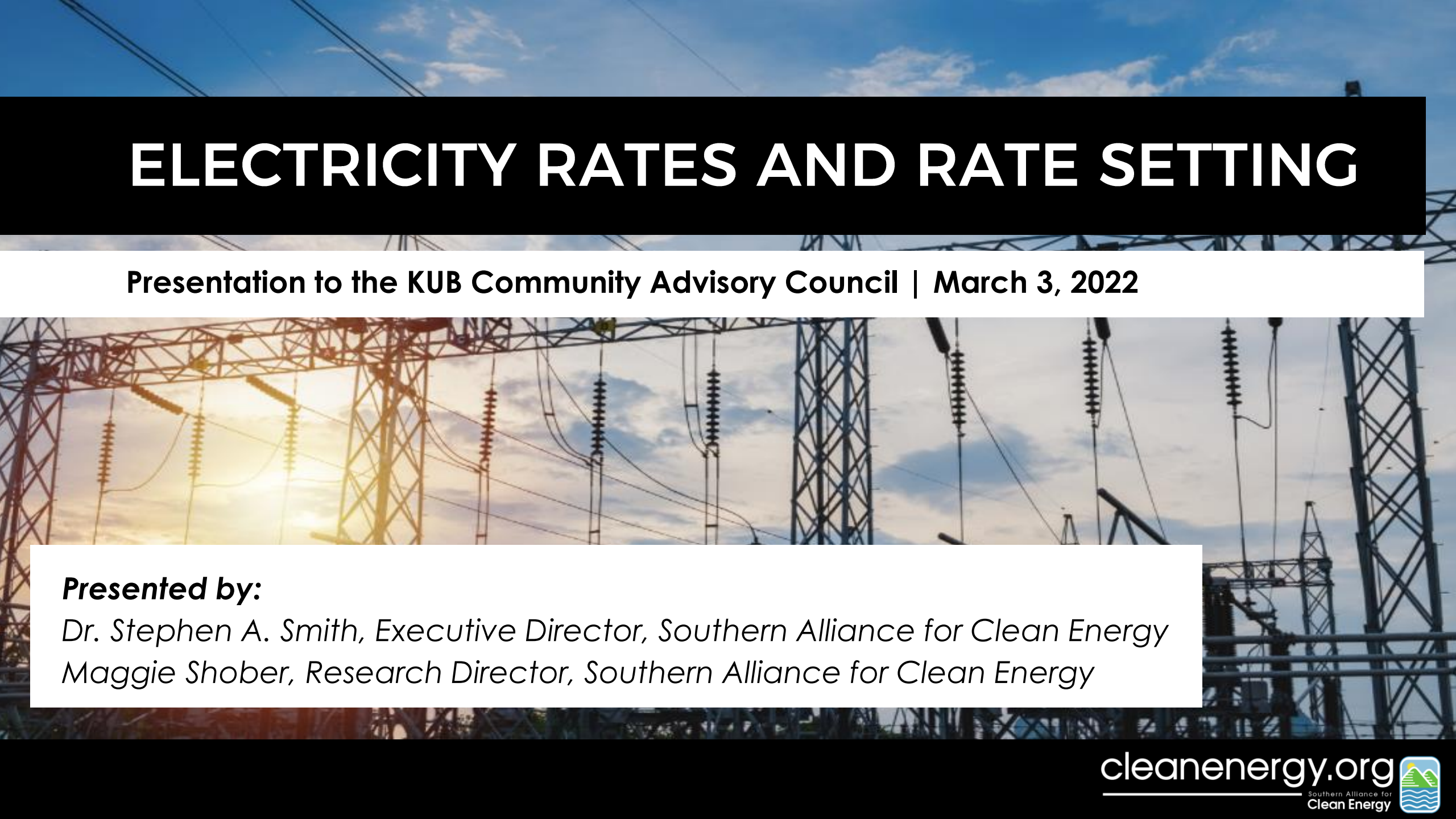

ELECTRICITY RATES AND RATE SETTING

Presentation to the KUB Community Advisory Council | March 3, 2022

Presented by:

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OBJECTIVES AND AGENDA

OBJECTIVES

- SACE is in no way interested in interfering with KUB's ability to raise the revenues required to maintain a reliable system.
- It is important that ratemaking decisions be informed and transparent.
- High fixed fees are regressive, disproportionately harm low-income customers, and discourage conservation.
- Rates are a part of a comprehensive approach to serving low-income customers in an equitable manner.

AGENDA

- Background on ratemaking for electric utilities
- KUB rate history and comparison
- Rate impacts on low-income customers

BONBRIGHT PRINCIPLES DATE BACK TO 1961

Rates are designed to satisfy numerous objectives, some of which may be in competition with others. In his seminal work, *Principles of Public Utility Rates,* Professor James Bonbright enumerated ten guiding principles for rate design, summarized below:

Sufficiency: Rates should be designed to yield revenues sufficient to recover utility costs.

Fairness: Rates should be designed so that costs are fairly apportioned among different customers, and "undue discrimination" in rate relationships is avoided.

Efficiency: Rates should provide efficient price signals and discourage wasteful usage.

Customer Acceptability: Rates should be relatively stable, predictable, simple, and easily understandable.

Source: Melissa Whitehed, Synapse Energy Economics, Paul Chernick, Resource Insight, Jim Lazar, RAP, *The Ratemaking Process*, July 2017. https://www.synapse-energy.com/sites/default/files/Ratemaking-Fundamentals-FactSheet.pdf.

PRINCIPLES FOR FAIR REFORM OF RESIDENTIAL RATE STRUCTURE

Southern Alliance for Clean Energy and 5 Lakes Energy

Fair cost allocation: Customers should pay for grid services and power supply in proportion to how much they use and when they use it. To the extent that a customer's capacity demand is more or less predictable than the typical customer, they may bear a disproportionate share of system reserve or regulation costs.

Economic security: Just as utilities pursue economic development for their communities, they should also pursue economic security by focusing on the circumstances of low income customers - including attention to the impact of rate structures on arrearages and disconnect costs, as well as energy efficiency incentives and opportunities.

Basic customer charge: A customer should be able to connect to the grid for no more than the utility's cost to connect the customer to the grid.

Align customer control of bills with utility cost control: Rates should be designed to align customer behavior with controlling long-term costs of the utility (e.g., marginal costs). Revenue goals should not be met by encouraging customer behavior that will drive up costs.

Transparency of bills: Customer bills should provide clear information regarding how they are charged for electricity.

PRINCIPLES FOR FAIR REFORM OF RESIDENTIAL RATE STRUCTURE, CONT'D

Southern Alliance for Clean Energy and 5 Lakes Energy

Transparency of utility practices: Customers should be provided with sufficiently clear and detailed information so that they have the opportunity to reach an informed opinion regarding whether the utility's rates are set using appropriate policies and standards.

Simplicity of rates: Customer size and sophistication matters: rate complexity should scale with the level of demand and the sophistication of the customer's energy systems. Customers should be able to control their bill through straightforward decisions. Utilities should not use randomized or mysterious charges to increase revenues from customers who are reducing their use of electricity.

Gradualism: Utility cost recovery should be adaptive, not protectionist, when adapting to changes in marginal costs. Similarly, utility rates should facilitate customer adoption of new technologies, without creating special, permanent benefits tied to specific technologies.

Fair valuation of DERs: Customers who provide services to the grid should be fairly compensated. Utility rates and policies should utilize an "open architecture" system that does not single out specific technologies (or ownership), other than using fees to cover directly associated costs (e.g., metering and interconnection).

Special purpose rates: New utility-owned infrastructure may require special rate design. Examples could include public electric vehicle charging stations and microgrids.

ELECTRIC RATE-SETTING BEST PRACTICES

- Rates should be based on costs; start with cost allocation
- Industry best practice is to have a transparent **Cost of Service Study** before setting rates
- Cost of Service Studies are performed to determine how to allocate a utility's revenue requirement among the customer classes (residential, commercial, industrial) and between fixed and variable rate components (basic service charge, energy rate)
- Comprehensive and transparent review of both the cost of service study and resulting rates by a regulatory body, a process that typically includes public filing of all documents and the opportunity for stakeholder to intervene and present testimony from subject matter experts

TWO MAIN COST OF SERVICE METHODS

BASIC CUSTOMER METHOD

- Only customer-related utility costs are included in the monthly fixed fee
- These costs include:
  - Cost of meter
  - Cost of billing
  - Cost of service line (pole to house)
- Most common in 2000, the most recent survey*

MINIMUM SYSTEM METHOD

- Includes the per customer costs from the Basic Customer method
- Adds to that the cost of a mythological "minimum" distribution system to serve each customer with a chosen amount of energy (i.e. 1 kWh)
- Cost of minimum system can be very sensitive to assumptions like the chosen amount of energy

* Source: Frederick Weston, "Charging for Distribution Utility Services: Issues in Rate Design," Prepared for the National Association of Regulatory Utility Commissioners (Montpelier, VT: Regulatory Assistance Project, December 2000).

QUOTES FROM REGULATORS ON FIXED FEES

SACE has a long history of intervening in rate cases across the Southeast, including an instrumental role in the rejection of fixed fee increases in Florida, the Carolinas, and Georgia.

In 1990 the Washington Utilities and Transportation Commission rejected the minimum system method.

"In this case, the only directive the Commission will give regarding future cost of service studies is to repeat its rejection of the inclusion of the costs of a minimum-sized distribution system among customer-related costs. As the Commission stated in previous orders, the minimum system method is likely to lead to the double allocation of costs to residential customers and over-allocation of costs to low-use customers. Costs such as meter reading, billing, the cost of meters and service drops, are properly attributable to the marginal cost of serving a single customer. The cost of a minimum sized system is not. The parties should not use the minimum system approach in future studies."

Source: WUTC v. Puget Sound Power and Light Company, Cause U-89-2688-T, Third Supp. Order, P. 71, 1990

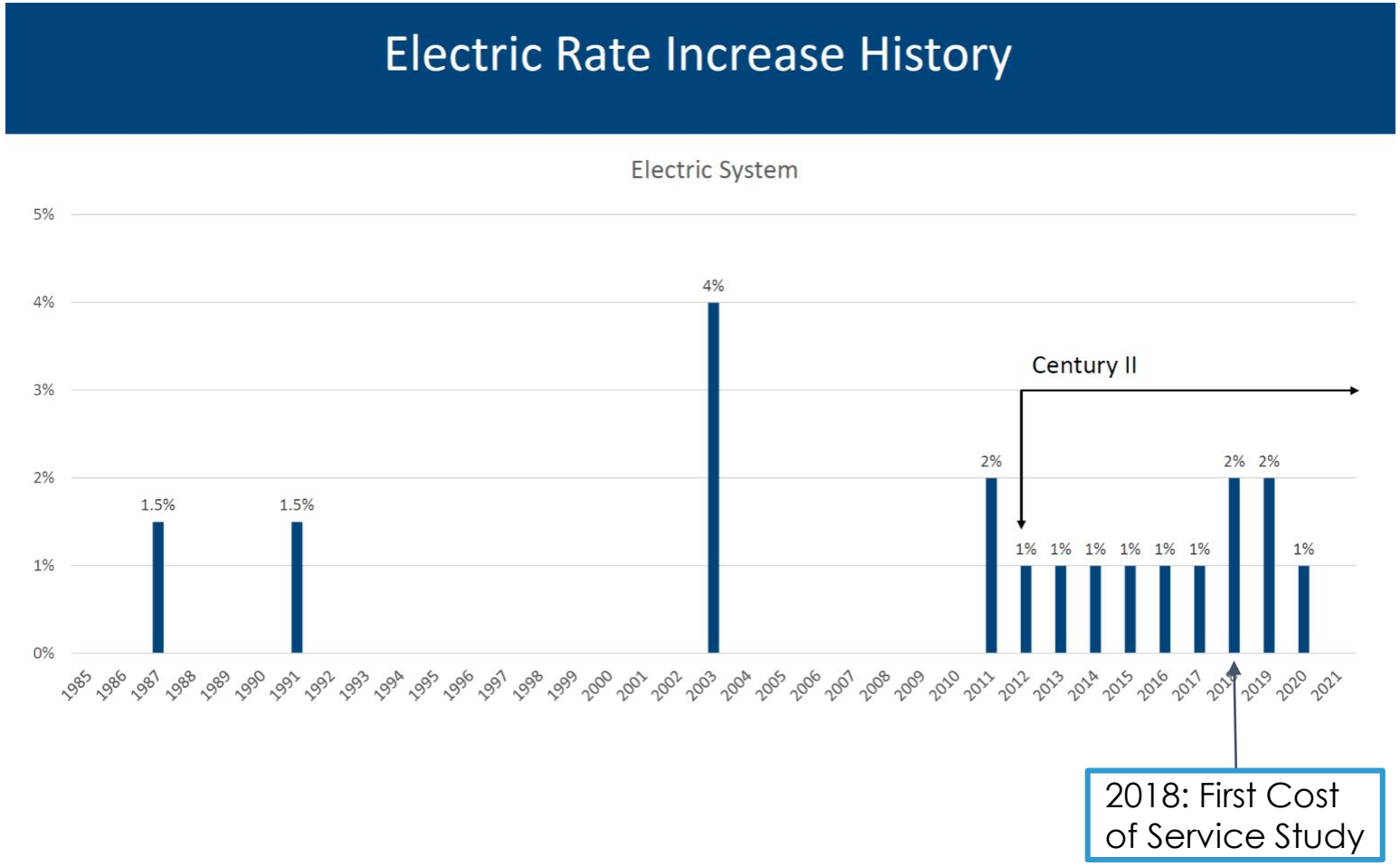
National Association of State Utility Consumer Advocates (NASUCA) adopted a resolution in 2015 opposing utilities' attempts to increase fixed fees. Some highlights:

- "In recent years, gas and electric utilities have sought to substantially increase the percentage of revenues recovered through the portion of the bill known as the customer charge"
- "These gas and electric utilities have sought to justify such increases by arguing that all utility delivery costs are "fixed" and do not vary with the volume of energy supply delivered to customers"
- "High customer charge rate design proposals… are unjust and inconsistent with sound rate design principles"
- "The imposition of high customer charge… unjustly shifts costs and disproportionately harms low-income, elderly, and minority ratepayers"
- High fixed charges "significantly reduce" a "customers' incentive to engage in conservation as well as federal and state energy efficiency programs" that are "a means to reduce customer utility bills, help mitigate the need for new utility infrastructure, and provide important environmental benefits"
- "NASUCA urges state public service commissions to reject gas and electric utility rate design proposals that seek to substantially increase the percentage of revenues recovered through the flat, monthly customer charges on residential customer utility bills – proposals that disproportionately and inequitably increase the rates of low usage customers, a group that often includes low-income, elderly and minority customers"

KUB RATE REGULATORY STRUCTURE & RATE HISTORY

KUB's rates are regulated by two entities:

- KUB Board, appointed by Knoxville mayor, approved by city council
- TVA (this is not typical, usually separate from wholesale provider)



KUB'S MINIMUM SYSTEMS METHODS RESULTS

Monthly Customer Charge Cost Breakdown

	Residential	
Distribution Customer Costs	$ 11.60	**Minimum System calculations = $14.79**
Transformer Customer Costs	2.65	
Substation Customer Costs	0.54	
Meter O&M	1.86	**Customer-related costs = $5.47**
Meter Reading	1.04	
Billing	1.28	
Services	0.40	
Customer Service	0.89	
Customer Charge	**$ 20.26**	

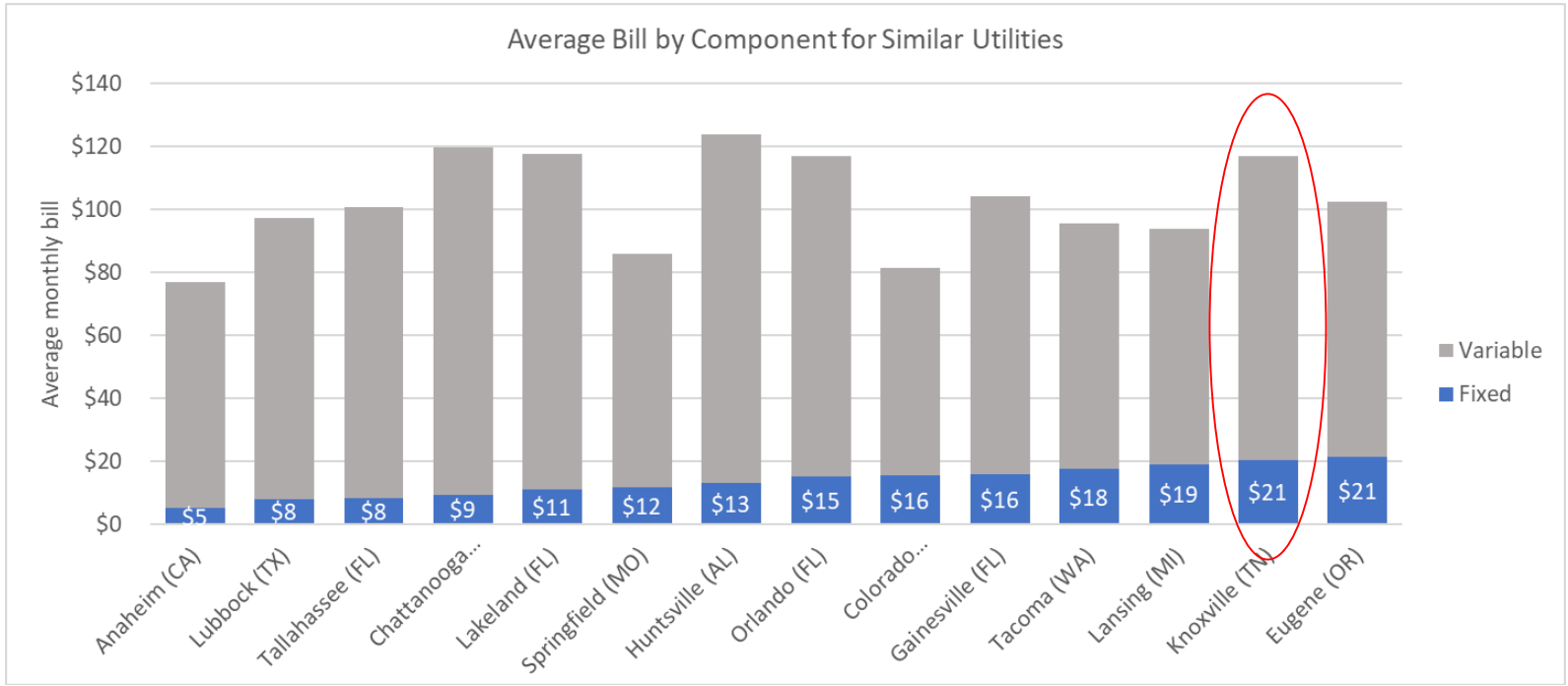
From KUB's 2018 Cost of Service Study, which used the Minimum System Method

Keeping KUB's revenues in 2020 flat we calculated an illustrative change to the fixed fee and energy rate when only customer-related costs are included in the fixed fee.

- Fixed fee changes from $20.50/month to **$6/month**
- Energy rate changes from 8.9 ¢/kWh to **10.1 ¢/kWh**

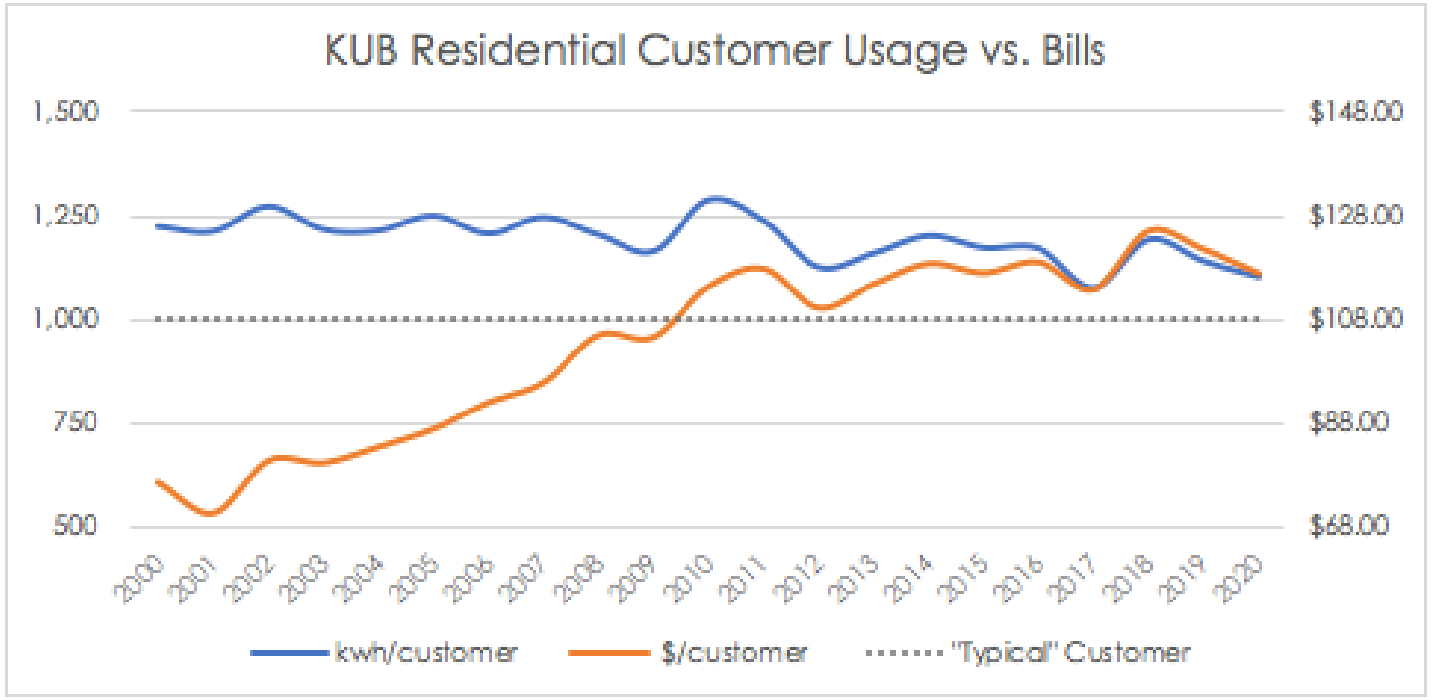
COMPARISON OF KUB RATES TO LIKE UTILITIES

- Rates should not be based on comparisons to other utilities, but these comparisons can be a helpful check
- Fixed fees have risen across TVA, so important to look beyond TVA utilities for comparisons
- Here similar means municipal utilities with similar residential customer numbers and percent of total customers



Source: U.S. Energy Information Administration (EIA), Annual Electric Power Industry Report Form-861, sales to ultimate customers; SACE research

HOW MUCH ENERGY DOES A TYPICAL CUSTOMER USE?



DEPENDS ON MANY FACTORS, INCLUDING:

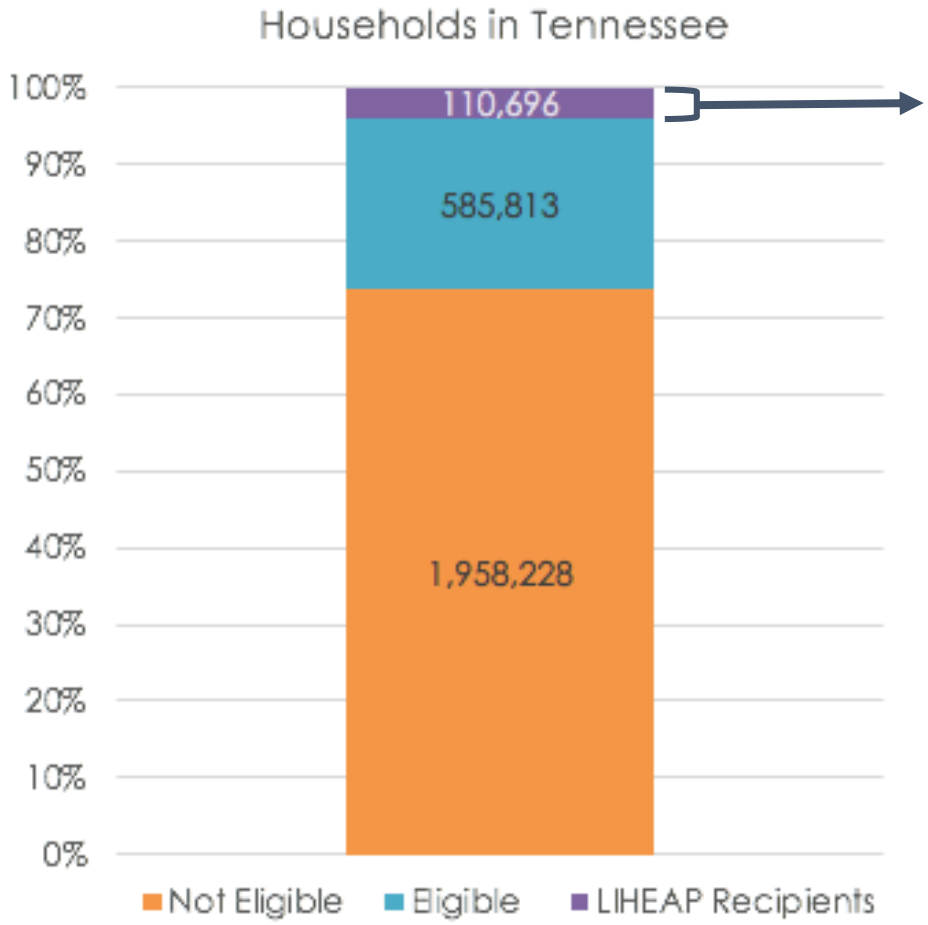
- **Timeframe**: Historical, current, multi-year average, forecasted.
- **House/apartment size**: 1,000-1,200 may be reasonable for a single family home, but what about apartment?
- **Income**: Even "average" bills can be unaffordable when incomes are low enough.

KUB-SPECIFIC INSIGHTS:

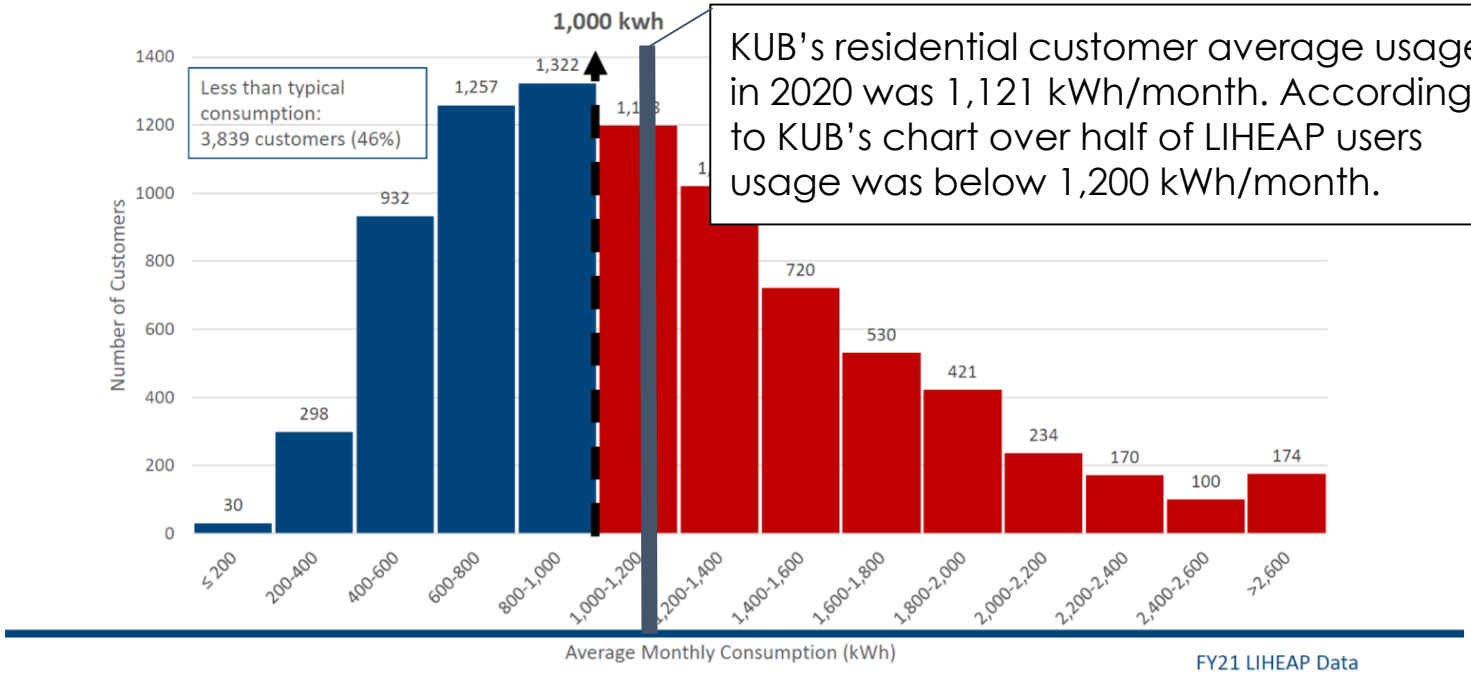
- KUB rate overview sets typical customer use at 1,000 kwh per month, $108 bill.
- The kwh used per customer shows low to flat growth, while the monthly $/customer has risen.

Source: U.S. Energy Information Administration (EIA), Annual Electric Power Industry Report Form-861, sales to ultimate customers

HOW MUCH ENERGY DOES A TYPICAL CUSTOMER USE?



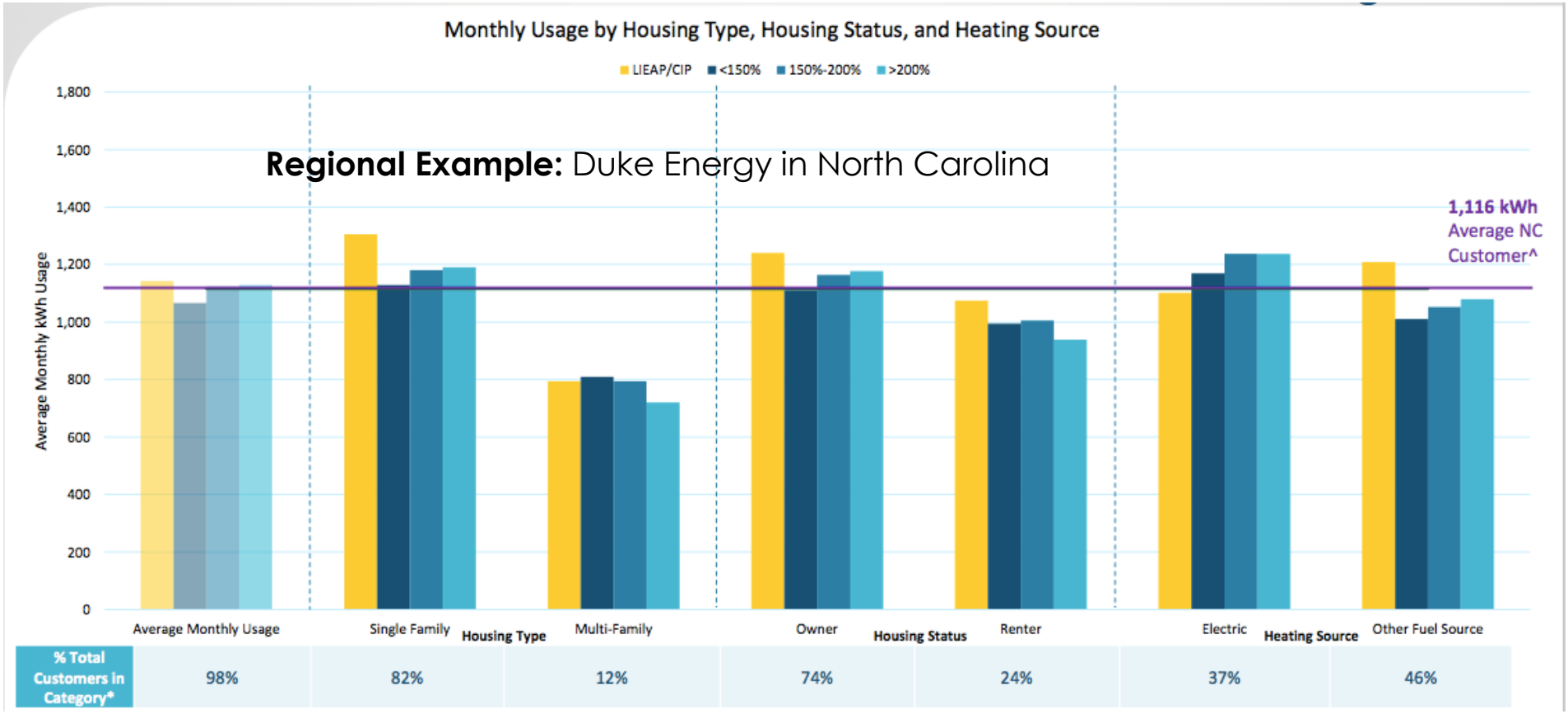
Low Income Home Energy Assistance Program (LIHEAP) Customer Usage



KUB's residential customer average usage in 2020 was 1,121 kWh/month. According to KUB's chart over half of LIHEAP users usage was below 1,200 kWh/month.

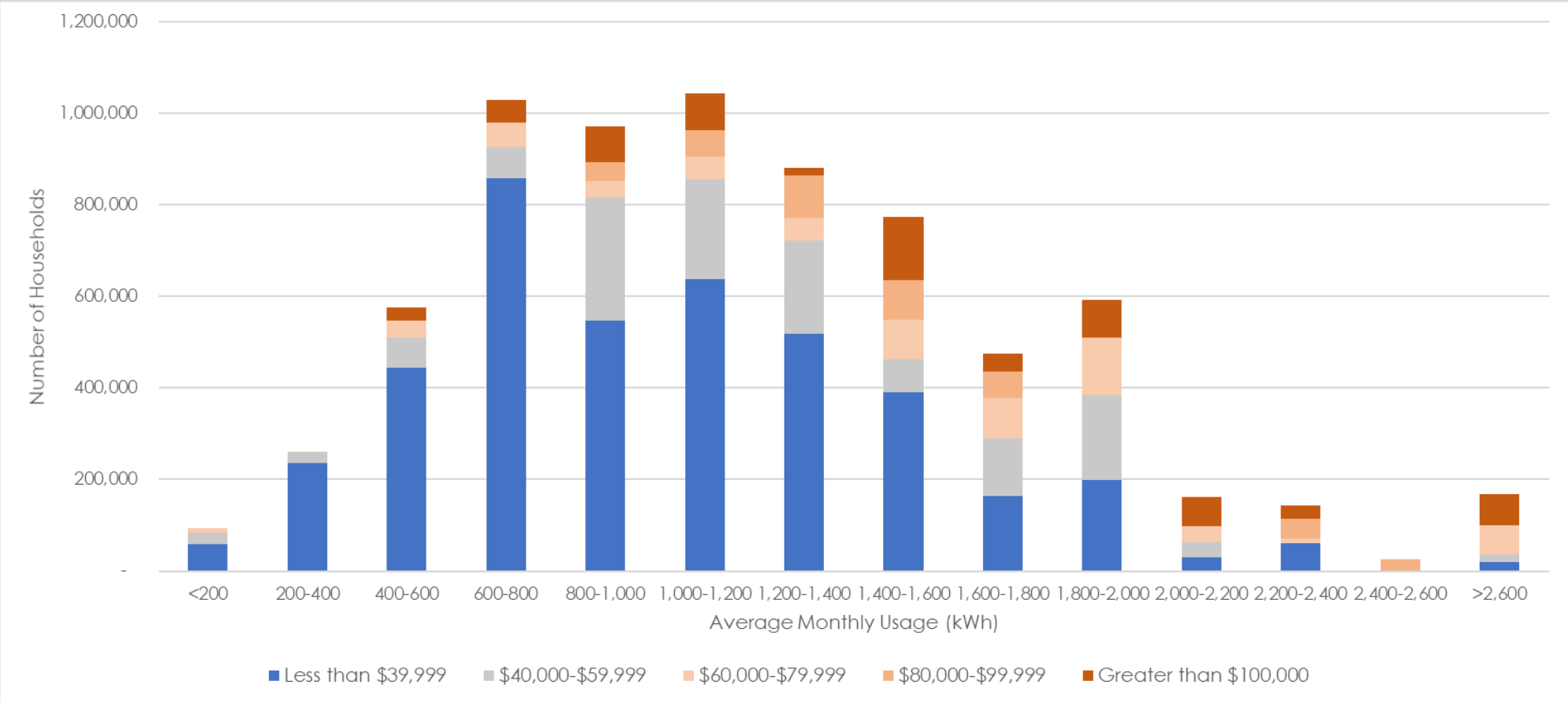
Sources: LIHEAP Performance Measurement Website (http://liheappm.acf.hhs.gov) for # of Eligible Households and Households Served; American Community Survey for Total # of Households in Tennessee

HOW MUCH ENERGY DOES A TYPICAL CUSTOMER USE?



Source: Duke Energy presentation to Low Income Affordability Collaborative (LIAC), December 2021

HOW MUCH ENERGY DOES A TYPICAL CUSTOMER USE?

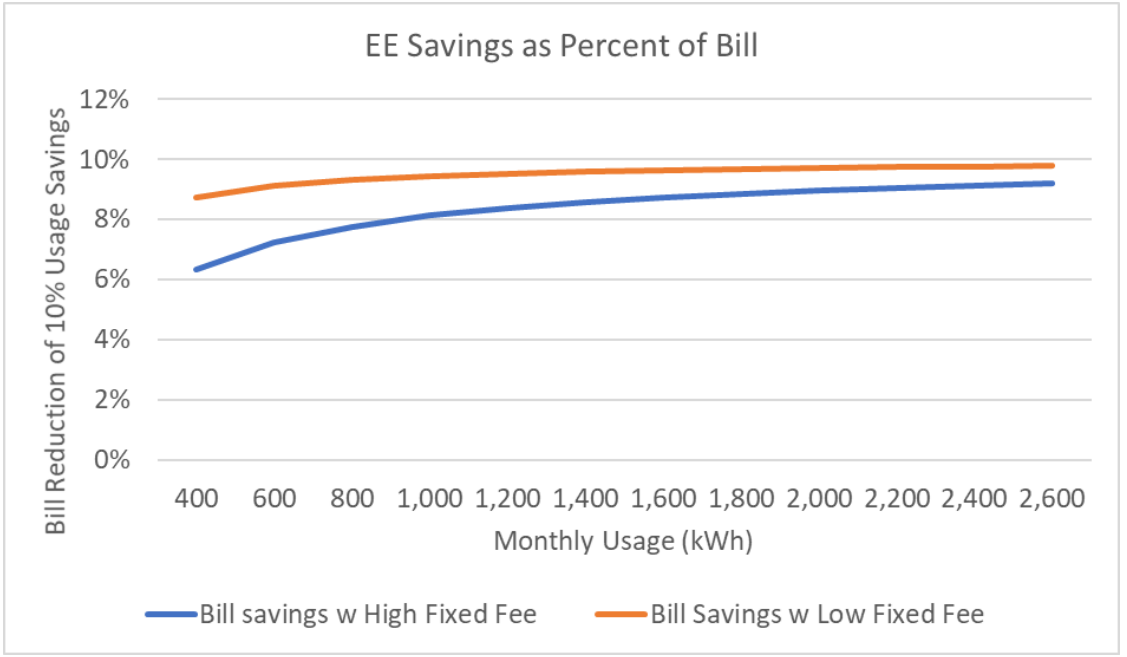


Sources: U.S. Energy Information Administration (EIA) Residential Energy Consumption Survey for East South Central Region (Tennessee, Mississippi, Alabama, and Kentucky)

KUB NEEDS TO ALIGN CUSTOMER COST CONTROL WITH UTILITY COST CONTROL

Fixed fees limit a customer's ability to lower their bills since a large portion of their bill comes from costs not related to volumetric usage. Residential customers should be able to control their bill through straightforward decisions, such as lowering behavioral usage, or undergoing energy efficiency improvement to their home.

Over time, KUB customers have trended towards low to no increases in energy usage, but the amount that customers pay each month has not followed this trend. Even at 1,000 kwh, the a customer bill is nearly 20% from fixed charges. At 500 kwh, it is approximately 32%.



HOW CAN KUB DETERMINE TRUE IMPACT OF ENERGY AFFORDABILITY?

LISTEN TO CUSTOMERS STRUGGLING WITH BILLS

- *"I am on a **fixed income** and it's hard enough to buy food, medicine. The electricity is high enough without having to pay that extra amount."* - Phyllis
- *"I'm a **single parent with two children on a limited income** and tight budget; can't afford high bills to stay warm."* - Robin

UNDERGO A COMPREHENSIVE ASSESSMENT OF RESIDENTIAL CUSTOMERS

- For example, following the most recent rate case, the North Carolina Utilities Commission ordered Duke Energy to ***"prepare an assessment of currency affordability challenges facing residential customers"***, including information on arrearage status and disconnection for non-payment (DNP)

FAIR RATES ARE PART OF THE SOLUTION TO ENERGY AFFORDABILITY

Fair utility rate structures are one part of a comprehensive approach to ensure residential customers needs are met. Changes to rates are necessary because relying solely on bill pay assistance programs may leave customers out.

LOWER FIXED FEES

- Goal of rolling back to Basic Service Method amount
- Fixed fees limit a customer's ability to *understand* their bills, and therefore *lower* their bills

EXPAND AND SUPPORT *EXISTING* PROGRAM

- *LIHEAP* and *WAP* may not be enough for local needs (such as homes requiring health/safety repairs).
- KUB's low-income weatherization budget has dropped from $15 million budget that weatherized 1,278 homes in 2015-2017, to $1 million per year to weatherize 728 homes since 2015.

CONSIDER WHERE *NEW* PROGRAMS CAN MEET GAPS

- Expand EE offerings available to hard to reach customers, such as low-to-moderate income (LMI).
- On-bill financing is tariff-based rather than loan-based so may be more inclusive/accessible.
- KUB should join in advocating for the prioritization of energy efficiency

DISCUSSION

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In 2015, LADWP was under a number of pressures and had to create a new rate structure that would respond to those pressures.

The pressures were:

- **California's Renewable Portfolio Standard (RPS), which was established in 2002 by Senate Bill (SB) 1078 (Sher, 2002) with the initial requirement that 20% of energy retail sales must be served by renewable resources by 2017. The program was accelerated in 2015 with SB350 (De Leon 2015) which mandated a 50% RPS by 2030.**
- **The City of LA's requirement that the utility be totally coal-free by 2025, which had been passed in 2013. That meant replacing 46% of their energy resources.**
- **Demand from low-income communities that already severe energy burdens not be increased.**

The 2015 LADWP Rate Case was the response to these pressures.

They clearly had to raise a large amount from their ratepayers while assuaging the concerns of the very well-organized residents in low-income neighborhoods.

The tiered rate structure we'll explore wasn't enough to satisfy those residents. They also had to raise their energy efficiency budget by 50%.

And that would require them to bring in even more money.

Just like in Tennessee, the laws governing utility rates would not allow them to give a special rate to poor people.

LADWP's very successful program of low-income energy efficiency upgrades provided them the opportunity to get broad public approval for the 2015 Rate Case.

But if energy efficiency works, it will also reduce the utility's income from usage fees.

So, similar to KUB, LADWP introduced a fixed fee to assure they would meet fixed costs. And of course, with an expanding net metering program for rooftop solar and the obligation to build out a vast system of utility-scale renewable resources, those fixed costs would be rapidly increasing.

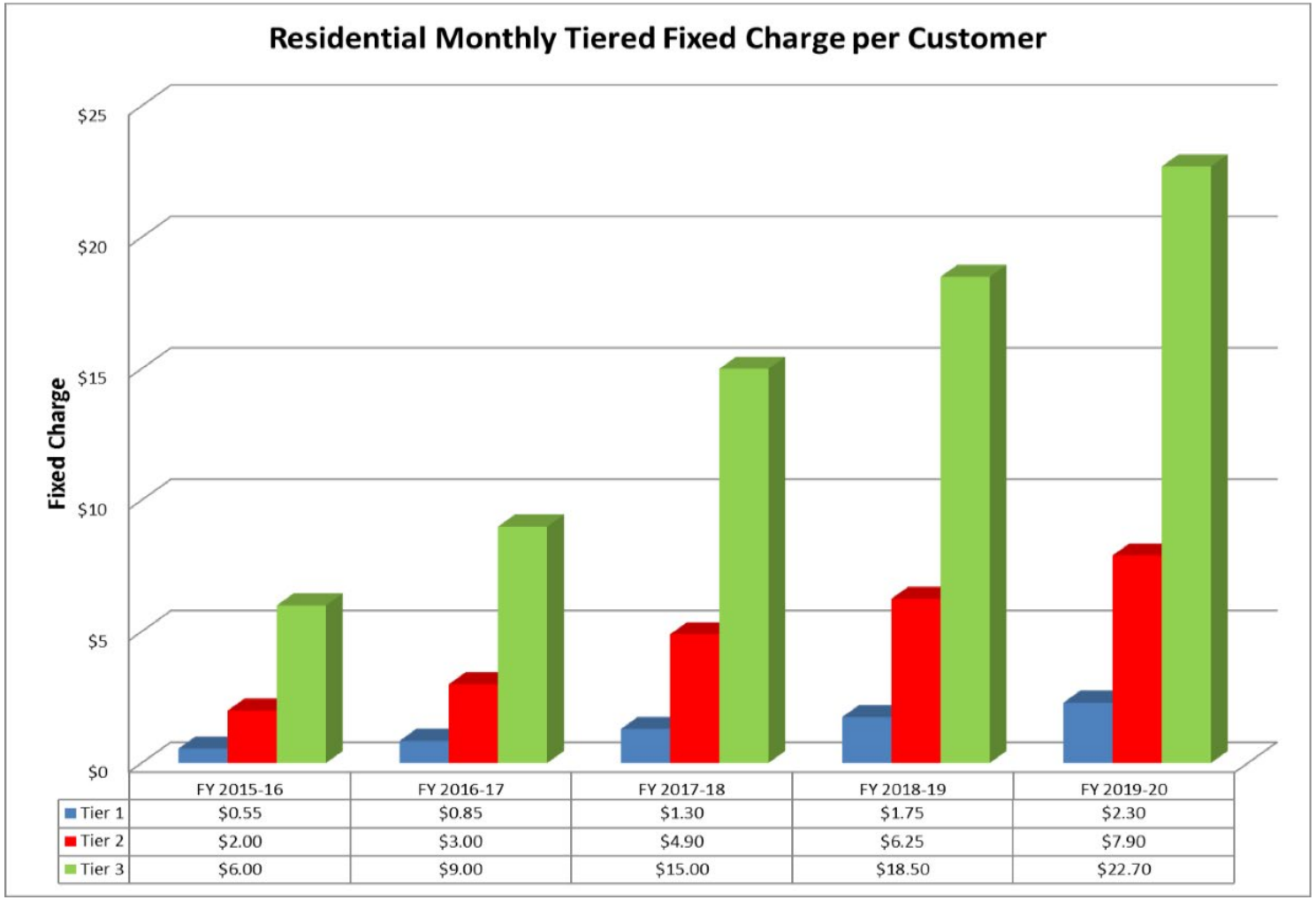
But to avoid unduly burdening LA's low-income communities, they created a tiered fixed fee – the amount based on consumption.

Let's see how it works.

Proposed Changes to LADWP Residential Rate Design

- LADWP proposes to implement a tiered fixed charge for Residential customers.
- The proposed fixed charge would be tied to the customer's usage, based on the higher of maximum monthly usage from the grid in the prior year or maximum monthly usage of electricity delivered to the grid in the prior year, as the capacity of the grid is designed based on the peak or maximum expected usage level.
- As more customers generate a portion of their energy needs, a utility's financial survival requires rate design mechanisms to change to ensure all customers continue to contribute to the basic fixed costs of providing electric service.

While customer usage will always vary, all customers should bear some of the burden of the distribution infrastructure costs.



	FY 2015-16	FY 2016-17	FY 2017-18	FY 2018-19	FY 2019-20
Tier 1	$0.55	$0.85	$1.30	$1.75	$2.30
Tier 2	$2.00	$3.00	$4.90	$6.25	$7.90
Tier 3	$6.00	$9.00	$15.00	$18.50	$22.70

The tiered fixed charge approach has several benefits, including, but not limited to:

- Ensuring the continuation of the same level of reliability for all customers;
- Encouraging increased energy efficiency measures by linking the three-tiered fixed charge to customer usage levels, as opposed to a single rate for all customers;
- Better matching of cost recovery and cost causation as determined through the new marginal cost of service study;
- Movement toward matching the level of fixed and variable costs with revenue from fixed and usage-based rate elements; and
- Minimizing the percentage rate increase for low usage customers or eliminating the impact on low usage customers as the fixed charge is not expected to exceed the current minimum usage charge.

Usage rates are tiered in the same way as fixed fees.

- LADWP's rate design encourages energy conservation. In order to send the proper conservation price signals to customers, electricity rates increase as consumption increases. This approach is consistent with the marginal costs to serve these customers, as well. Therefore, the proposed rate design allocates more of the rate increase to customers that consume higher levels of electricity, and customers at lower consumption levels receive lower relative rate increases.
- The average annual five-year rate increases proposed for each tier are: 2.4% for tier 1, 5.1% for tier 2 and 7.5% for tier 3 (for summer), respectively.

Proposed Thresholds for Residential Tiered Fixed Charge
Zone 1 Monthly Usage (kWh) Zone 2 Monthly Usage (kWh)

	Zone 1	Zone 2
Tier 1	0 ≤ and ≤ 350	0 ≤ and ≤ 500
Tier 2	350 < and ≤1050	500 < and ≤1500
Tier 3	> 1050	> 1500

Now we’ll see the fees and rates arranged in one chart clearly indicating the incentive for conservation and efficiency.

Tiers	Monthly Zone 1 Usage Allocation (kWh)	Monthly Zone 2 Usage Allocation (kWh)	Monthly Tiered Fixed Charge ($)	Summer Energy Charge ($/kWh)	Winter Energy Charge ($/kWh)
FY 2015-16					
Tier 1	0 ≤ and ≤ 350	0 ≤ and ≤ 500	$0.55	$0.1494	$0.1494
Tier 2	350 < and ≤1050	500 < and ≤1500	$2.00	$0.1816	$0.1816
Tier 3	> 1050	> 1500	$6.00	$0.2305	$0.1816
FY 2016-17					
Tier 1	0 ≤ and ≤ 350	0 ≤ and ≤ 500	$0.85	$0.1524	$0.1524
Tier 2	350 < and ≤1050	500 < and ≤1500	$3.00	$0.1877	$0.1877
Tier 3	> 1050	> 1500	$9.00	$0.2435	$0.1877
FY 2017-18					
Tier 1	0 ≤ and ≤ 350	0 ≤ and ≤ 500	$1.30	$0.1577	$0.1577
Tier 2	350 < and ≤1050	500 < and ≤1500	$4.90	$0.1980	$0.1980
Tier 3	> 1050	> 1500	$15.00	$0.2659	$0.1980
FY 2018-19					
Tier 1	0 ≤ and ≤ 350	0 ≤ and ≤ 500	$1.75	$0.1606	$0.1606
Tier 2	350 < and ≤1050	500 < and ≤1500	$6.25	$0.2089	$0.2089
Tier 3	> 1050	> 1500	$18.50	$0.2850	$0.2089
FY 2019-20					
Tier 1	0 ≤ and ≤ 350	0 ≤ and ≤ 500	$2.30	$0.1640	$0.1640
Tier 2	350 < and ≤1050	500 < and ≤1500	$7.90	$0.2226	$0.2226
Tier 3	> 1050	> 1500	$22.70	$0.3096	$0.2226

- LADWP's proposed monthly tiered fixed charge coupled with increases in the energy rate by tier is equitable and balanced. By assigning a proportionally higher fixed charge to higher usage customers, low usage customers who may not benefit from or be able to afford customer-owned solar are not unduly impacted. LADWP's tiered fixed charge comprises a lower percentage of customers' monthly bills at lower usage levels than if a single fixed charge across all customers was used.
- LADWP's proposed balance of fixed charges and energy charges is competitive, but still provides an incentive for customer-installed generation.

In preparing this presentation, I conferred with David Rahimian and George Chen of LADWP. David is in charge of Legislative and Intergovernmental Affairs and George is the Power System Rates Manager. We discussed LADWP's 2015 Rate Case which presented a rate increase to be phased in over 5 years between 2015 and 2020. In addition to a tiered system of usage rates, the utility combined a system of tiered fixed charges as well. As shown in the previous sections taken from the rate case, this combined system was designed to provide for the costs of reliability upgrades while at the same time incentivizing conservation and efficiency. An additional purpose was to relieve burdens on low-income customers who could not afford rooftop solar so they wouldn't foot the costs of their neighbors' solar installations.

As we ended our conversation, I asked David and George three questions:

1. In 2015, LADWP set a goal for a 15% reduction in electricity demand by 2020. Did they achieve that?

   Yes. In 2011, average residential energy consumption was 500 KWh. Now it's 410 KWh.

2. Did the rate structure unduly impact poor people?

   As far as we can tell, no. There's been no increase in LIHEAP applications in 6 years.

3. Did this rate structure hold up over time? Is it still in place?

   Yes. There have been incremental adjustments to rates, but the structure is still the same.

The rate structure takes care to assure the recovery of fixed costs. With an aggressive EE program, they foresaw the likelihood of decreased revenue from usage.

In 2002, California Senate Bill 1078 established the RPS program, requiring 20% renewable energy by 2017. By 2010, they had already achieved that goal. So they set a new goal of 33% by 2020. The RPS has been regularly increased as each goal is met. Late last year, the LA City Council voted to have LADWP transition to 100% renewable energy by 2035. That's a decade earlier than LA's previous goal. The vote followed the publication and dissemination of a study by NREL and LADWP called LA 100, exploring various means to get to 100% renewable energy. Today we'll explore the rate design that will help LA achieve this latest goal.