Kathleen H. Richard
Counsel

NCRH 20 / P.O. Box 1551
Raleigh, NC 27602

o: 919.546.6776

kathleen.richard@duke-energy.com

January 18, 2022

VIA ELECTRONIC FILING

Ms. A. Shonta Dunston, Chief Clerk
North Carolina Utilities Commission
4325 Mail Service Center
Raleigh, North Carolina 27699-4300

RE: Joint North Carolina Low-Income Affordability Collaborative Quarterly Progress Report
Docket Nos. E-7, Subs 1213, 1214 and 1187 and E-2, Subs 1219 and 1193

Dear Ms. Dunston:

Pursuant to North Carolina Utilities Commission's ("Commission") March 31, 2021 *Order Accepting Stipulations, Granting Partial Rate Increase, and Requiring Customer Notice* in Docket Nos. E-7, Sub 1213, E-7, Sub 1214, and E-7, Sub 1187, and the Commission's April 16, 2021 *Order Accepting Stipulations, Granting Partial Rate Increase, and Requiring Customer Notice* in Docket Nos. E-2, Sub 1219 and E-2, Sub 1193, I enclose for filing in the above-referenced dockets the Joint North Carolina Low-Income and Affordability Collaborative Quarterly Progress Report of Duke Energy Carolinas, LLC, Duke Energy Progress, LLC and the Public Staff.

Please do not hesitate to contact me if you have any questions or need additional information.

Sincerely,

Kathleen H. Richard

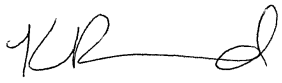
Enclosure

cc: Parties of Record

CERTIFICATE OF SERVICE

I certify that a copy of Duke Energy Carolinas, LLC,, Duke Energy Progress, LLC and the Public Staff's Joint NC Low-Income Affordability Collaborative Quarterly Progress Report, in Docket Nos. E-7, Sub 1213, E-7, Sub 1214 and E-7, Sub 1187 and E-2, Sub 1219 and E-2, Sub 1193, has been served by electronic mail, hand delivery, or by depositing a copy in the United States Mail, 1st Class Postage Prepaid, properly addressed to parties of record.

This the 18th day of January, 2022.



Kathleen H. Richard
Counsel
Duke Energy Corporation
P.O. Box 1551/NCRH 20
Raleigh, North Carolina 27602
Tel. 919.546.6776
Kathleen.richard@duke-energy.com

Guidehouse

North Carolina Low Income Affordability Collaborative

Quarterly Progress Report

Prepared for:

DUKE ENERGY®

Duke Energy

Submitted by:

Guidehouse Inc.
101 S. Tryon Street, Suite 2820
Charlotte, North Carolina 28202
Telephone (704) 347-7626
jamie.bond@guidehouse.com

Reference No.: Janury18, 2022

Table of Contents

1. Status Reporting for the LIAC

This progress report details the status and efforts of the collaborative on the affordability of electric service for low-income customers ("LIAC" or "Affordability Collaborative") established by the North Carolina Utilities Commission (the "Commission" or "NCUC") in its April 16, 2021 Order Accepting Stipulations, Granting Partial Rate Increase and Requiring Customer Notice in Docket Nos. E-2, Sub 1219 and Sub 1193 and its March 31, 2021 Order Accepting Stipulations, Granting Partial Rate Increase, and Requiring Customer Notice in Docket Nos. E-7, Sub 1213, Sub 1215, and Sub 1187 ("Rate Case Orders"). In those Rate Case Orders, the Commission directed Duke Energy Progress, LLC ("DEP") and Duke Energy Carolinas, LLC ("DEC", collectively, "Duke Energy") and the Public Staff of the North Carolina Utilities Commission ("Public Staff"), within 90 days of the Rate Case Orders, to convene a collaborative for interested stakeholders to address the affordability of electric service for low-income customers.

Additionally, the Commission directed Duke Energy and the Public Staff in its Rate Case Orders to file a report that briefly summarizes the progress to date made by the Affordability Collaborative within 180 days of the date of the DEC Rate Case Order[1] (and quarterly progress reports thereafter). Guidehouse prepared this Q4 progress report on behalf of Duke Energy and the Public Staff to fulfill the quarterly reporting requirement set forth in the Rate Case Orders. The next quarterly progress report (the Q1 Report) will be filed with the Commission on April 15, 2022.

1.1 Stakeholder Participation

LIAC members aligned around a plan to convene approximately every six-weeks as part of a series of workshops. In addition to the nine (9) workshops planned over the 12-month period, the LIAC will host two (2) additional sessions: 1) a special session during which the LIAC will host a joint workshop with members of Duke Energy's Demand-Side Management and Energy Efficiency (EE) and the Comprehensive Rate Review (CRR) collaboratives, and 2) a special session during which new income qualified programs being proposed by LIAC members can be presented to the group.

[1] The Duke Energy Carolinas, LLC and Public Staff's North Carolina Low Income Affordability Collaborative 180-day Progress Report in Docket Nos. E-7, Sub 1213; E-7, Sub 1214; and E-7, Sub 1187 and Duke Energy Progress, LLC and Public Staff's North Carolina Low Income Affordability Collaborative 180-day Progress Report in Docket Nos. E-2, Sub 1219 and E-2, Sub 1193 were filed with the Commission on September 27, 2021 in accordance with the Rate Case Orders.

Figure 1. Conducted and Planned LIAC Sessions

To date, the LIAC has convened for four (4) of the nine (9) workshops planned, as highlighted by **Figure 1**. Over the course of the workshops that have been held to date, a total of 71 individuals, excluding Guidehouse facilitators, participated in at least one of the LIAC sessions, with an average participation of 42 stakeholders per session.

Table 1 list the stakeholder organizations that participated in one or more of the LIAC sessions to date.

Table 1 . Organizations That Participated in One or More LIAC Workshops

Stakeholder Participation in the LIAC
Organizations in Attendance
• AARP • Advance Carolina • Apartment Association of NC • Appalachian Voices • Carolina Industrial Group for Fair Utility Rates (CIGFUR) • Charlotte Area Fund • Crisis Assistance Ministry • City of Raleigh • Dominion Energy • Duke Energy • Duke University – Nicholas Institute for Environmental Policy Solutions • Legal Aid of North Carolina • National Consumer Law Center • National Institute Economic Development • NC Attorney General's Office NC Community Action Association • NC Dept of Environmental Quality • NC Dept of Health & Human Services • NC Justice Center • NC Office of Recovery & Resiliency • NC Sustainable Energy Association • NC Electric Membership Corporation • Public Staff of NC Utilities Commission • Rowan Helping Ministries • Sierra Club – Asheville • Southeast Energy Efficiency Alliance Southern Alliance for Clean Energy • Southern Environmental Law Center • Vote Solar

1.2 Launch of LIAC Subteams

To address the LIAC tasks outlined by the Commission within the defined 12-month period, the LIAC mobilized four (4) subteams **(Table 2**).

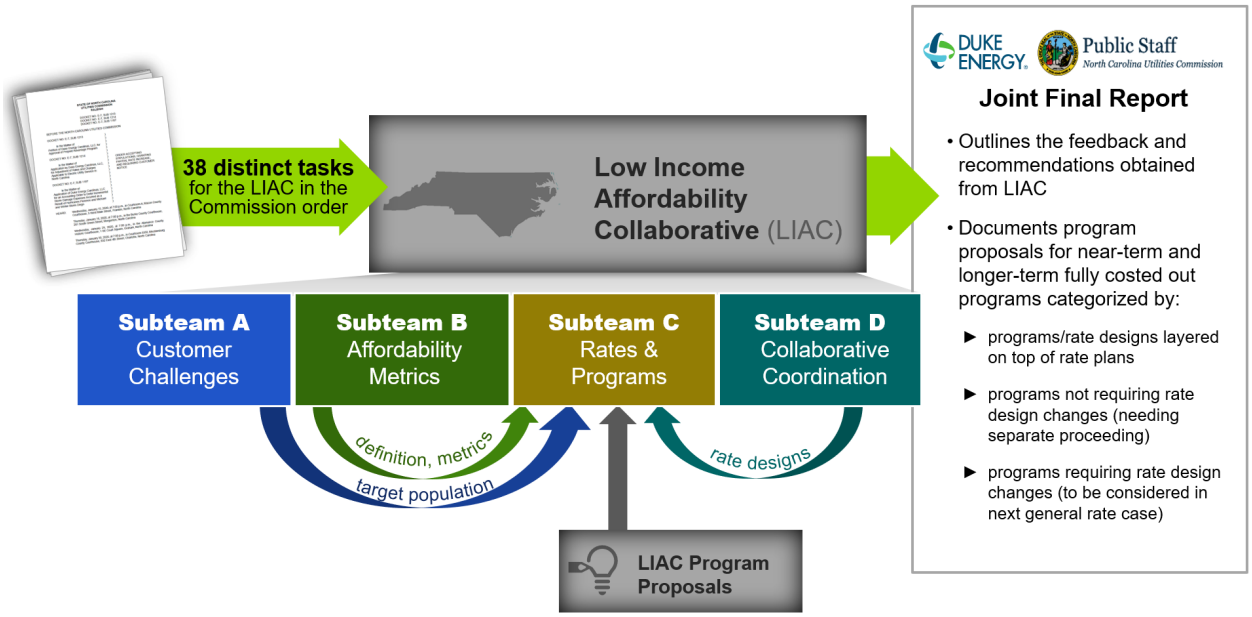
Activities for each subteam have been led by two LIAC co-leads and have been driven by the set of accountabilities described in **Appendix B.** In general, each of the subteams have convened weekly or bi-weekly, as determined by members of each of the subteams. Individual subteams have begun working through specific tasks with the goal of generating findings or framing recommendations that will eventually be presented to the larger LIAC body for decisions or endorsement.

Table 2. LIAC Subteams and Subteam Co-Leads

LIAC Subteams	Subteam Co-Leads
Subteam A – Customer Challenges	Rory McIlmoil, *Appalachian Voices* Arnie Richardson, *Duke Energy*
Subteam B – Affordability Metrics	La'Meshia Whittington, *Advance Carolina* Conitsha Barnes, *Duke Energy*
Subteam C – Rates and Programs	Ken Szymanski, *Apartment Association of North Carolina* Detrick Clark, *North Carolina Community Action Association*
Subteam D – Collaborative Coordination	Paula Hemmer, *NC Department of Environmental Quality* Thad Culley, *Sunrun*

The combination of subteam outputs, decisions and recommendations that have been endorsed by the broader LIAC is being captured on an ongoing basis for incorporation in the final set of recommendations and responses provided to the Commission (**Figure 2**).

Figure 2. Overall Approach to Capturing LIAC Input

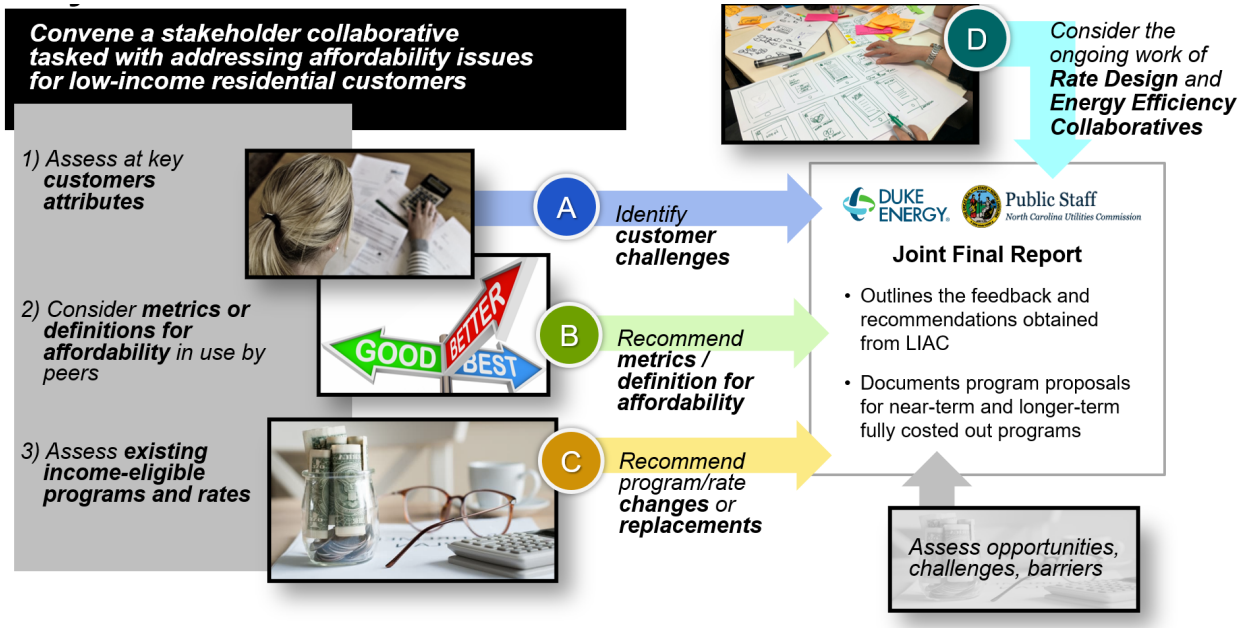


2. LIAC Progress Towards Objectives

The objectives of the LIAC are outlined in the Rate Case Orders. A summary of key tasks associated with achieving those LIAC objectives is depicted in **Figure 3**. These key tasks are being supported by Subteams A, B, C and D (as noted in the previous section).

Progress being made on these tasks by the subteams is described in the subsections that follow.

Figure 3. Key LIAC Tasks Supported by Subteams



2.1 Identifying Customer Challenges

The members of Subteam A collected and incorporated LIAC feedback on its initial analysis of Duke Energy's North Carolina residential customer demographic data presented to the LIAC during Workshop 2. During Workshop 3, Subteam A presented updated findings to the broader LIAC and collected additional feedback. Following Workshop 3, Subteam A distributed a revised version of customer demographic data to the LIAC. The latest version of the material shared has been included in this report as **Appendix C. NC Low Income Collaborative Analytics.** Subteam A is using this material as a basis for its assessment of customer challenges, which is currently being prepared for socialization with the LIAC.

2.2 Recommending Affordability Metrics

Members of Subteam B have begun identifying available resources, research needs and subject experts with who the subteam might confer. The subteam began hosting matter speakers in November and continue to research how affordability is defined and applied in other jurisdictions

to assist low income customers. Subteam B members have hosted speakers to educate members on affordability concepts of such as self-sufficiency standard ("SSS") and electric energy burden[2].

To further inform the work underway to identify opportunities to address affordability for low income customers, the LIAC led by members of Subteam B intend to collect input directly from individuals participating in low-income programs and from staff members who directly support these programs-.

2.3 Recommending Rates and Programs

Subteam C began hosting subject matter expert ("SME") speakers in November to educate subteam members on the existing income-qualified programs offered in North Carolina by Duke Energy as well as the associated requirements. To position the subteam to assess alternative rate options, the group invited a Duke Energy SME to present an overview of rate design concepts, as well as an overview of existing and alternative rates under consideration. These rate design concepts were then presented to the broader LIAC during Workshop 4. The material presented has been included in this report as **Appendix D. Rate Design and Cost of Service**. A Duke SME also presented to the subteam regarding the existing portfolio of energy efficiency programs targeted at income qualified customers, as well as additional income qualified programs and pilots that are in the process to being implemented. Subteam C will support a presentation of existing rates, customer offerings and energy efficiency programs to the broader LIAC during the next LIAC workshop (Workshop 5) scheduled in February 2022.

2.4 Collaborating with EE and CRR Collaboratives

Subteam D first convened in early December to begin developing and building the subteam member's understanding of the goals and deliverables of the EE and CRR collaboratives as well as identify the representatives of each of these collaboratives with overlapping participation in the LIAC. The group also worked to map out the goals and logistics needed to support a joint meeting between the various Duke Energy collaboratives.

As discussed further in Section 3.1 of this report, t Subteam D scheduled the date of the joint session (January 26, 2022), socialized a draft agenda among subteam members, and identified presenters.

[2] The self-sufficiency standard is a budget-based, living wage measure that defines the real cost of living for working families at a minimally adequate level and is sometimes used as an alternative to the official poverty measure (see **https://www.selfsufficiencystandard.org/**). Electric energy burden generally means the percentage of household income spent on electric energy costs. The meaning of SSS and electric energy burden can vary depending on the program or agency that utilizes such terms.

3. LIAC Upcoming Activities

3.1 Joint Collaborative Session

The LIAC is hosting a joint meeting with Duke Energy's EE Collaborative and CRR Collaborative on January 26, 2022. The objective of the session is to allow representatives from each of the collaboratives to describe, for the benefit of all meeting participants, the purpose of their individual collaboratives as well as the value or outputs the each of the collaboratives are working to deliver.

During the joint session, each of the collaboratives will have the opportunity to offer a deeper dive on a topic or set of topics that related to the low income customers and energy affordability.

3.2 Overview of Existing Programs (Workshop V)

The next LIAC workshop (Workshop 5) will be held February 3, 2022. During Workshop 5, Subteam C will lead the LIAC through an overview and discussion of existing Duke Energy income-qualified programs to position the LIAC to determine: 1) the percentage of residential customers who are eligible for each existing program, 2) the percentage of eligible customers who take advantage of these programs, and 3) the impact of existing programs on the electric energy burden for enrolled customers.

Additionally, Subteam C will build on the rate and billing concepts overviewed during Workshop 4 and host LIAC discussion of: 1) a minimum bill concept, 2) an income-based rate plan, and 3) a social security income-based ratepayer group to position the LIAC to assess the appropriateness of implementation of these offerings in North Carolina.

4. Progress Report Summary

In summary, as of the date of this report, the following progress has been made.

- The Low Income Affordability Collaborative has been mobilized.
- Guidehouse has conducted four (4) of nine (9) planned LIAC workshops with Joint Collaborative Session and Workshop 5 planned and scheduled
- LIAC subteams have been launched and are meeting regularly.
- Initial Duke Energy North Carolina residential customer demographic data have been compiled, analyzed and presented to the Collaborative.
  - LIAC feedback has been collected; revised demographic data have been compiled, analyzed and presented to the LIAC members
- A Joint Collaborative Session (including LIAC, Energy Efficiency and Comprehensive Rate Design) has been planned and will be conducted prior to the end of January.
- Process for LIAC members to propose new programs has been initiated and initial input has been collected.

Appendix A. Organizations Invited to Participate in LIAC

The list of stakeholder organizations approved by the Commission and invited to participate in the LIAC is provided below.

- AARP
- Advance Carolina
- Apartment Association of North Carolina
- Appalachian Voices
- Carolina Small Business Development Fund
- ChargePoint
- Charlotte Area Fund
- Carolina Industrial Groups for Fair Utility Rates (CIGFUR)
- City of Raleigh
- Crisis Assistance Ministry
- Dominion Energy
- Duke Energy
- Legal Aid of North Carolina
- National Association for the Advancement of Colored People (NAACP)
- National Institute Economic Development
- North Carolina Attorney General's Office
- North Carolina Community Action Association
- North Carolina Dept of Environmental Quality (State Weatherization)
- North Carolina Dept of Health and Human Services
- North Carolina Justice Center
- North Carolina League of Municipalities
- North Carolina Office of Recovery & Resiliency (HOPE/ERA)
- North Carolina Sustainable Energy Association
- North Carolina Electric Membership Corporation (NCEMC)
- Nicholas Institute (Duke University)
- Public Staff of the North Carolina Utilities Commission
- Rowan Helping Ministries
- Sierra Club
- Southeast Energy Efficiency Alliance (SEEA)
- Southern Alliance for Clean Energy (SACE)
- Southern Environmental Law Center (SELC)
- Sunrun
- Vote Solar

Appendix B. LIAC Subteam Descriptions

The LIAC established four (4) subteams through which work is being conducted.

SUB-TEAM A
Customer Challenges

SUB-TEAM FOCUS

Position the LIAC to **prepare an assessment of current affordability challenges** facing residential customers

- Consider the customer demographic data and other information
- Use the data and information to identify affordability challenges for NC residential customers
- Develop "assessment" recommendations

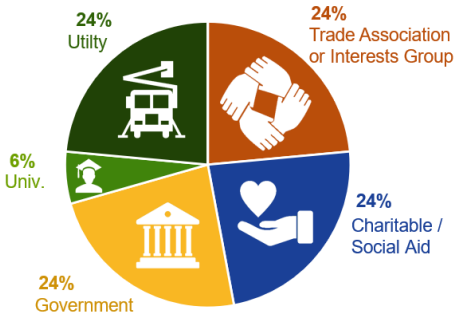
SUB-TEAM TASKS*

1) Compile data inputs needed to conduct assessment
2) Align on interpretation of data
3) Develop insights to share with boarder LIAC and propose assessment

Exploring customer energy affordability challenges

NUMBER OF SUB-TEAM MEMBERS 19

SUB-TEAM COMPOSITION



** Subject to change*

SUB-TEAM B
Affordability Metrics

SUB-TEAM FOCUS

Position the LIAC to develop suggested metrics or definitions for "affordability" in the context of the Company's provision of service in its North Carolina service territory and explore trends in affordability.

- Address associated questions posed in the Commission order
- Report findings to broader LIAC

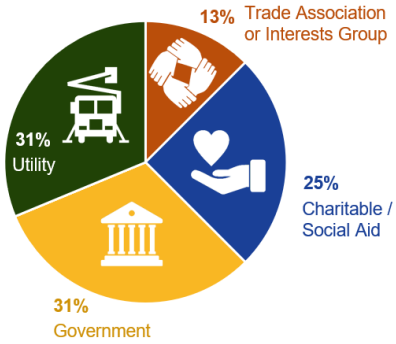
SUB-TEAM TASKS*

1) Identify and compile information to be investigated
2) Align on questions to be answered
3) Identify any expert input / opinions needed to support positions (LIAC education)
4) Suggest metrics / definition for "affordability"
5) Prepare and present suggestions to broader LIAC for consideration

Benchmarking definitions of and metrics used for defining "affordability"

NUMBER OF SUB-TEAM MEMBERS 19

SUB-TEAM COMPOSITION



** Subject to change*

SUB-TEAM C
Current State Customer Offerings

SUB-TEAM FOCUS

Investigate the strengths and weaknesses of existing rates, rate design, billing practices, customer assistance programs and energy efficiency programs in addressing affordability

Address associated questions posed in the Commission order

Report findings to broader LIAC

SUB-TEAM TASKS*

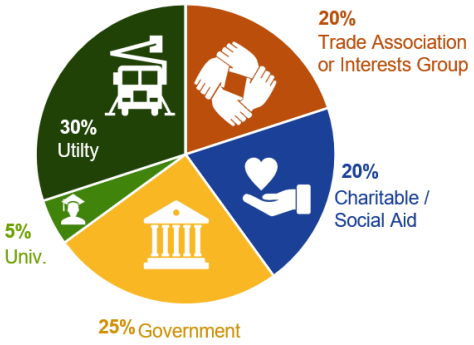
1) Identify and compile information to be investigated
2) Align on questions to be answered
3) Identify any expert input / opinions needed to support investigation (LIAC education)
4) Conduct investigation(s)
5) Prepare and present findings to broader LIAC for consideration

** Subject to change*

Investigating current assistance programs, rate designs, cost impacts

NUMBER OF SUB-TEAM MEMBERS 20

SUB-TEAM COMPOSITION



SUB-TEAM D
Collaborative Coordination

SUB-TEAM FOCUS

Identify interim material produced from this collaborative to be shared and information available from each of the other two groups available to our groups.

Support LIAC in development of approach for reaching LIAC "consensus" for making recommendations to the Commission

SUB-TEAM TASKS*

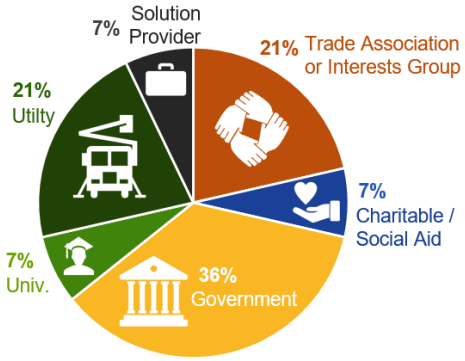
1) Identify information to be shared with EE and Comprehensive Rated Design Collaboratives
2) Identify information available from the EE and Comprehensive Rated Design Collaboratives
3) Determine, compile and report out to LIAC any relevant input from other two collaboratives
4) Develop and present recommended approach to LIAC "consensus"

** Subject to change*

Engaging the EE and CRD Collaboratives; proposing consensus and prioritization rules

NUMBER OF SUB-TEAM MEMBERS 14

SUB-TEAM COMPOSITION



Appendix C. NC Low Income Collaborative Analytics

During Workshop 2 Duke Energy subject matter experts presented an overview of an initial analysis of North Carolina residential electric customer demographic data. During Workshop 3, with the goal of positioning the Affordability Collaborative to begin its assessment of affordability challenges facing North Carolina residential customers.

During Workshop 3, Subteam A presented revised analysis of customer demographic data (version 2) adjusted for LIAC input collected during Workshop 2. Following Workshop 3, Subteam A distributed another revised analysis of customer demographic data (version 3) adjusted for LIAC input collected during Workshop 3. This appendix includes the latest version (version 3) of the analysis shared with the LIAC.

NC Low Income Collaborative Analytics

Version 3 - December 2021

DUKE ENERGY®

DUKE ENERGY

TODAY'S GOAL

- Present updates and the output of the demographic data analysis performed on Duke Energy Carolinas and Duke Energy Progress (the "Companies") low-income customer accounts - analysis as defined in the NCUC order
- Answer questions about this analysis
- Share next steps for Sub-Team A to complete assessment of current affordability challenges

OVERALL GOAL

- Equip LIAC to **prepare an assessment** of current affordability challenges

  (using the data presented today as key input into assessment)

LANGUAGE FROM THE COMMISSION ORDER

Prepare an **assessment of current affordability challenges** facing residential customers. The assessment should:

- Provide an **analysis of demographics of residential customers**, including number of members per household, types of households (single family or multi-family), the age and racial makeup of households, household income data, and other data that would describe the types of residential customers the Company now serves. To the extent demographics vary significantly across the Company's service area, provide additional analysis of these demographic clusters.
- **Estimate the number of customers** who live in households with incomes at or less than 150% of the federal poverty guidelines (FPG), and those whose incomes are at or less than 200% of the FPG.
- For the different demographic groups identified as part of a. and b., provide an **analysis of patterns and trends** concerning energy usage, disconnections for nonpayment, payment delinquency histories, and account write-offs due to uncollectability.

Requested Information in Version 3:
(Information added post-Workshop III hosted on November 12, 2021)

- kWh per Square Foot by Arrearage Status to better show energy intensity
  - Slides 25, 35, 45 & 55
- Numbers and Percent of Customers in each Segment (income level, arrears status, DNPs)
  - Slides 28-30, 38-40, 48-50, 58-60
- Notes
  - Totals may not add up perfectly due to unknown data (~2%) which is not included
  - Due to data privacy, segments under 100 customers have been removed; totals reflect data shown

Scope of Analysis

Included in Analytics

Per North Carolina Utilities Commission Order:

- Insights into customers under 150% and 200% federal poverty level (FPL)
- Demographics/housing including dwelling type, heating source, renter/owner, racial makeup, age of account holder and number of people in the household
- Trends in delinquency, write-offs, disconnect non-pay (DNP) and energy usage

Per LIAC Members Request:

- AMI Load Shapes
- Additional Insights into Acxiom Data
- Tables including relative information
- More insight into energy intensity

Other:

- Low Income Energy Assistance Program and Crisis Intervention Program (LIEAP/CIP) recipients as their own segment

Not included in Analytics:

Per LIAC Request:

- Zip code/customer level data – Conversations on a Code of Conduct waiver are in progress
- EE Participation – Will be included in analysis of current programs
- Food deserts, health care deserts, etc. The Companies do not have the data nor expertise on these topics.
- Mobile/Manufactured Homes analysis – Lack of quality data
- Energy Burden analysis was not completed – Will be included in a future iteration

This Analysis Utilizes the Best Data Sources at Duke's Disposal Right Now

- Acxiom (3rd party provider for demographic information) has been verified as useful and reasonably accurate over large data sets, like the ones included in this presentation
  - Correlates with Census data and billing system
  - Correlates when compared with Duke employee checks on personal information (on subset of variables)
  - Primary use case is for marketing
- A great number of external data sources could theoretically be used for this analysis
  - To acquire individual customer-level data requires careful adherence to customer privacy laws and practices
  - Transferring, cleaning, verifying, and analyzing any new data sources on every North Carolina customer would take months
  - Duke Energy will continue to investigate additional data sources as necessary
- To supplement and validate research into low income, low resources customers, the Department of Health and Human Services and Duke Energy entered in a data share agreement permitting the Company to perform analysis on Duke Energy customers identified as Low Income Energy Assistance Program and Crisis Intervention Program recipients ("LIEAP/CIP").
- LIEAP & CIP programs are intended to help low-income families who need assistance during an energy crisis to ensure they have access to both heating and cooling services.
- The Companies were provided ~52k customers (active as of 2021)
  - LIEAP Qualifications: Less than 130% FPL and reserves at or below $2,250
  - CIP Qualifications: Less than 150% FPL and in an energy crisis

Acxiom Data Process

Collect information at a household level

Public data, buying activity, online registrations, magazine subscriptions, survey data, warranty information, etc.

Model missing data

Uses other known variables of customers and information at the zip+4 and zip level using their proprietary model

Race: surname, language preference, geography, country of origin, etc.

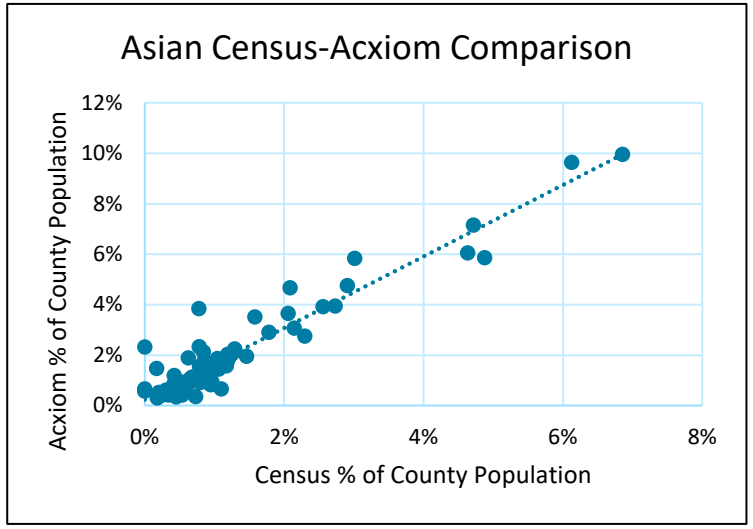
Income: age, occupation, home ownership, and median income for the local area

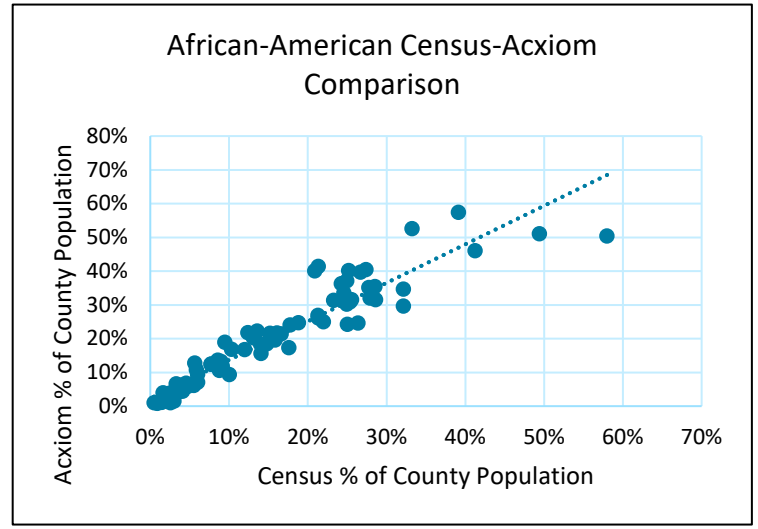
Optimize to resemble US Census norms at the highest accuracy rate possible

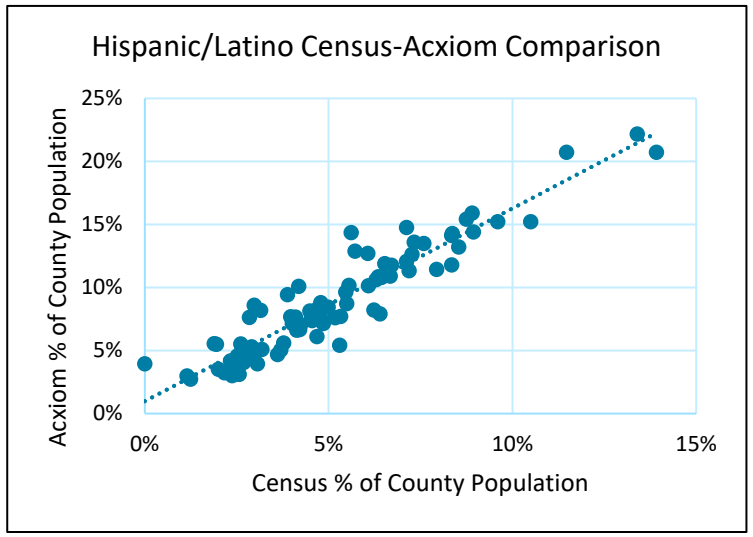
Balancing happens at a state level for most variables

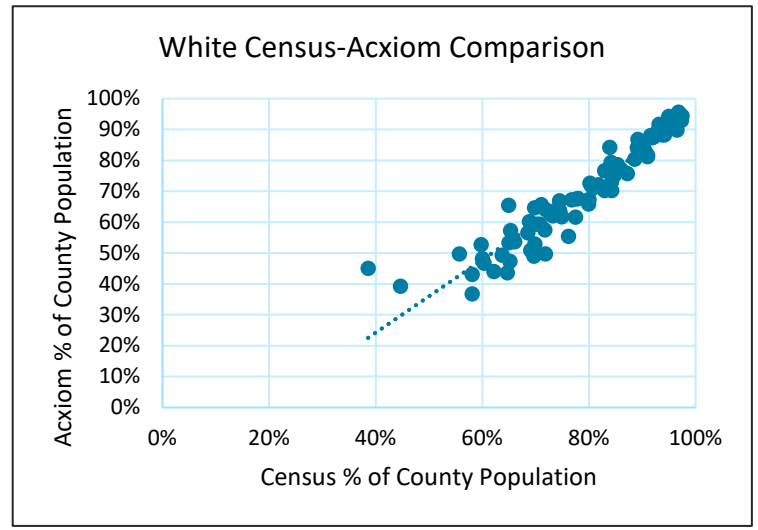
Census-Acxiom Race Count Comparisons

- Acxiom and Census results are similar when comparing counties by the racial makeups
- Acxiom slightly overestimates Hispanic/Latino, African-American, and Asian populations compared to the Census, while underestimating White population
- Acxiom data is at the Duke account level, which could explain the slight disparities
  - This count only includes one adult per household
  - This would not include households not served by Duke Energy









Hispanic/Latino were consolidated in the Census and Acxiom

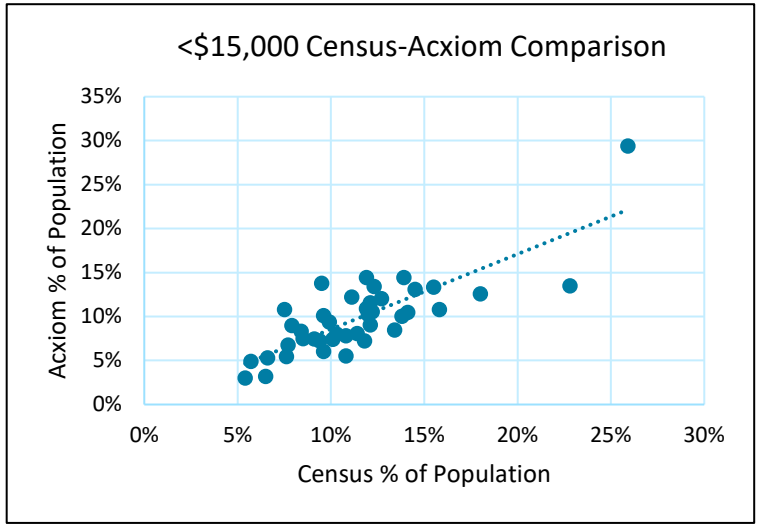
Census-Acxiom FPL Comparisons

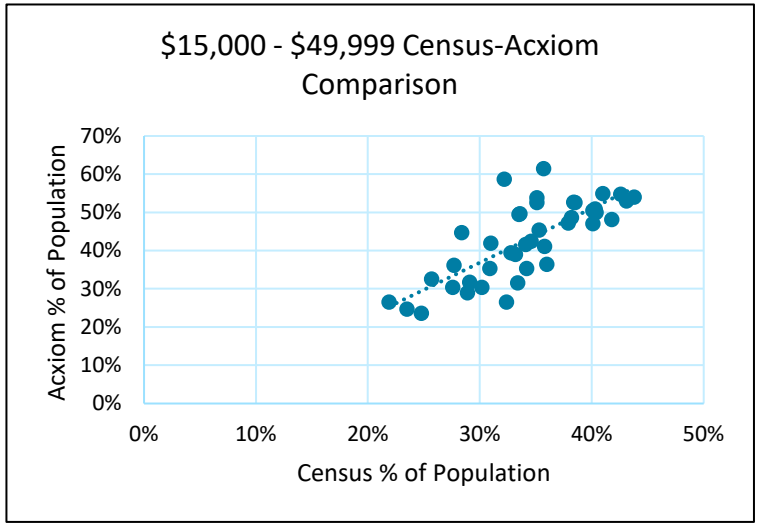
- Acxiom and Census results are similar when comparing counties by the income levels
- Acxiom slightly overestimates lower incomes compared to the Census, while underestimating higher incomes

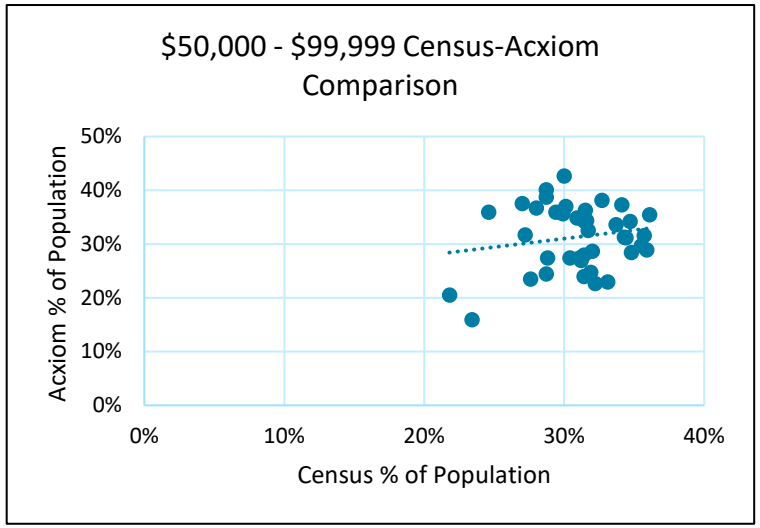
Acxiom Modeling Results

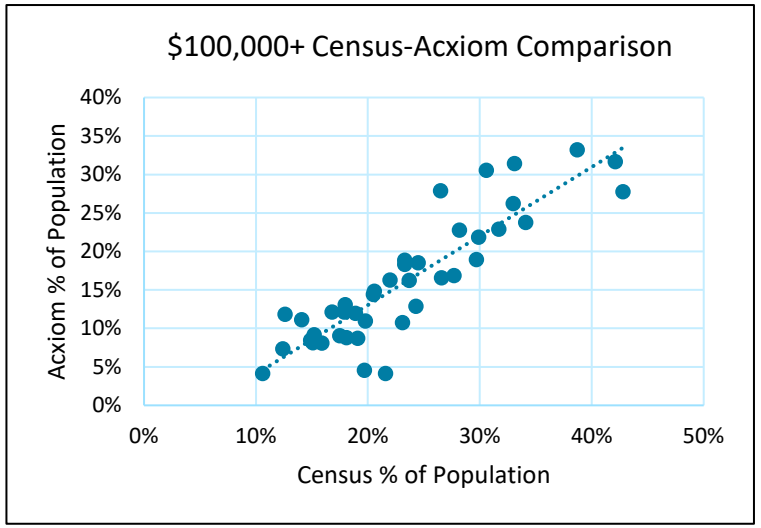
Data Source	<150%	150% to 200%	>200%
Household/ Household Inferred	88.0%	88.0%	94.5%
Zipcode+4	10.4%	8.0%	3.8%
Zip code	1.6%	4.0%	1.7%

Includes Income & number of people in household









Overview of Data Analysis Conducted

Assessing Customer Demographics: By Income Level

- The Federal Poverty Level ("FPL") is a measure of income **per household member**
- *Relationship of Household Income to FPL* is a common way to classify by income
- Shortfalls of using this metric:
  - Indicator lags up to a year
  - Does not capture recent changes to status (e.g., job loss, family catastrophe, etc.)
  - Does not account for those with high access to economic resources (i.e., wealthy with low or no reportable income)

150% of Federal Poverty Level

Household Size	Maximum Countable Annual Income
1	$19,320
2	$26,130
3	$32,940
4	$39,750
5	$46,560
6	$53,370
7	$60,180
8	$66,990

Assessing Customer Demographics: By Arrears

Arrears: Money that is past due

Intended to supplement, not replace, other measures of struggling customers

Intended for analytical purposes

1. **Direct measure** of how much customers are struggling to pay their bills
2. Should identify low economic resource customers that could be **struggling for many reasons**, not only low-income
3. **High quality data source**, updated monthly

Assessing Customer Demographics: Income Level + Account Status

- Requires 3rd party survey data (impacting data accuracy)
- Requires 3rd party verification for program eligibility use
- Not a good indicator of access to economic resources

Income (FPL)

- ✓ Industry Standard Metric
- ✓ Despite drawbacks is believed to be a good metric

- Does not reflect level of high energy burden
- Does not alone capture low-income population

Payment Status (Arrears)

- ✓ Analyzes customers struggling to keep the lights on
- ✓ Readily accessible, high-quality data

OUR APPROACH:
Combining Income + Payment Status

- **Good data:** accessible, higher-quality
- **Good for targeting:** identifies those struggling with energy affordability; identifies those with high energy burdens

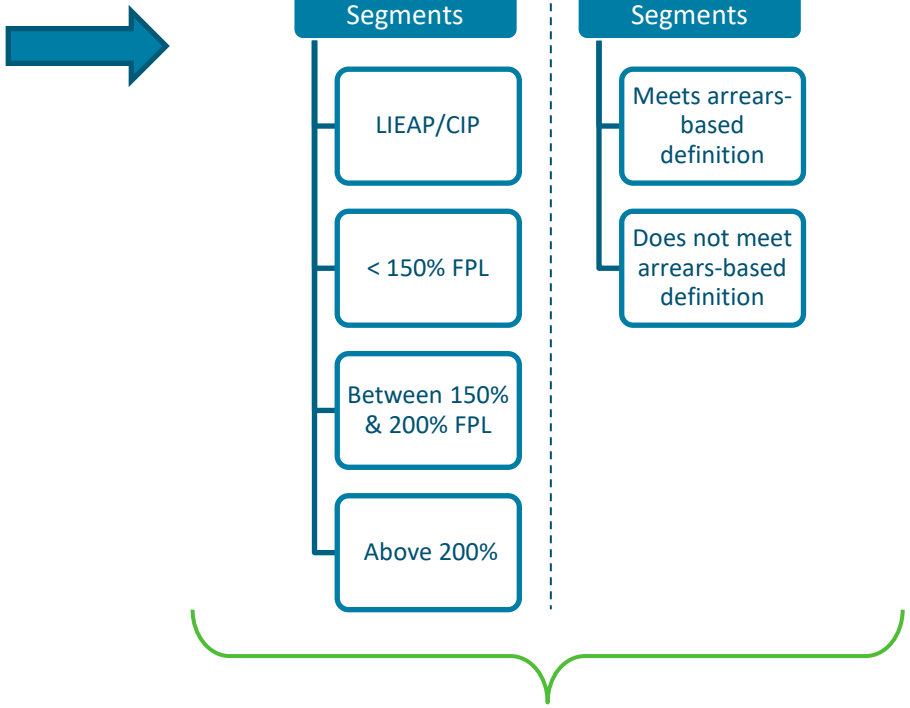
Analysis Approach

Third Party Data

- Demographics (income range, number of people in household, etc.)
- Housing Data (housing type, square footage, owner/renter, etc.)
- Duke Energy choice of demographic data, updated quarterly
- Uses aggregated public data on individuals or zip code averages
- Directionally valid, not to be used for eligibility
- LIEAP/CIP data quality believe to be excellent*

**LIEAP/CIP data is from 2021, after the study time period*

DATASET:
North Carolina (DEC & DEP)
Pre-Covid data (3/2019-2/2020):
2.37 million residential accounts
Customers who were active for the full time period



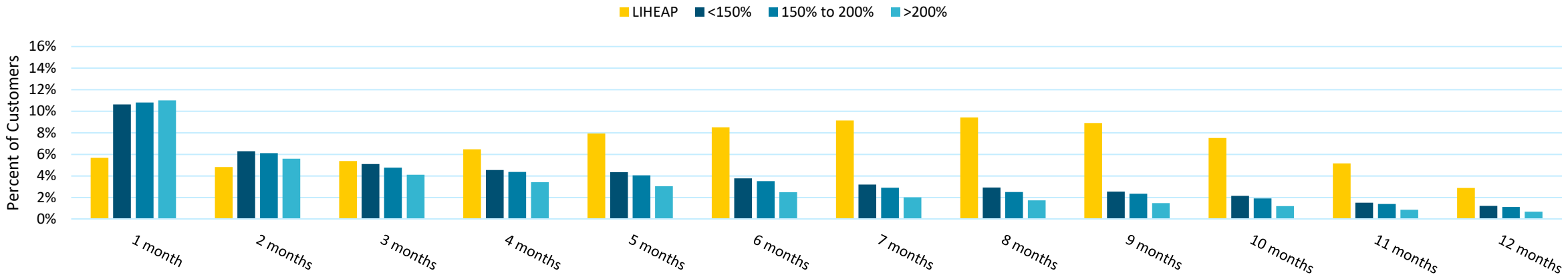
Company Billing Data

- Billing and charges data (charges, past due amounts, disconnects)
- Customer Data (location, heating type, age, etc.)
- High quality, updated monthly, unique to the Companies data source

By considering income and arrearage status the Companies can better identify customers who may truly be struggling to afford their energy bills

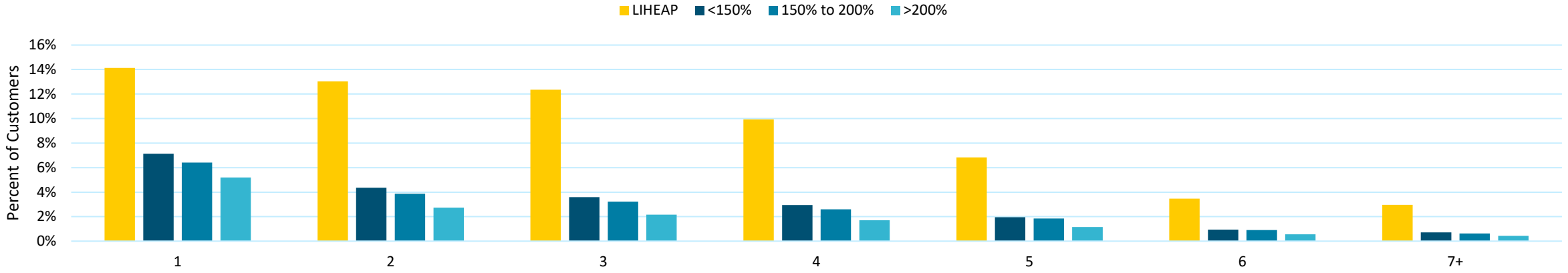
Trends in Arrears

Months Spent with Past Due Amount 1x Average Bill



*Numbers are mutually exclusive

Months Spent with Past Due Amount 2x Average Bill



*Numbers are mutually exclusive

Drawing the Line for Defining which Customers are Struggling with Arrears

EXPECTATIONS (HYPOTHESIS):

- LIEAP/CIP recipients are much more likely to struggle to stay current on their bill – must have low financial reserves or be in an energy crisis in addition to being low-income
- Not all struggling/vulnerable/low-income customers will struggle with arrears (as some simply prioritize electricity bill over other expenses and others receive assistance)
- Some customers above 200% FPL struggle to pay their bill
- Some customers will miss payments for non-financial reasons

Evaluated metrics to arrive a definition of customers struggling with arrears:

- High % of customers below 200% FPL
- High % of LIEAP/CIP recipients
- Low % of Customers above 200% FPL
- Reasonable total % of the population

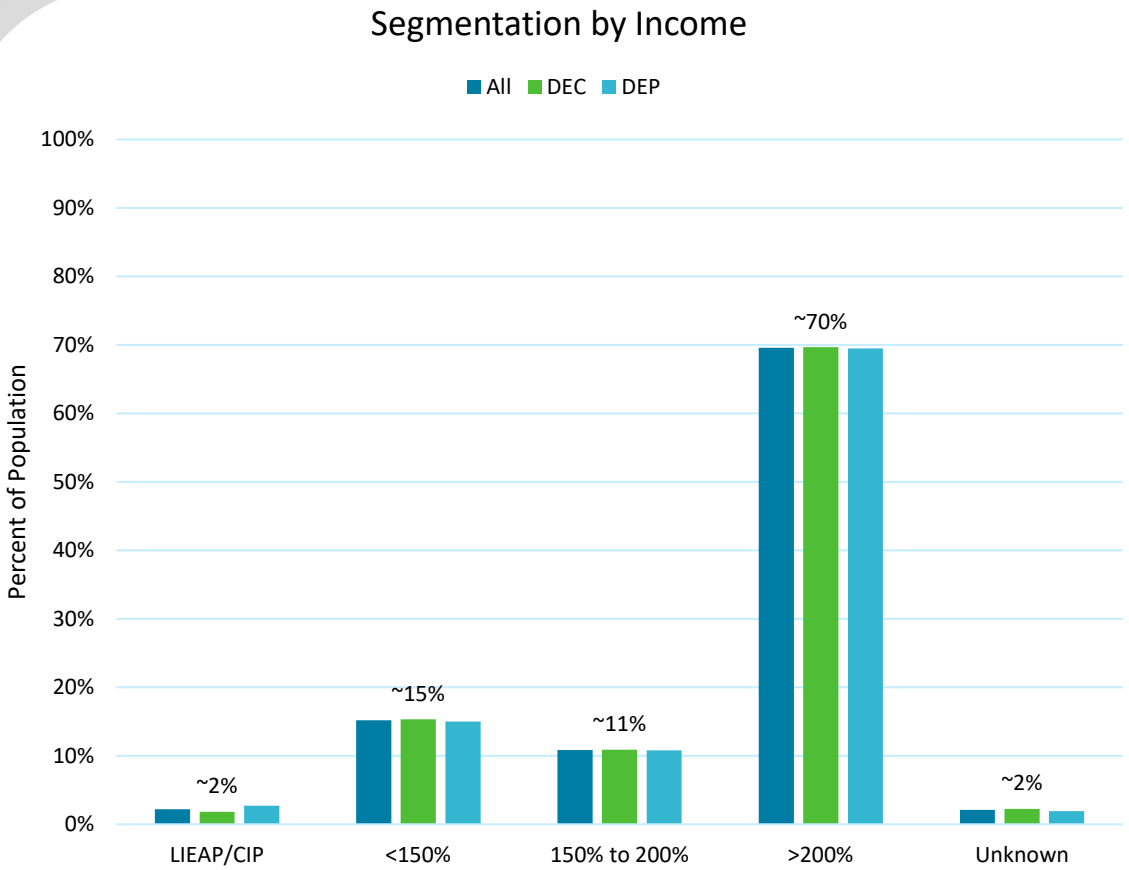
	% of Customer that meet Arrears Definition				
Arrears Segmentation for Analytics	**Customers LIEAP/CIP**	**Customers < 150% FPL**	**Customers 150-200% FPL**	**Customers >200% FPL**	**Total Customer Population**
2 Months spent at 2x average bill overdue OR 6 Months spent at 1x average bill overdue	57%	21%	18%	13%	15%

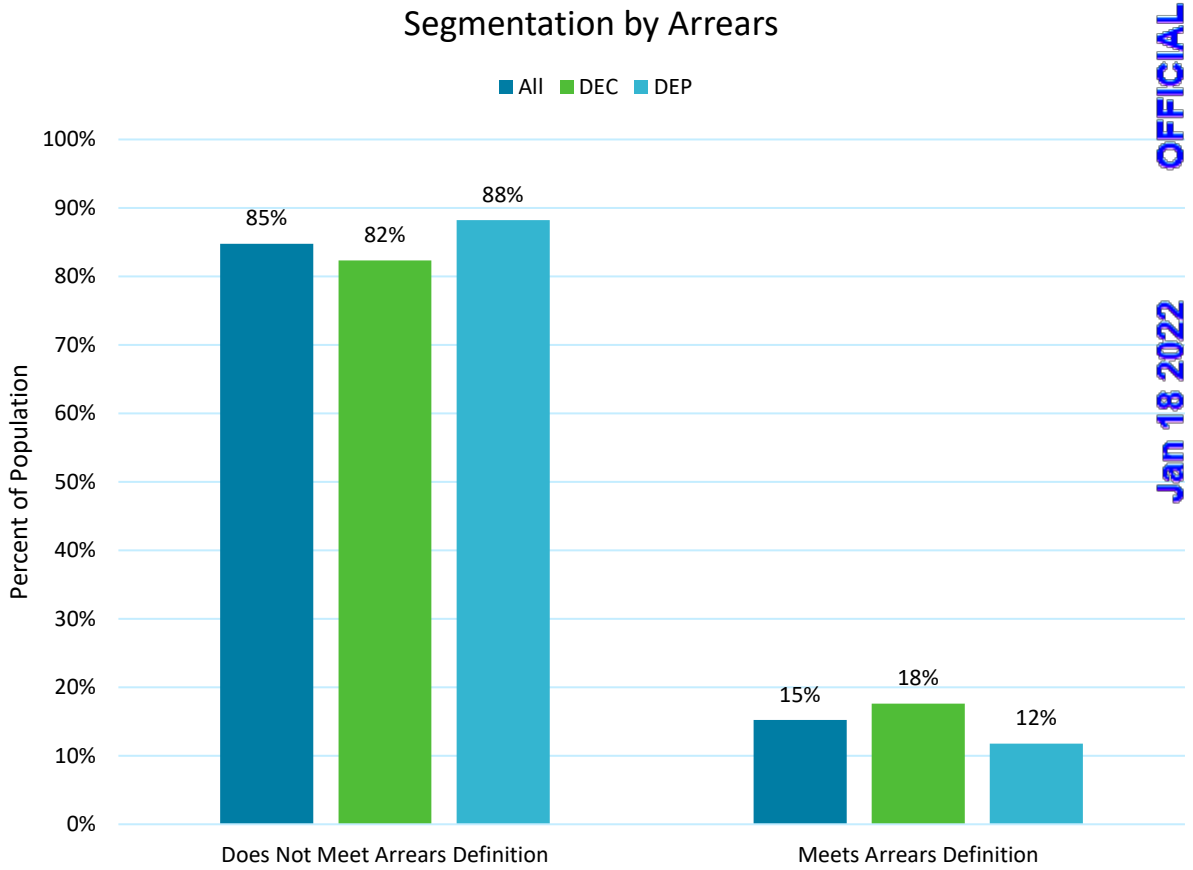
Definition not used to define affordability or eligibility for different programs

Analysis of NC Customers

**As we look at sub-categories of customers, we had to remove some data due to privacy and accuracy concerns. This will be represented by grey bars in the graphs.*

Segmenting by Income and Arrears in North Carolina

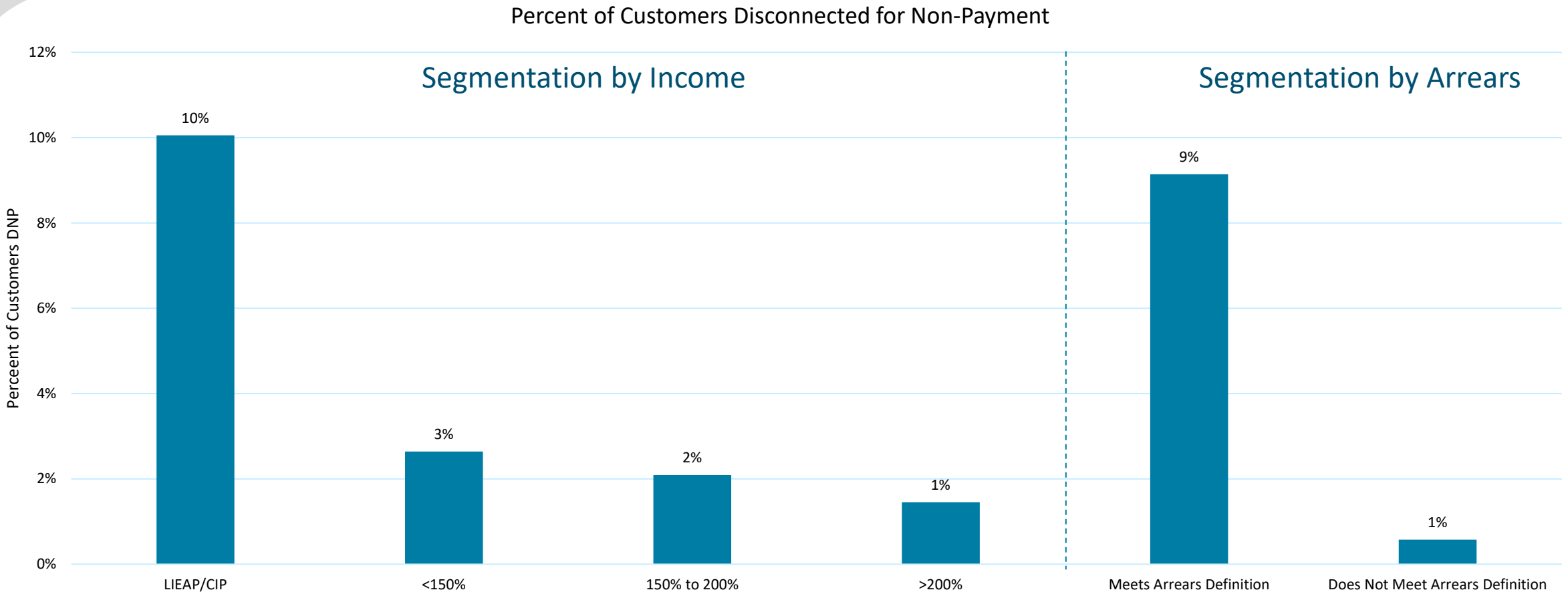




Recovered additional historic Acxiom data from this time period to decrease the amount of Unknown from version 1

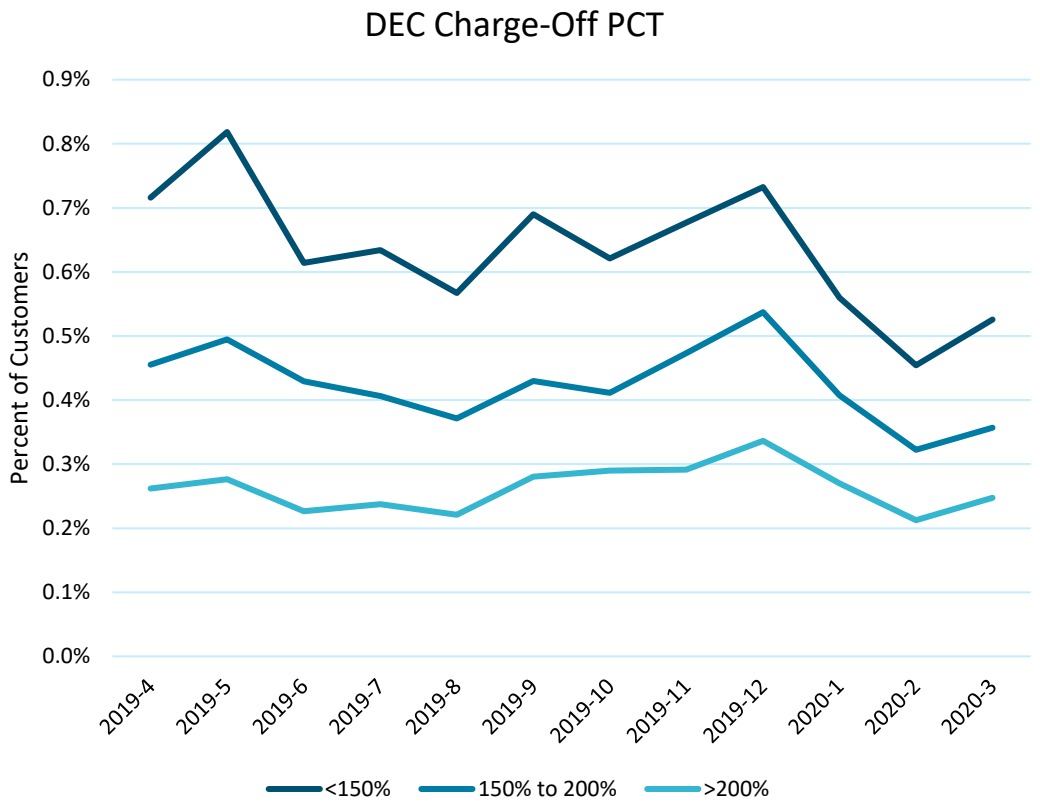
- Some customers did not have income information in the third-party data
- No major differences between DEC and DEP customers

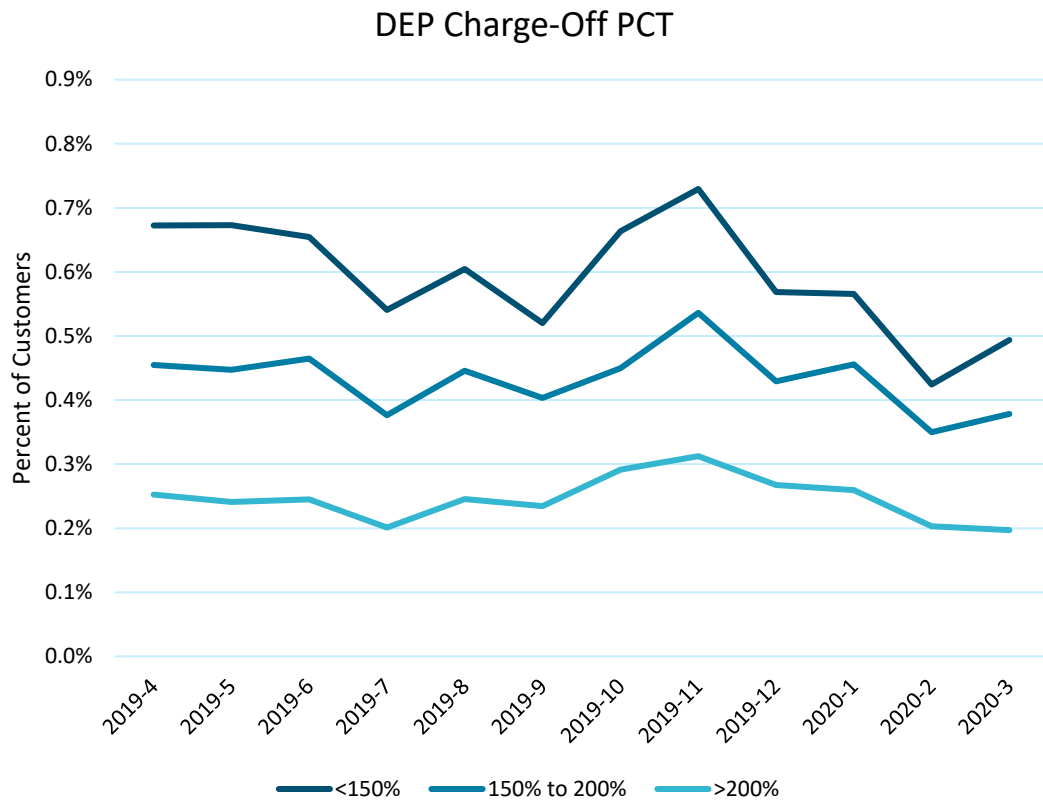
DNPs by Income & Arrearage Definition



- We see a higher percentage of LIEAP/CIP customers and customers who meet the Companies' arrears definition disconnected for non-pay (DNP)
- Similar percent of population for LIEAP/CIP (2% of population) and customers that meet arrears definition (15% of population)
- Helps validate that the included FPL data is directionally correct and arrears definition is capturing struggling customers

Charge-Offs



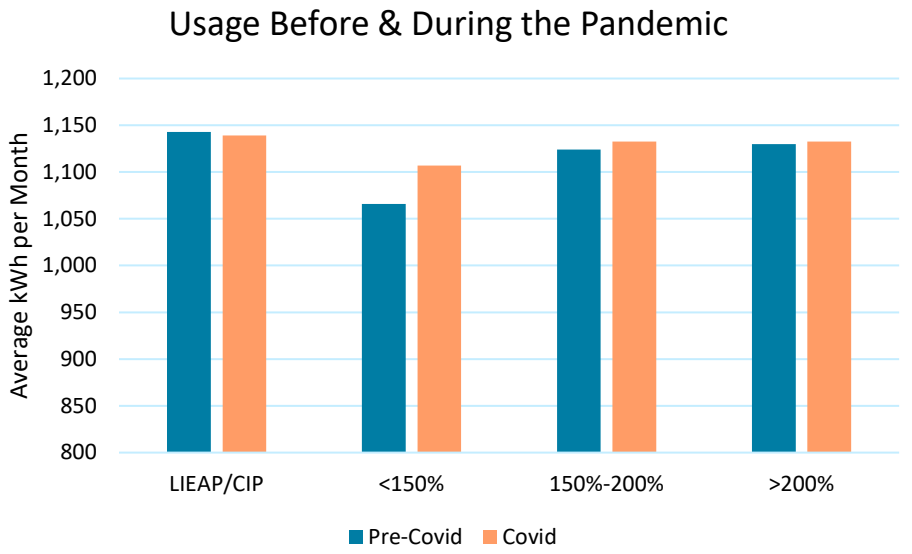


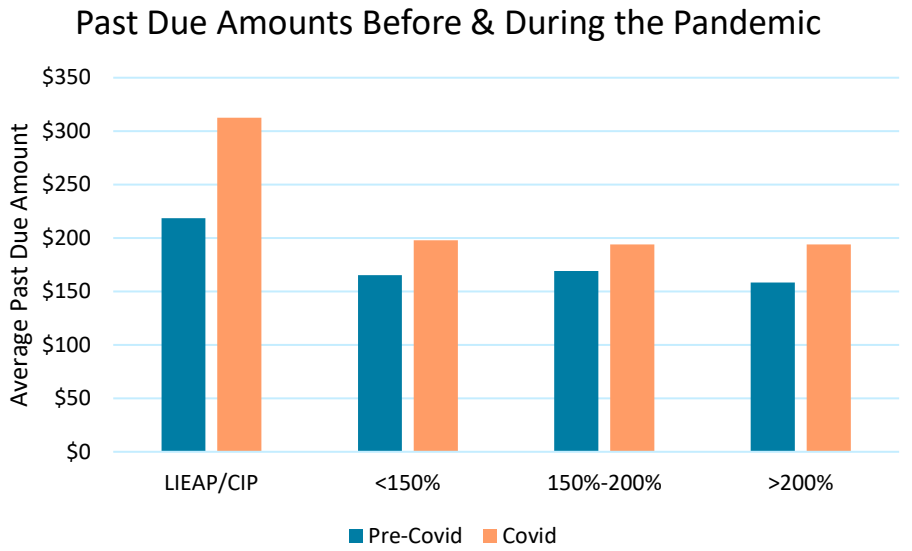
# of customers charged off in that month / (# of active customers in that month + customers charged off)

- Charge-off is for customers who closed their account but still owed money and ended up in collection
- This population is on customers who closed their account during this time period, while the rest of the analysis is based on a population that was active the entire time period
- Charge-off customers were all closed by March 1, 2020, and the LIEAP/CIP list is from 2021

Data Shows Limited Impact of the Pandemic on Key Metrics

- Usage did not meaningfully change for residential customers
  - Affected by weather in addition to changes in customers' consumption habits
  - Consistent with Load Research data and similar to other Southeast utilities
- Past due amounts (i.e., arrears) grew significantly for LIEAP/CIP customers and slightly for customers with incomes less than 200% FPL
  - The disconnection moratorium likely affected payment behaviors for some customers





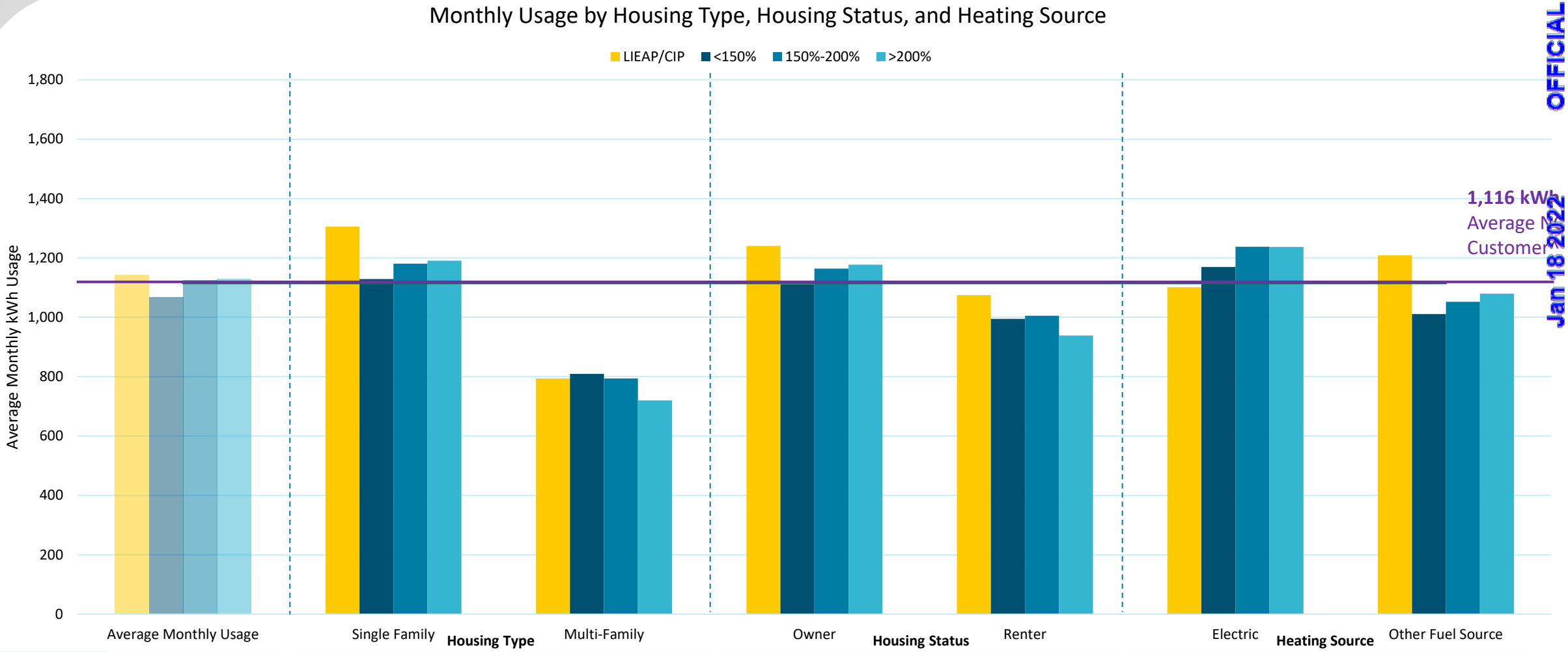
Analysis by Housing Type, Housing Status, and Heating Source

Housing Type: Single Family or Multi-Family

Housing Status: Owner or Renter

Heating Source: Electric or Other Fuel Source

Average Monthly Usage by Income for Housing Type, Housing Status, and Heating Source

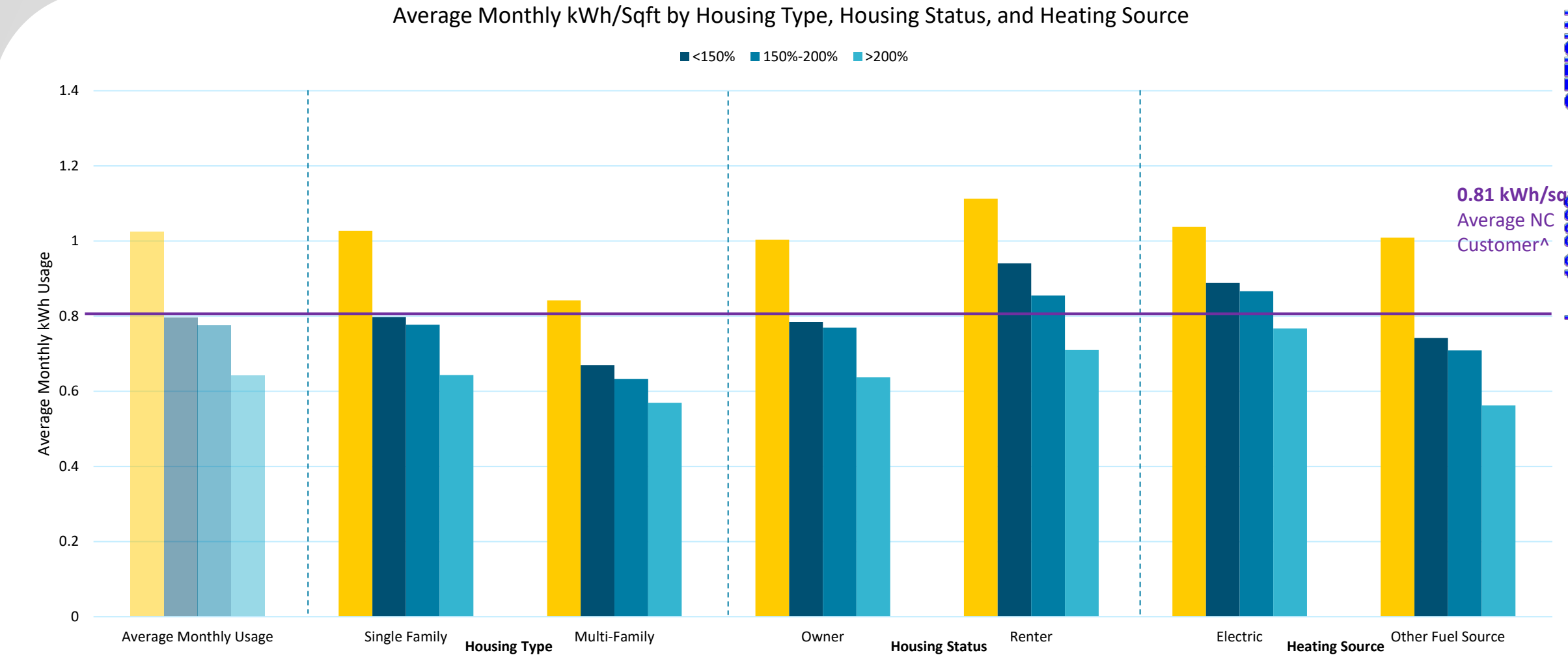


% Total Customers in Category*	98%	82%	12%	74%	24%	37%	46%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square foot by Income for Housing Type, Housing Status and Heating Source

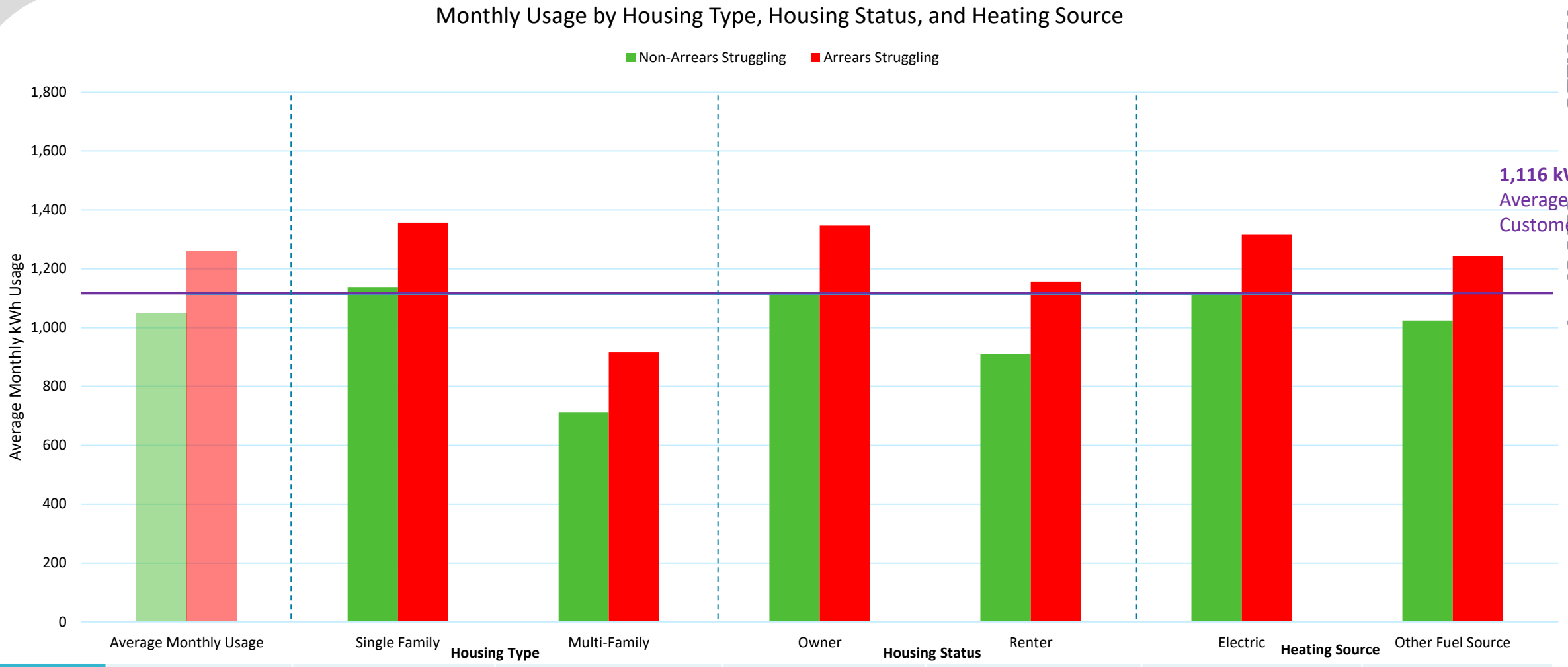


% Total Customers in Category*	98%	82%	12%	74%	24%	37%	46%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage by Arrearage Status for Housing Type, Housing Statue, and Heating Source

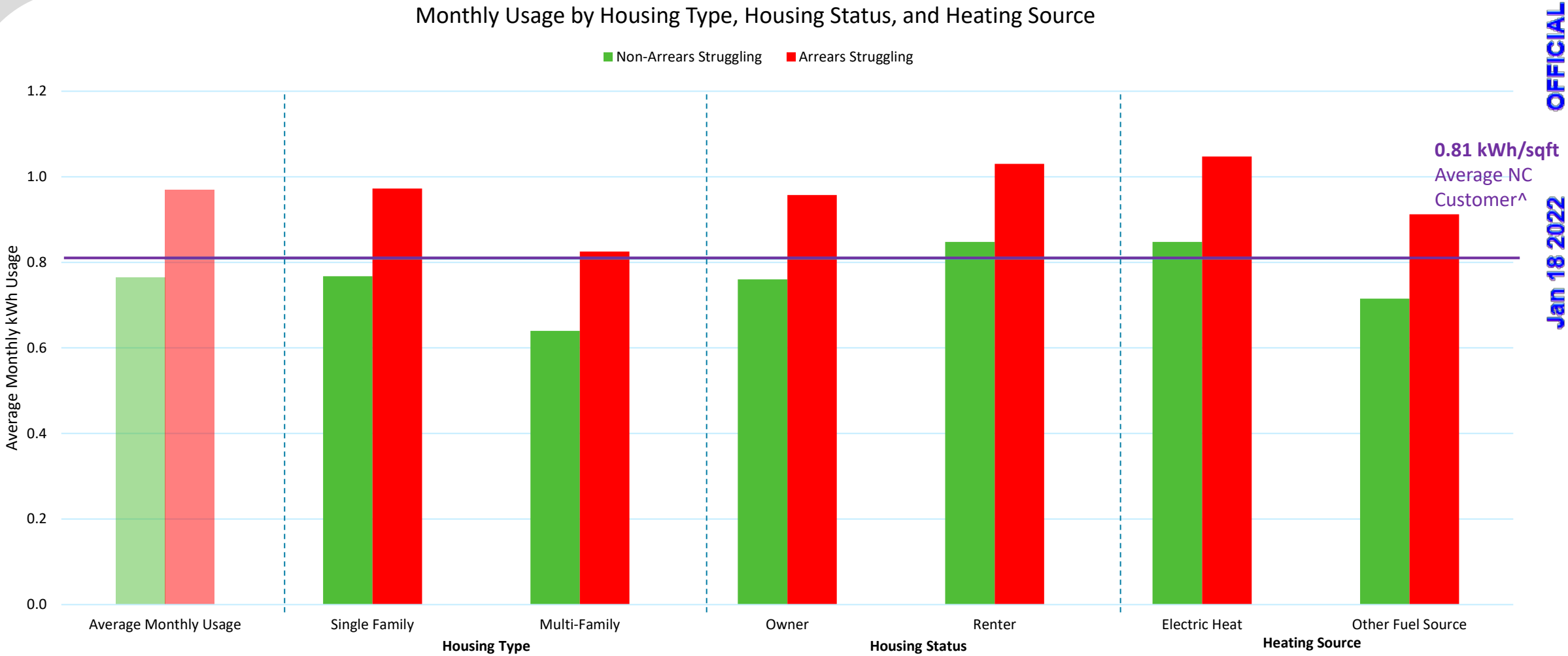


% Total Customers in Category*	100%	82%	12%	74%	24%	37%	46%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square Foot by Arrearage Status for Housing Type, Housing Statue, and Heating Source

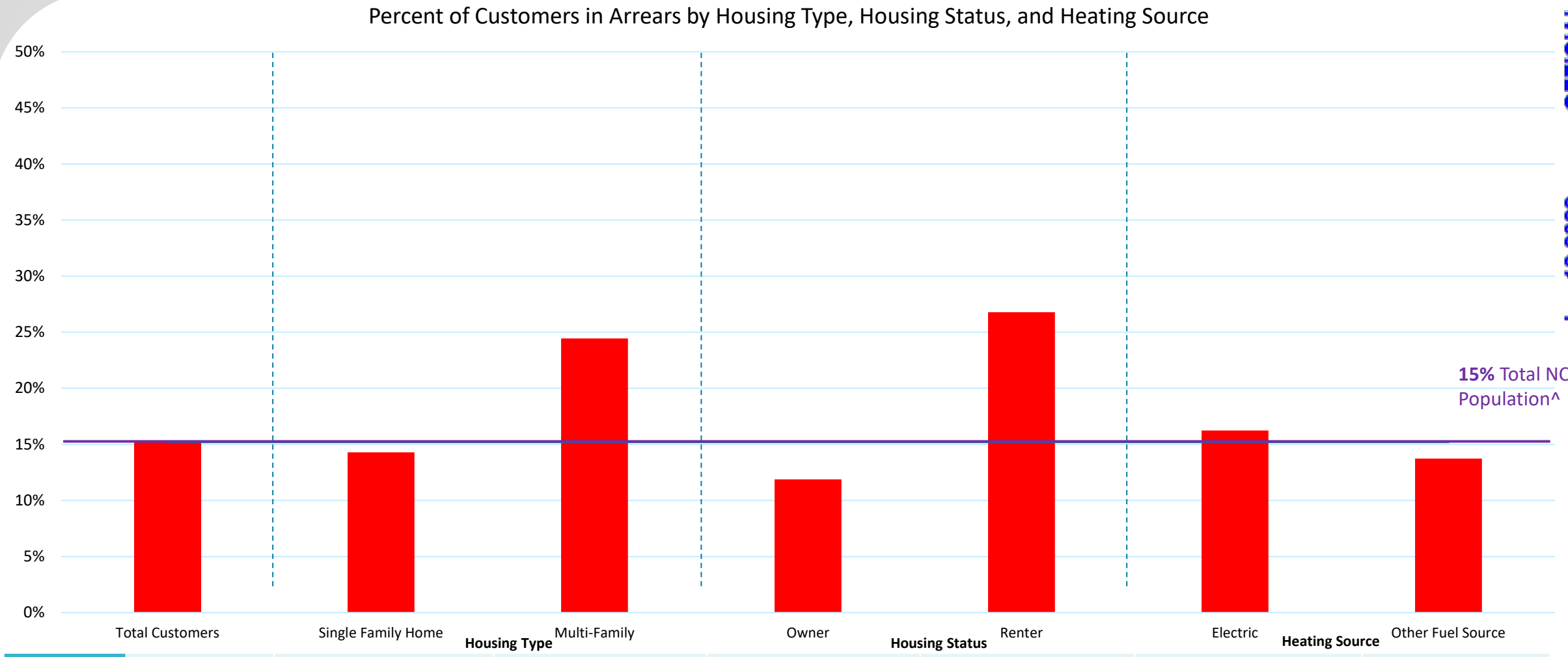


% Total Customers in Category*	100%	82%	12%	74%	24%	37%	46%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Percent of Customers in Arrears for Housing Type, Housing Statue, and Heating Source

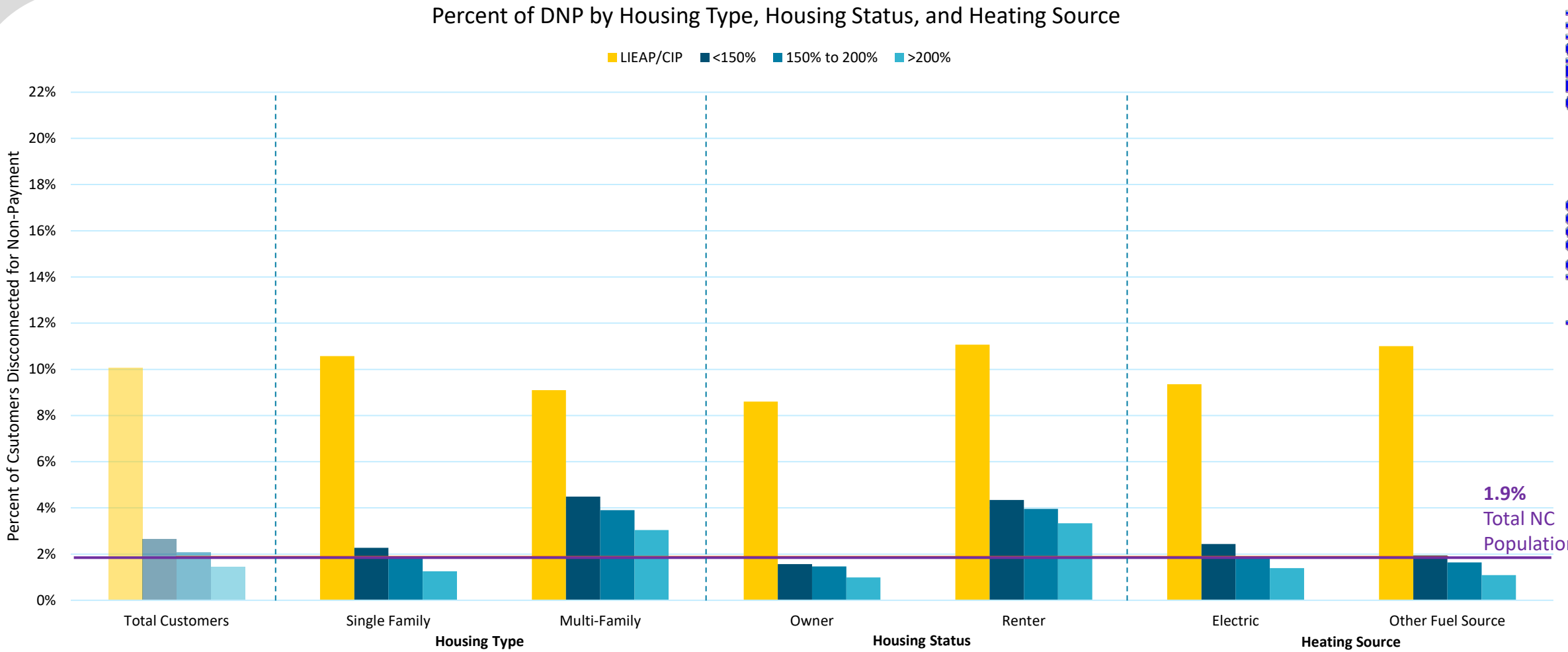


	Total Customers	Housing Type		Housing Status		Heating Source	
		Single Family Home	Multi-Family	Owner	Renter	Electric	Other Fuel Source
% Total Customers in Category*	100%	82%	12%	74%	24%	37%	46%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Percent of DNP by Income for Housing Type, Housing Status, and Heating Source



% Total Customers in Category*	98%	82%	12%	74%	24%	37%	46%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%
^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Income Level

Total Numbers	Total Customers	Single Family	Multi-Family	Owner	Renter	Electric Heat	Other Fuel Source
LIEAP/CIP	52,028	34,084	16,149	21,179	30,802	31,290	18,982
<150% FPL	360,934	276,514	62,450	220,982	139,952	137,682	161,184
150%-200% FPL	258,004	216,235	27,495	193,380	64,624	104,286	115,486
>200%	165,2317	1,422,799	180,336	1,326,020	326,297	608,292	787,181
Total	2,323,283	1,949,632	286,430	1,761,561	561,675	881,550	1,082,833

Percent of Customers in each Segment	Total Customers	Single Family	Multi-Family	Owner	Renter	Electric Heat	Other Fuel Source
LIEAP/CIP	2%	1.5%	0.7%	0.9%	1.3%	1.3%	0.8%
<150% FPL	16%	11.9%	2.7%	9.5%	6.0%	5.9%	6.9%
150%-200% FPL	11%	9.3%	1.2%	8.3%	2.8%	4.5%	5.0%
>200%	71%	61.2%	7.8%	57.1%	14.0%	26.2%	33.9%

Arrearage Status Based on Arrears Definition

(See slide 15)

Total Numbers	Total Customers	Single Family	Multi-Family	Owner	Renter	Electric Heat	Other Fuel Source
Meets Arrears	361,453	278,887	70,022	209,102	150,435	143,288	148,651
Does not Meet Arrears	2,012,425	1,670,922	216,413	1,552,622	411,265	738,340	934,286

Percent of Customers in each Segment	Total Customers	Single Family	Multi-Family	Owner	Renter	Electric Heat	Other Fuel Source
Meets Arrears	15.2%	11.7%	2.9%	8.8%	6.3%	6.0%	6.3%
Does not Meet Arrears	84.8%	70.4%	9.1%	65.4%	17.3%	31.1%	39.4%

Total Numbers	Total Customers	Single Family	Multi-Family	Owner	Renter	Electric Heat	Other Fuel Source
LIEAP/CIP	5,231	3,605	1,469	1,822	3,408	2,928	2,088
<150% FPL	9,540	6,292	2,803	3,462	6,078	3,358	3,131
150%-200% FPL	5,390	4,046	1,074	2,835	2,555	1,980	1,890
>200%	23,981	17,804	5,485	13,089	10,891	8,472	8,610
Total	44,142	31,747	10,831	21,208	22,932	16,738	15,719

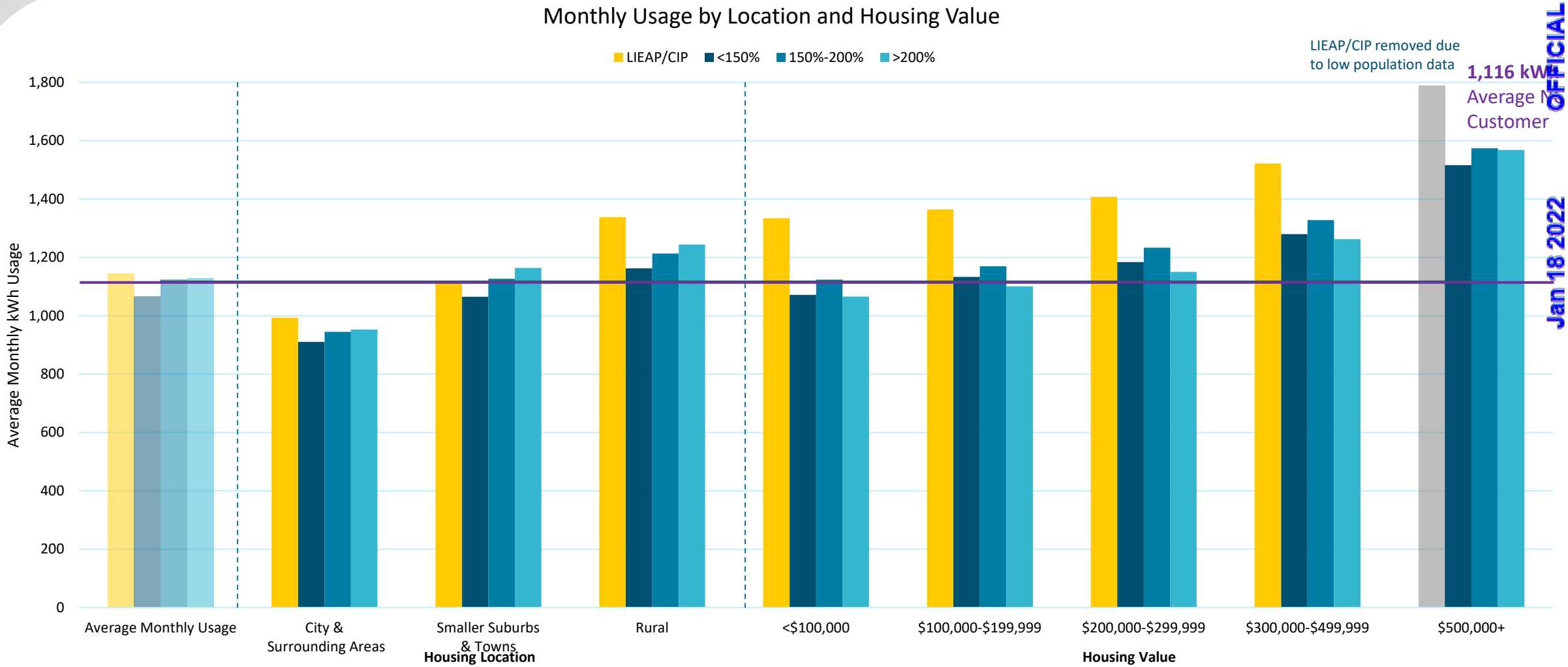
Percent of Customers in that Segment DNP (i.e., percent of Single Family customers DNP)	Total Customers	Single Family	Multi-Family	Owner	Renter	Electric Heat	Other Fuel Source
LIEAP/CIP	10.1%	10.6%	9.1%	8.6%	11.1%	9.4%	11.0%
<150% FPL	2.6%	2.3%	4.5%	1.6%	4.3%	2.4%	1.9%
150%-200% FPL	2.1%	1.9%	3.9%	1.5%	4.0%	1.9%	1.6%
>200%	1.5%	1.3%	3.0%	1.0%	3.3%	1.4%	1.1%

Analysis by Housing Location and Housing Value

Housing Location: City & Surrounding Area, Smaller Suburbs & Towns, Rural

Housing Value: <$100,000, $100,000-$199,999, $200,000-$299,999, $300,000-$499,999, $500,000+

Average Monthly Usage by Income for Location and Housing Value

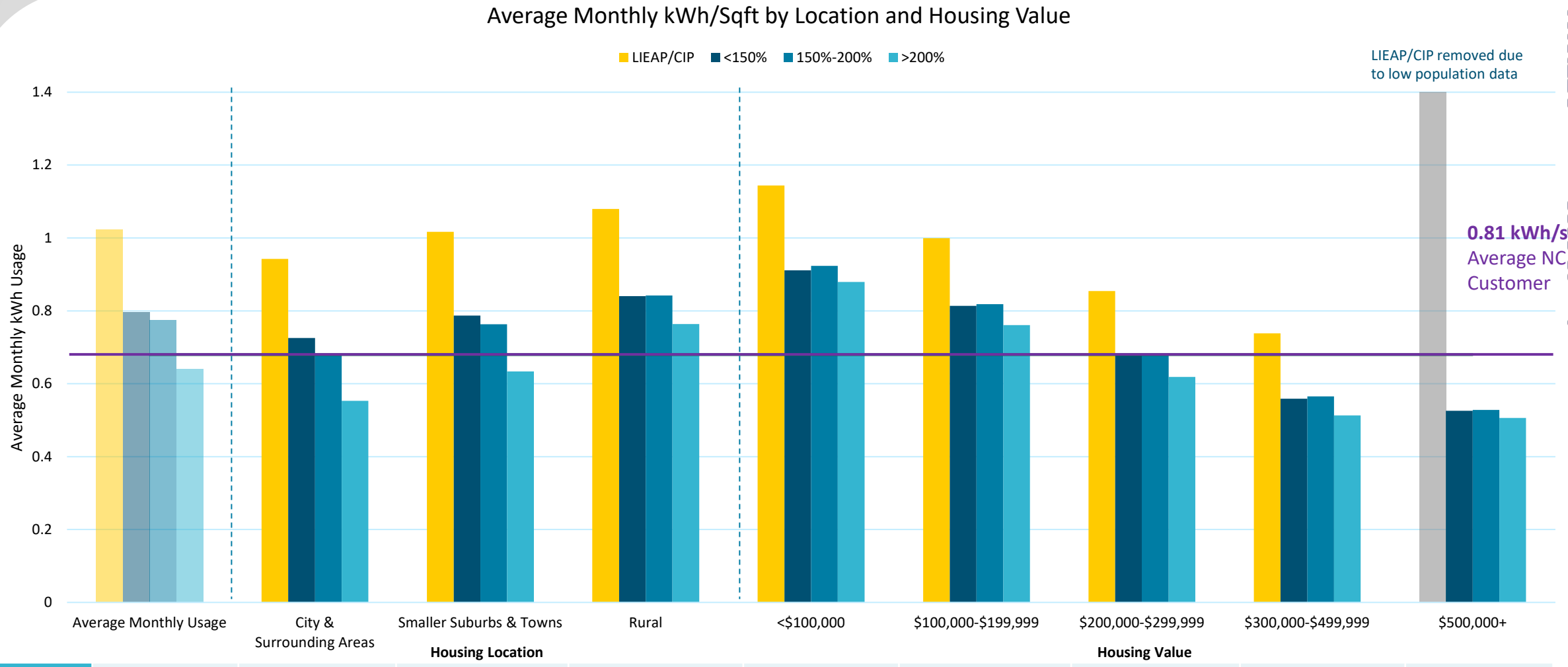


% Total Customers in Category*	98%	23%	49%	26%	7%	22%	16%	13%	5%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square foot by Income for Location and Housing Value

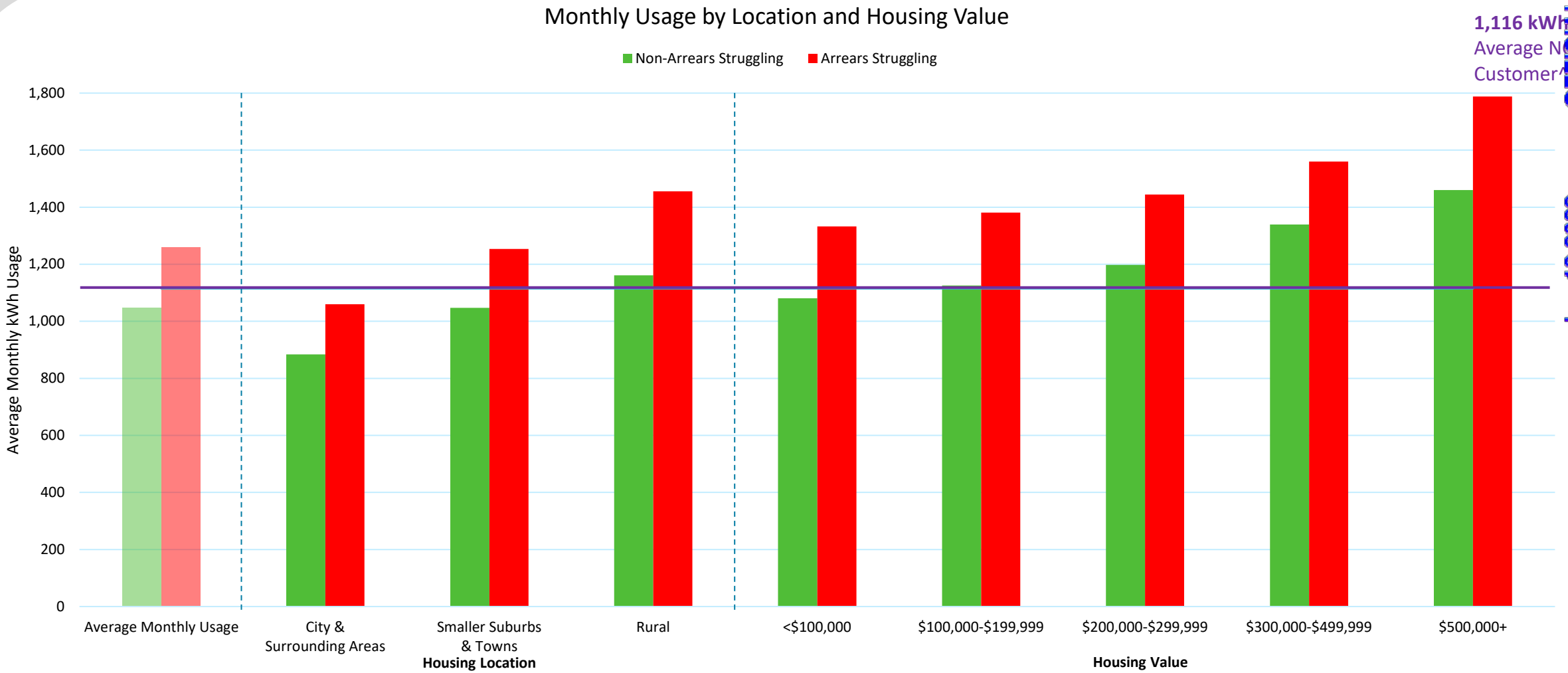


% Total Customers in Category*	98%	23%	49%	26%	7%	22%	16%	13%	5%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage by Arrearage Status for Location and Housing Value

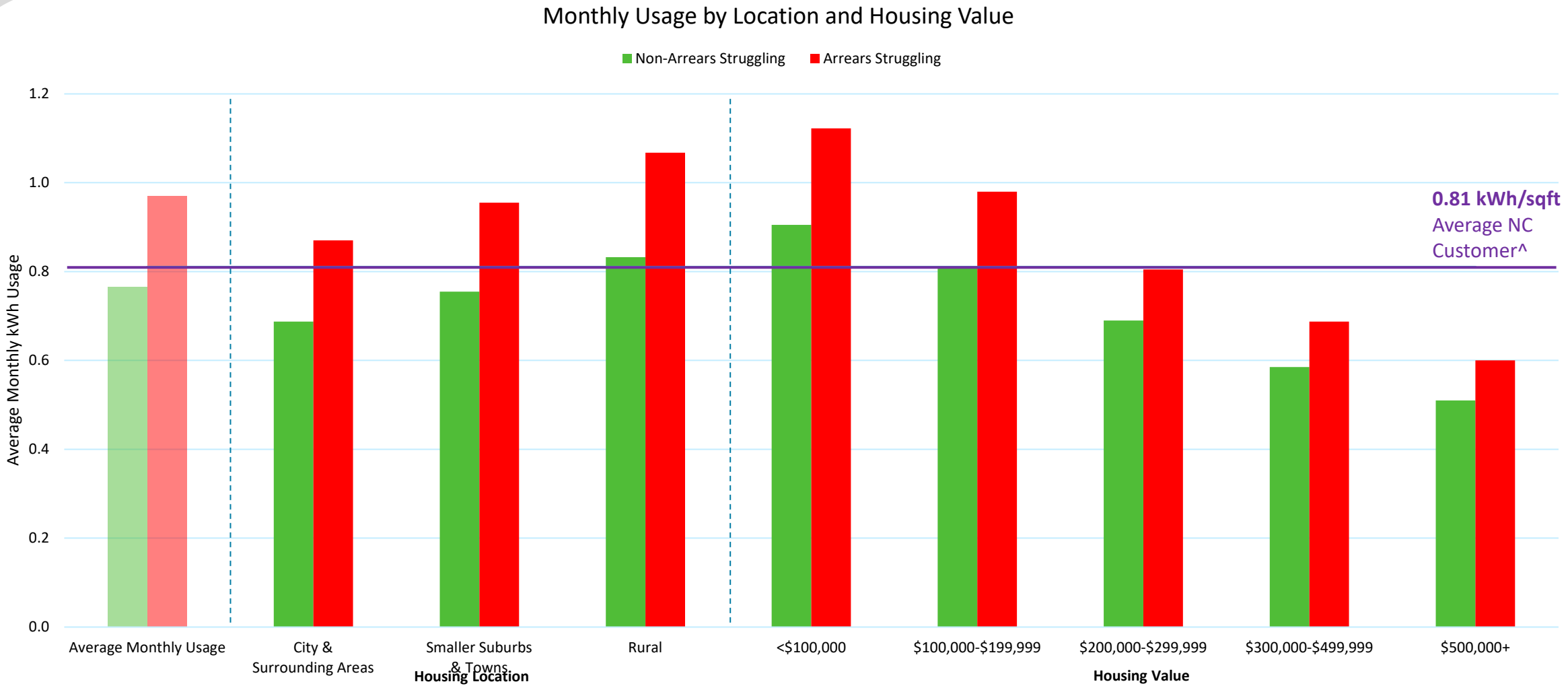


% Total Customers in Category*	100%	23%	49%	26%	7%	22%	16%	13%	5%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square Foot by Arrearage Status for Location and Housing Value

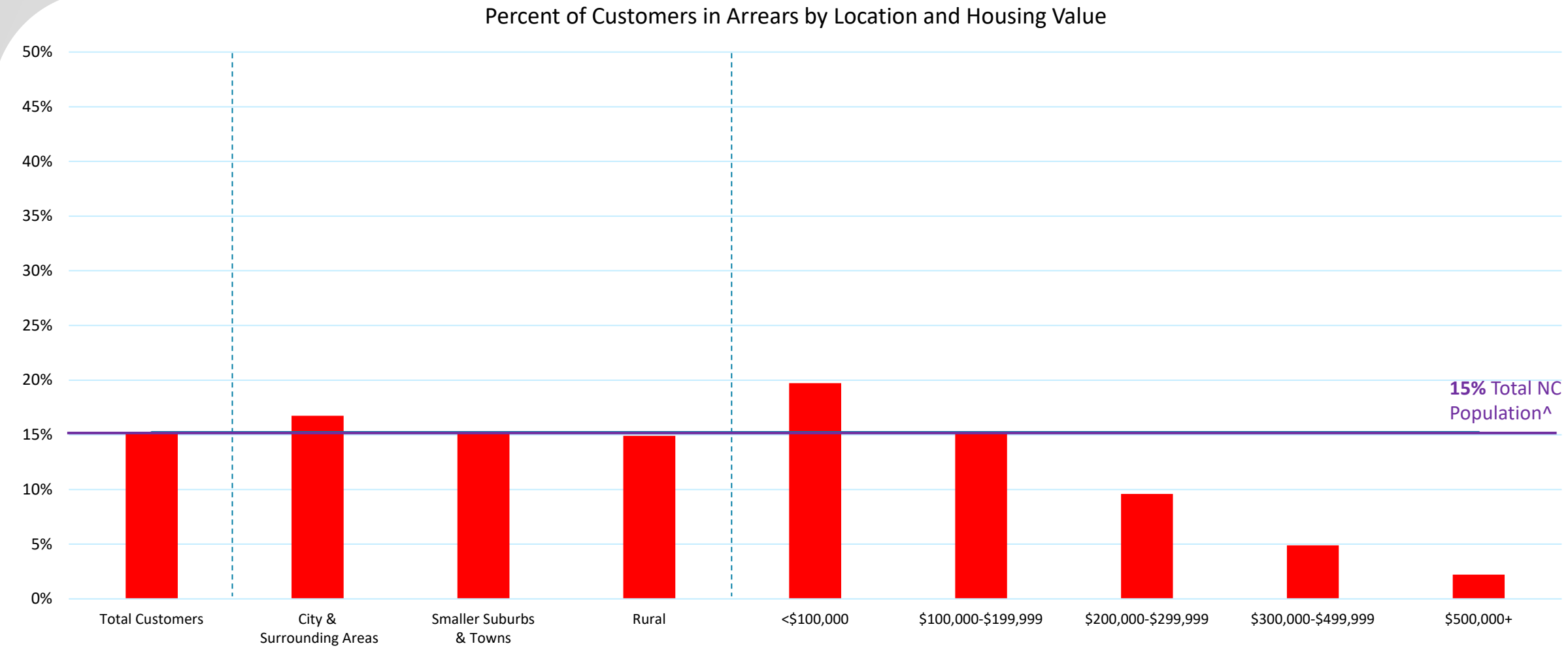


% Total Customers in Category*	100%	23%	49%	26%	7%	22%	16%	13%	5%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Percent of Customers in Arrears for Location and Housing Value

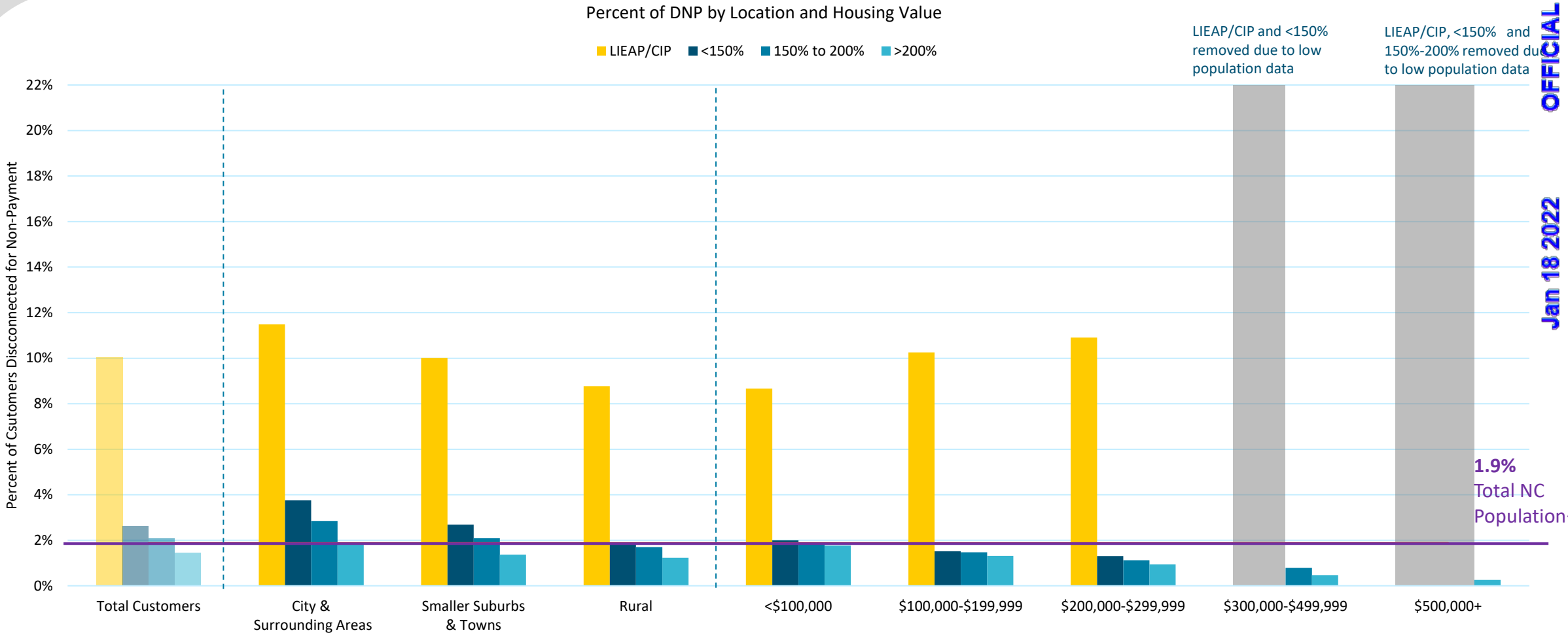


% Total Customers in Category*	100%	23%	49%	26%	7%	22%	16%	13%	5%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Percent of DNP by Income for Location and Housing Value



% Total Customers in Category*	98%	23%	49%	26%	7%	22%	16%	13%	5%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Income Level

Total Numbers	City & Surrounding Areas	Smaller Suburbs & Towns	Rural	<$100,000	$100,000-$199,999	$200,000-$299,999	$300,000-$499,999	$500,000+
LIEAP/CIP	13,516	24,509	13,956	4,444	5,971	1,605	338	--
<150% FPL	77,809	156,085	127,040	49,738	78,648	26,857	12,374	3,378
150%-200% FPL	47,412	119,386	91,206	29,197	73,774	31,747	16,075	3,922
>200%	409,457	864,479	378,381	79,640	375,294	316,415	275,851	118,813
Total	548,194	1,164,459	610,583	163,019	533,687	376,624	304,638	126,113

Percent of Customers in each Segment	City & Surrounding Areas	Smaller Suburbs & Towns	Rural	<$100,000	$100,000-$199,999	$200,000-$299,999	$300,000-$499,999	$500,000+
LIEAP/CIP	0.6%	1.1%	0.6%	0.2%	0.3%	0.1%	0.0%	-
<150% FPL	3.3%	6.7%	5.5%	2.1%	3.4%	1.2%	0.5%	0.1%
150%-200% FPL	2.0%	5.1%	3.9%	1.3%	3.2%	1.4%	0.7%	0.2%
>200%	17.6%	37.2%	16.3%	3.4%	16.2%	13.6%	11.9%	5.1%

Arrearage Status Based on Arrears Definition

(See slide 15)

Total Numbers	City & Surrounding Areas	Smaller Suburbs & Towns	Rural	<$100,000	$100,000-$199,999	$200,000-$299,999	$300,000-$499,999	$500,000+
Meets Arrears	91,820	176,706	91,011	32,161	80,544	36,110	14,944	2,786
Does not Meet Arrears	456,406	987,833	519,648	130,872	453,177	340,543	289,730	123,409

Percent of Customers in each Segment	City & Surrounding Areas	Smaller Suburbs & Towns	Rural	<$100,000	$100,000-$199,999	$200,000-$299,999	$300,000-$499,999	$500,000+
Meets Arrears	3.9%	7.4%	3.8%	1.4%	3.4%	1.5%	0.6%	0.1%
Does not Meet Arrears	19.2%	41.6%	21.9%	5.5%	19.1%	14.3%	12.2%	5.2%

Total Numbers	City & Surrounding Areas	Smaller Suburbs & Towns	Rural	<$100,000	$100,000-$199,999	$200,000-$299,999	$300,000-$499,999	$500,000+
LIEAP/CIP	1,552	2,454	1,224	385	612	175	-	-
<150% FPL	2,920	4,195	2,425	993	1,196	351	-	-
150%-200% FPL	1,347	2,492	1,551	558	1,086	358	128	-
>200%	7,408	11,887	4,685	1,407	4,947	2,968	1,287	306
Total	13,227	21,028	9,885	3,343	7,841	3,852	1,415	306

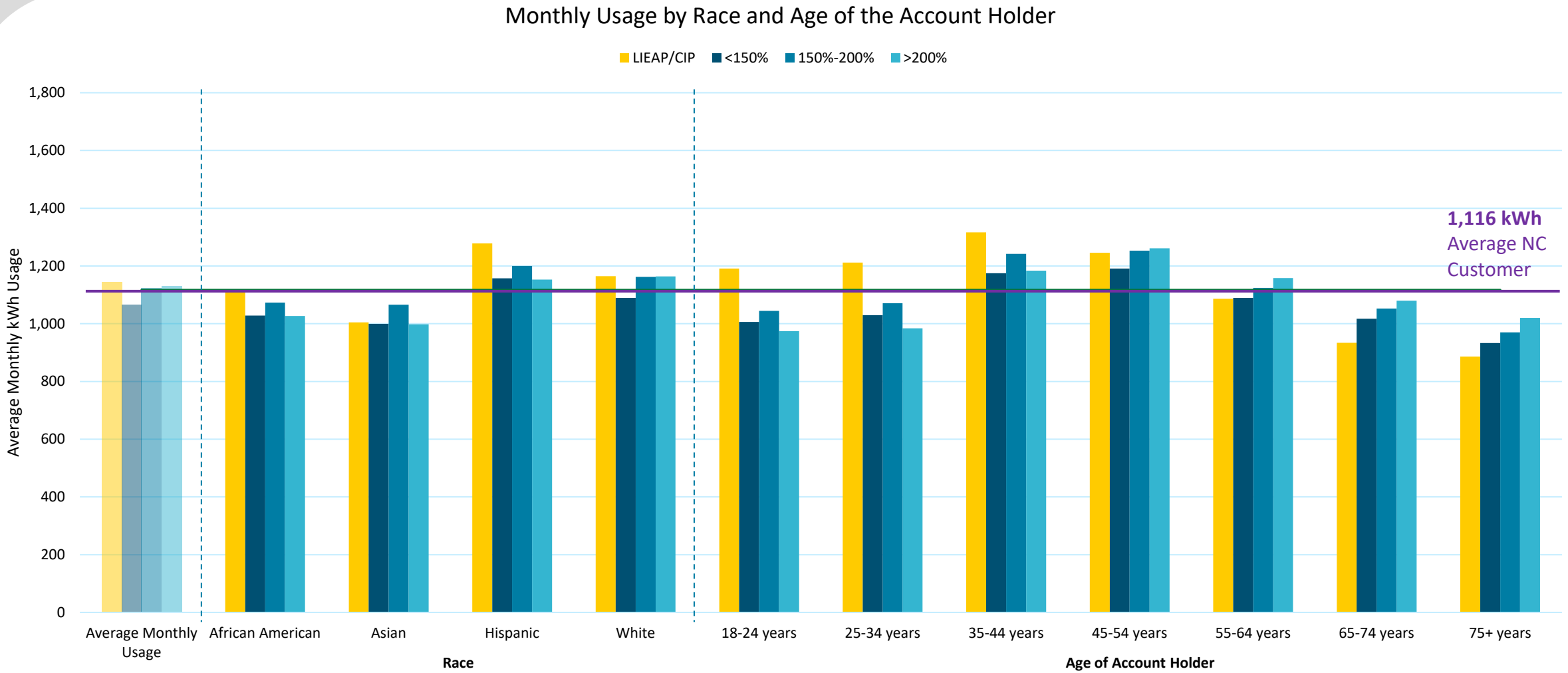
Percent of Customers in that Segment DNP (i.e., percent of <$100,000 customers DNP)	City & Surrounding Areas	Smaller Suburbs & Towns	Rural	<$100,000	$100,000-$199,999	$200,000-$299,999	$300,000-$499,999	$500,000+
LIEAP/CIP	11.5%	10.0%	8.8%	8.7%	10.2%	10.9%	-	-
<150% FPL	3.8%	2.7%	1.9%	2.0%	1.5%	1.3%	-	-
150%-200% FPL	2.8%	2.1%	1.7%	1.9%	1.5%	1.1%	0.8%	-
>200%	1.8%	1.4%	1.2%	1.8%	1.3%	0.9%	0.5%	0.3%

Analysis by Race and Age of the Account Holder

Race: African American, Asian, Hispanic, White

Age of Account Holder: 18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75+

Average Monthly Usage by Income for Race and Age of the Account Holder

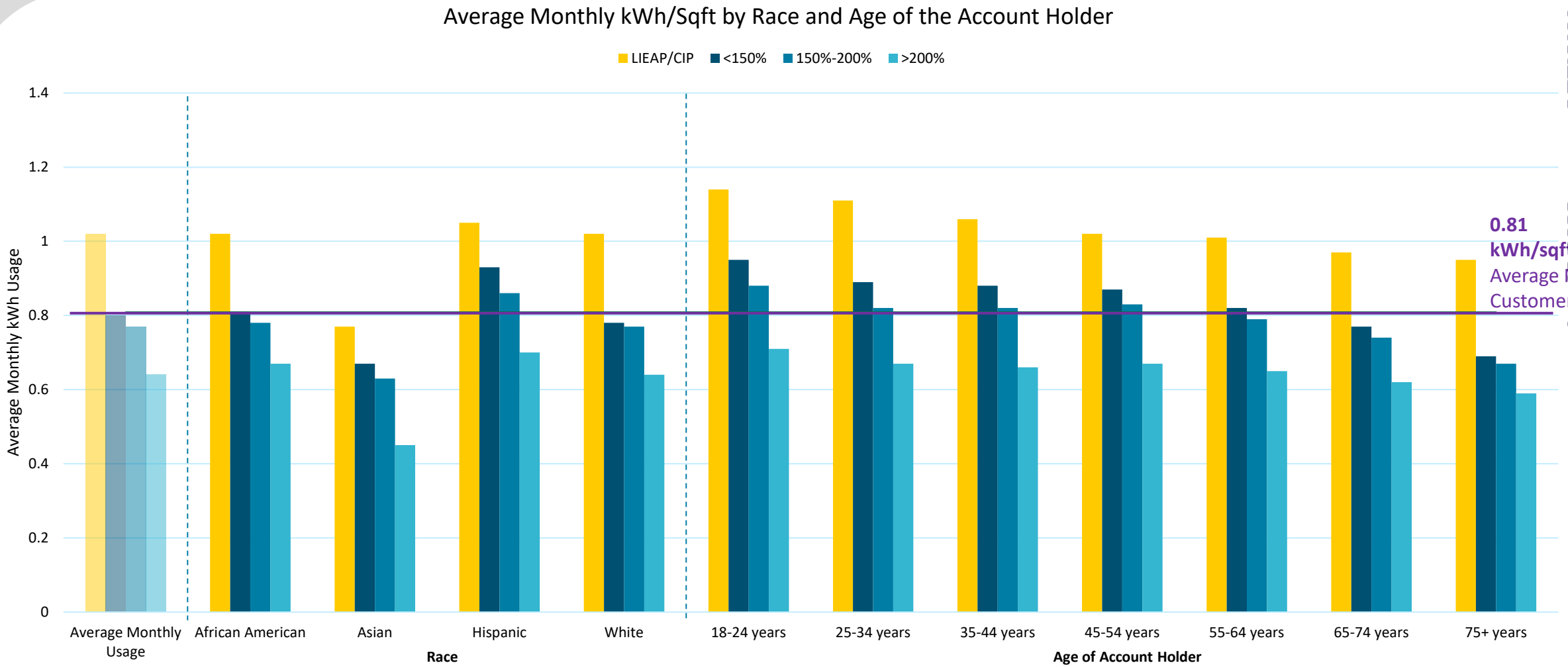


	Average Monthly Usage	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
% Total Customers in Category	98%	11%	2%	5%	72%	1%	11%	16%	19%	20%	17%	14%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square foot by Income for Race and Age of the Account Holder

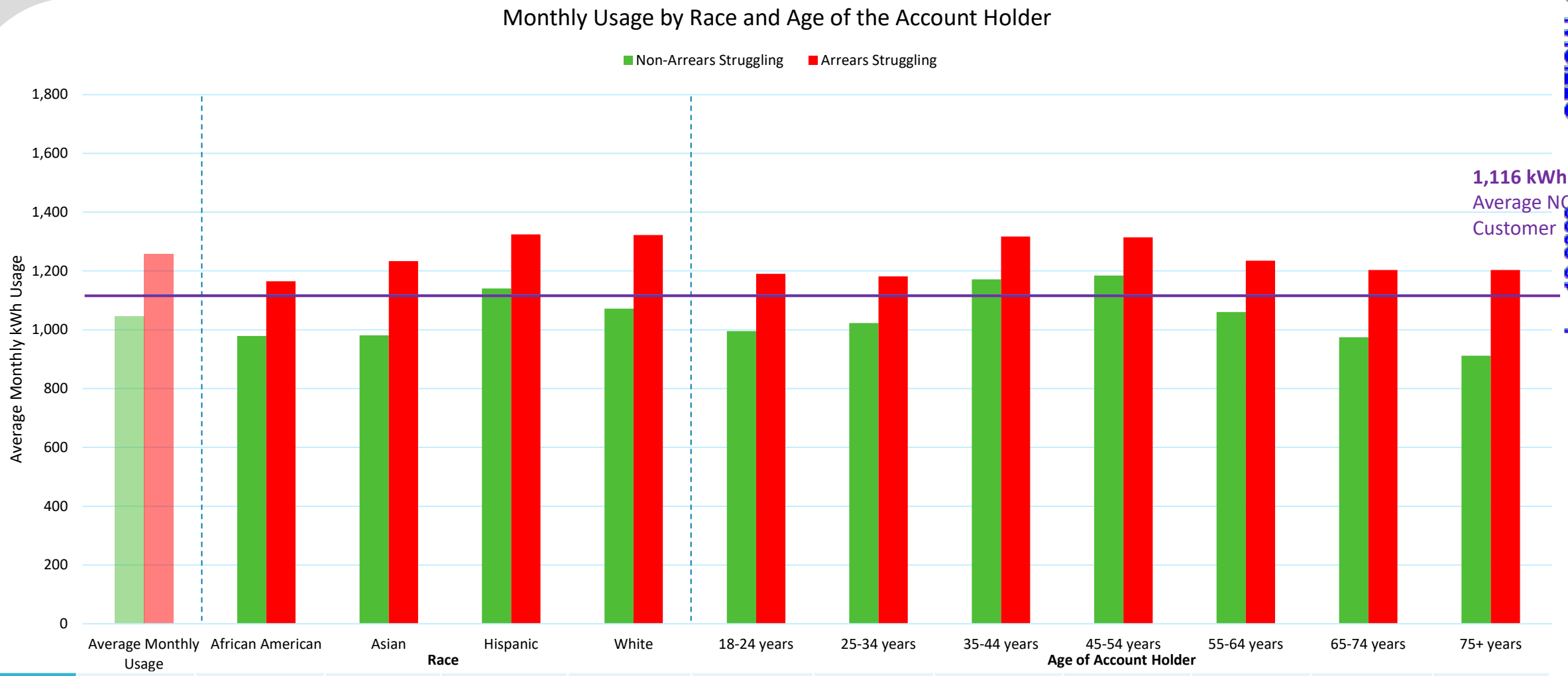


	Average Monthly Usage	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
% Total Customers in Category	98%	11%	2%	5%	72%	1%	11%	16%	19%	20%	17%	14%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage by Arrearage Status for Race and Age of the Account Holder

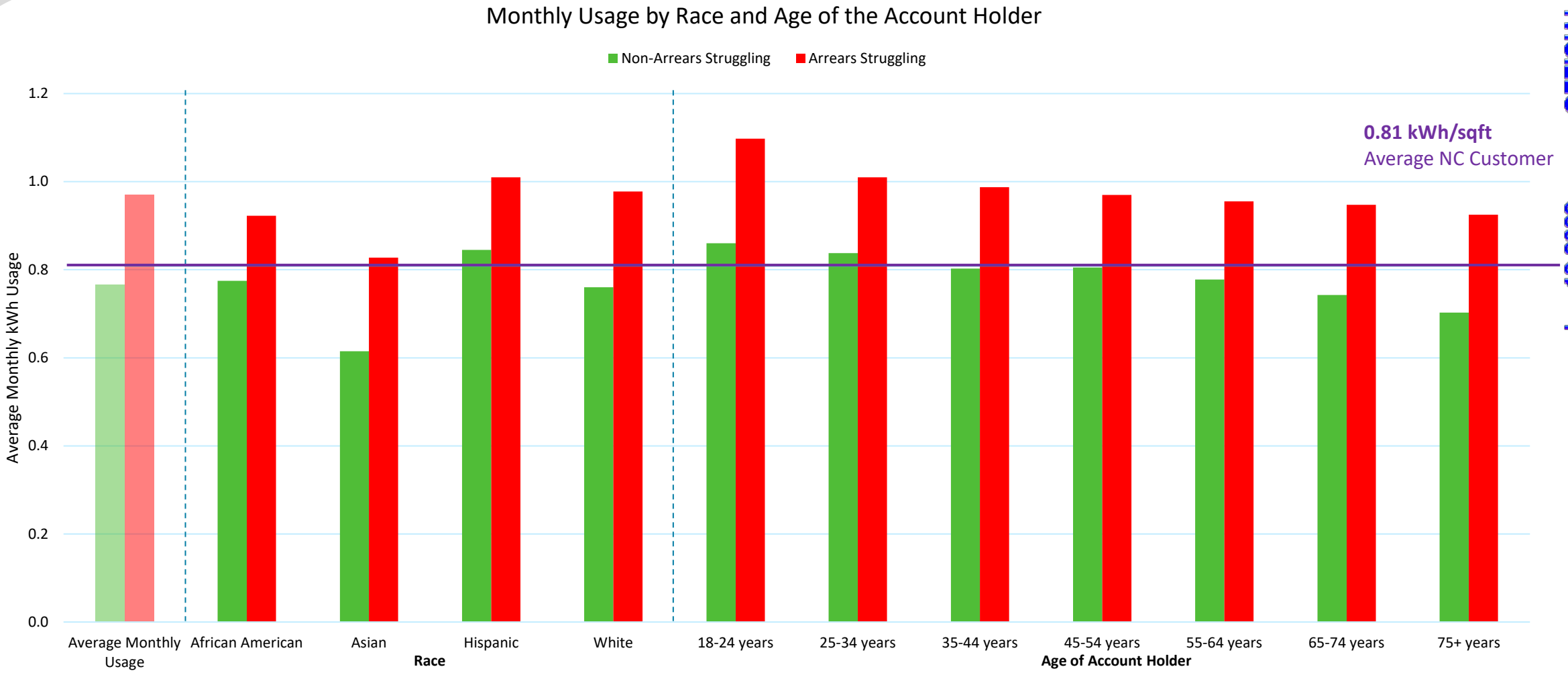


	Average Monthly Usage	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
% Total Customers in Category	100%	11%	2%	5%	72%	1%	11%	16%	19%	20%	17%	14%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square Foot by Arrearage Status for Race and Age of the Account Holder

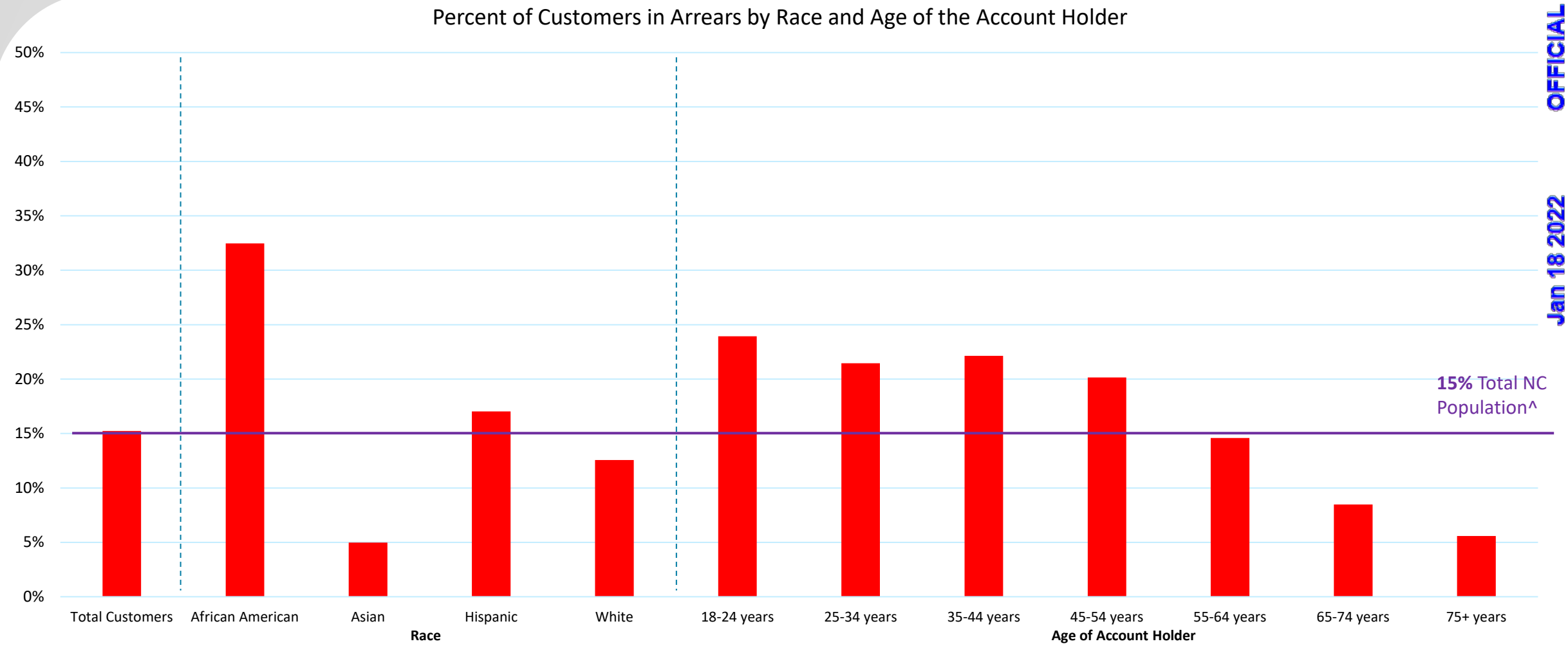


	Average Monthly Usage	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
% Total Customers in Category	100%	11%	2%	5%	72%	1%	11%	16%	19%	20%	17%	14%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Percent of Customers in Arrears for Race and Age of the Account Holder

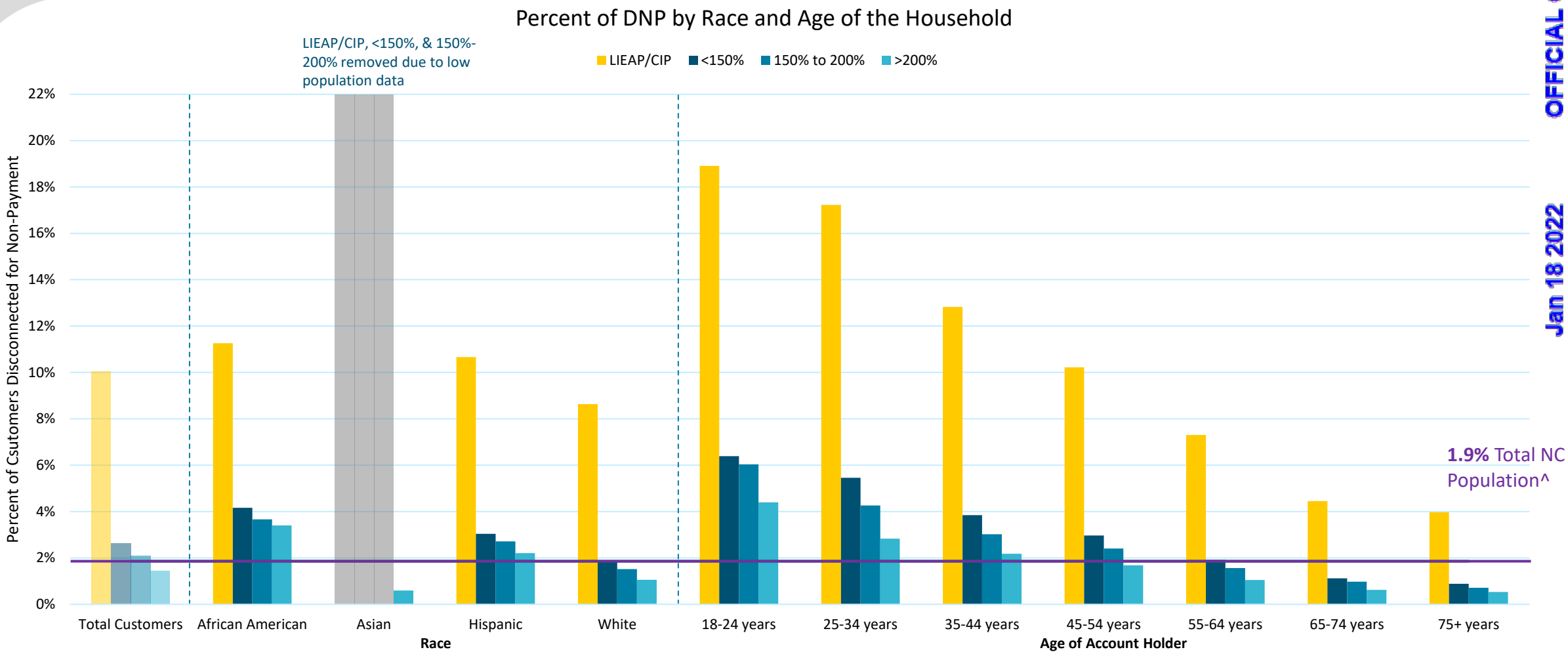


	Total Customers	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
% Total Customers in Category	100%	11%	2%	5%	72%	1%	11%	16%	19%	20%	17%	14%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Percent of DNP by Income for Race and Age of the Account Holder



% Total Customers in Category	98%	11%	2%	5%	72%	1%	11%	16%	19%	20%	17%	14%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%
^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Income Level

Total Number of Customers in each Segment	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
LIEAP/CIP	18,151	303	2,307	25,940	1,338	8,267	10,153	9,253	10,606	8,011	4,350
<150% FPL	56,175	5,037	25,863	230,595	9,436	46,283	58,634	60,035	57,099	52,310	76,048
150%-200% FPL	30,220	3,772	13,705	179,350	4,025	27,405	42,749	49,779	48,975	41,025	43,595
>200%	159,661	43,911	74,130	1,284,497	1,8349	182,888	265,680	324,604	356,949	302,856	199,621
Total	264,207	53,023	116,005	1,720,382	33,148	264,843	377,216	443,671	473,629	404,202	323,614

Percent of Customers in each Segment	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
LIEAP/CIP	0.8%	0.0%	0.1%	1.1%	0.1%	0.4%	0.4%	0.4%	0.5%	0.3%	0.2%
<150% FPL	2.4%	0.2%	1.1%	9.9%	0.4%	2.0%	2.5%	2.6%	2.5%	2.3%	3.3%
150%-200% FPL	1.3%	0.2%	0.6%	7.7%	0.2%	1.2%	1.8%	2.1%	2.1%	1.8%	1.9%
>200%	6.9%	1.9%	3.2%	55.3%	0.8%	7.9%	11.4%	14.0%	15.4%	13.0%	8.6%

Arrearage Status Based on Arrears Definition

(See slide 15)

Total Numbers

	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
Meets Arrears	85,761	26,41	197,71	216,091	7,934	56,850	83,507	89,439	69,162	34,325	18,059
Does not Meet Arrears	178,452	50,388	96,241	1,504,455	25,215	208,002	293,730	354,263	404,512	369,917	305,599

Percent of Customers in each Segment

	African American	Asian	Hispanic	White	18-24 years	25-34 years	35-44 years	45-54 years	55-64 years	65-74 years	75+ years
Meets Arrears	3.6%	0.1%	0.8%	9.1%	0.3%	2.4%	3.5%	3.8%	2.9%	1.4%	0.8%
Does not Meet Arrears	7.5%	2.1%	4.1%	63.4%	1.1%	8.8%	12.4%	14.9%	17.0%	15.6%	12.9%

Total Numbers

	African American	Asian	Hispanic	White	18-24 years old	25-34 years old	35-44 years old	45-54 years old	55-64 years old	65-74 years old	75+ years old
LIEAP/CIP	2,044	-	246	2,240	253	1,424	1,302	946	775	357	173
<150% FPL	2,340	-	787	4,303	603	2,527	2,256	1,783	1,098	588	677
150%-200% FPL	1,109	-	372	2,725	243	1,168	1,293	1,201	766	402	313
>200%	5,437	262	1,637	13,620	807	5,177	5,802	5,477	3,748	1,901	1,064
Total	10,930	262	3,042	22,888	1,906	10,296	10,653	9,407	6,387	3,248	2,227

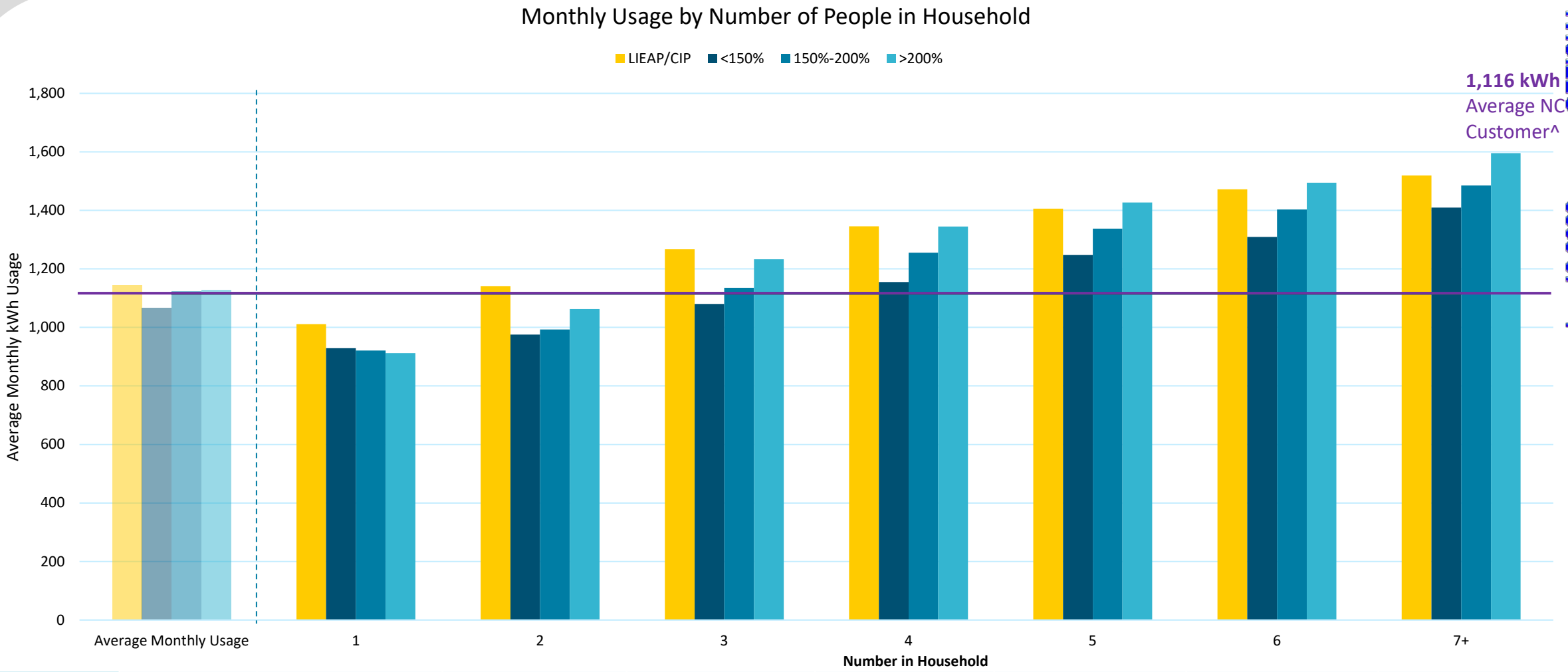
Percent of Customers in that Segment DNP (i.e., percent of 18-24 years old customers DNP)

	African American	Asian	Hispanic	White	18-24 years old	25-34 years old	35-44 years old	45-54 years old	55-64 years old	65-74 years old	75+ years old
LIEAP/CIP	11.3%	-	10.7%	8.6%	18.9%	17.2%	12.8%	10.2%	7.3%	4.5%	4.0%
<150% FPL	4.2%	-	3.0%	1.9%	6.4%	5.5%	3.8%	3.0%	1.9%	1.1%	0.9%
150%-200% FPL	3.7%	-	2.7%	1.5%	6.0%	4.3%	3.0%	2.4%	1.6%	1.0%	0.7%
>200%	3.4%	0.6%	2.2%	1.1%	4.4%	2.8%	2.2%	1.7%	1.1%	0.6%	0.5%

Analysis by Number of People in the Household

Number of People in the Household: 1, 2, 3, 4, 5, 6, 7+

Average Monthly Usage by Income for Number of People in the Household

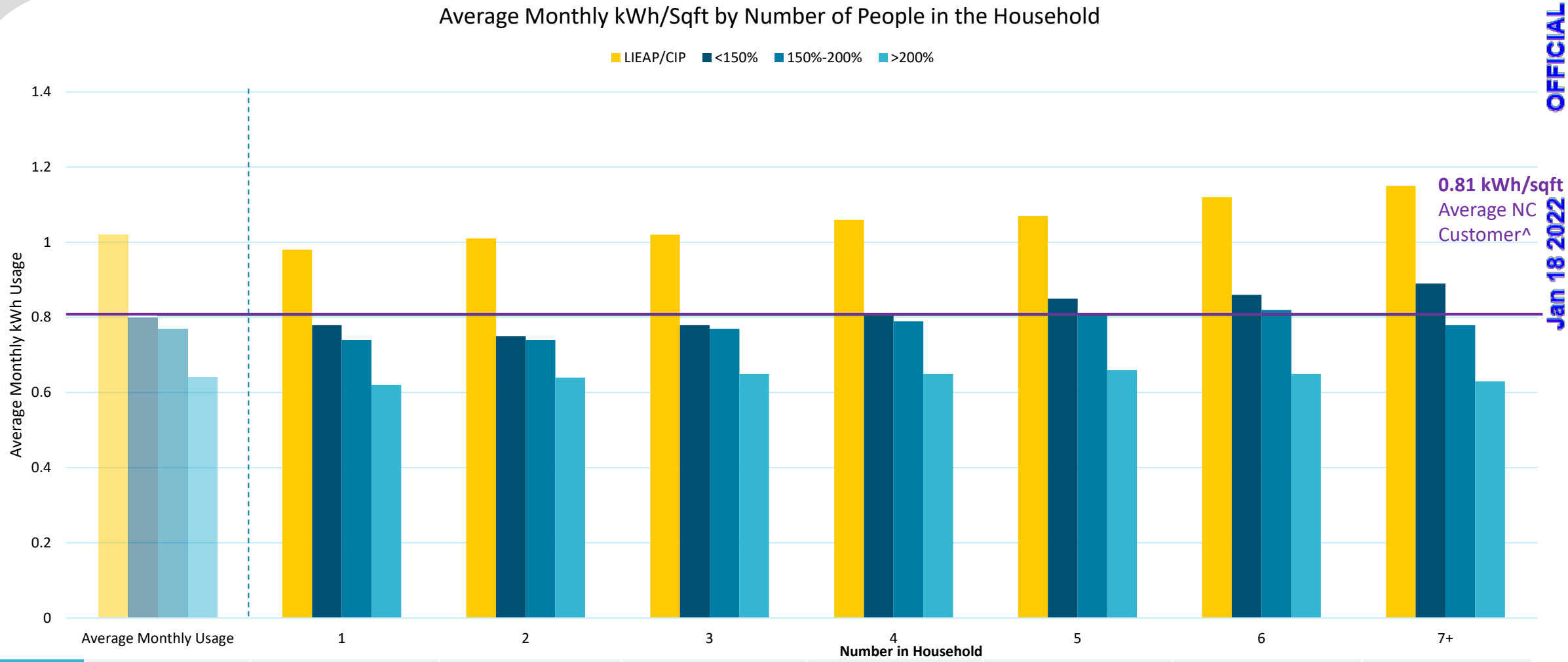


% Total Customers in Category*	98%	24%	29%	22%	12%	6%	2%	2%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square foot by Income for Number of People in the Household

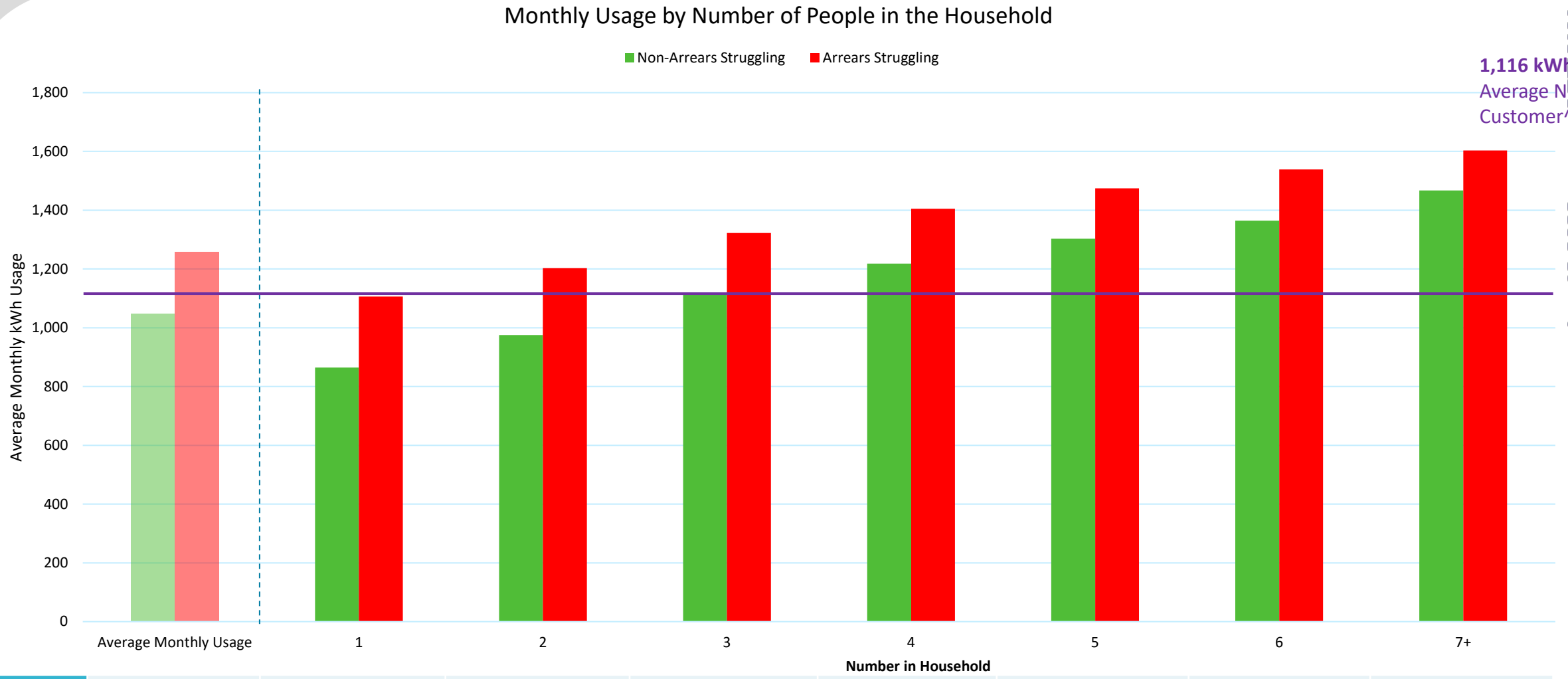


	Average Monthly Usage	1	2	3	4	5	6	7+
% Total Customers in Category*	98%	24%	29%	22%	12%	6%	2%	2%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage by Arrearage Status for Number of People in the Household

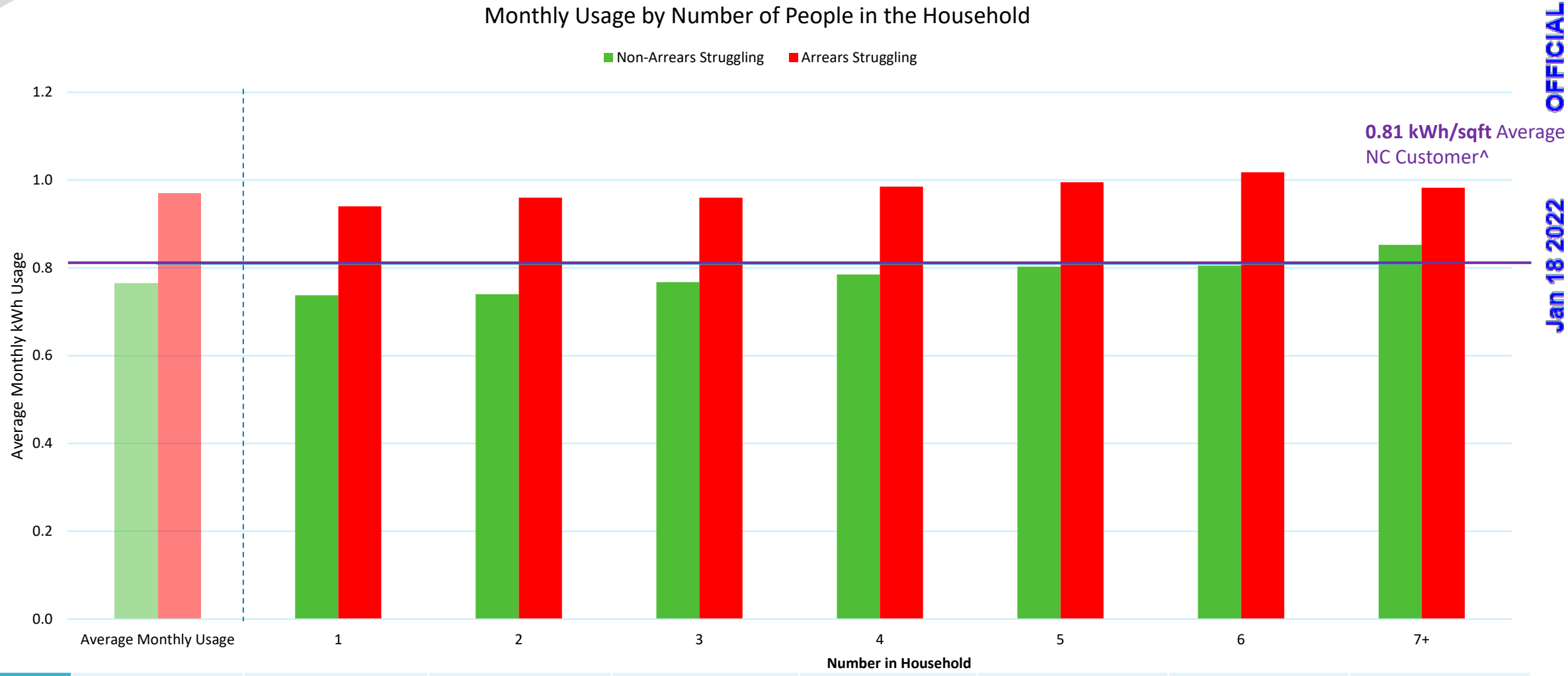


% Total Customers in Category*	100%	24%	29%	22%	12%	6%	2%	2%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

Average Monthly Usage per Square Foot by Arrearage Status for Number of People in the Household

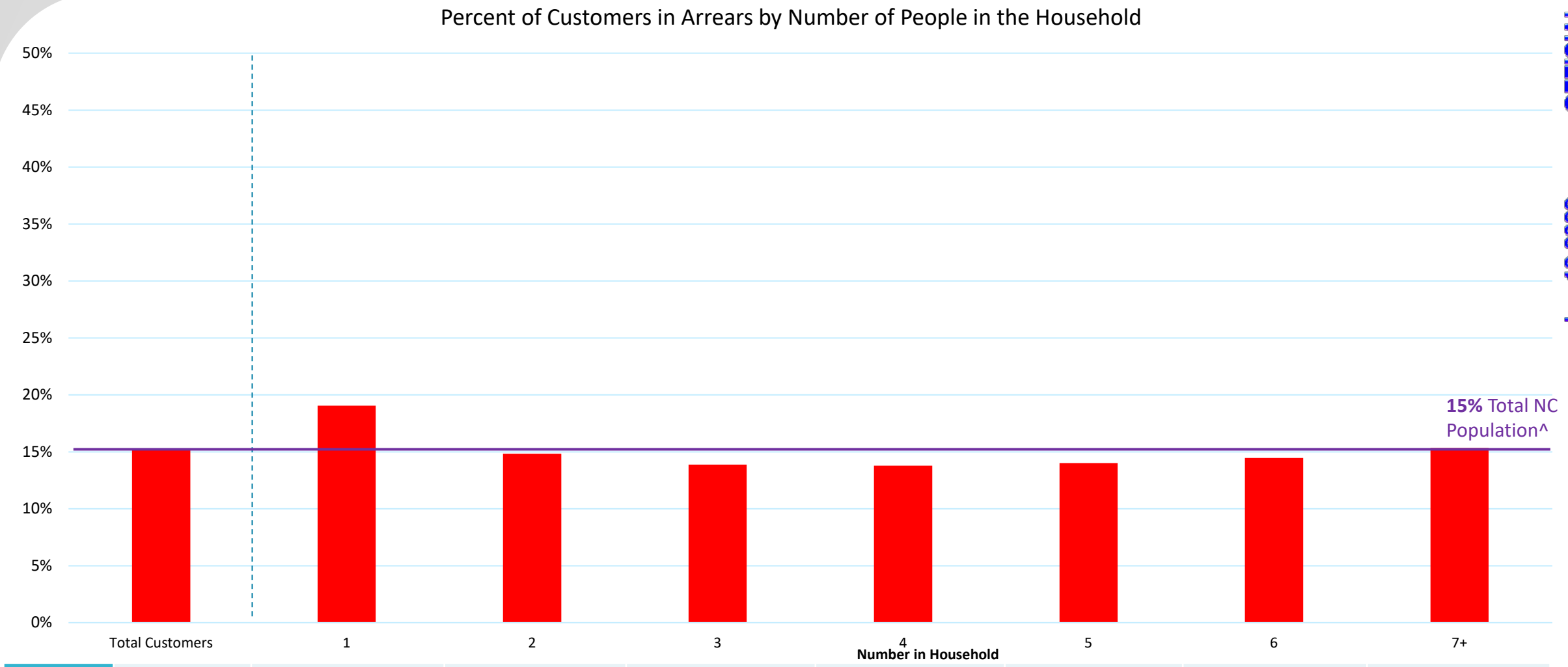


	Average Monthly Usage	1	2	3	4	5	6	7+
% Total Customers in Category*	100%	24%	29%	22%	12%	6%	2%	2%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The average line includes customers who could not be categorized, therefore there may be instances of all groups above average

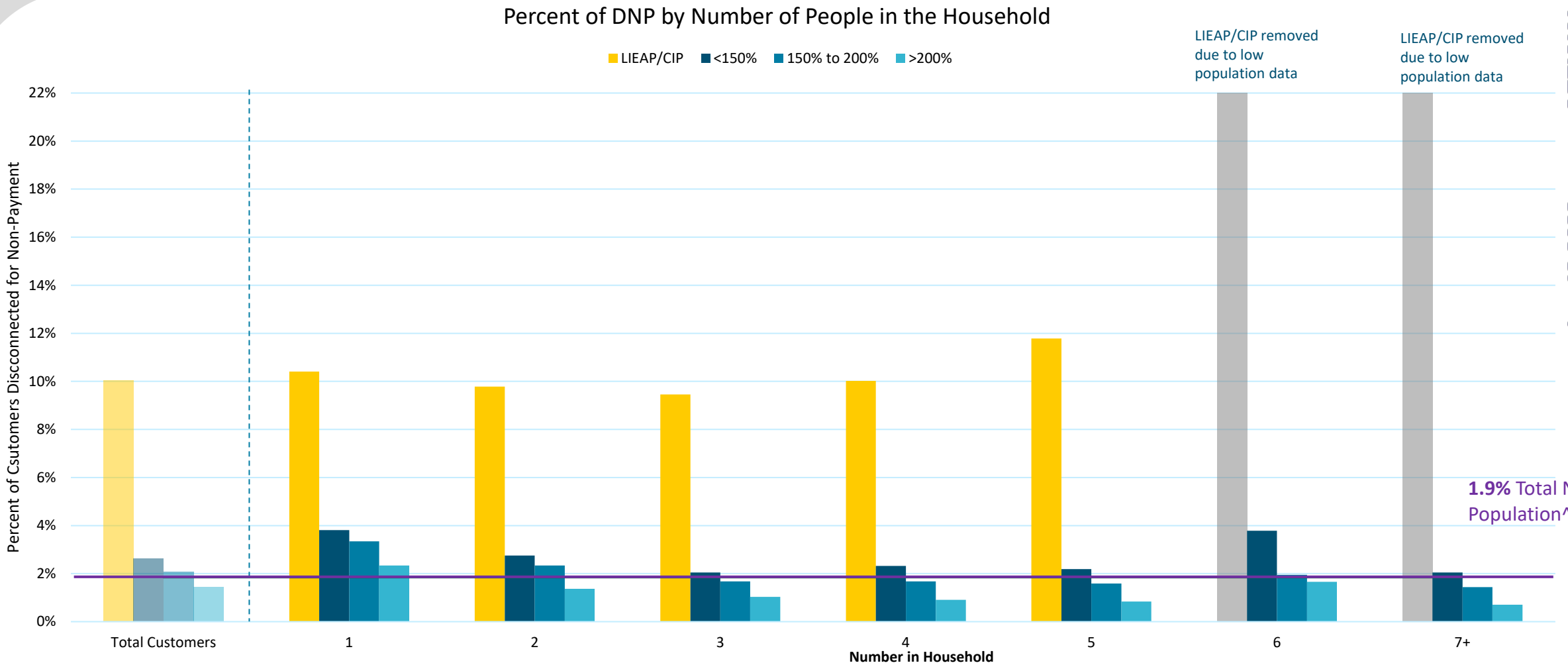
Percent of Customers in Arrears for Number of People in the Household



	Total Customers	1	2	3	4	5	6	7+
% Total Customers in Category*	100%	24%	29%	22%	12%	6%	2%	2%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%
^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Percent of DNP by Income for Number of People in the Household



	Total Customers	1	2	3	4	5	6	7+
% Total Customers in Category*	98%	24%	29%	22%	12%	6%	2%	2%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

^The total line includes customers who could not be categorized, therefore there may be instances of all groups above the total

Income Level

Total Numbers	1	2	3	4	5	6	7+
LIEAP/CIP	20,815	15,621	8,588	3,862	1,773	468	471
<150% FPL	73,902	97,666	87,773	41,184	29,324	10,944	10,943
150%-200% FPL	34,581	78,964	53,767	54,254	19,687	7,840	7,841
>200%	447,357	485,100	381,532	189,572	93,775	17,012	17,017
Total	576,655	677,351	531,660	288,872	144,559	36,264	36,272

Percent of Customers in each Segment	1	2	3	4	5	6	7+
LIEAP/CIP	0.9%	0.7%	0.4%	0.2%	0.1%	0.0%	0.0%
<150% FPL	3.2%	4.2%	3.8%	1.8%	1.3%	0.5%	0.5%
150%-200% FPL	1.5%	3.4%	2.3%	2.3%	0.8%	0.3%	0.3%
>200%	19.3%	20.9%	16.4%	8.2%	4.0%	0.7%	0.7%

Arrearage Status Based on Arrears Definition

(See slide 15)

Total Numbers	1	2	3	4	5	6	7+
Meets Arrears	109,860	100,445	73,812	39,802	20,236	9,814	5,568
Does not Meet Arrears	466,828	576,956	457,889	249,098	124,343	58,069	30,704

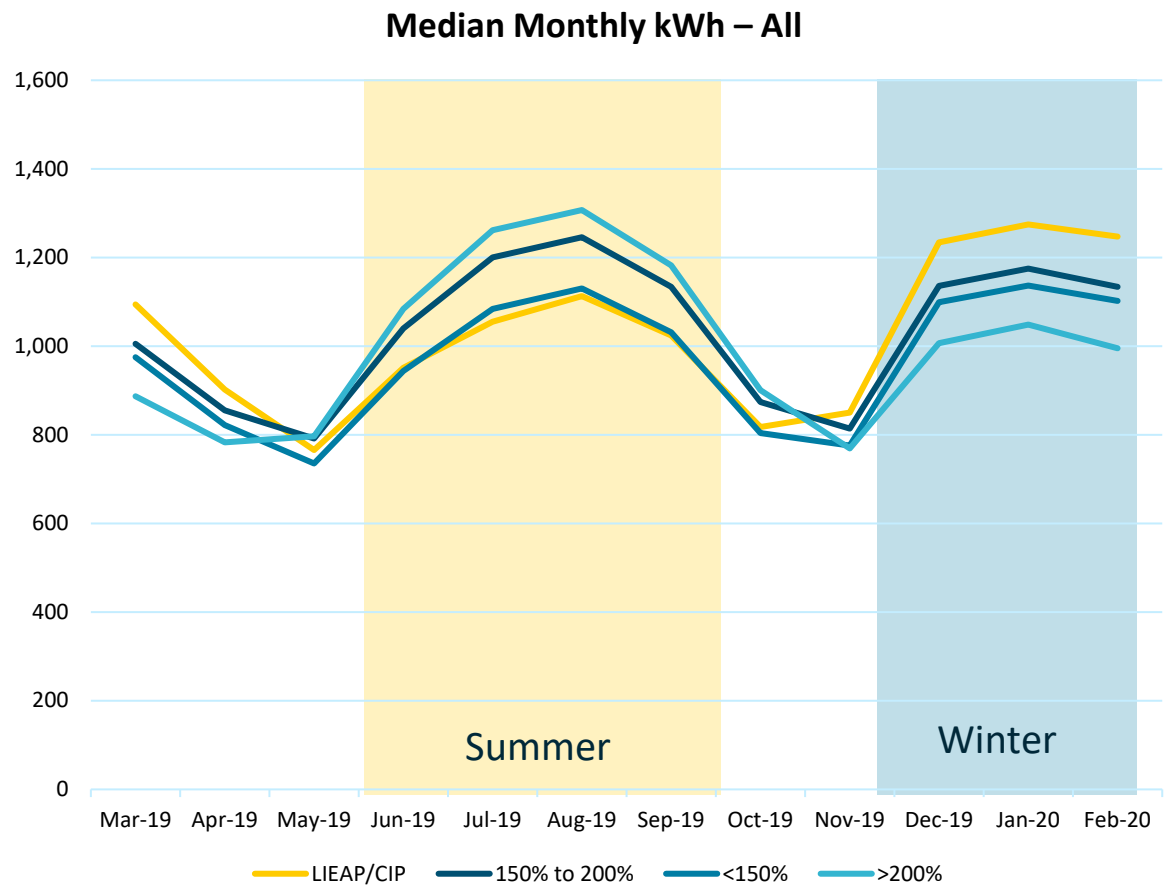
Percent of Customers in each Segment	1	2	3	4	5	6	7+
Meets Arrears	4.6%	4.2%	3.1%	1.7%	0.9%	0.4%	0.2%
Does not Meet Arrears	19.7%	24.3%	19.3%	10.5%	5.2%	2.4%	1.3%

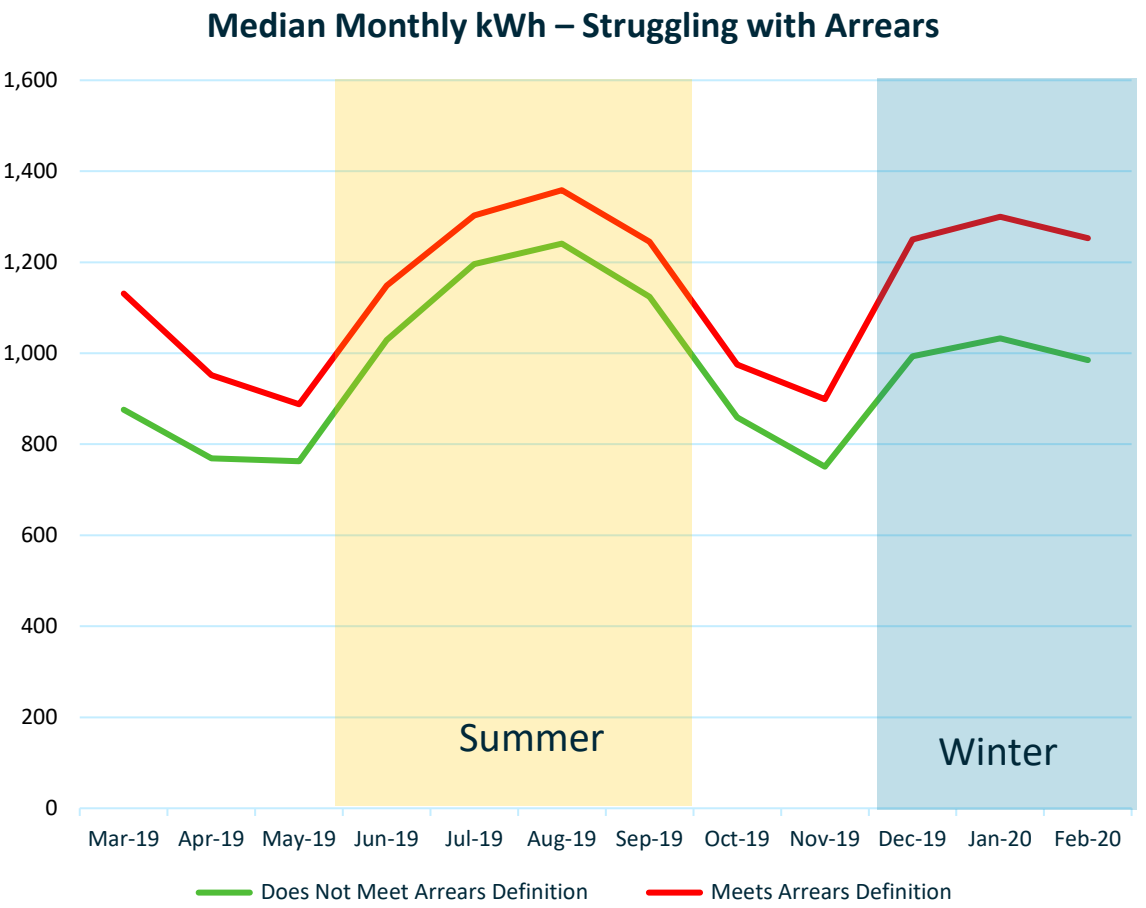
Total Number of Customers in each Segment							
	1	2	3	4	5	6	7+
LIEAP/CIP	2,166	1,528	812	387	209	-	-
<150% FPL	2,814	2,690	1,800	956	642	414	224
150%-200% FPL	1,157	1,844	901	909	313	153	113
>200%	10,463	6,651	3,960	1,718	786	282	120
Total	16,600	12,713	7,473	3,970	1,950	849	457

Percent of Customers in that Segment DNP (i.e., percent of 2 people household customers DNP)							
	1	2	3	4	5	6	7+
LIEAP/CIP	10.4%	9.8%	9.5%	10.0%	11.8%	-	-
<150% FPL	3.8%	2.8%	2.1%	2.3%	2.2%	2.1%	2.0%
150%-200% FPL	3.3%	2.3%	1.7%	1.7%	1.6%	1.7%	1.4%
>200%	2.3%	1.4%	1.0%	0.9%	0.8%	0.7%	0.7%

Analysis of Billing Data

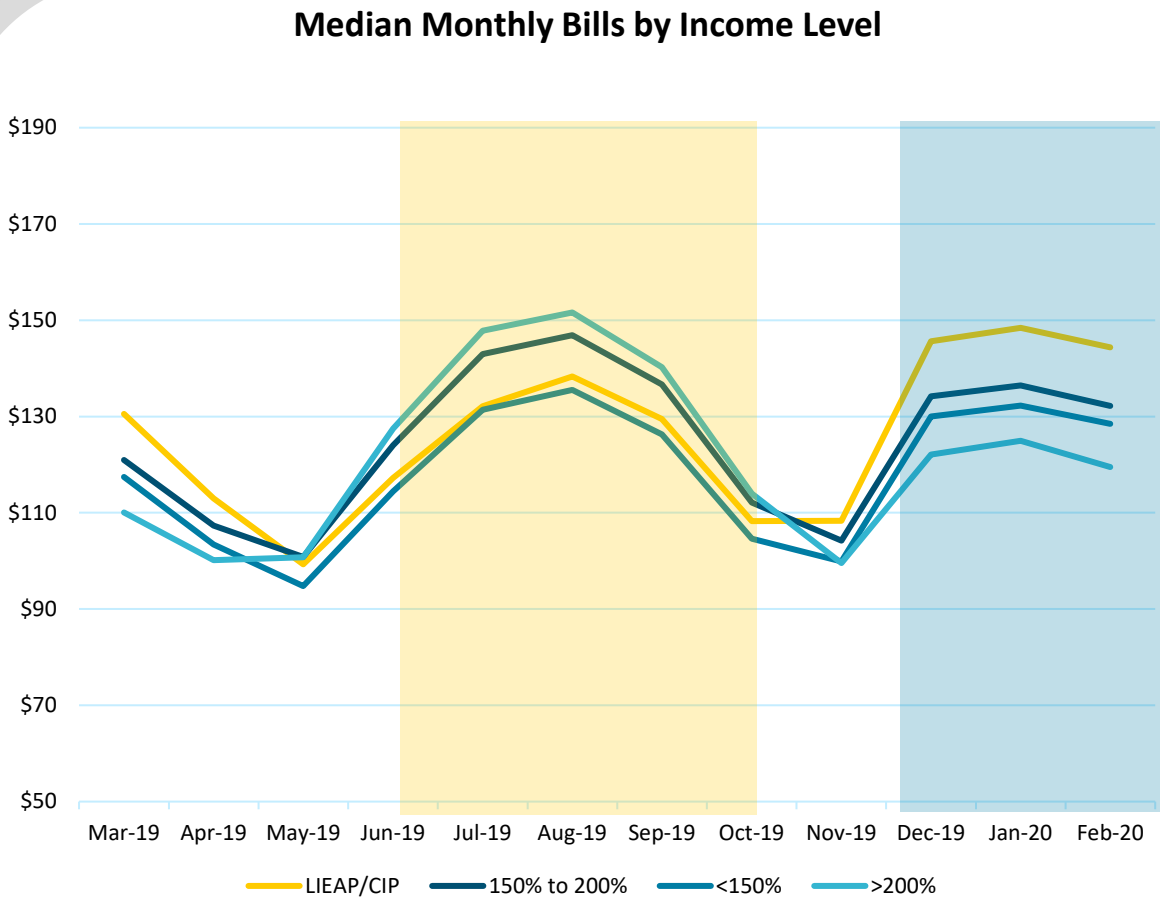
Median Monthly kWh

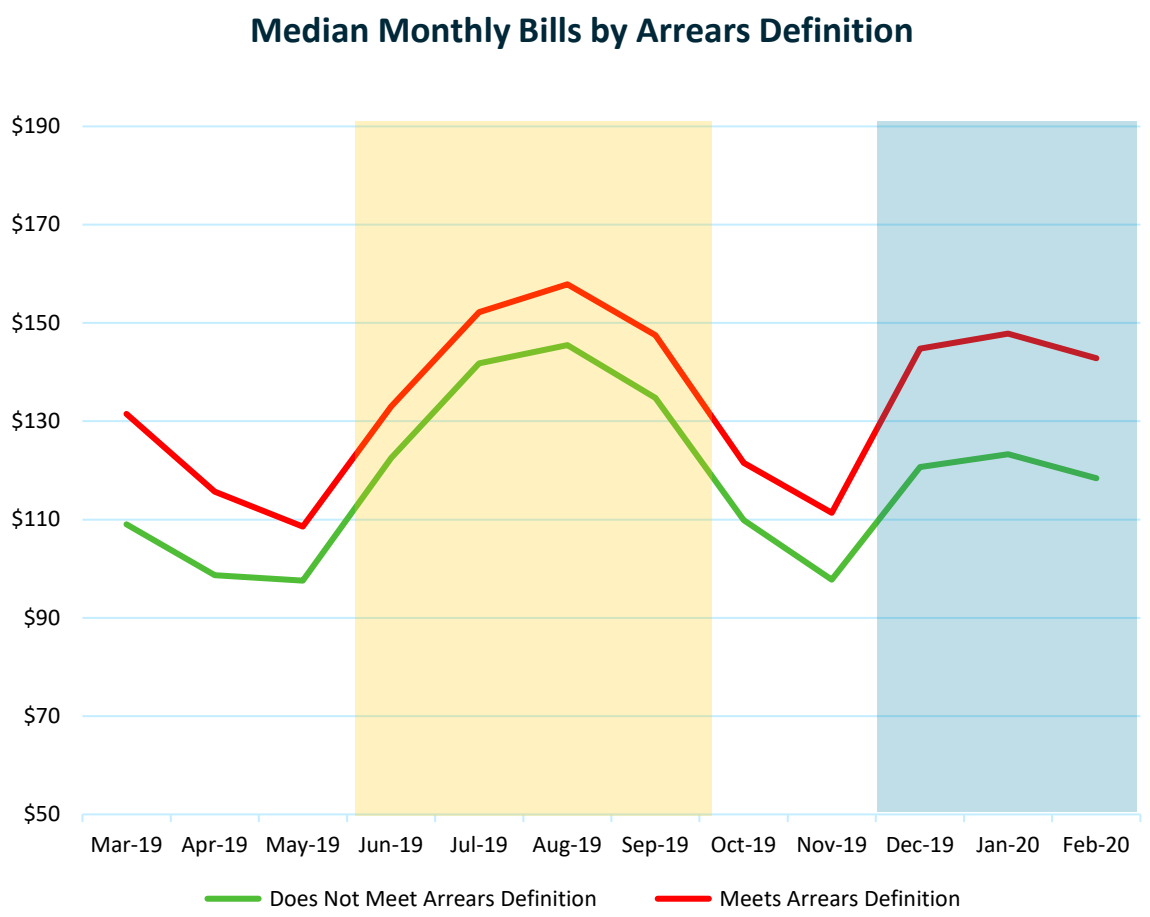




- Low income & LIEAP/CIP customers use more energy in the winter, less in the summer
- Customers struggling with arrears use more kWh per month than other customers year-round

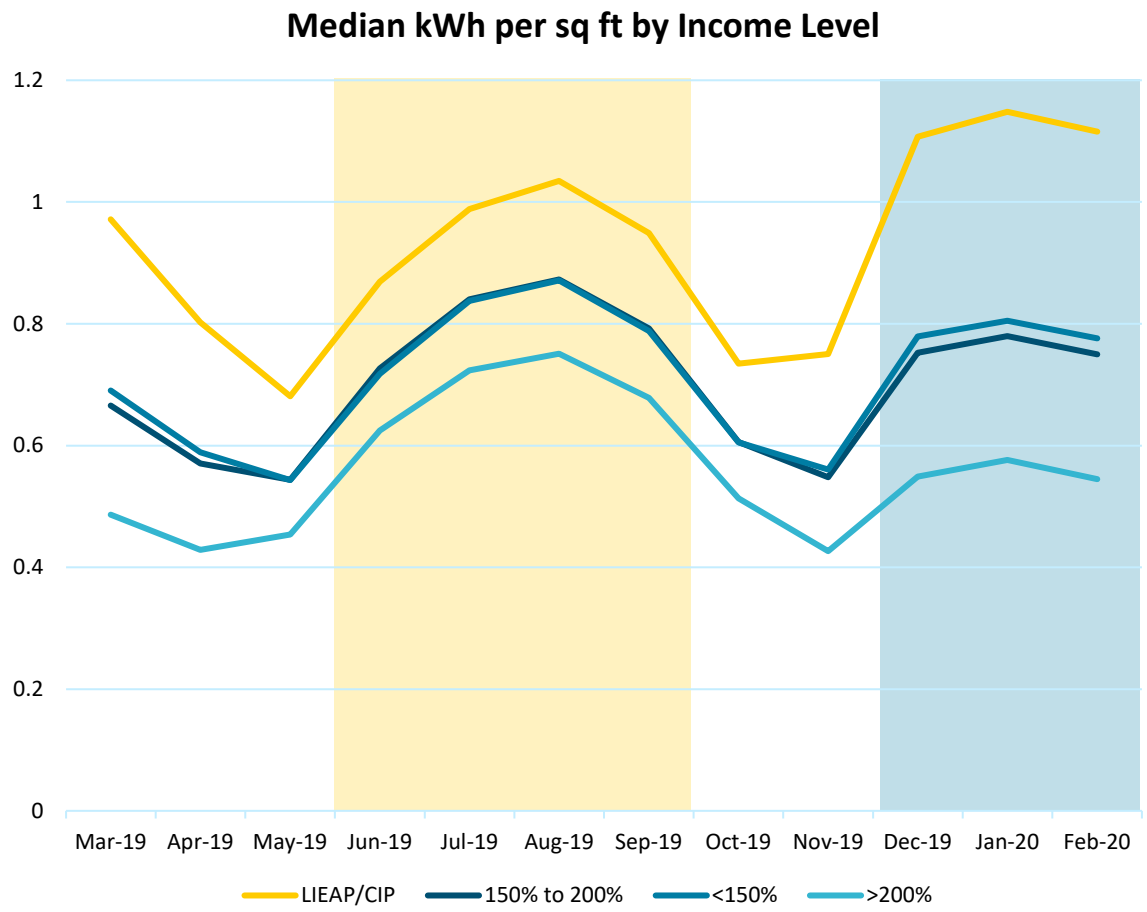
Median Monthly Bills

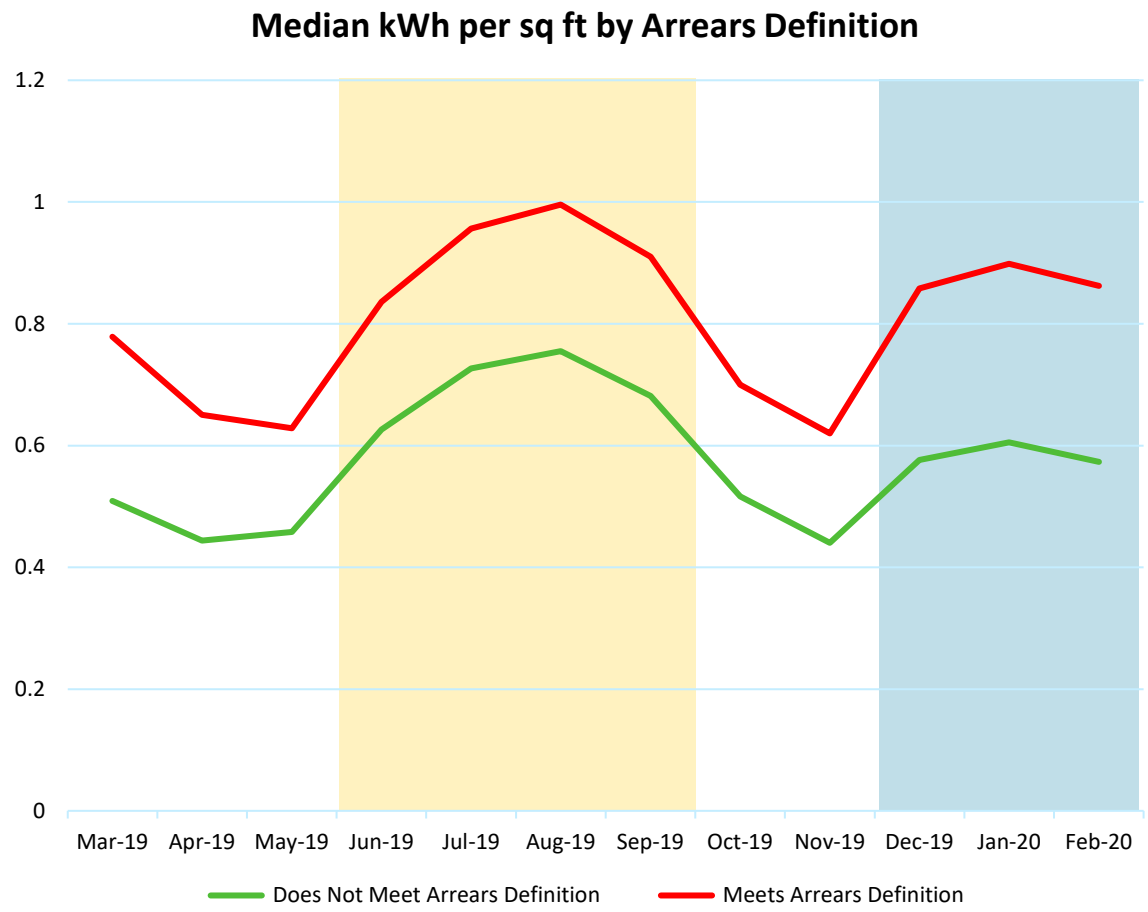




- Directly correlated with kWh usage
- LIEAP/CIP customers have higher charges in the winter, lower in the summer
- Customers struggling with arrears have new charges that are 14% higher year-round and 20% higher in the winter

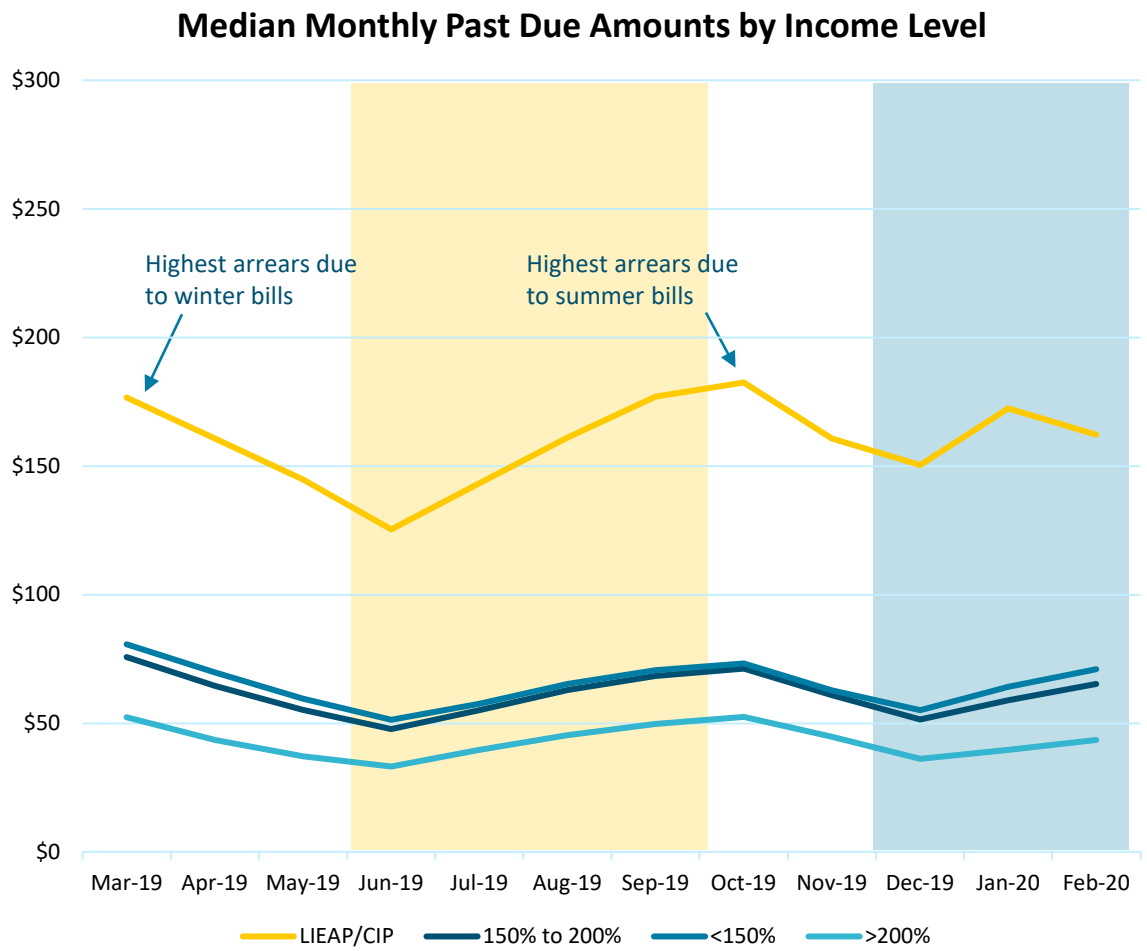
Median kWh per sq ft

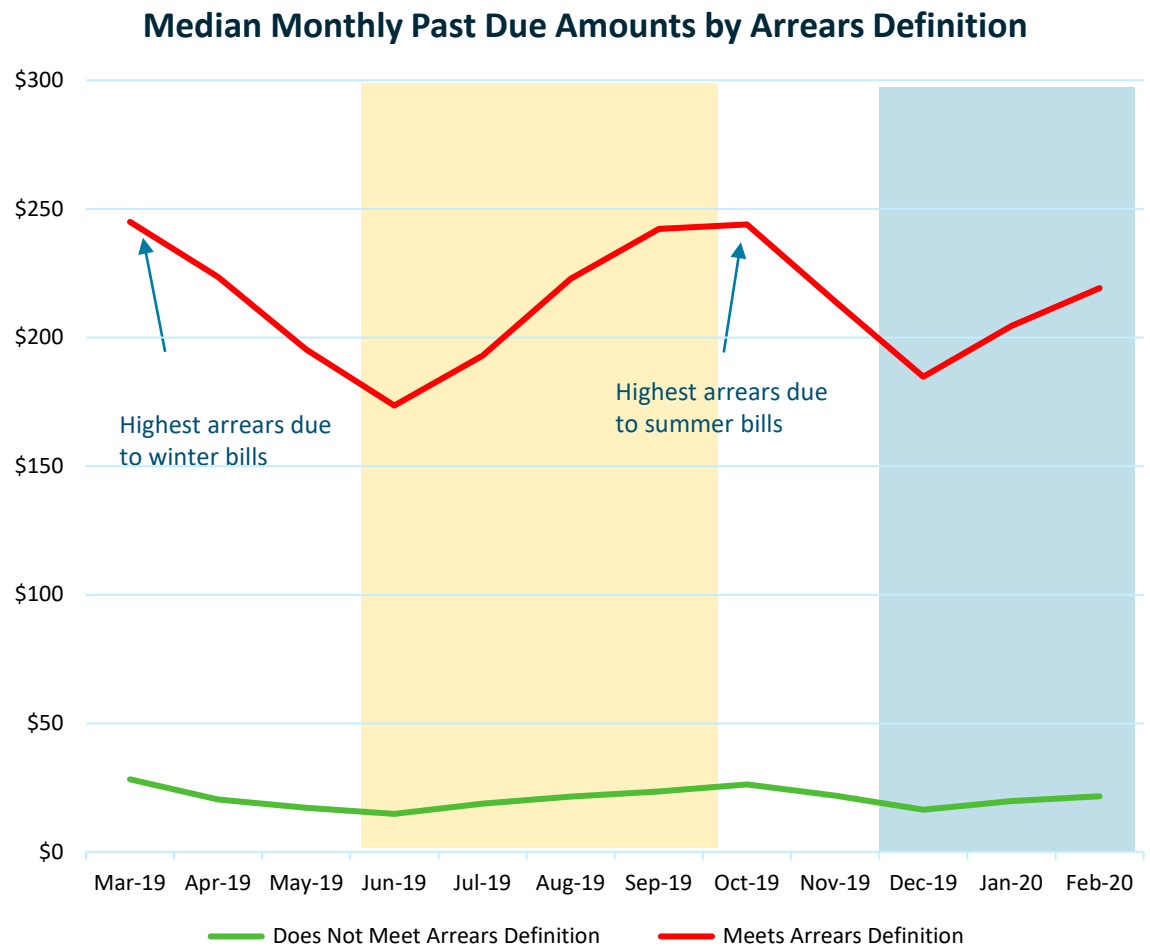




- LIEAP/CIP customers use two times more electricity in peak winter months per square foot than customers above 200% FPL
- Arrears struggling customers use over 33% more electricity in peak winter months per square foot

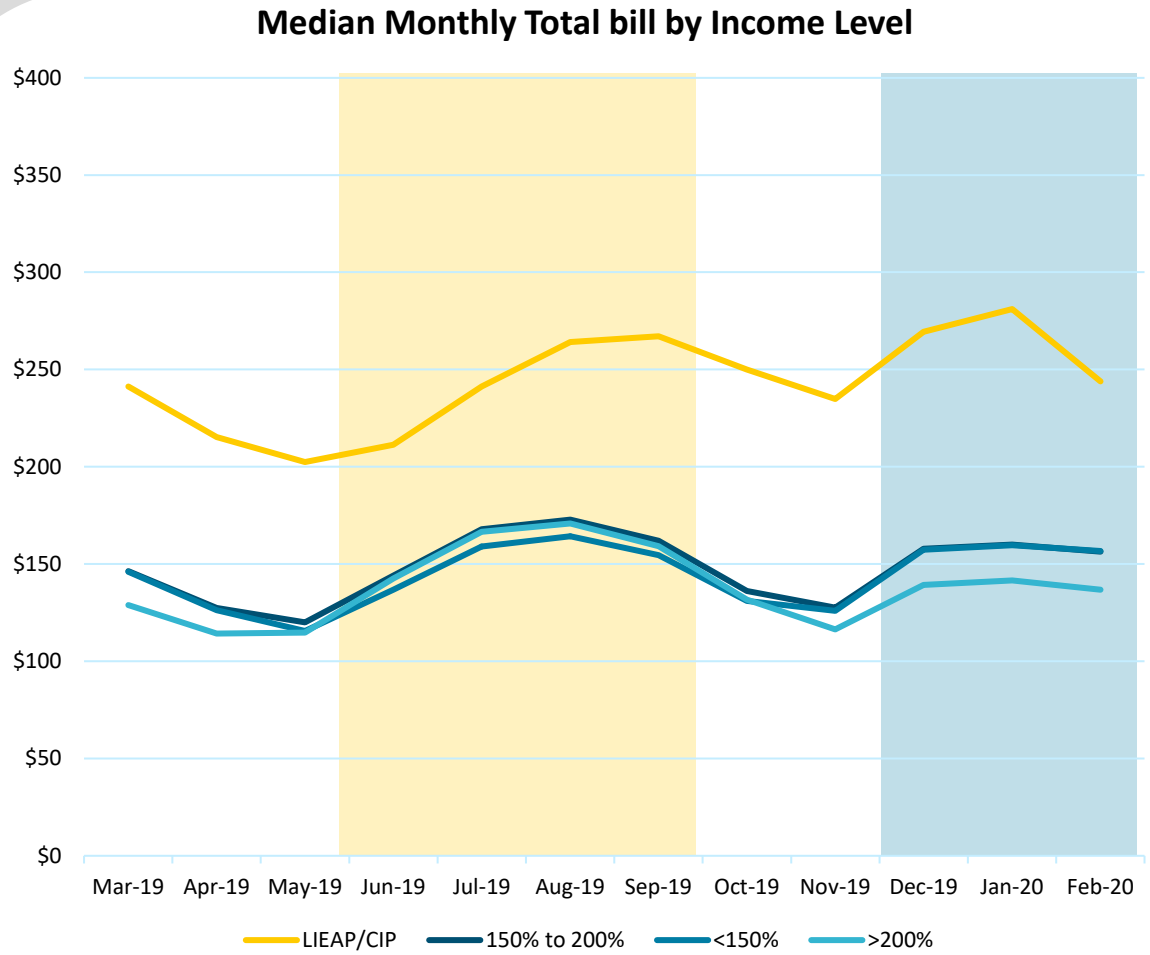
Meidan Monthly Past Due Amounts

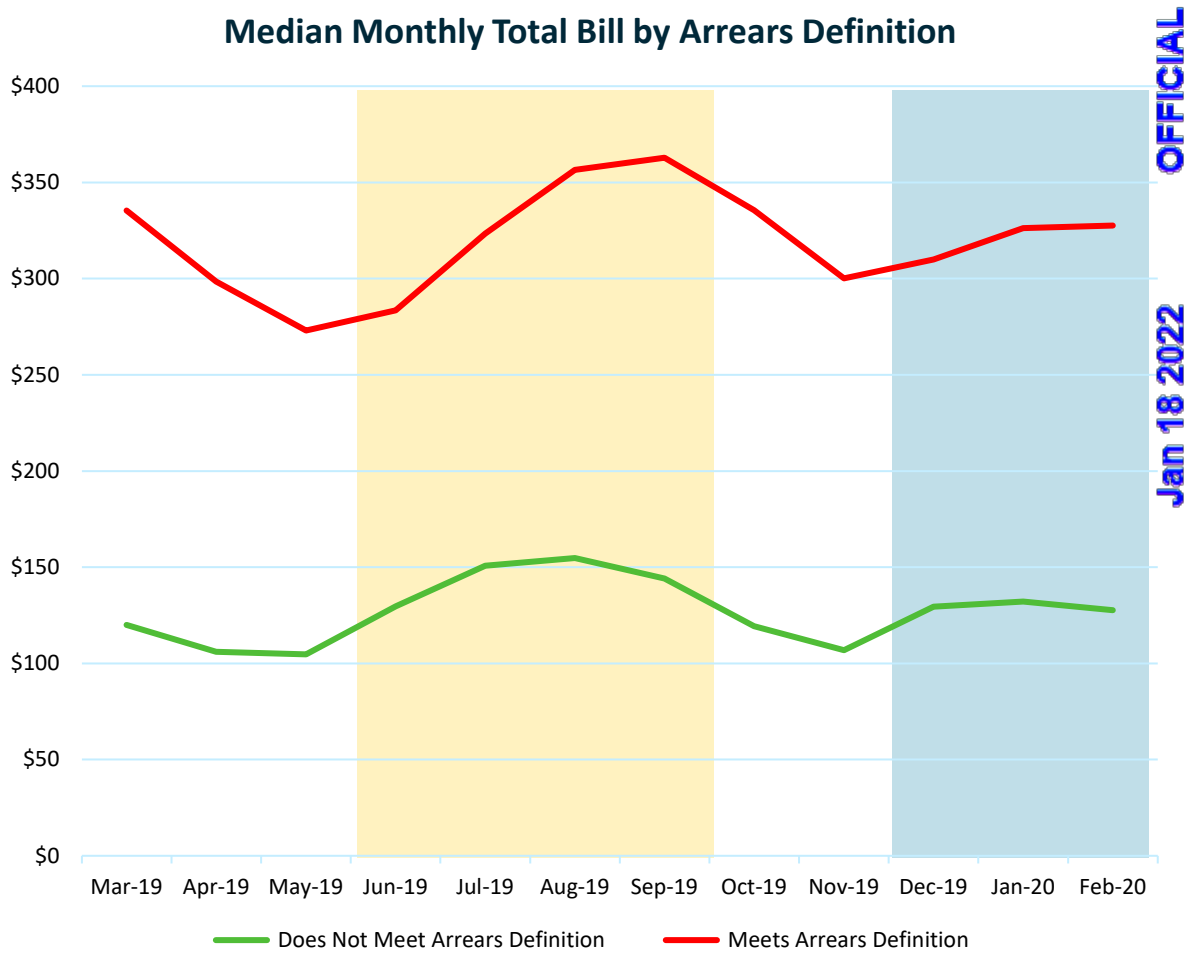




- LIEAP/CIP customers owe 3.5 times more in arrears at the end of summer and winter than customers above 200% FPL
- Median summer and winter peaks in arrears are over $240 and occur at the end of each season for struggling customers

Median Total Monthly Bills

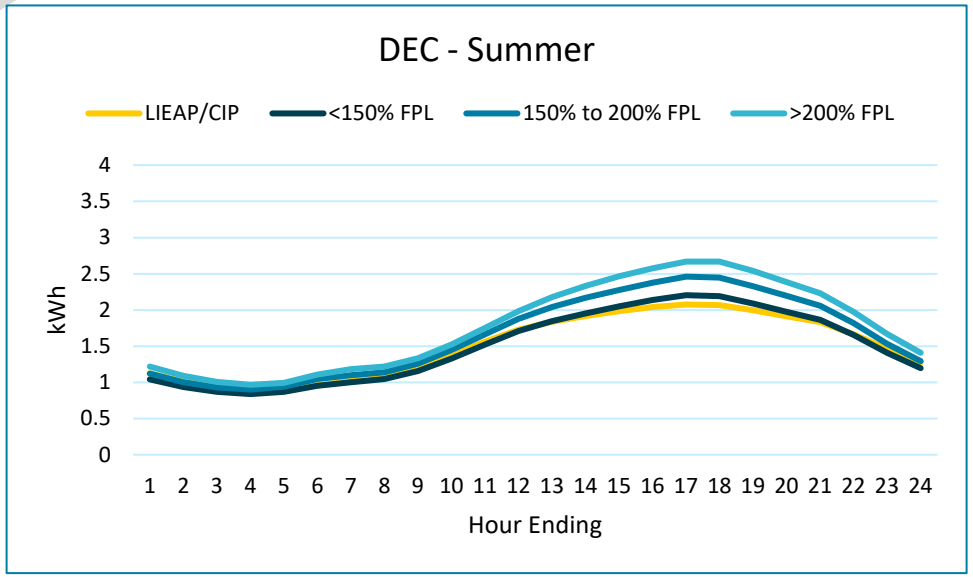


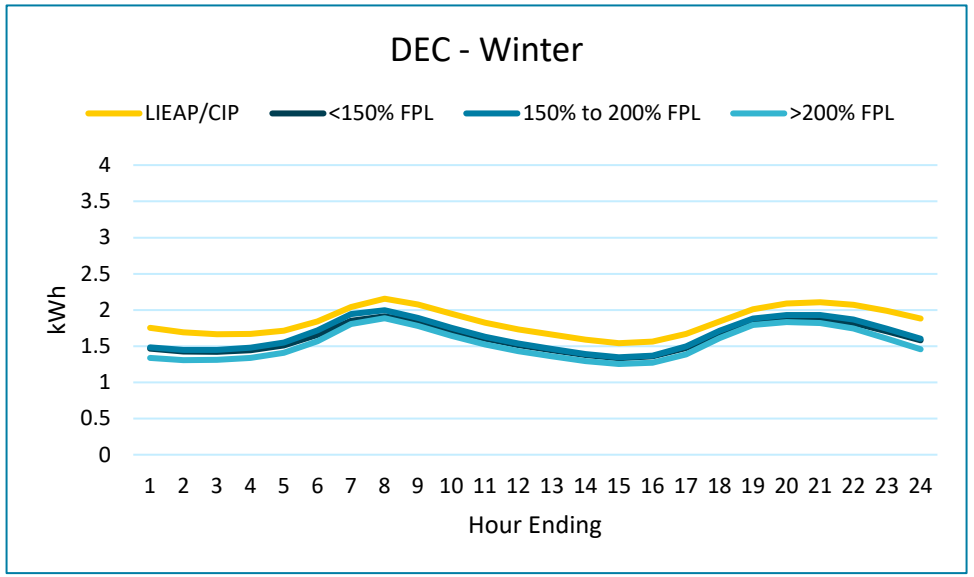


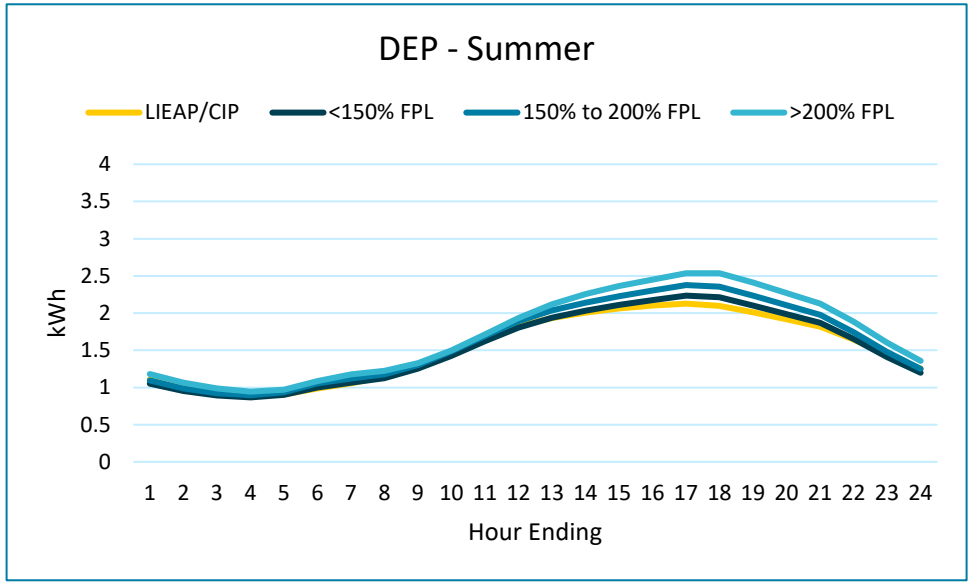
- LIEAP/CIP customers face a significantly higher total bill burden, particularly in the winter
- Non-LIEAP/CIP customers below 200% FPL do not appear to face a significantly higher total bill burden, especially in the summer
- Arrears struggling customers have a 64% higher total bill burden in peak winter months

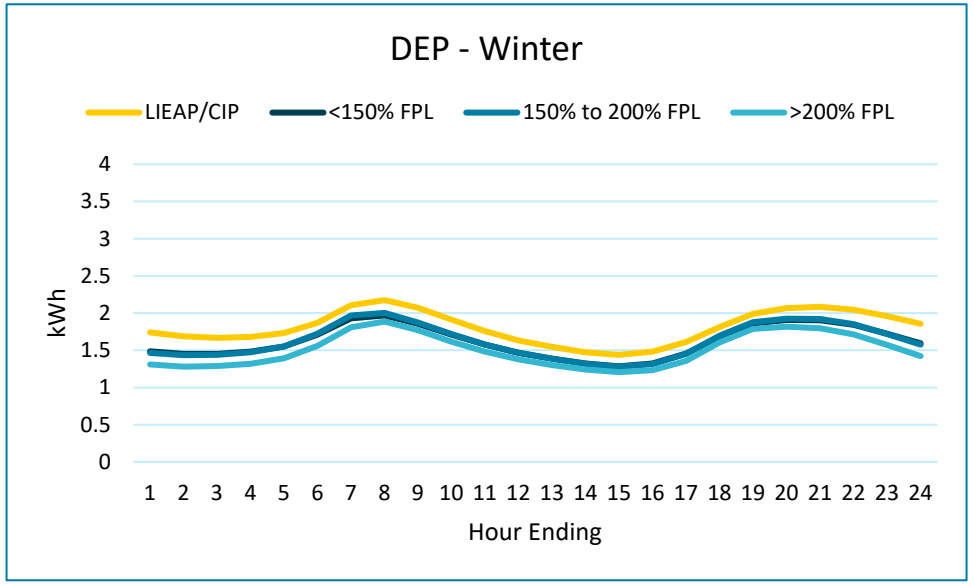
Analysis of Interval Data

Average Weekday Load Shape by Season & Income Segmentation

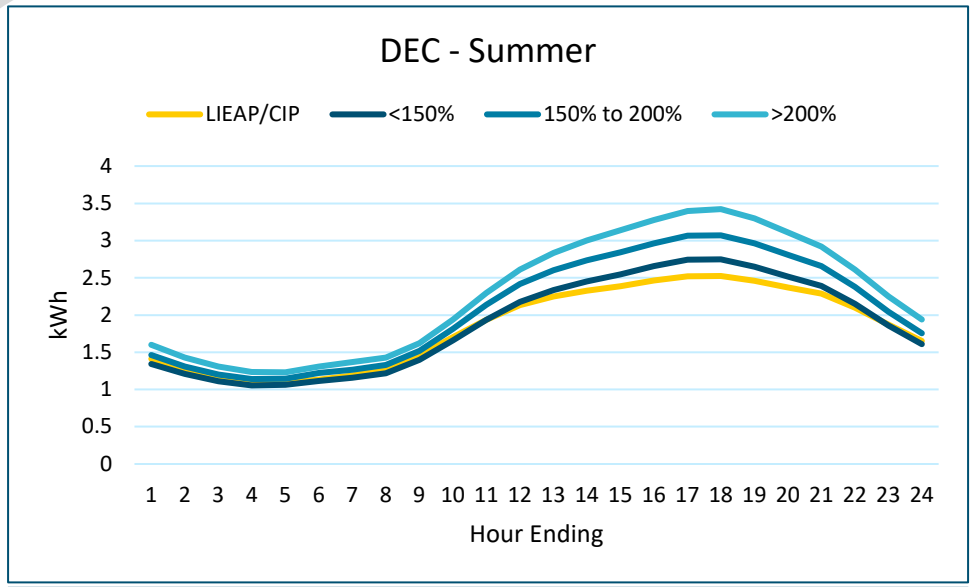


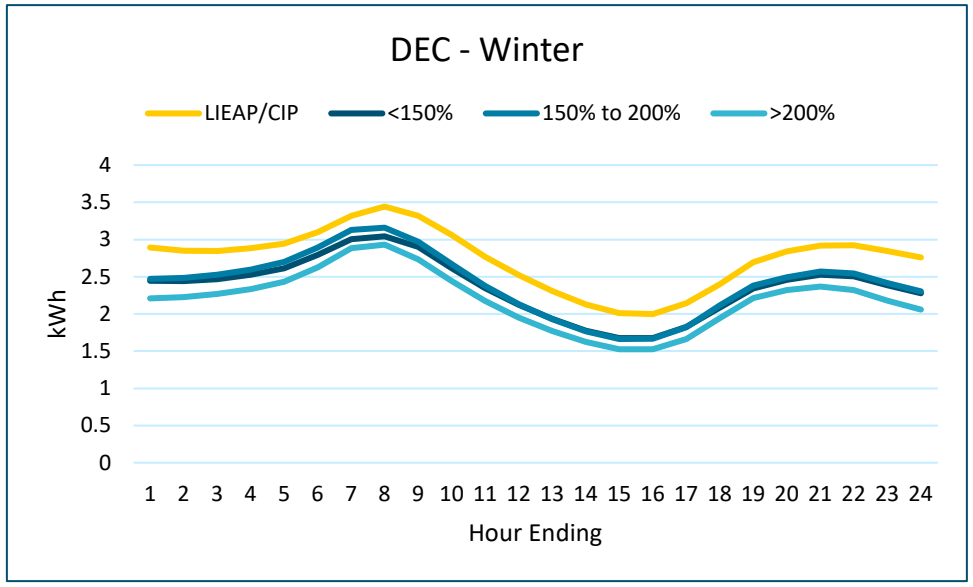


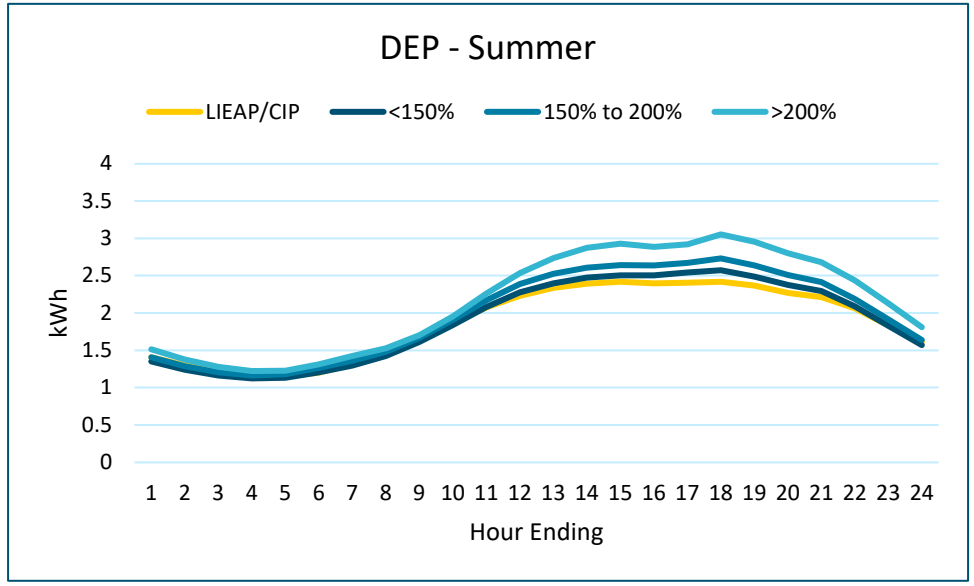


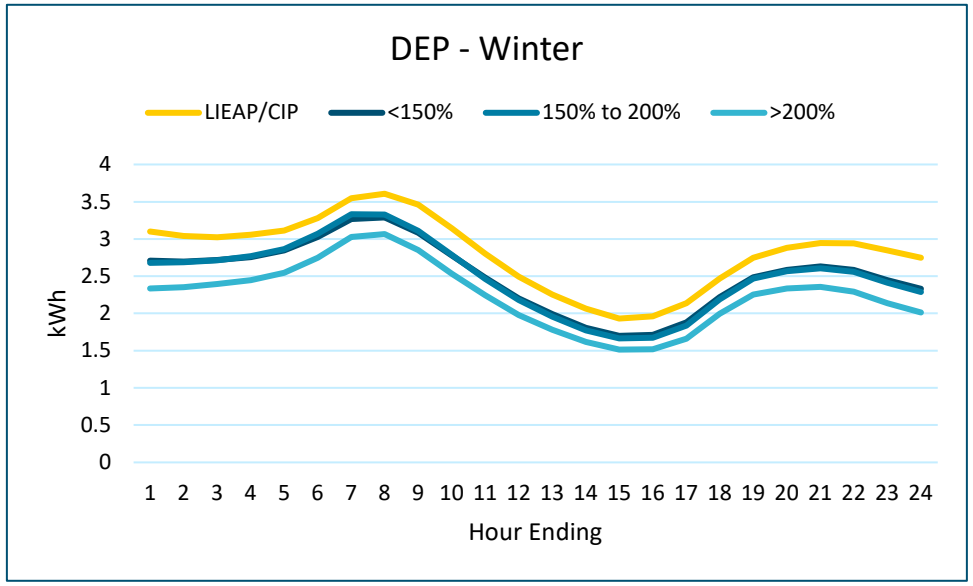


Peak Day Load Shape by Season & Income Segmentation

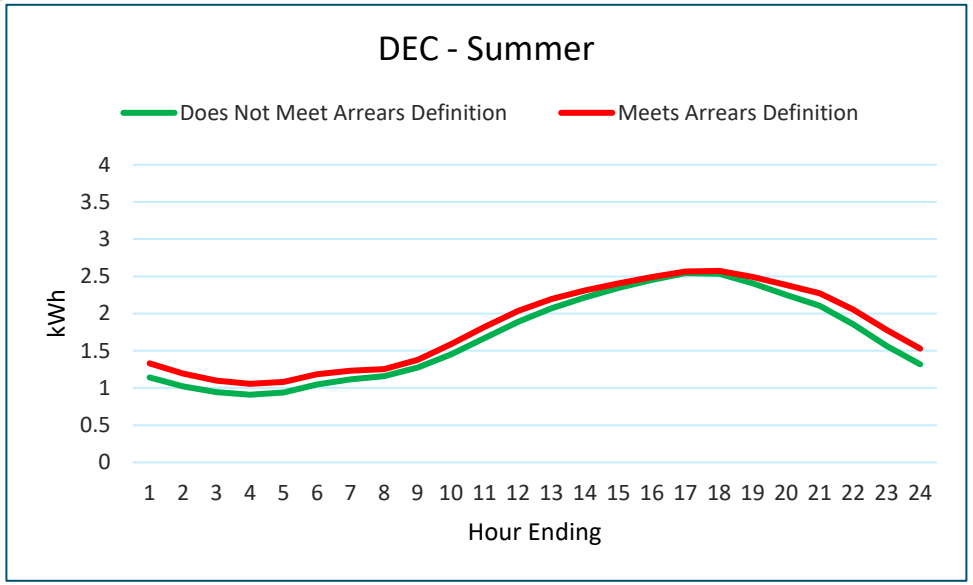


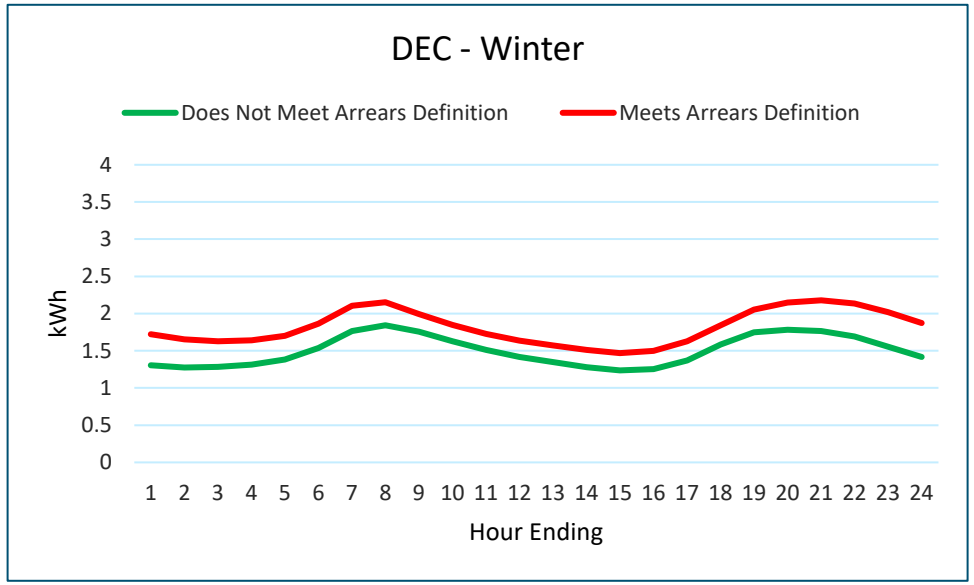


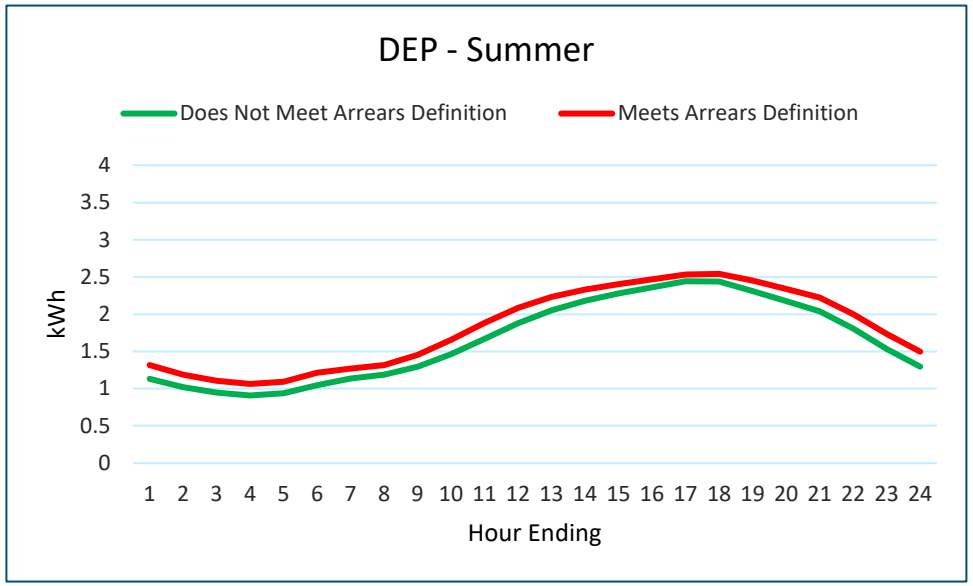


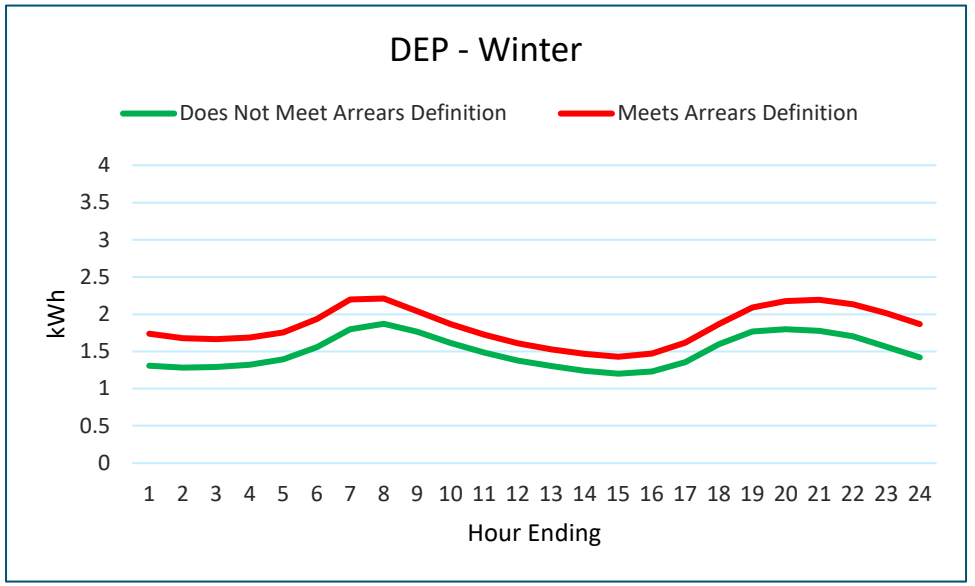


Average Weekday Load Shapes By Season & Arrearage Status

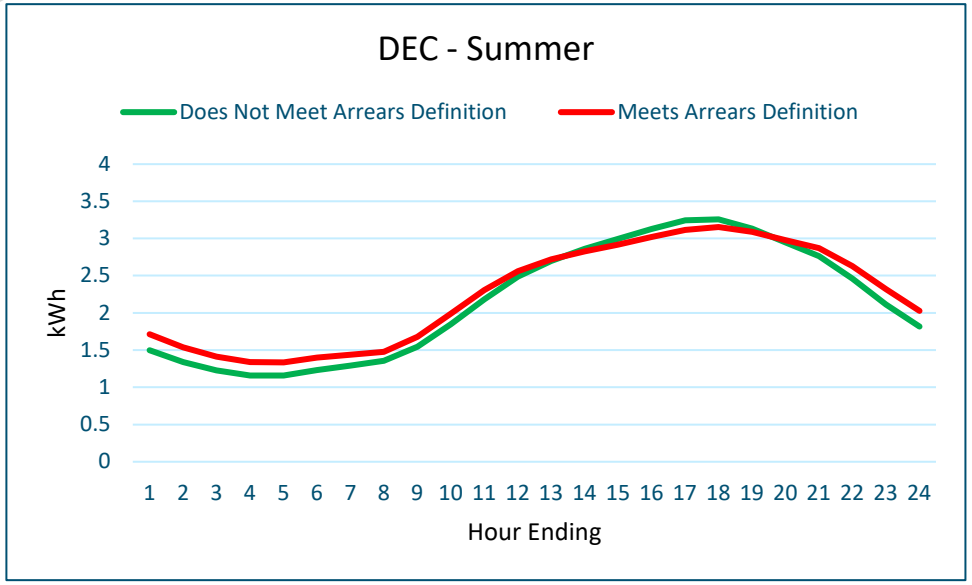


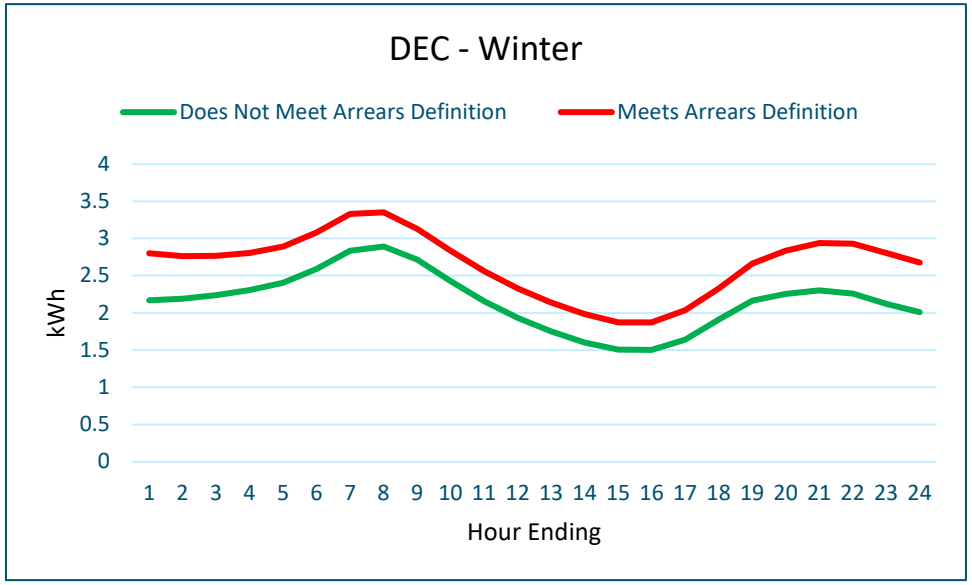


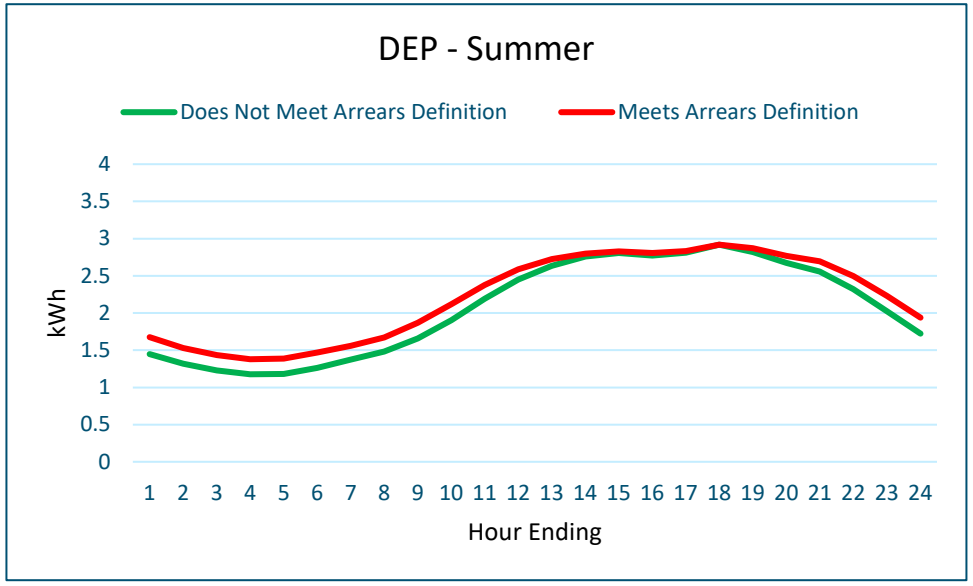


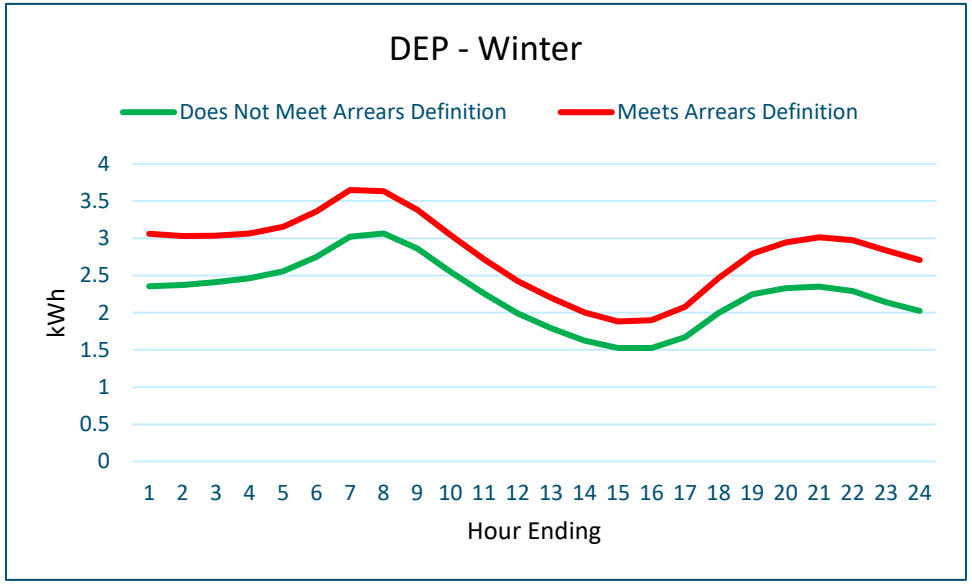


Peak Day Load Shapes by Season & Arrearage Status







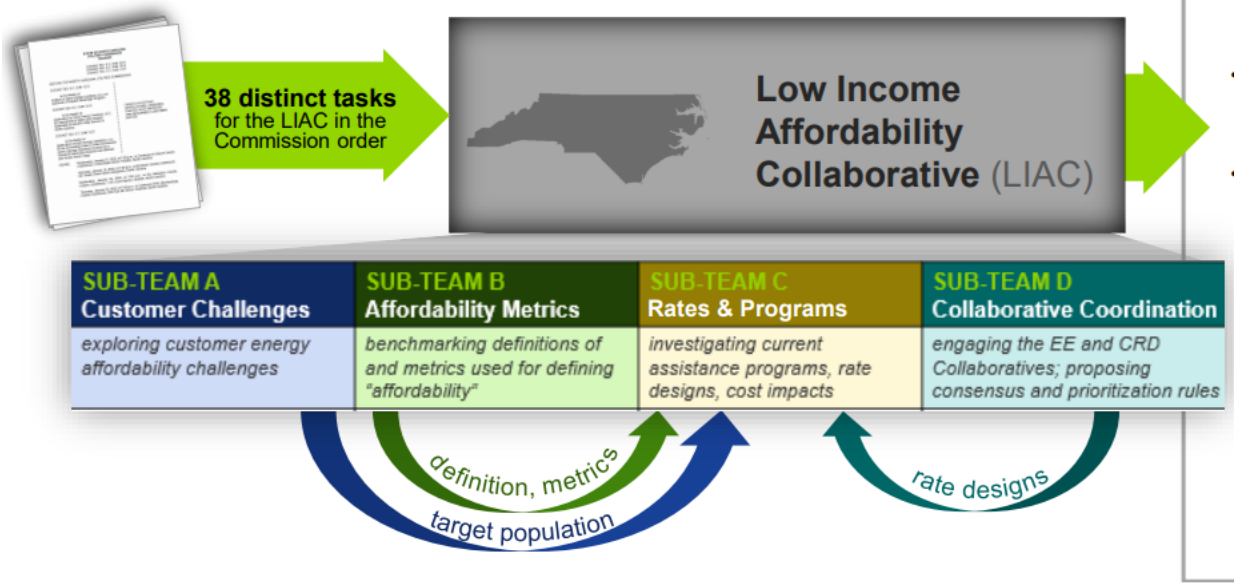


What's Next?

Analyze Customers and Present Findings and Trends

Collect and Incorporate Feedback to enhance analysis

Begin Working with Sub-Teams



DUKE ENERGY. Public Staff North Carolina Utilities Commission

Joint Final Report

- Outlines the feedback and recommendations obtained from LIAC
- Documents program proposals for near-term and longer-term fully costed out programs categorized by:
  - programs/rate designs layered on top of rate plans
  - programs not requiring rate design changes (needing separate proceeding)
  - programs requiring rate design changes (to be considered in next general rate case)

Appendix D. Rate Design and Cost of Service

During Workshop 4, Subteam C presented an overview of rate design concepts, as well as an overview of existing and alternative rates under consideration. This appendix includes the rate design material shared with the LIAC.

NC Low Income Collaborative Rate Design and Cost of Service

December 2021

DUKE ENERGY®

TODAY'S GOAL

- Provide Duke Energy's analysis on some of the questions from the Commission Orders related to rate design and cost of service

OVERALL GOAL

- Equip LIAC to **prepare an assessment** of current cost-of-service and rate design challenges

  (using the data presented today as key input into assessment)

LANGUAGE FROM THE COMMISSION ORDER

Findings of Fact Nos. 52-54 (emphasis added)

3. Investigate the strengths and weaknesses of **existing rates, rate design**, billing practices, customer assistance programs and energy efficiency programs in addressing affordability. Questions that should be addressed include:

E. Are the follow programs […] appropriate for implementation in North Carolina […]:

- 1) minimum bill concepts as a substitute for fixed monthly charges
- 3) Segmentation of the existing residential rate class to take into account different levels of usage

F. How do specific programs addressing affordability affect cost-causation and allowance of costs among classes?

G. How does cost-of-service allocation affect rate design and affordability of rates?

Agenda

- Cost of Service 101
- Rate Design 101
- Analysis of segmenting the residential rate class
  - Theory
  - Methodology
  - Results from DEP
- Analysis of a minimum bill as an alterative to a fixed charge

Cost of Service 101

The Ratemaking Process

Step 1: Revenue Requirement

- How much should the utility collect?
- Commission determines the total revenue needed for the utility to cover its operating expenses, depreciation, taxes, and a rate of return on rate base

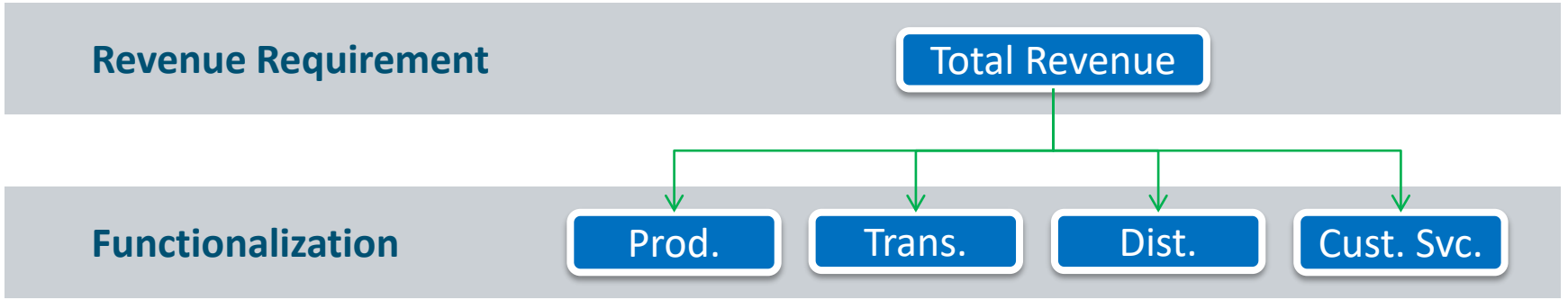
Step 2: Cost Allocation

- Who should pay?
- Cost of Service Study is performed
- Allocates utility system costs (revenue requirement) to different customer classes

Step 3: Rate Design

- How should prices be set?
- Commission approves a set of rates intended to recover revenue requirement
- Reflects multiple, competing priorities

Embedded Cost Allocation: Categorizing Costs of the Utility System by Function



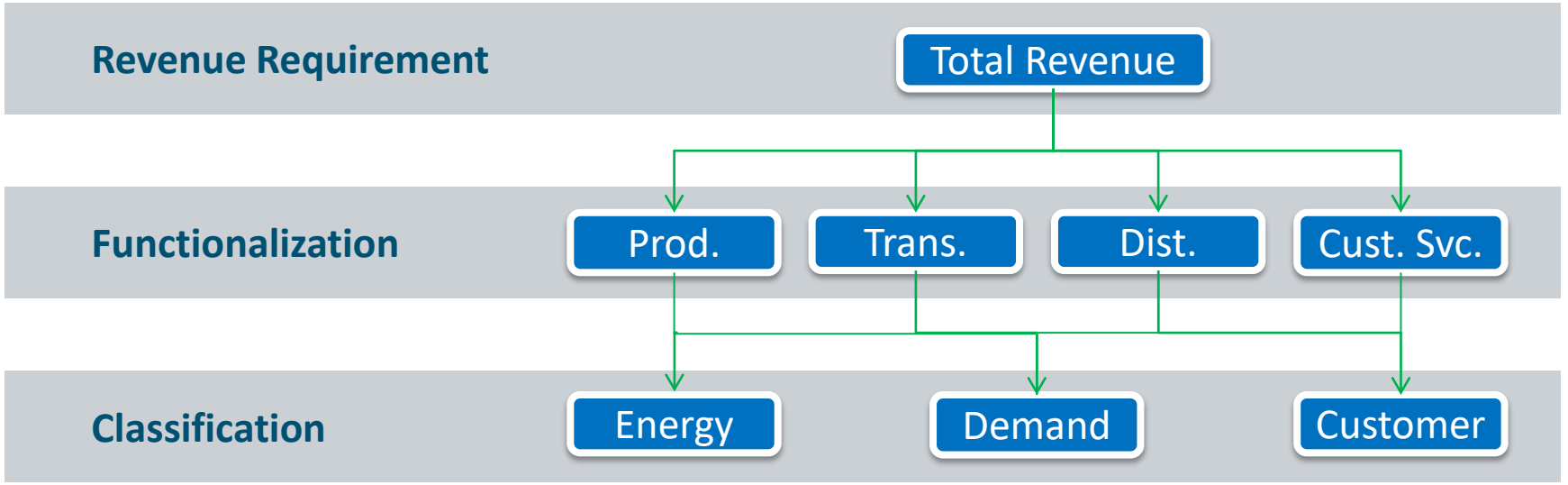
Functionalization of Costs:

- Production (e.g. power plants, fuel)
- Transmission (e.g. high voltage power lines)
- Distribution (e.g. distribution feeders, substations, etc.)
- Customer Service (e.g. metering, billing, call centers, etc.)
- Based on FERC Uniform System of Accounts

Cost Classifications

- **Energy** 
  - Unit: kWh
  - Examples: fuel, purchased power, net of reagents
  - ~20-35% of costs
- **Customer** 
  - Unit: per customer
  - Examples: cost of connection, billing, customer support
  - ~10-20% of costs
- **Demand (Capacity)** 
  - Unit: kW
  - Comprised of production, transmission, and distribution
  - ~45-60% of costs
  - Analogy - Like maintaining a highway with 100 lanes to ensure there is no congestion for a rush-hour that occurs only a few times a year

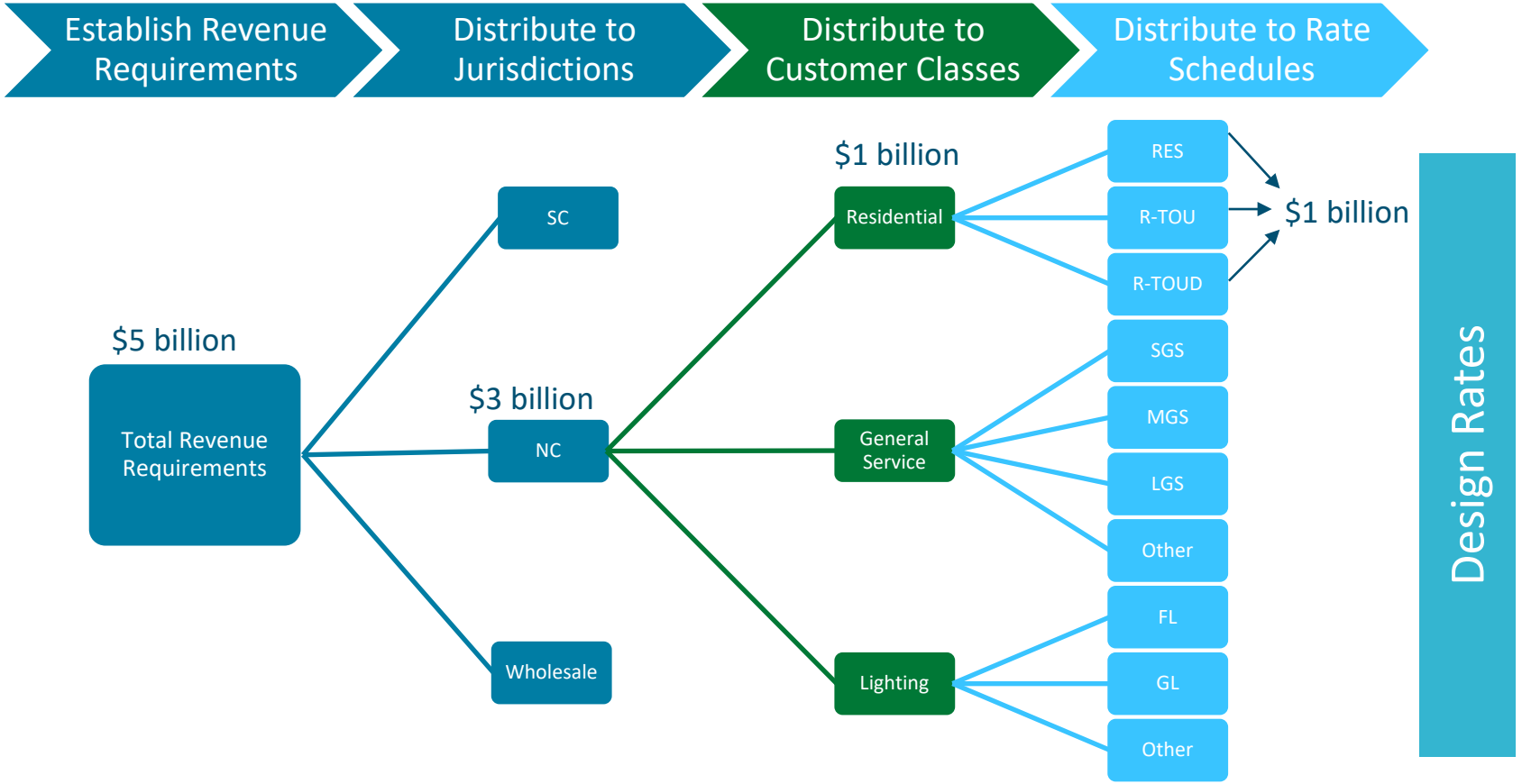
Classifying Costs by Causation



Classification of Costs:

- Energy-related (generally variable cost, corresponding to kWh consumed)
- Demand-related (generally fixed costs, corresponding to peak kW)
- Customer-related (generally related to number of customers)

Illustrative Cost of Service Allocation



Cost Allocation

- Once costs are functionalized (P, T, D, and C) and classified (energy, demand, customer) then costs need to be allocated to customer/rate classes
- Some costs are directly assigned
  - Example: distribution demand costs are directly assigned to each jurisdiction based on their asset's location, and then allocated across rate classes within each jurisdiction
- Energy and customer cost allocation factors can be less complicated
  - Example: energy costs allocated based upon kWh
- Demand allocation factors are created using different methodologies, all of which try to reflect a customer class's contribution to the peak demand

Embedded Capacity/Demand Cost Allocation

- The Single Summer Coincident Peak ("SCP") is used to allocate production and transmission costs in Duke jurisdictions in the Carolinas per the most recent North and South Carolina Rate cases

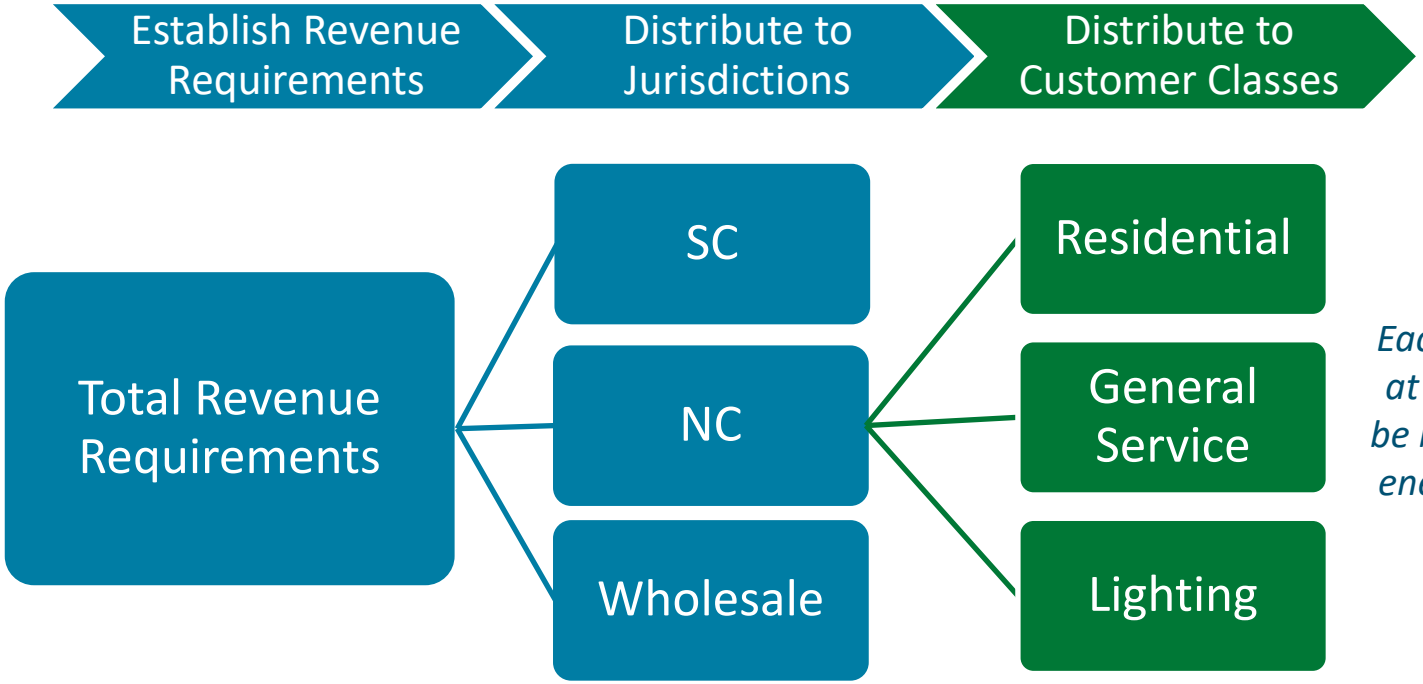
- In a hypothetical, illustrative example, if the utility's summer peak during the test year occurs on 7/25 at hour ended 4 pm with a demand of 10 MW, and residential has a demand of 5 MW at that hour, then the residential class is allocated 50% of the costs

Ratemaking Principles

- **Cost-Causation:** The cost-causer should bear the costs
  - Considered “fair”
  - Sends accurate price signal
  - Can be very complex to administer on an individual level

- **Average Cost Ratemaking:** Charges are established using overall characteristics of a group/class
  - Administratively simple
  - May reflect public policy/business goals
  - Will have a range of impacts on individual customers

Cost of Service Allocation (revisited)



Each revenue requirement at the rate class level can be broken out by customer, energy, and demand costs

Breaking out costs/revenue requirements by type of cost and by customer class becomes the basis for rate design

Rate Design 101

High-Level Rate Design Goals

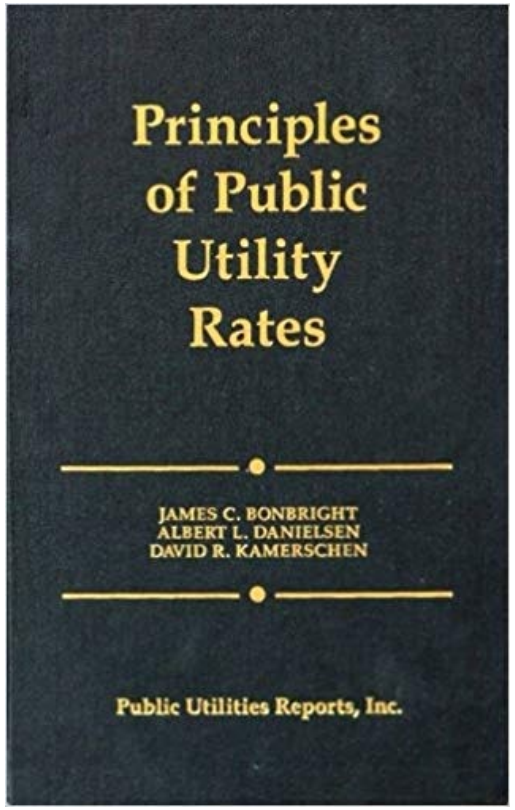
- Recognize Cost Causation (No Unjust or Undue Discrimination)
- Incent Beneficial Consumption Patterns (Efficient Price Signals)
- Recover Cost to Serve (i.e., recover revenue requirement)
- Meets Public Policy Goals (as determined by the utility commissions and state governments)

Bonbright's More Detailed Rate Design Principles

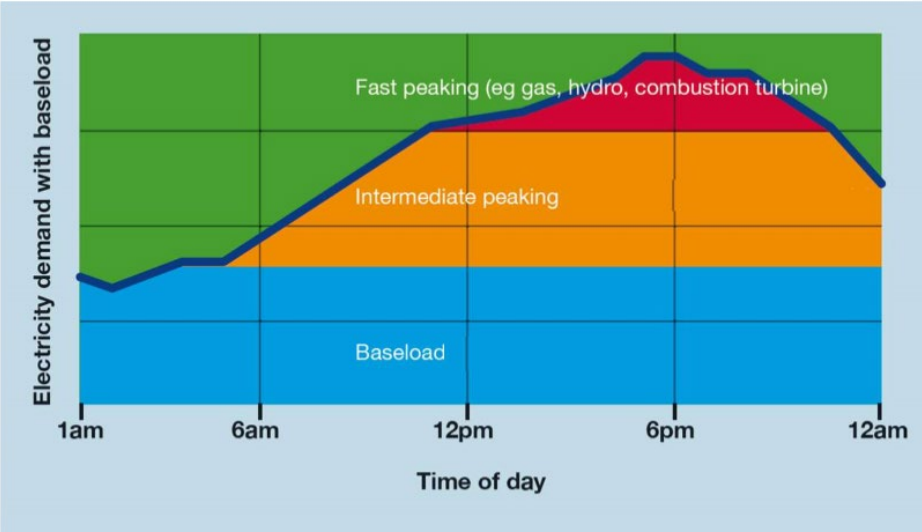
Fairness in apportioning costs among customers to match the cost-of-service and to avoid "undue discrimination"

Other Principles

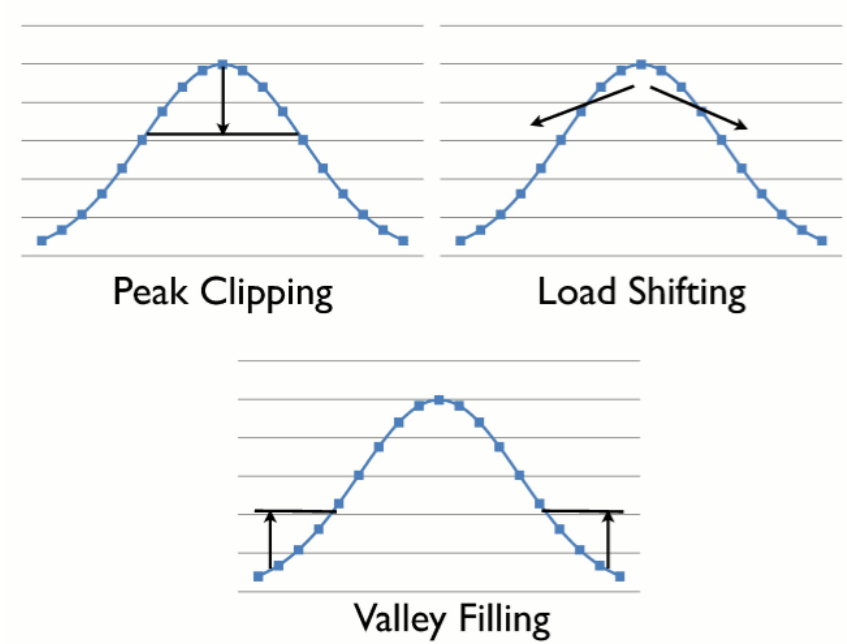
- Simplicity, understandability, and "freedom from controversies as to proper interpretation"
- Effective yield of revenue requirements under just and reasonable standard
- Revenue and cash flow stability
- Stability of rates themselves, minimal sudden adverse changes for customers
- Promoting efficient use of energy



Good Rate Design Incents Efficient Usage



Sources: NC Public Staff
https://files.nc.gov/pubstaff/documents/files/Ratemaking%20Presentation%20%283-18%29.pdf



Typical Rate Calculation Examples

Billing Determinant × Price = **Expected Revenue**

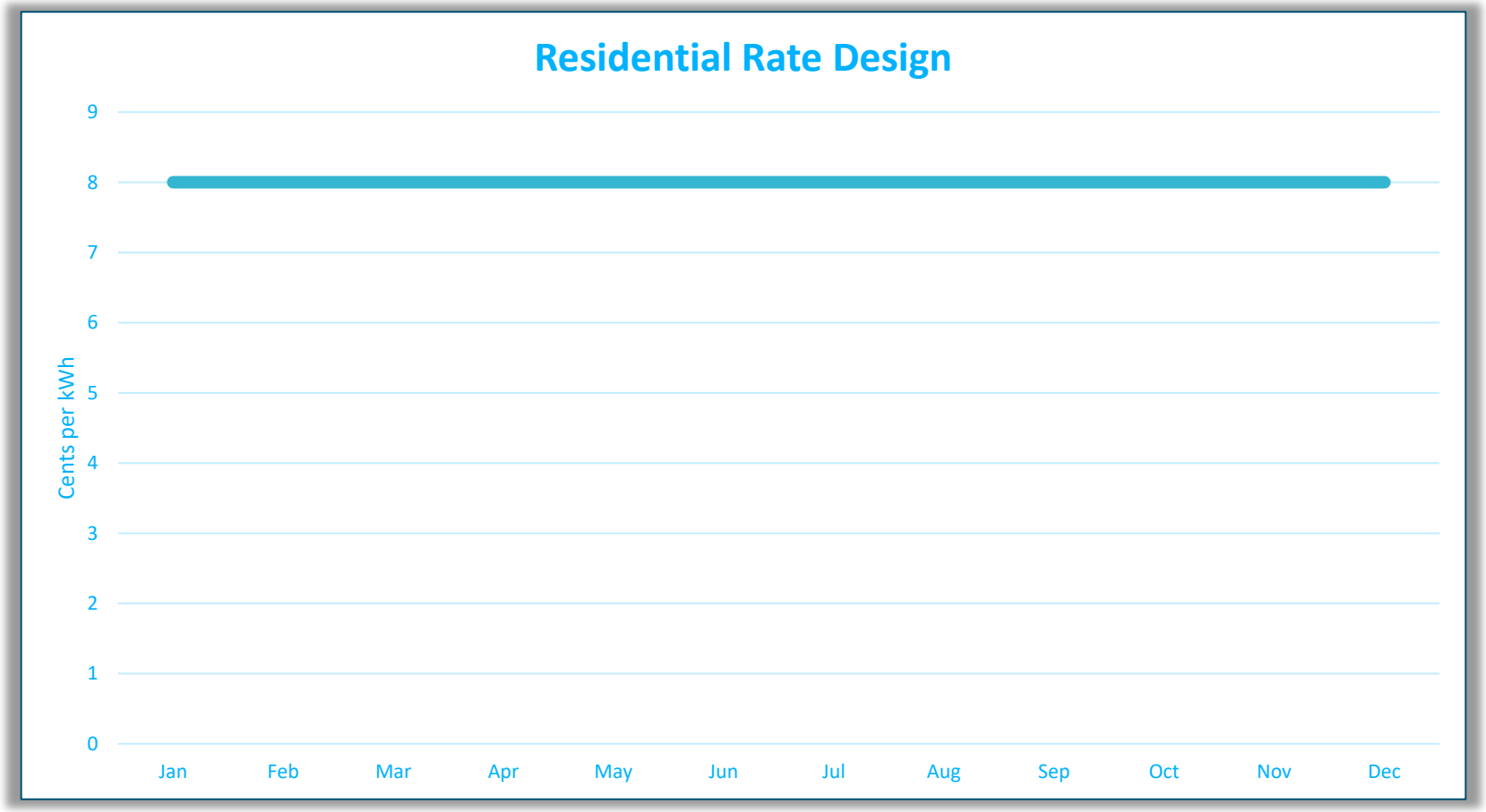
100k Customer Bills × $10 Customer Charge = **$1 million Expected Revenue**

100 Million kWh × $0.10 Energy Charge = **$1 million Expected Revenue**

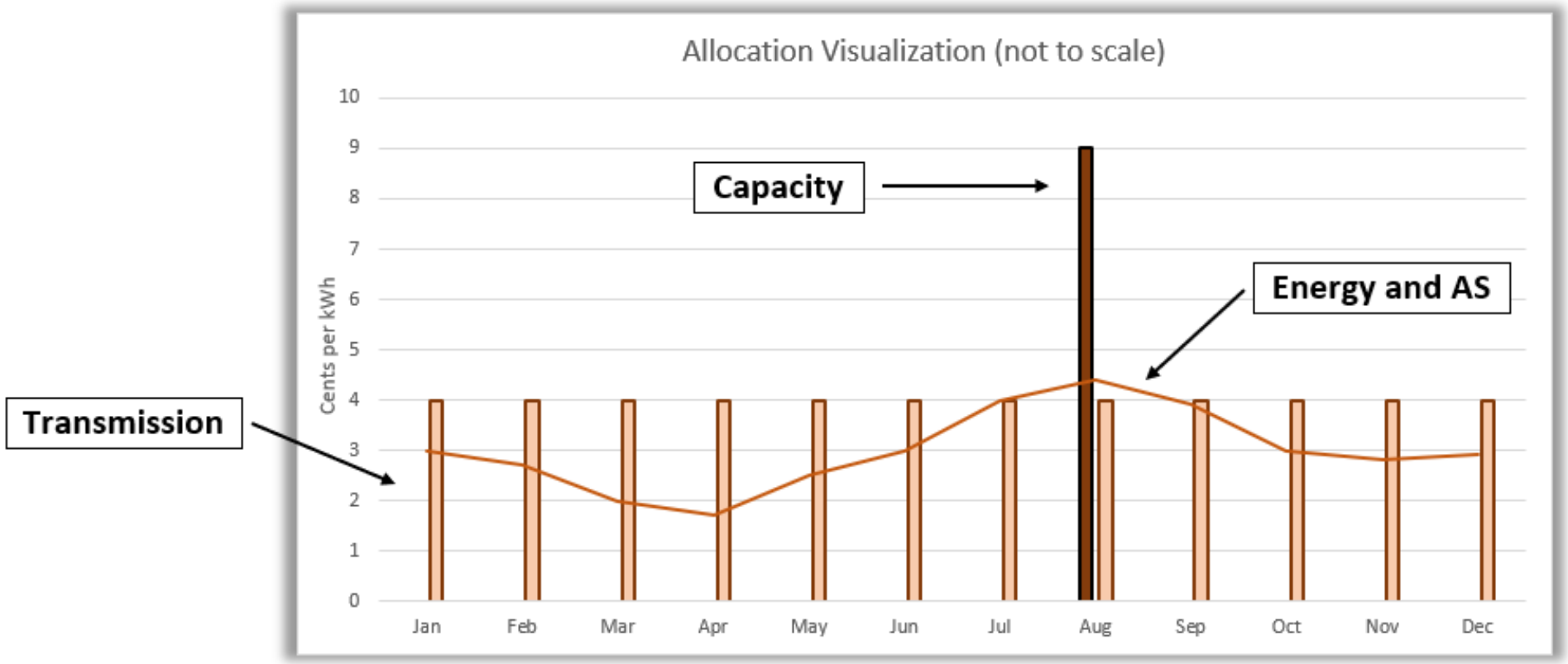
Prices will not Perfectly Match Cost of Service

- Impractical – cost allocation is often retrospective, design must be forward-looking
- Utilities are network systems
  - Contains a variety of joint and common system costs that are shared (i.e. socialized) among all customers
- Cross-subsidies are inherent in network systems
  - i.e. some customers will pay more or less than their fair share of the common system costs
  - i.e. some cross-subsidies or “cost shifts” are generally unavoidable in any rate design (though their nature and magnitude may differ)
- Many cross-subsidies are known and justified for policy reasons
  - i.e. low income, new neighborhood infrastructure, service to rural customers

Typical residential rate design...



However, how costs are actually incurred looks more like…



Illustrative example

Types of Charges

- Customer Charge
  - Example: Base Facilities Charge
  - Theory: Recovers costs per customer, such as billing costs
- Energy Charge
  - Per kWh energy charge
  - Theory: Recovers cost of producing energy
- Demand Charge
  - Per kW demand charge
  - Theory: Recovers capacity/demand costs
- Many variants on each charge
  - Examples: TOU rates for energy charges, coincident demand charges, minimum bills, etc.

Relationship between Charges and Costs

Cost Classifications		Categories of Charges
Customer Costs	⇢	Customer Charge
Energy Costs	⇢	Energy Charge
Demand Costs	⇢	Demand Charge

There should be a relationship between costs and charges but be careful to remember they are different!

Cost to Serve Lenses

- **Embedded Cost:** actual cost of investment or operating expenses at the cost during the test year
  - Energy example: fuel, reagent, and variable O&M costs
  - In the Carolinas, used to set revenue requirements

- **Marginal Cost:** the current cost of the next unit
  - Energy example: current cost of providing an additional kWh
  - In the Carolinas, traditionally used to inform specific prices/charges
  - Should help align rate design and IRPs

- Ratemaking is a blend of these two perspectives
  - Embedded cost takes priority – utility must collect revenue requirement
  - Aim to incorporate marginal cost in rate design as much as possible to send optimal price signals

Measuring Costs and Cross-Subsidization

Embedded Cost Cross-Subsidization

- Are customers paying their fair share of historical costs?
- Each group of customers brings costs (as allocated in the Cost-of-Service Study) and revenues to their rate class
- Analogy: paying my share of the dinner we ate last night

Marginal Cost Cross-Subsidization

- Are customers paying their fair share of future/incremental costs?
- Customers will add marginal costs and revenues to the utility
- Analogy: paying my share of the dinner we are going to have tomorrow
  - Different prices from the dinner we ate last night

Customers revenues > Customers costs ⟶ Customers subsidizing others

Customers costs > Customers revenues ⟶ Customers being subsidized

Embedded Cost – Unit Costs

- Production and Transmission ("P&T") Demand allocated based on 1 Summer CP Methodology
  - Unit costs summed because they use the same methodology for this purpose
- Distribution ("D") Demand allocated using non-coincident peak
- Energy Costs allocated using kWh's
- Customer Costs allocated using number of bills
- Derived from the compliance Cost of Service Studies from the last rate case

Unit Costs				
	unit	DEP	DEC - RS	DEC - RE
P&T Demand	$/kW-Month CD	$ 15.54	$ 15.66	$ 16.29
D Demand	$/kW-Month NCD	$ 1.50	$ 2.03	$ 2.07
Energy	$/kWh	$ 0.0346	$ 0.0231	$ 0.0232
Customer	$/Month	$ 27.64	$ 21.95	$ 22.81

Illustrative Embedded Cost Calculations

DEP Energy Calculation

	(a)	(b)	(c)	(d)
	Energy Unit Cost	Annual kWh	Energy Annual COS Estimate	Monthly COS Estimate
			= a x b	= c/12
Pre-EE Customer	$0.03461	16,000	$554	$46
Post-EE Customer	$0.03461	12,000	$415	$35
Reduction in Rate Class Revenue Requirement			$139	$11

DEP Production & Transmission Calculation

	(a)	(b)	(c)	(d)
	P&T Unit Cost (per month)	kW	P&T Monthly COS Estimate	Annual COS Estimate
			= a x b	=c*12
Pre-EE Customer	$15.54	3	$47	$559
Post-EE Customer	$15.54	2	$31	$372
Reduction in Rate Class Revenue Requirement			$16	$180

F. How do specific programs addressing affordability affect cost-causation and allowance of costs among classes?

- Energy efficiency programs lower energy usage or demand would lower the residential allocation of embedded costs
- Any program that could potentially increase usage or demand would increase the residential allocation of embedded costs
- The effect any of these programs would have on other customer's rates will depend on the revenue collected from each customer (i.e. contribution to the rate class's revenue) compared with the costs allocated to the rate class due to that customer (i.e. contribution to the rate class's revenue requirement)

Customers revenues > Customers costs ⟶ Customers subsidizing others

Customers costs > Customers revenues ⟶ Customers being subsidized

G. How does cost-of-service allocation affect rate design and affordability of rates?

- Changes in cost-of-service allocation methodologies will change the revenue requirement for each rate class, with some having a higher revenue requirement and some having a lower one
- Cost-of-service and rate design and inherently linked in many ways
- Cost-of-service, including unit costs, help guide rate design, although there are good reasons why the two may – and to a certain extent will inevitably – be different

Segmenting the Residential Rate Class – Theory

What Drives the Cross-Subsidies by Usage?

- An embedded cross-subsidy analysis is equivalent to an analysis of segmenting the residential rate class

Consider a **theoretical** utility with only customer and energy costs

- Unit Customer Costs = $25/Customer-Month, Unit Energy Costs = $0.03/kWh
- Prices: $10/bill fixed charge, $0.045/kWh energy charge
- 10,000 bills per year with average usage of 1,000 kWh per bill
- Revenue Requirement = $550,000; Estimated Revenue = $550,000

Usage Determines Over/Under-Recovery of Fixed Costs

Usage of 1,000 kWh per Bill

- Bill = $10 fixed charge + 1,000 kWh x $0.045 kWh = $55
- Cost = $25 fixed charge + 1,000 kWh x $0.03 kWh = $55

→ **Costs and Revenues Balanced**
$15 in fixed cost shortfall
- $15 volumetric cost over-recovery
= $0 difference

Usage of 500 kWh per bill

- Bill = $10 fixed charge + 500 kWh x $0.045 kWh = $32.50
- Cost = $25 fixed charge + 500 kWh x $0.03 kWh = $40

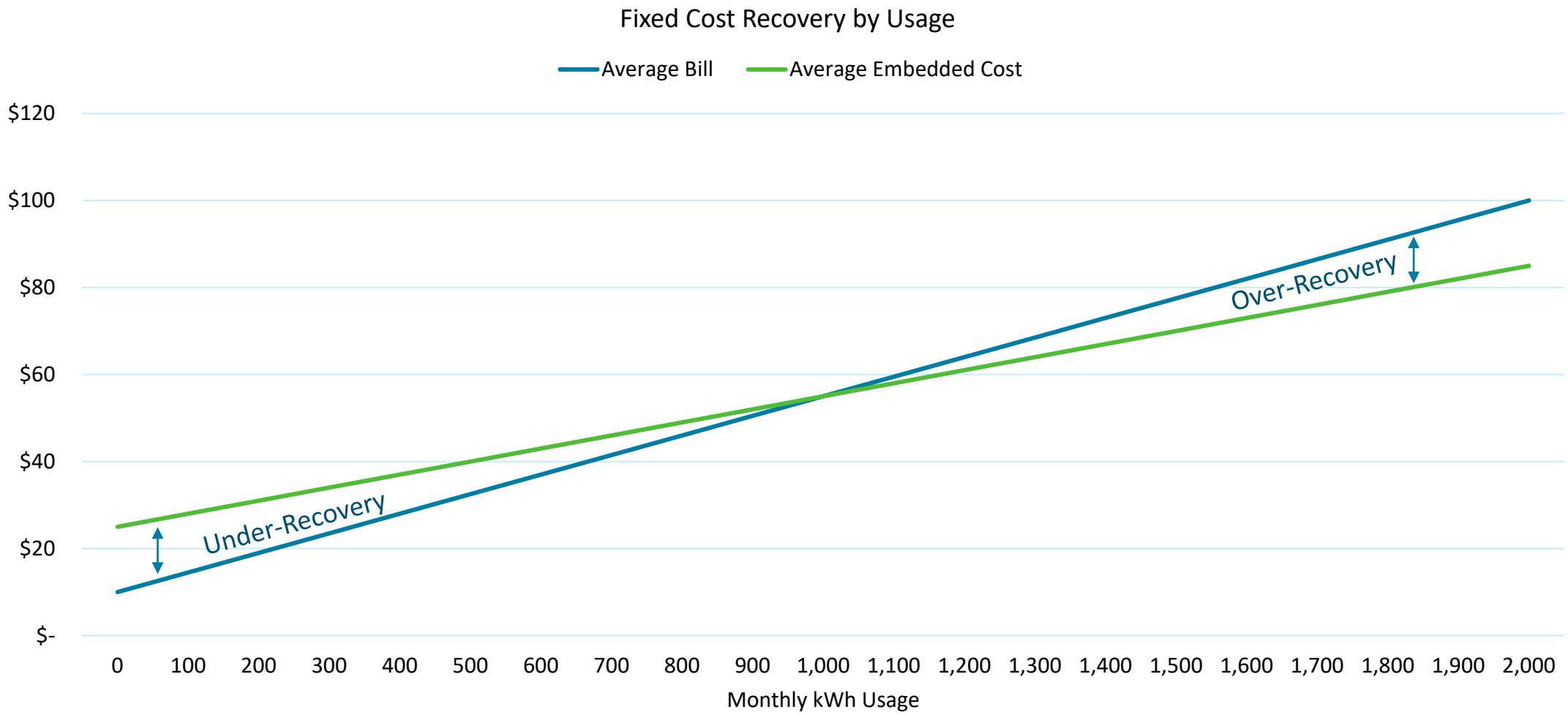
→ **Costs > Revenues**
$15 in fixed cost shortfall
- $7.50 volumetric cost over-recovery
= $7.50 total under-recovery

Usage of 1,500 kWh per bill

- Bill = $10 fixed charge + 1,500 kWh x $0.045 kWh = $77.50
- Cost = $25 fixed charge + 1,500 kWh x $0.03 kWh = $70

→ **Revenues > Costs**
$15 in fixed cost shortfall
- $22.50 volumetric cost over-recovery
= $7.50 total over-recovery

Cross-Subsidies by Usage - Visualized



What Drives the Cross-Subsidies by Usage? – Adding Demand

Consider a **theoretical** utility with only customer, energy, and demand costs

- Unit Customer Costs = $25/Customer-Month, Unit Energy Costs = $0.03/kWh
- Prices: $10/bill fixed charge, $0.095/kWh energy charge, no demand charge
- 10,000 bills per year with average usage of 1,000 kWh per bill
- Revenue Requirement = $1,050,000; Estimated Revenue = $1,050,000

- Average Demand of 5 kW (27% load factor)
- Demand Unit Cost of $10/kW

Load Factor Determines Demand/Capacity-Based Cross-Subsidies

Usage of 1,000 kWh per Bill; 5 kW demand (27% load factor)

- Bill = $10 fixed charge + 1,000 kWh x $0.095 kWh = $105
- Average Cost = $25 fixed charge + 1,000 kWh x $0.03 kWh + 5 kW * $10/kW = $105

→ **Costs and Revenues Balanced**
$15 in fixed cost shortfall +
$50 demand costs -
$65 volumetric over-recovery
= $0 difference

Usage of 1,000 kWh per Bill; 8 kW demand (17% load factor)

- Bill = $10 fixed charge + 1,000 kWh x $0.095 kWh = $105
- Cost = $25 fixed charge + 1,000 kWh x $0.03 kWh + 8 kW * $10/kW = $135

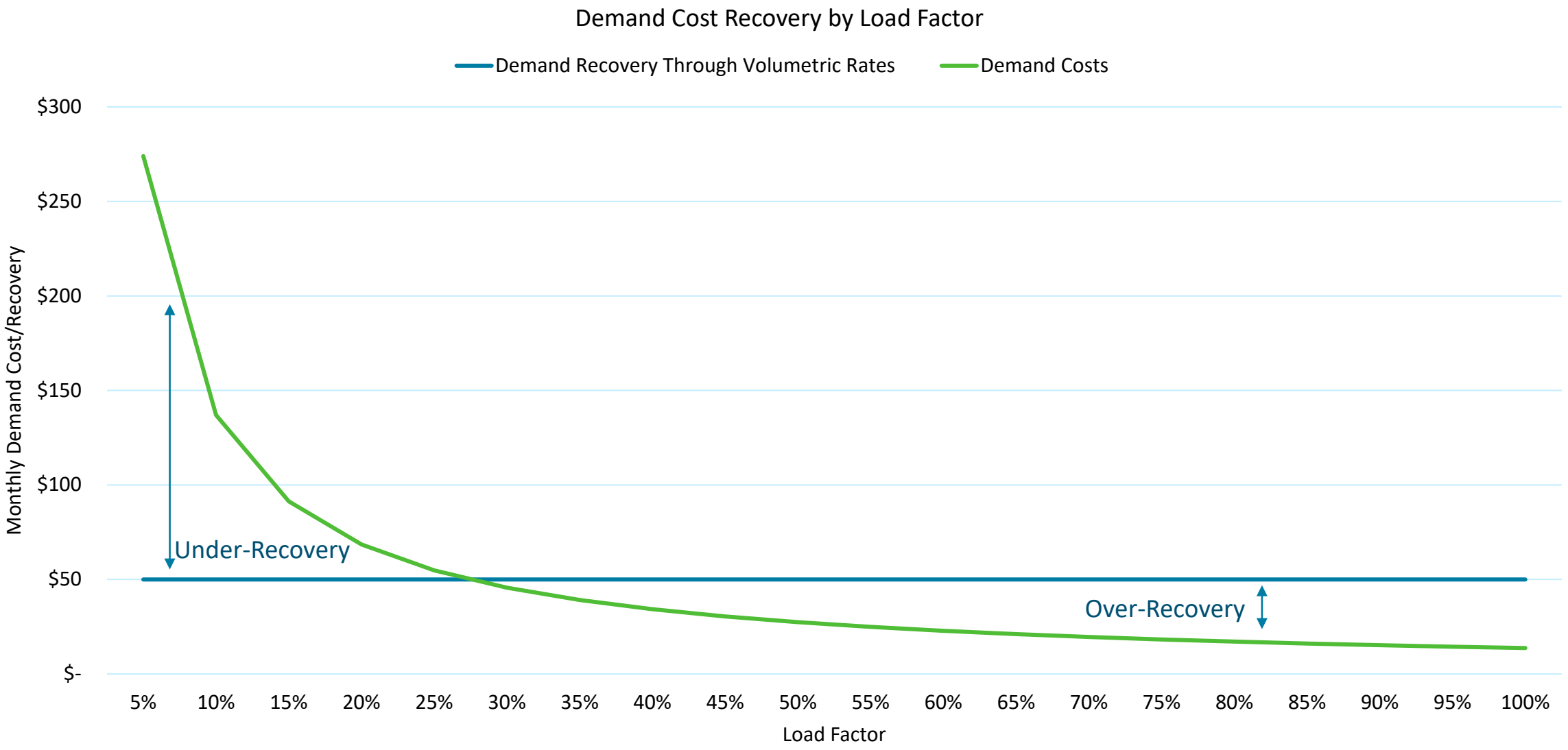
→ **Costs > Revenues**
$15 in fixed cost shortfall +
$80 demand costs –
$65 volumetric over-recovery
= $30 under-recovery

Usage of 1,000 kWh per Bill; 2 kW demand (68% load factor)

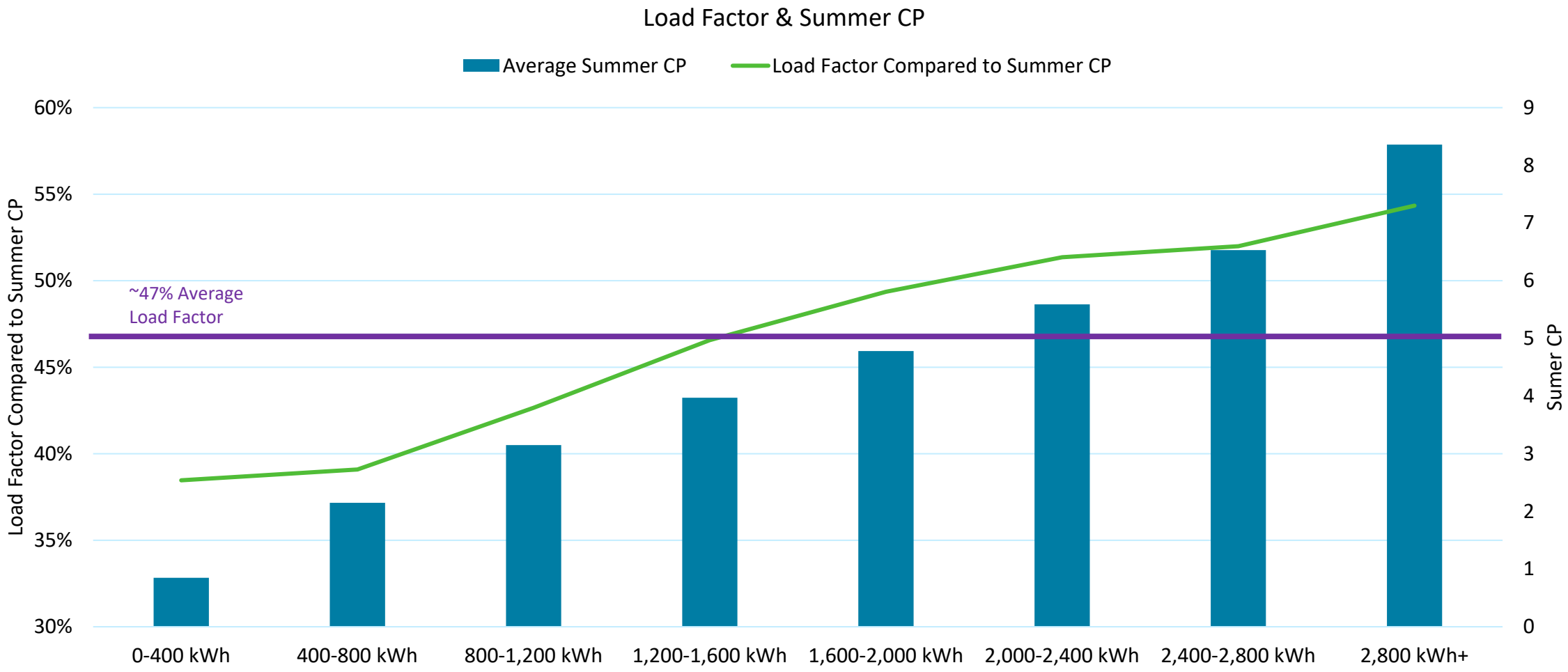
- Bill = $10 fixed charge + 1,000 kWh x $0.095 kWh = $105
- Cost = $25 fixed charge + 1,000 kWh x $0.03 kWh + 2 kW * $10/kW = $75

→ **Revenues > Costs**
$15 in fixed cost shortfall +
$20 demand costs –
$65 volumetric over-recovery
= $30 over-recovery

Load Factor and Cross-Subsidization Visualized



Load Factor & Summer CP by Usage – Actual DEP Data



Higher Usage Customers have a higher load factor and thus there is an over-recovery of demand costs since there is no demand charge (demand is recovered volumetrically)

Segmenting the Residential Rate Class – Methodology

Embedded Cost Analysis

Load Shapes

Load data from nearly 1mm customers

- AMI data from residential customers
- Only included customers with a full year's worth of data

Estimated Bills

Calculate monthly bills using load shapes

- Billing determinants x rates
- For RES it is the customer charge + kWh x kWh rate

Embedded Cost

Load Shapes by Unit Costs

- Production demand = kW at summer system peak × P unit cost
- Transmission demand = kW at summer system peak × T unit cost
- Distribution demand = non-coincident peak kW × D unit cost
- Energy = kWh × energy unit cost
- Customer = number of contracts × customer unit cost x 12 months

For the entire rate class, average embedded costs should be very close to average bills because both have the same revenue requirement

Marginal Cost Analysis

Load Shapes

Load data from nearly 1mm customers ✓

Estimated Bills

Calculate monthly bills using load shapes ✓

Marginal Cost Benefit

Multiply load shape by marginal cost rates

- Production demand = kW savings at system peak × P marginal capacity cost
- T&D demand = kW savings at system peak × T&D marginal capacity cost
- Energy = kWh in an hour x marginal cost in that hour

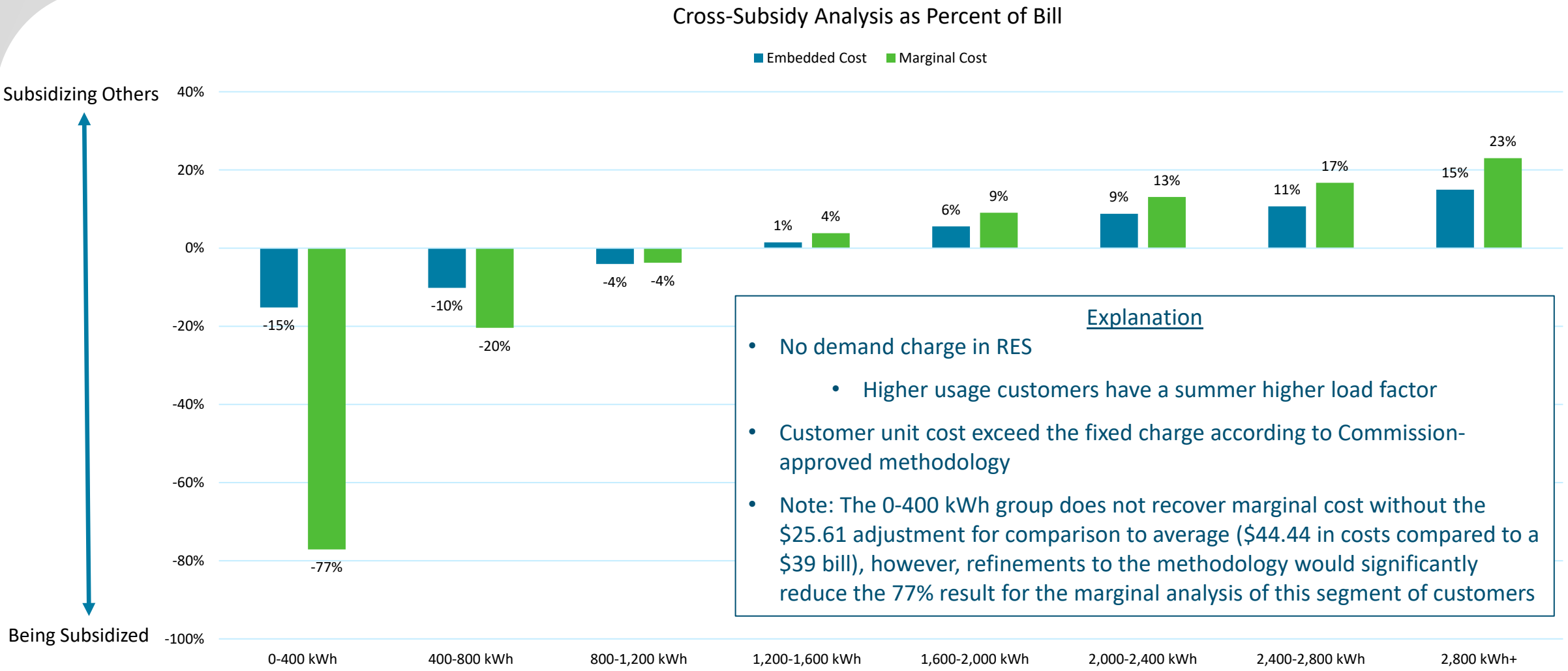
Average marginal cost will not necessarily be the same as average bills

Final Notes on Methodology - DEP

- Average estimated bill = $130.07
- Average embedded cost = $138.84
  - Different from estimated bill likely due to difference in time period between unit costs (CY2018) and the data used (2020-2021 data) and any customers without AMI data for the time period
  - Results were adjusted by the difference ($8.27) to ensure the bill estimates and unit costs have the same revenue requirement
- Average marginal cost = $77.54
  - There are no marginal estimates for customer costs, therefore the bill estimates compared with marginal costs subtracted out the customer unit cost ($27.64 per bill)
  - Even with the adjustment for customer costs, there was a $24.89 difference between the average marginal cost and the average bill. This is expected because marginal costs should not equal average costs.
  - To enable comparisons, the bill estimates were adjusted by an additional $24.89 when compared to marginal cost. The resulting calculation shows which groups of customers are contributing relatively more or less towards the recovery of marginal cost.

Segmenting the Residential Rate Class

Cross-Subsidy Analysis by Usage: Actual DEP Data



Explanation

- No demand charge in RES
  - Higher usage customers have a summer higher load factor
- Customer unit cost exceed the fixed charge according to Commission-approved methodology
- Note: The 0-400 kWh group does not recover marginal cost without the $25.61 adjustment for comparison to average ($44.44 in costs compared to a $39 bill), however, refinements to the methodology would significantly reduce the 77% result for the marginal analysis of this segment of customers

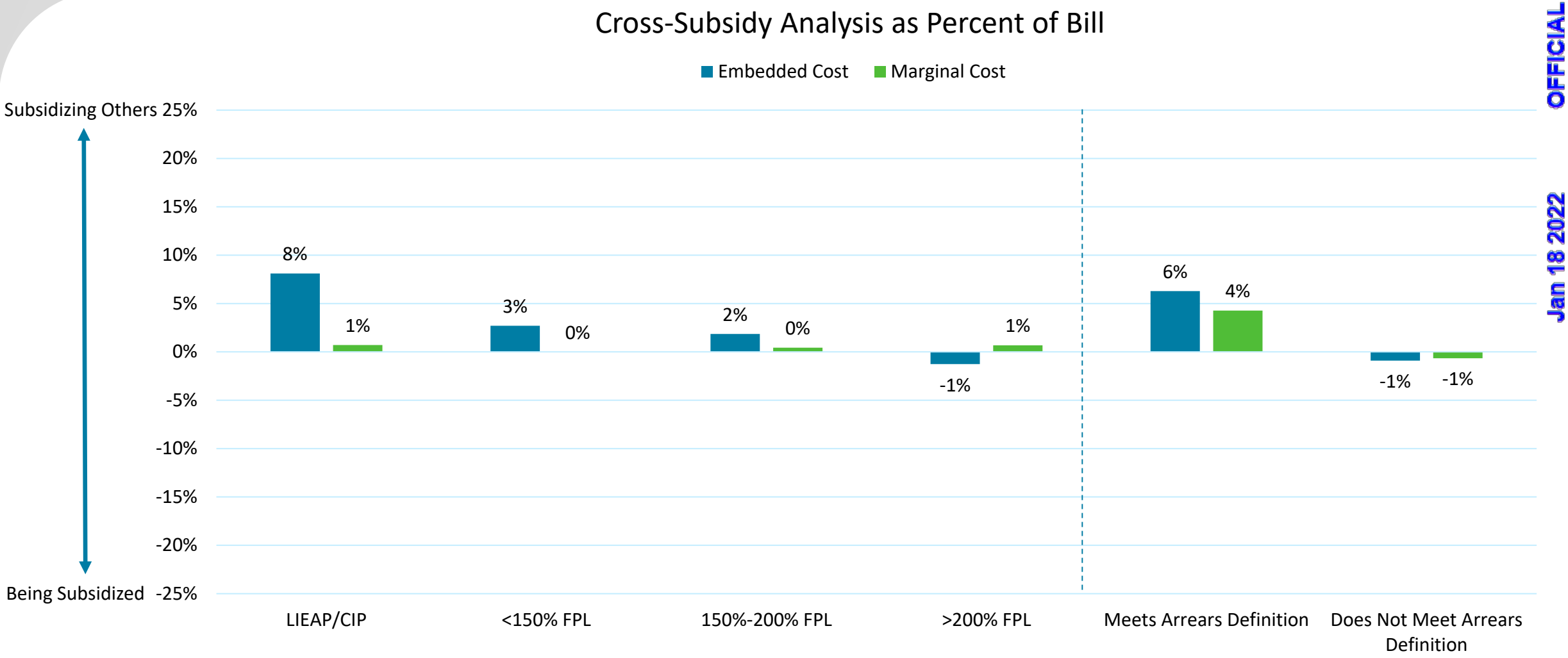
	0-400 kWh	400-800 kWh	800-1,200 kWh	1,200-1,600 kWh	1,600-2,000 kWh	2,000-2,400 kWh	2,400-2,800 kWh	2,800 kWh+
% Total Customers in Category*	8%	24%	29%	21%	11%	5%	2%	2%

*Percentages may not add up to 100% due to rounding

Notes on Cross-Subsidies by Usage

- Public Policy goal to encourage energy conservation
  - ✓ Lower usage customers are successfully using less energy
- Public Policy goal to encourage energy efficiency and conservation
  - ✓ Higher volumetric prices encourage energy efficiency and energy conservation

Cross-Subsidy Analysis by Income and Arrears Status: DEP



% Total Customers in Category*	3%	12%	8%	63%	12%	88%

*Not all customers can be categorized, resulting in percentages not necessarily summing to 100%

Segmentation Analysis Conclusions

- High-usage customers generally subsidize low-usage customers
- Customers receiving LIEAP/CIP and that meet the arrearage definition appear to be subsidizing other customers
- Cost allocation methodologies may change in the future with unknown effects on this analysis

Minimum Bill Analysis

Minimum Bill – Bill no less than $XX

	Higher Fixed Charge	Minimum Bill
Number of Customers Affected		
Effect on Volumetric Charge		
Amplifies Incentive for EE		

Assuming A Minimum Bill of $30, without Riders in DEP

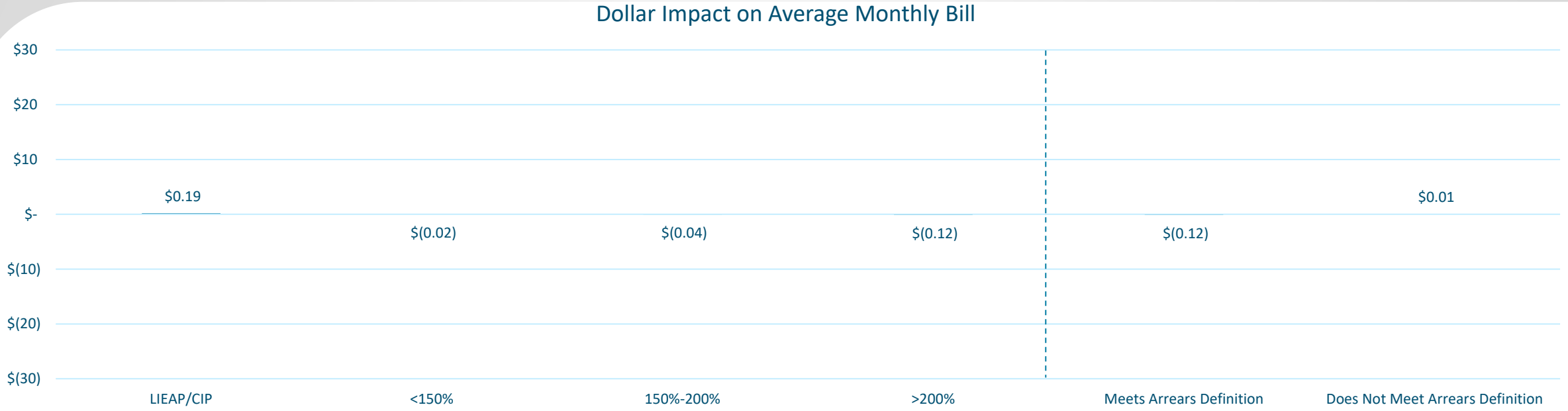
Current RES

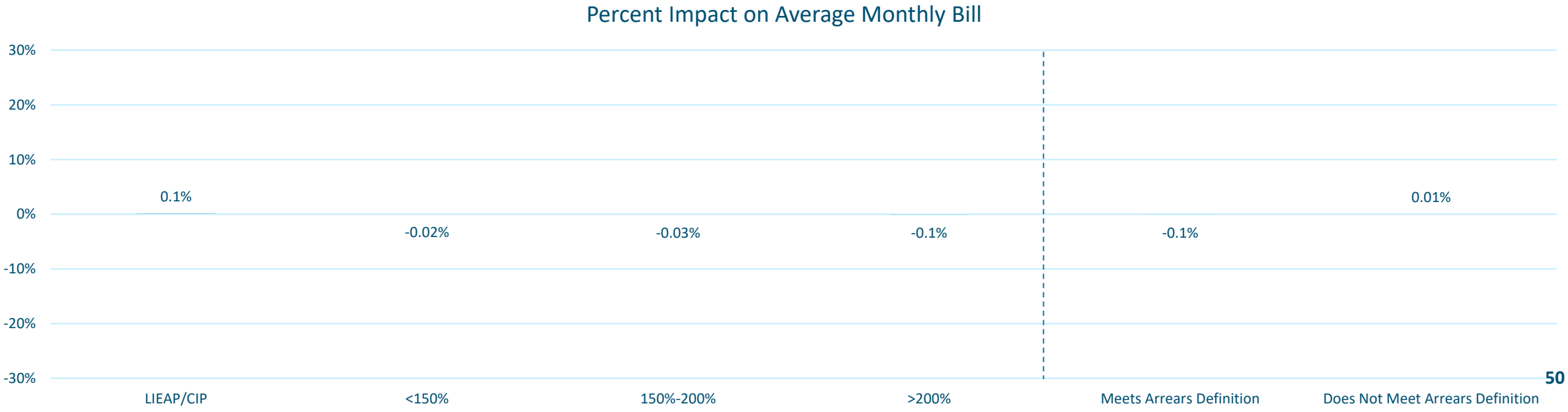
- $14 fixed charge, 10.772 cents/kWh July-October, 10.271 cents/kWh November-June
- $130.07 Average Monthly Bill

Minimum Bill RES

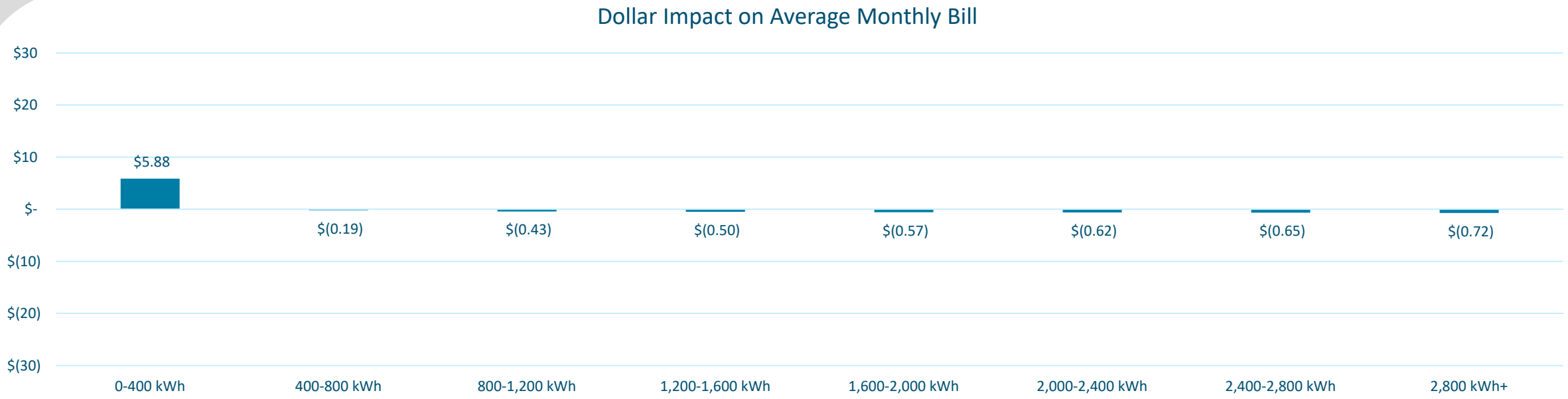
- $14 fixed charge, 10.763 cents/kWh July-October, 10.262 cents/kWh November-June
- $130.57 Average Monthly Bill
  - 50 cents off revenue neutrality – results adjusted by subtracting 50 cents from segment average bill

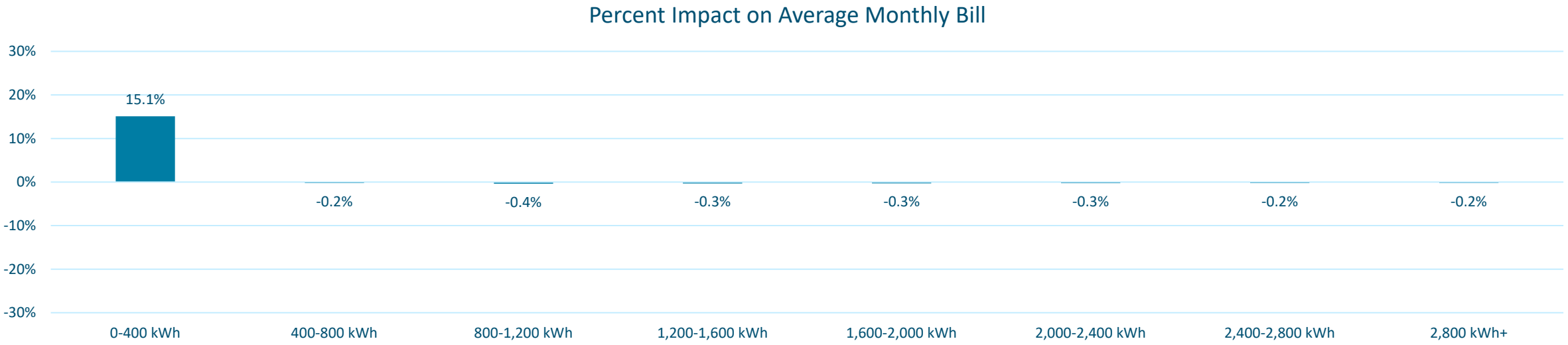
A Minimum Bill has a Very Small Impact by Income and Arrears Status



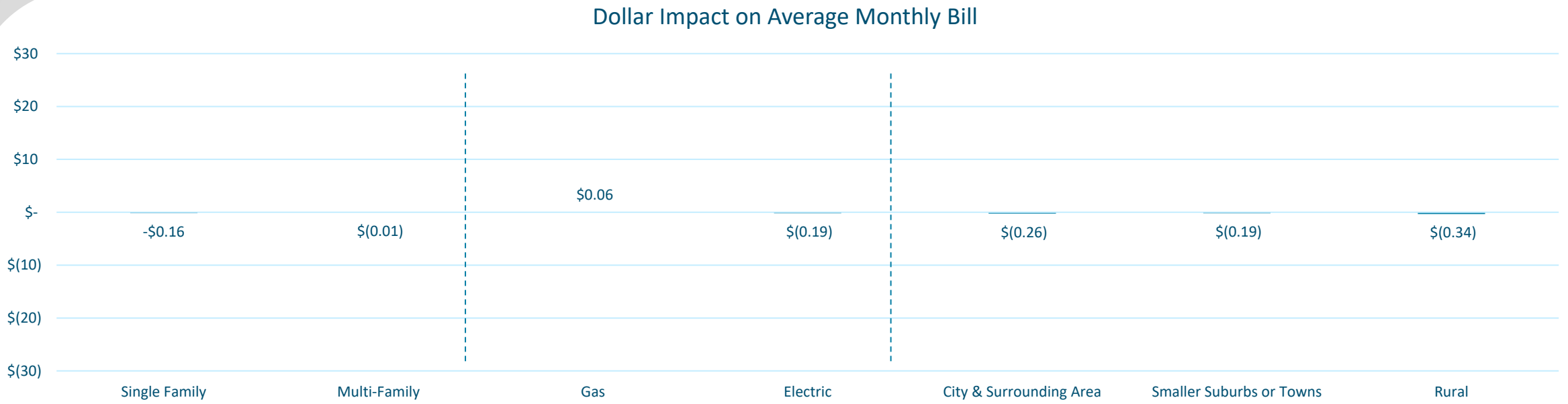


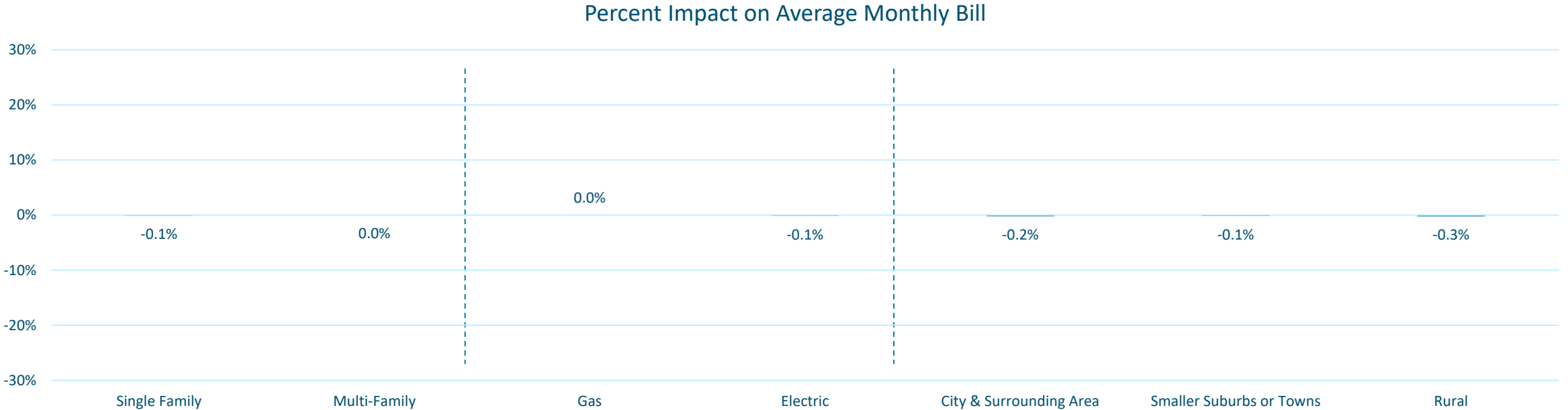
A Minimum Bill Only has a Significant Impact by Usage on Very Low Usage





A Minimum Bill has Very Small Impact by Housing Type, Heating Source, or Housing Location





Minimum Bill Conclusions

- A very high minimum bill would be needed to replace the revenue from eliminating the fixed charge
- A minimum bill can help ensure very low usage customers contribute more towards the rate class's revenue requirement
  - Typically affects few customers and thus has a low impact on the volumetric rate
- Little clear evidence that a minimum bill would a significant impact on low-income/vulnerable customers
  - Impact may be more significant if there was a large percentage of vacation homes that are largely vacant for parts of the year

Recap of Goals of This Presentation

Findings of Fact Nos. 52-54 (emphasis added)

3. Investigate the strengths and weaknesses of existing rates, rate design, billing practices, customer assistance programs and energy efficiency programs in addressing affordability. Questions that should be addressed include:

E. Are the follow programs […] appropriate for implementation in North Carolina […]:

1) minimum bill concepts as a substitute for fixed monthly charges

3) Segmentation of the existing residential rate class to take into account different levels of usage

F. How do specific programs addressing affordability affect cost-causation and allowance of costs among classes?

G. How does cost-of-service allocation affect rate design and affordability of rates?

Appendix E. LIAC New Program Proposals

During Workshop 3, LIAC members expressed a desire to accelerate the process enabling LIAC members to submit new income-qualified program for consideration the goal of providing additional time for members to discuss proposed ideas. In response, Guidehouse shared an electronic program proposal submission form with LIAC members on November 28, 2021. This appendix includes a view of that LIAC New Program Proposal form.

North Carolina Low Income Affordability Collaborative

Program Proposal Worksheet

Convened by DUKE ENERGY. Public Staff North Carolina Utilities Commission

Supported by Guidehouse

Use this form to draft your proposal; formal submissions should be submitted vial the submission link:

SUBMITTER

Enter your name and organization.	
Enter your email address.	

PROGRAM DETAILS

PROGRAM NAME: For the purposes of this proposal process, please provide a name for the proposed program. *(Note that this may change if implemented.)*	
PROGRAM DESCRIPTION: How might the program be described to the general public? Include any key elements important to program implementation or program success.	
PROGRAM OBJECTIVE: Note any specific benefit(s) the program intended to deliver to participants.	
TARGET PARTICIPANTS: Identify the population or demographic is this program intending to help.	

PROGRAM ADMINSTRATION

PRGRAM ADMINSTRATION: Please share any thoughts you have about who might administer this program. *(i.e., who would enroll participants? Who would validate eligibility? Who would track the progress, etc.)*	
ELIGIBILITY CRITERIA: Identify the criteria program administrators might use to screen for participation eligibility.	
SUCCESS METRICS: What metric(s) might we monitor to determine if the program is successful or not (and how might the metrics trend if the program is successful)?	
PROGRAM PARTNERS: Identify any market actor or partners crucial to program delivery, if applicable.	

ADDITIONAL

ADDITIONAL INFORMATION: What additional information would you like to share about this proposed program? *(e.g., has it been successfully implemented in another jurisdiction? Has it be previously proposed and rejected in NC? Are there any specific regulatory or policy barriers that would need to be addressed if proposed program is implemented? etc.)*	

guidehouse.com