rate base) growing.

Our rate system is also very regressive.
Millionaires and low-income customers pay the same rates to access electricity.

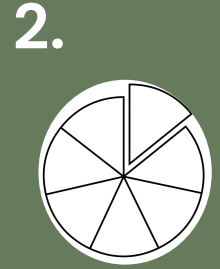
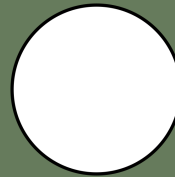
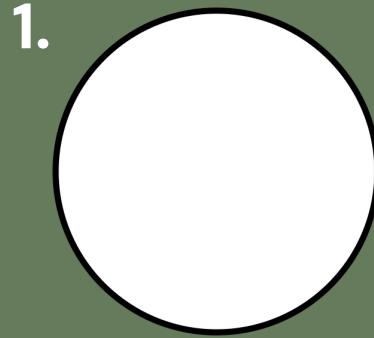


Leading to the pie (aka rate base) being divided up inequitably.

California needs to
deploy solutions that:

1. shrink the pie and

2. equitably divide up
the pie.



In 2022, lawmakers passed AB 205 in 2022 requiring the CPUC to implement **income-graduated fixed charges that lower bills for low-income customers.**

This can help more **equitably divide up the pie.**



This bill would delete the requirement that each electrical corporation offer default rates to residential customers with at least two usage tiers. The bill would additionally require the PUC to ensure that the approved fixed charges do not unreasonably impair incentives for beneficial electrification and greenhouse gas reduction. The bill would instead authorize the PUC to authorize fixed charges for any rate schedule applicable to residential customer accounts. The bill would eliminate the cap on the amount of the fixed charge that the PUC may authorize. The bill would require the fixed charge to be established on an income-graduated basis, as provided, with no fewer than 3 income thresholds so that low-income ratepayers in each baseline territory would realize a lower average monthly bill without making any changes in usage. The bill would require the PUC, no later than July 1, 2024, to authorize a fixed charge for default residential rates. The bill would prohibit the PUC from applying the composite tier method to the treatment of any revenues resulting from any fixed charge adopted pursuant to these provisions.

What is an income graduated fixed charge?

Source: SoCal Edison (top),
NRDC (bottom) from SoCal Edison

TODAY, SOUTHERN CALIFORNIA EDISON CUSTOMER BILLS ARE MADE UP OF SEVERAL PARTS:



FIXED COSTS of safely building, maintaining and operating the electric grid and of providing customer support.



AMOUNT OF ELECTRICITY that customers use; these costs are passed to customers without any markup.



WHAT DOES THE NEW STATE LAW REQUIRE?

CERTAIN COSTS on electricity bills to be separated into a monthly fixed charge as a line item

VARIABLE CHARGE based on the electricity the residential customer uses during their billing period

WHAT IS INCLUDED IN THE CPUC'S **FIXED CHARGE** PROCESS?

- THE STATE LAW requires fixed charges be set based on income level, so that electricity bills of lower-income households would on average decrease as a result of the fixed charge.
- TIMELINE: CPUC Decision in 2024, implementation in 2025 (at the earliest).

NOW:



RATES DECREASE

ADD FIXED CHARGE



HIGH INCOME



MED/LOW INCOME



VERY LOW INCOME



RATES DECREASE

ADD FIXED CHARGE

CEJA's Proposal

- **Five tier income-graduated structure**, modeled after CA's income tax system
- **Defines low-income at or below 80% of area median income**, in accordance with the California Health and Safety Code
- **Would lower bills for over 85% of California households** by ensuring the wealthiest pay their fair share

Income-Graduated Tiers:

1. 0% - 80% AMI
2. 80% AMI - \$200k
3. \$200k - \$500k
4. \$500k - \$2 million
5. Above \$2 million



CEJA's proposal would meet the legal mandate of AB 205.

(b) In regards to Section 739.9 of the Public Utilities Code, as amended by this act, it is the intent of the Legislature to do both of the following:

(1) Authorize the Public Utilities Commission to establish reasonable fixed charges on default residential customer rates to help stabilize rates and equitably allocate and recover costs among residential customers in each electrical corporation's service territory.

(2) If the Public Utilities Commission establishes fixed charges on default residential customer rates, ensure that the fixed charges are established to more fairly distribute the burden of supporting the electric system and achieving California's climate change goals through the fixed charge.

SEC. 15. (a) For the purposes of complying with Section 41 of the Revenue and Taxation Code, with respect to Section 17131.20 of the Revenue and Taxation Code, as added by this act, the Legislature finds and declares that the purpose of the

The Details Matter

- The CPUC has to get the design right in order to lower bills for most Californians.
- Utility proposals could increase rates for low-income households.
- Other parties' proposals would treat customers who earn *less* than the area median income (AMI) as *high income*.



Thank you!

Alexis Sutterman: alexis@ceja.org

Theo Caretto: theodore@cbeval.org