Virginia State Corporation Commission
eFiling CASE Document Cover Sheet

Case Number (if already assigned) PUR-2021-00054

Case Name (if known) Application of Shenandoah Valley Electric Cooperative, For a general increase in electric rates

Document Type EXTE

Document Description Summary Direct Testimony & Exhibits of Solar United Neighbors of Virginia (Part 1 of 2)

Total Number of Pages 69

Submission ID 22363

eFiling Date Stamp 7/28/2021 2:07:07PM

210730092

REISINGERGOOCH
ATTORNEYS AT LAW

William T. Reisinger
REISINGERGOOCH, PLC
1108 East Main Street, Suite 1102
Richmond, Virginia 23219
(804) 223-6391
Will@ReisingerGooch.com

July 28, 2021

VIA ELECTRONIC FILING

Bernard Logan, Clerk
c/o Document Control Center
State Corporation Commission
1300 E. Main Street
Richmond, VA 23219

Re: *Application of Shenandoah Valley Electric Cooperative,*
For a general increase in electric rates
Case No. PUR-2021-00054

Dear Mr. Logan:

Pursuant to the Commission's April 5, 2021, Order for Notice and Hearing in the above-captioned matter, please find the attached Direct Testimony of respondent Solar United Neighbors of Virginia.

Should you have any questions about this filing, please do not hesitate to contact me.

Sincerely,

/s/ William T. Reisinger

William T. Reisinger

cc: Certificate of Service

CERTIFICATE OF SERVICE

I hereby certify that a true copy of the foregoing was served this 28th day of July, 2021, by first class mail and/or e-mail to:

Cody T. Murphey, Esquire
Eric M. Page, Esquire
Eckert Seamans Cherrin & Mellott LLC
cmurphey@eckertseamans.com
epage@eckertseamans.com

Roderick B. Williams, Esquire
County Attorney
Frederick County, Virginia
rwillia@fcva.us

Kiva Bland Pierce, Esquire
State Corporation Commission Staff
kiva.pierce@scc.virginia.gov

/s/ William T. Reisinger

COMMONWEALTH OF VIRGINIA
STATE CORPORATION COMMISSION

APPLICATION OF	)	
	)	
SHENANDOAH VALLEY ELECTRIC COOPERATIVE	)	**CASE NO. PUR-2021-00054**
	)	
	)	
For a general increase in electric rates	)	

DIRECT TESTIMONY OF KARL R. RÁBAGO

ON BEHALF OF

SOLAR UNITED NEIGHBORS

28 July 2021

Summary of Direct Testimony of Karl R. Rábago
On Behalf of Solar United Neighbors

I am Karl R. Rábago, and I appear on behalf of Solar United Neighbors. I am principal of Rábago Energy LLC, a Colorado limited liability company, with a business address of 2025 E. 24th Avenue, Denver, Colorado.

My testimony reviews Shenandoah Valley Electric Cooperative's (the "Coop") proposed rate structures for residential service Coop members to be included in Rate A-13.

My review of the Coop's application, supporting testimony, and responses to interrogatories leads me to conclude that the rates proposed for residential members are unjust, discriminatory, and unreasonable, and should be rejected by the Commission in this case.

The Coop proposes a 20% increase to its already excessive fixed customer charge of $25 per customer per month. The proposed fixed charge is unreasonable on its face: it is wildly inconsistent with rates in the region, regressive in its application to lower-income members, and will frustrate the economics of investment in energy efficiency, distributed generation, and other distributed energy resources. Because the fixed customer charge significantly weakens the price signal associated with consumption of energy, by resulting in greatly reduced volumetric charges, it encourages higher bills and higher Coop costs that will result from over-consumption. The fixed charge proposal also sends inefficient price signals to the Coop, weakening the incentive to manage and control costs on behalf of Coop members.

The Coop's fixed customer charge is unjustified and unsupported by sound principles of rate making. The Coop relies on the discredited and unreasonable minimum system and minimum intercept methods to assign demand- and energy-related costs to the customer charge, almost entirely for the purpose of improving the certainty of cost recovery from members.

I recommend that the Coop's fixed customer charge proposal for residential members be denied, and that the Coop be ordered to reduce its fixed customer charge by $5 each year until the monthly charge to members is no higher than $15.

The Coop also proposes a demand charge be added to residential member bills. The proposed demand charge is, in practical effect, another increment to the fixed customer charge. The demand charge is by design ineffectual and is not based on cost causation. The demand charge is designed as a Trojan Horse rate with the Coop planning unspecified and not-specifically timed changes to the charge in the future.

I recommend that the Coop's demand charge proposal for residential members be denied in its entirety.

I. WITNESS IDENTIFICATION AND QUALIFICATIONS

Q. Please state your name, business name and address, and role in this proceeding.

A. My name is Karl R. Rábago. I am the principal of Rábago Energy LLC, a Colorado limited liability company, located at 2025 E. 24th Avenue, Denver, Colorado. I appear here in my capacity as an expert witness on behalf of the Virginia chapter of Solar United Neighbors ("SUN").

Q. Please summarize your experience and expertise in the field of electric utility regulation and the renewable energy field.

A. I have worked for more than 30 years in the electricity industry and related fields. I have been actively involved in a wide range of electric utility issues across the United States as an expert witness.

My previous employment experiences include service as a Commissioner with the Public Utility Commission of Texas, as a Deputy Assistant Secretary with the U.S. Department of Energy, as a Vice President with Austin Energy, and as a Director with AES Corporation, among others. A detailed resume is attached as Exhibit KRR-1.

Q. Have you ever testified before the Virginia State Corporation Commission ("Commission") or other regulatory agencies?

A. Yes. In Virginia, I have submitted testimony in Virginia SCC Cases PUE-2012-00064, PUE-2013-00088, PUE-2014-00026, PUE-2015-00035, PUE-2015-00036, PUE-2016-00049, PUE-2016-00050, PUR-2017-00051, PUR-2017-00045, PUR-2018-00065, PUR-2019-00050, PUR-2020-00035, PUR-2020-00135, PUR-2020-00134, and PUR-2020-00169. Additionally, in the past nine years, I have submitted testimony, comments, or presentations in proceedings in Alabama, Arkansas, Arizona, California, Colorado, Connecticut, District of Columbia, Florida, Georgia, Guam, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Puerto Rico, Rhode Island, Vermont, Virginia, Washington, and Wisconsin. I have also testified before the U.S. Congress and have been a participant in comments and briefs filed at several federal agencies and courts. A listing of my previous testimony is attached as Exhibit KRR-2.

Q. **Do you have any special expertise relating to the regulation and operations of electric cooperatives and public power?**

A. Yes. During my tenure as a public utility commissioner for the State of Texas, our commission fully regulated cooperatives, including distribution and generation and transmission cooperatives. Our commission made hundreds of record decisions relating to rates, services, finances, and structure for electric cooperatives, municipal electric utilities, municipal power authorities, and investor-owned utilities. I have been a member of the largest electric cooperative, Pedernales Electric, on two occasions and served on that coop's customer advisory committee at the invitation of the board of directors. I have also served on the executive management team of Austin Energy, the electric utility for the City of Austin, Texas.

Q. **What information did you review in preparing this testimony?**

A. I reviewed relevant pre-filed testimony of SVEC, discovery request responses prepared by the Coop, and other materials and authorities as cited in this testimony.

Q. **What is the purpose of your testimony?**

A. In this testimony, I will review and offer recommendations to the Commission regarding issues arising in the application of Shenandoah Valley Electric Cooperative ("SVEC" or the "Coop") for a general increase in electric rates, docketed before the Commission as Case Number PUR-2021-00054. The issues that I will address relate to rate making and revenue requirement, particularly the Coop proposals to maintain and increase unreasonably high fixed customer charges, and to institute a residential member demand charge. My testimony also presents several alternative rate design approaches that the Coop should have considered and should be ordered to evaluate in order to develop rates that are just, reasonable, and fair to residential members.

Q. What is your overall assessment of the rate design proposals being put forward by the Coop management and board in this proceeding?

A. The proposed rates for residential members are not in the best interests of the Coop's members and are not in the public interest. They are unjust, unfair, and unreasonable, for the following reasons, among others:

- The proposed fixed customer and demand charges are not grounded in sound rate making practices.
- The proposed fixed customer and demand charges are economically regressive, imposing extreme burdens on low-use and low-income customers at a time when many families in the Coop's service territory are struggling to recover from a pandemic and economic downturn.
- The proposed rates are complex and punitive, including a proposal that nearly one-third of the average member's monthly bill will be non-bypassable and cannot be reduced by conservation, efficiency, or investment in distributed generation. The rates

deprive members of effective control over the charges they pay for their service. The rate structure includes an unreasonably large fixed charge, a demand-charge that is based on non-coincident peak usage and not based on cost-causation, a new 800 kWh per month tier for summer rates during four months of the year, a power cost delivery charge, and a completely restructured distribution delivery charge. The Coop management proposes further complications and additional rate increases in the near future.

- The proposed rates include rate elements about which management has provided no education or tools to assist members in managing their electricity bills. The proposed rates were not developed through any process that relied upon or engaged residential members in any process of democratic control.
- The proposed rates are not designed to enable residential members to exercise more control over their electricity usage or to empower customers with meaningful opportunities to economically manage their electricity bills.
- The proposed rates send exactly the wrong price signal to the Coop's management, encouraging overbuilding, economic waste, and fiscal irresponsibility by insulating spending decisions from the reduced revenues consequences that would ordinarily accompany efforts to unjustly extract monopoly rents from service subscribers.

For all these reasons and others, I recommend that the Commission deny the proposed changes in the rate design for the residential members of the Coop.

Q. **What are the key statutory provisions guiding the Commission's review of this application?**

A. Distribution electric cooperatives in Virginia are granted considerable discretion to change rate structures and rate levels under Va. Code § 56-585.3. At the same time, and as the Coop itself recognizes, the regulated utility services offered by the Coop "must be reasonably adequate, and the charge for any regulated utility service rendered must be nondiscriminatory, reasonable, and just."[1] The regulated utility services of the Coop are subject to the jurisdiction of the Commission in the same manner and to the same extent as other regulated utility services.[2]

III. THE FLAWED AND UNJUST PROPOSAL TO INCREASE THE FIXED CUSTOMER CHARGE BY 20%

III.A. OVERVIEW OF FIXED CHARGE PROPOSAL

Q. What does the Coop propose to do with the fixed customer charge for residential customers?

A. The Coop already maintains an extremely high fixed customer charge of $25 per customer per month for single phase residential customers, and proposes to increase the charge by 20%, to $30 per month. If the coop's rates are approved as proposed, residential members using the average monthly amount of electricity would be required to pay bills in which more than 20% of the bill is fixed, regardless of what they did to conserve energy efficiently. The fixed customer charge proposal is to increase revenues collected from residential members through the charge by about $4.8 million per year,[3] or 90% of the total proposed rate increase of $5.3 million.[4] Such a dramatic increase violates the generally accepted principle of gradualism in the implementation of rates,[5]

---

[1] Va. Code § 56-234; Coop application at 4.
[2] Va. Code § 56-231.34.
[3] Coop Sched. 15B – Sch. A-12.
[4] Coop Sched. 3.
[5] J. Lazar, P. Chernick, & W. Marcus, *Electric Cost Allocation for a New Era: A Manual,* Regulatory Assistance Project (2020) (hereinafter "RAP Cost Allocation Manual") at § 27.4, p. 237-239.

but as I will point out in my testimony, any increase to the Coop's fixed customer charge is unreasonable, unjust, and unfair.

Q. How does the proposed 20 percent increase in the fixed customer charge compare to the rate of inflation?

A. According to the data gathered by the U.S. Labor Department, the cumulative rate of inflation based on the Consumer Price Index shows a cumulative rate of inflation between 2015, when the Coop's last rate increase was approved, and the year 2020, the Coop's test year in this proceeding, of 8.4%.[6] The Coop's fixed charge proposal is about 240% greater than the cumulative rate of inflation. Even though the Coop does not use a future test year, the fixed charge increase is more than 150% greater than the projected cumulative rate of inflation out to the year 2022, the Coop's rate year in this proceeding.[7]

Q. Is the fixed customer charge increase the only proposed fixed charge increase proposed by the Coop?

A. Not in practical effect. The Coop also proposes a residential demand charge at $.10 per kW. As I will address in this testimony, the demand charge is proposed for implementation with no expectation that it will operate as a price signal and without any prior education of members and without deployment of the tools that members can use to manage the costs. As I and my co-author, Radina Valova, explained in an article we published in 2018, a demand charge like the one proposed by the Coop is essentially a fixed charge.[8] In this case, a fair reading of the Coop proposal is that the additional

---

[6] *See US Inflation Calculator,* Coin News, available at: https://www.usinflationcalculator.com. Calculated as 20% / 8.45% = 2.38.
[7] *Id.* Calculated as 20% / 12.8% = 1.56.
[8] K. Rábago & R. Valova, *Revisiting Bonbright's Principles of Public Utility Rates in a DER World,* The Electricity Journal 31 (2018), at § 3.3.

revenue of about $1 million in the proposed demand charge is just another fixed charge. When considered along with the proposed fixed customer charge, the net effect is that about 108% of the proposed increase in revenue requirements is related to fixed and practically non-bypassable charges on residential members.

Q. Why are the Coop's proposed fixed customer charges so high?

A. The Coop's fixed customer charges are unreasonably high because the Coop puts costs into the fixed customer charge that simply do not belong there. As explained in more detail later, rather than limit the fixed customer charge to the recovery of customer costs—costs that vary solely or primarily due to the number of customers served, the Coop uses unreasonable minimum system and minimum intercept (also known as zero intercept) methods to allocate costs caused by energy use and demand to the customer cost category.

Q. Electric cooperatives are different from investor-owned utilities in that the members are the owners of the coop. Does the nature of the Coop as an electric distribution cooperative justify the excessive fixed customer charge?

A. No. The Coop provides no evidence that because it is organized as a cooperative its proposed higher fixed customer charges are required or even economically efficient. The Coop has not undertaken any education of its members about the fixed customer charges it proposes and why it proposes them and did not secure any feedback from member about the proposed charges.[9] In fact, the Coop asserts that "the Seven Cooperative Principles," "the Cooperative's education of its members regarding the fixed customer charges," and "how the proposed fixed customer charge is the product of democratic

[9] Coop response to SUN-VA 2-6.

member control" are not factors for the Commission to consider in ruling on the Coop's general rate proceeding.[10] The only reason the Coop cites for its high fixed costs is a desire to recover the very high fixed costs the Coop management and board are incurring.[11]

Q. **Are the Coop management's proposed increase to the fixed customer charge or the methods relied upon in developing the fixed customer charge proposal reflective or the product of Coop member democratic control?**

A. No, and the Coop management believes that both democratic control and member education, principles of the Seven Cooperative Principles, are irrelevant to the residential fixed customer charge proposal.[12] Further, the Coop has never provided any information to its member-owners about the methods it has selected for use in developing the fixed customer charge for residential members.[13]

Q. **Is the proposed fixed customer charge in line with other cooperative fixed customer charges or investor-owned utility fixed customer charges in rates in the region surrounding the Coop's service territory?**

A. No. The Coop's existing and proposed fixed customer charge for residential members is significantly greater than the charge paid by customers served by other utilities nearby. As shown in Figure KRR-1 below, while the Coop charges $25 per customer per month and would charge $30 if its proposal were approved, other electric service provider basic customer charges are much less. As explained in this testimony, the extremely high fixed

[10] Coop response to SUN-VA 2-22.
[11] Coop response to SUN-VA 2-8, stating that "the proposed fixed customer charges help to stabilize and ensure recovery of fixed costs."
[12] Coop response to SUN-VA 2-22
[13] Coop response to SUN-VA 3-41.

customer charges proposed by the Coop are unjustified, and in the context of neighboring service providers, are unjust and discriminatory. The Coop management asserts that how its fixed customer charge compares to regional utility charges is irrelevant.[14]

Figure KRR-1 – Regional Fixed Customer Charges[15]

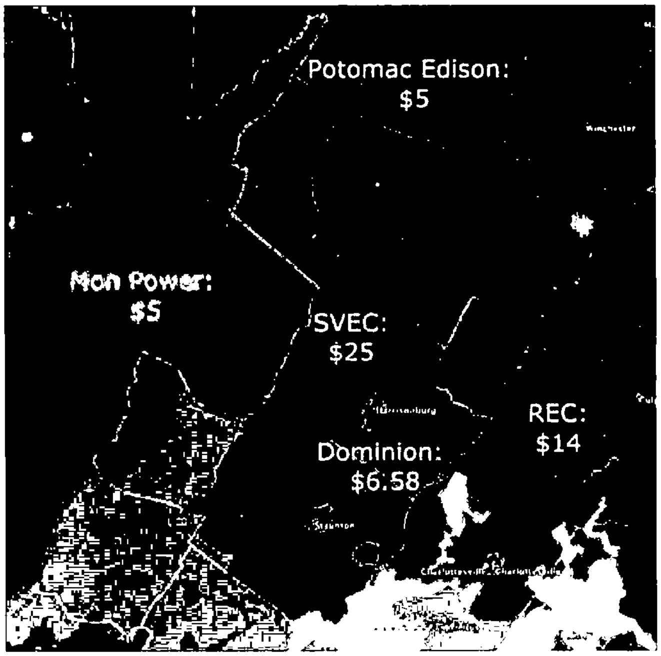


Table KRR-1 - Regional Fixed Customer Charges

Service Provider	Monthly Charge	Difference from SVEC Current Charge ($25/cust/mo)	Difference from SVEC Proposed Charge ($30/cust/mo)
Monongahela Power	$ 5.00	-80%	-83%
Rappahannock Electric Coop	$ 14.70	-41%	-51%
Potomac Edison	$ 5.00	-80%	-83%
Dominion Virginia Elec. Power	$ 6.58	-74%	-78%

[14] Coop response to SUN-VA 3-42.

[15] Rates available at: https://www.dominionenergy.com/virginia/rates-and-tariffs/residential-rates, https://www.firstenergycorp.com/content/dam/customer/Customer%20Choice/Files/west-virginia/tariffs/WVMPRetailTariff.pdf, https://www.firstenergycorp.com/content/dam/customer/Customer%20Choice/Files/west-virginia/tariffs/WVPERetailTariff.pdf, https://www.myrec.coop/sites/myrec/files/documents/Electric%20Rates/2021/Schedule%20A-1%20Residential.pdf

Q. What are your main concerns with the fixed customer charge and other fixed charges?

A. Fixed customer charges that are unreasonable, like that proposed by the Coop, send a strong price signal *against* the efficient use of electricity and investment in distributed generation ("DG"), distributed storage, demand response, and other distributed energy resources ("DER"). Fixed customer charges, because they are implemented in a way so as to reduce volumetric charges and the bill impact of incremental volumetric use, encourage excessive, wasteful, and polluting energy use. Fixed customer charges like the one proposed by the Coop are economically regressive—they disproportionately burden low users of electricity, who are often low-income members. Unreasonably high fixed customer charges also send perverse price signals to the Coop, weakening cost-control discipline and driving overbuilding and excessive investment. These impacts are averse to the interests of cooperative members.

Q. Do high fixed customer charges impact the effectiveness of Time of Use ("TOU") and other time-varying rate designs?

A. High fixed customer charges undercut the cost-effectiveness of time-varying rates such as TOU rates because the bill savings and charges possible from those rates are constrained by the "floor" of a fixed monthly charge. In addition, the percentage of the customer bill represented by the customer charge decreases with high use when high fixed charges are in place, meaning the benefits of TOU rates are skewed in favor of high users and more wealthy customers. This means that both high fixed charges and TOU rates will operate effectively as non-bypassable taxes on low users.

Q. Is the Coop also proposing changes in volumetric charges?

A. Yes. The Coop is proposing a new demand charge based on customer peak demand, changing its declining block variable distribution charge to a flat and significantly lower rate, and seasonally differentiated power supply rates that are also inclining rates in the summer.[16] The reduction in the distribution delivery charge mitigates the overall bill impact of the proposed rate changes, especially for high users of electricity. However, the lower and flat variable distribution charge compounds the anti-efficiency and anti-distributed generation impacts of the proposed fixed customer charge—making it even less economical to invest in those bill-saving solutions for Coop members.

Q. In general, how should the fixed customer charge be built up?

A. In general, fixed customer charges should be built up based on costs that vary only with the number of customers. This approach is often called the basic customer method and several states employ it.[17] This approach is also consistent with recognized expert recommendations on rate design.[18]

---

[16] Coop Sched. 15B – Sch. A-12.

[17] *See e.g.*, Order at *83, Case No. U-20162, 2019 WL 2028379 (Mich. Pub. Serv. Comm'n. May 2, 2019) ("monthly customer charge for residential and commercial secondary customers should only recoup those costs directly linked to the customer's mere existence (i.e., costs to connect the customer to the system)."); Decision D.17-09-035, Decision Identifying Fixed Cost Categories to be Included in a Fixed Charge, at 2, 33 (Cal. P.U.C. Sept. 28, 2017) ("fixed charge should include only revenue cycle service (costs for account set-up, metering services, billing and payment), with certain exclusions, all meter capital costs, and minimum service drop and final line transformer costs calculated by using the minimum observed cost for the residential class"); Order ¶¶ 14–15, Docket No. 120,924-U, 70 P.U.R.4th 475 (Kan. State Corp. Comm'n, Sept. 27, 1985) (customer charges should "more nearly reflect [] the cost of adding a customer to the system…"); *see also* Whited, Melissa, et al., *Caught in a Fix, The Problem with Fixed Charge for Energy*, Synapse Energy Economics, Inc., at 8 (Feb. 9, 2016) (noting that most fixed charges recover a portion of the cost of meters, service lines, meter reading, and customer billing and generally range from $5 to $10) (Attached as Exhibit KRR-3), https://www.synapse-energy.com/sites/default/files/Caught-in-a-Fix.pdf.

[18] *See e.g.*, Jim Lazar & Wilson Gonzalez, *Smart Rate Design for a Smart Future*, Regulatory Assistance Project ("RAP"), at 38, 85 (July 2015) (Attached as Exhibit KRR-4), http://www.raponline.org/wp-content/uploads/2016/05/rap-lazar-gonzalez-smart-rate-design-july2015.pdf.

III.B. FIXED CUSTOMER CHARGE IMPACTS ON LOW-INCOME MEMBERS AND OTHER POPULATIONS OF CONCERN

Q. What are the economic and regulatory policy benefits of taking a narrow view of the costs that are loaded into fixed customer charges and of keeping fixed customer charges low?

A. Increasing fixed customer charges is economically regressive. That is, the burden of an increase in fixed customer charges falls disproportionately on low-income customers who are more likely to be the low users of electricity, and thus experience higher bill impacts from fixed charge increases. Essentially, increases to fixed customer charges make it harder for customers that use less to pay less.

Q. What is the Coop's position on the potential economic impacts of its proposed fixed customer charge and rate design on low-income members?

A. The Coop takes the unreasonable view that the way in which the fixed customer charge impacts low-income members is irrelevant to this proceeding.[19] The Coop management asserts that it does not possess average household monthly income data for its residential members.[20]

Q. Do you agree with the Coop on this issue?

A. No, and I think the Commission should disagree with the Coop's position as well. It is required by Virginia statute and fundamental to the sound principles of rate making that rates should be just and reasonable. The Commission should reject the Coop proposal and direct it to reconsider its rate proposals in light of these principles.

Q. What evidence does the Coop provide or possess regarding the numbers, income

---

[19] Coop response to SUN-VA 3-46, 3-49.
[20] Coop response to SUN-VA 3-48.

levels, and electric usage patterns of its low-income members?

A. None. The Coop has not conducted a bill-frequency analysis,[21] so it does not know how consumption levels are distributed among residential members. The Coop has not studied the average monthly household income for its residential members,[22] so it does not know the energy burden felt by its members as a result of the proposed rates. The Coop does not know how its residential members break down by household income in relation to federal poverty level, or how household income and poverty levels correlate with ethnic or racial or age distributions,[23] so it does not know the energy justice implications of its proposed rates on low- and moderate-income members. The Coop has not evaluated how its proposed rate changes will impact members of color, elderly members, and low-income member households in terms of energy burden and electricity burden;[24] so it does not know its proposed rates impact energy justice in general.

Q. What evidence is there that low-income customers tend to be lower users of energy and more impacted by the Coop's proposed rate changes?

A. The Coop does not maintain information that tracks and matches household energy consumption rates, household income, and other key demographic information that would inform how rate changes impact low-income customers, people of color, the elderly, and people on fixed incomes.[25] For that reason, I have sought out other sources for information on this issue.

Q. Why does the source and nature of low-income customer data matter?

---

[21] Coop response to SUN-VA 2-15.
[22] Coop response to SUN-VA 2-16.
[23] Coop response to SUN-VA 2-17.
[24] Coop response to SUN-VA 2-18.
[25] Coop responses to SUN-VA 2-15 through 2-18.

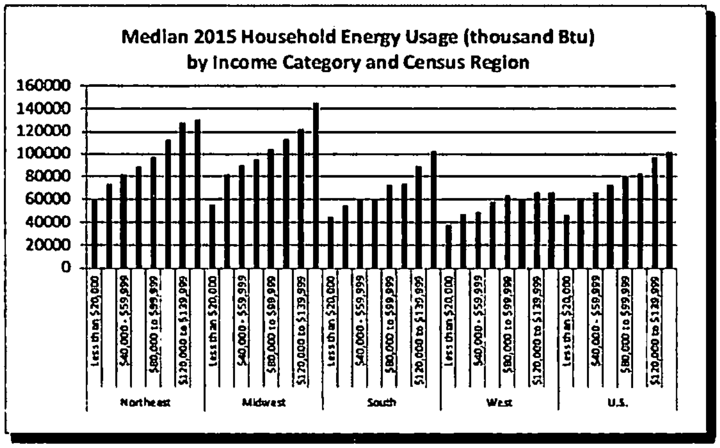
A. The Coop, as a member-owned association, should be the first, best source of information about its members in order to develop and propose electric service rates that are just, reasonable, and fair to those members. In my opinion, any regulatory or legislative discretion granted to electric service cooperatives which operate as a service monopoly in their service territory must be conditioned on a demonstrably closer connection to and focus on the needs and characteristics of those members. But the Coop doesn't have that information and doesn't consider it. Fortunately, there is substantial and publicly available information about household income and energy and electricity use for Virginia as a whole. There is also census track information available for the Coop's service territory specifically. Unfortunately, this data confirms the unjust, unreasonable, and unfair impacts of the Coop's proposed rates.

Q. What does the publicly available information and about income and energy use show?

A. This information, which is discussed in further detail below, is gathered by the U.S. Energy Information Administration ("EIA") and confirms that increasing the residential fixed customer charge will disproportionately and adversely impact low-income customers, customers over 65 years old, and people of color. In Virginia, like most states, energy usage generally increases as annual income increases. While not every low-income customer is a low use customer and not every high-income customer is a high energy user, the relationship between the two for most customers is well-established and clear. According to the EIA data analyzed by the National Consumer Law Center ("NCLC")[26] there is a clear correlation between income and electricity use.

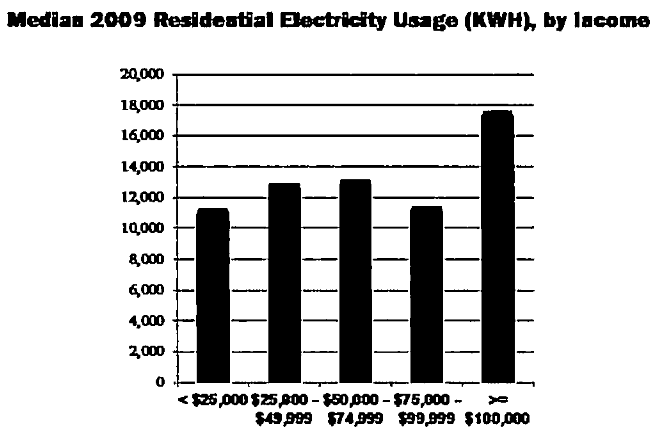
[26] John Howat et al., *Reversing Energy System Inequity: Urgency and Opportunity During the Clean Energy Transition*, NCLC, at 2 (Mar. 5, 2019),

Figure KRR-2: Median 2015 Household Energy Usage by Income Category and Census Region



Virginia-specific data[27] provided in the last detailed survey conducted by the EIA confirms that usage and income are correlated, and lower use customers are typically lower income customers while higher use customers are typically higher income customers.

Figure KRR-3: Median 2009 Residential Electricity Usage by Income



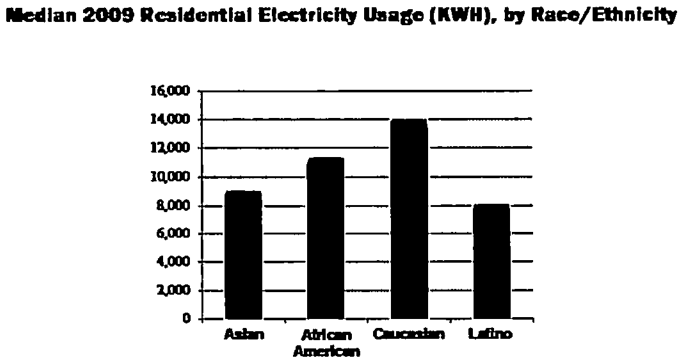
https://www.nclc.org/images/pdf/special_projects/climate_change/report-reversing-energy-system-inequity.pdf.

[27] NCLC, *Utility Rate Design: How Mandatory Monthly Customer Fees Cause Disproportionate Harm, US Region: VA* (2015), https://www.nclc.org/images/pdf/energy_utility_telecom/rate_design/VA-FINAL2.pdf.

Lower income customers, despite using less energy, also suffer from a higher energy burden than higher income customers—meaning energy costs constitute a higher share of the household's income.

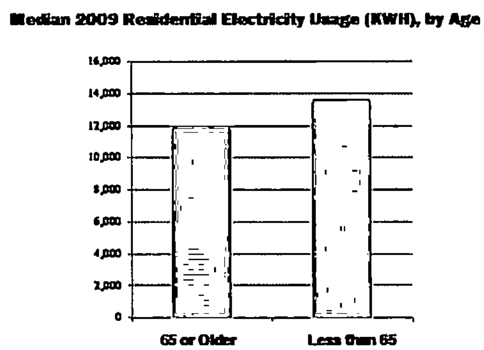
The NCLC/EIA data indicate that energy use is highest by white customers and lower for Black, Hispanic/Latinx, and Asian customers.[28]

<u>Figure KRR-4: Median 2009 Residential Electricity Usage by Race/Ethnicity</u>



Electricity consumption in Virginia also inversely correlates with age:[29]

<u>Figure KRR-5: Median 2009 Residential Electricity Usage by Age</u>



Q. Is any other data available on energy burdens in the Coop's service territory?

[28] *Id.*
[29] *Id.*

A. An energy burden analysis conducted by Appalachian Voices,[30] a regional advocacy group, shows that about 17% of the Coop's households, about 14,800 member households, would qualify as "low-income" and have household income of less than 150% of the federal poverty level. These households have an average of $16,206 in annual household income, compared with an income of $77,591 per household for the total population. These low-income members are also lower users of energy, with annual energy use about $400 lower per year than households as a whole. Even with this lower usage, low-income households suffer under an energy burden of about 14.2%--the share of household income that goes to energy costs—while the burden for all households is 3.5%, about one-fourth as much. The following figures depict the distribution of energy burden by census tract in the Coop service area for all incomes (Figure KRR-6), low-income energy burden for low-income households by census tract (Figure KRR-7), and race demographics in terms of percent population of Black, Indigenous, and People of Color ("BIPOC") by census tract (Figure KRR-8). Viewed together, the figures also reveal a strong correlation between income level and racial demographic.

[30] R. McIlmoil, SVEC Energy Burden Analysis, Appalachian Voices (Jul. 1, 2021), utilizing data from U.S. DOE Low-Income Energy Affordability Data (LEAD) tool (2018), and U.S. Census tract data (2020).

Figure KRR-6 – Energy Burden for All Incomes by Census Tract, SVEC

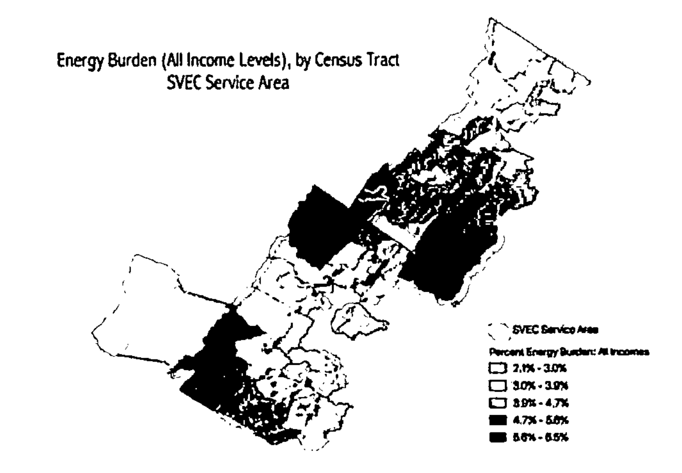


Figure KRR-7 – Low-Income Energy Burden by Census Tract, SVEC

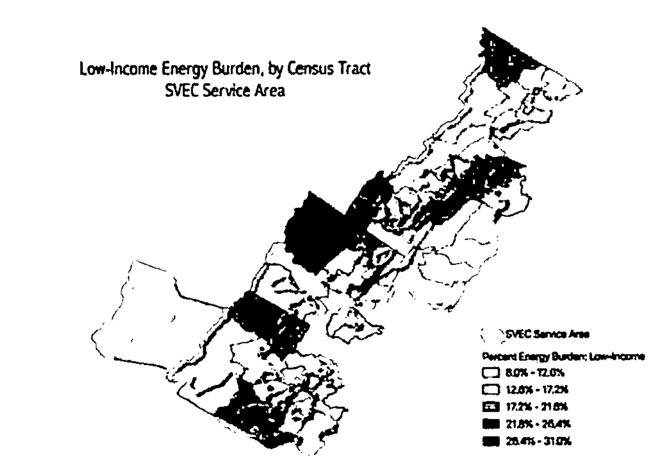
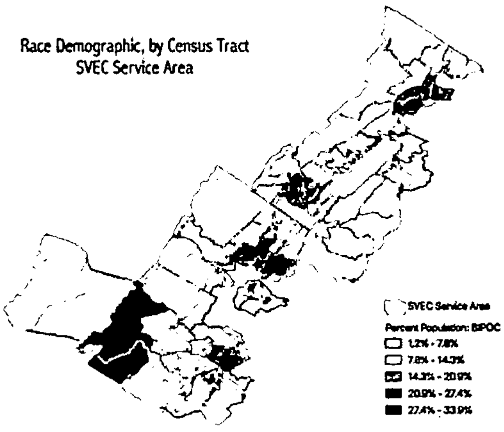


Figure KRR-8 – Race Demographic by Census Tract, SVEC



Q. What do you conclude from this data and how should it impact the determination of whether the Coop's rates are just, reasonable, and fair?

A. The Coop's proposed high fixed customer charge for residential customers means that nearly one-third of the monthly bill for the average Coop residential member is fixed and cannot be managed or reduced. For low-use, low-income members this fraction is even higher, meaning that both the marginal and overall value of energy efficiency improvements or investment in self-generation is less efficacious and less economically attractive. In addition, areas of the Coop's service area have high energy burdens, high low-income energy burdens, and high populations of Blacks, indigenous peoples, and people of color—meaning that it is all the more unreasonable, unfair, and unjust that the Coop would propose rates that disproportionately burden these populations. Worse still, the Coop has not taken any steps to understand important facts about its members and invests no effort at all in evaluating the impact of its proposed rates on its customers. Such ignorance renders the foundation for the proposed rates inadequate.

III.C. THE COOP'S FLAWED METHOD FOR CREATING ITS PROPOSED CUSTOMER CHARGES

Q. Are high customer charges required by statute, regulation, or economic policy?

A. No. There is no rule of economics nor any Virginia statute that requires any fixed charge. There are utilities that, like many competitive businesses, recover costs only through usage-based charges. Still more utilities recover only small portions of revenue through fixed charges, relying on the basic customer or new customer methods of classifying costs as customer costs.

Q. What should guide the Commission's determination of just, reasonable, and fair fixed customer charges to be assessed by the Coop?

A. Where a customer charge is used, it should be limited to recover no more than actual customer costs. The general rule for defining a customer cost is this: *If the cost disappears because the customer leaves the system, the cost is a customer cost.* The consumption function of the meter, the service drop, and a reasonable share of customer service spending would all meet this test, and therefore these costs are included in approaches like the basic customer method. Likewise, if the cost remains after a customer leaves the system, the cost is not a customer cost. Shared transformers, secondary and primary distribution lines, program-specific marketing, and some customer care expenses all are non-customer costs, and the principle of cost-causation dictates that those costs should not be recovered through a fixed or customer charge.

In 1961, James C. Bonbright defined customer costs as follows:

> [The customer costs] are those operating and capital costs found to vary with the number of customers regardless, or almost regardless, of power consumption.

> Included as a minimum are costs of metering and billing along with whatever other expenses the company must incur in taking on another consumer.[31]

This definition remains valid and reasonable today.

Q. Which costs meet this definition for legitimate and reasonable customer costs?

A. Some costs can be easily and objectively classified as customer costs. These include the cost of establishing service, which includes a fraction of a customer accounts system, billing software, and the time that customer service representatives spend on establishing new accounts. These costs are all costs that pass the simple test: *they go away if the customer goes away.* Legitimate and reasonable customer costs also include the costs related to the consumption function of meter purchase, installation, activation, and service, but not the entire costs of modern meter functions. And these costs include the incremental costs of the service drop from the last, smallest transformer to the customer meter box. These are the costs that, as Professor Bonbright defines them, "must incur in taking on another customer."[32]

Q. Why is the correct classification of costs for recovery through the fixed customer charge so important?

A. Correct classification of costs included in the fixed customer charge results in lower charges, meaning more of the revenue requirement for service—the costs that vary with the level and volume of cost-causing usage—is collected through variable charges. That establishes a powerful relationship between usage and charges that drives economic use of electricity services. The strongest and most economically efficient price signals would

---

[31] *Id.*

[32] James C. Bonbright, *Principles of Public Utility Rates*, at 347–49 (1961) ("Bonbright"), http://media.terry.uga.edu/documents/exec_ed/bonbright/principles_of_public_utility_rates.pdf.

be sent under the "new customer" method or basic customer method of composing customer charges, and which only charge customers with the incremental connection costs for new customers on a per-customer basis or with the basic cost of connecting the customer to utility service, which I believe the Coop should study.

Simply stated, Bonbright's definition ensures that the customer charge is limited to the marginal cost of connecting the customer to the grid and should include only costs that vary directly with the number of customers.[33] A fixed charge limited to customer costs is typically in the range of $5–$10 per customer per month, depending on local prices, the billing period used, and other factors.[34]

Q. Did the Coop evaluate the option of recovering the additional $4.8 million from residential customers through the variable distribution charge?

A. No.

Q. Can you estimate the impact on the variable charge if the $4.8 million increase allocated to residential members were to be recovered through an increase only in the distribution variable charge?

A. Yes. If the fixed charge were to remain unchanged, and assuming the full $4.8 million is to be recovered, the fixed customer charge could stay at $25 per customer per month and the volumetric distribution charge would be increased. To preserve the price signal that great use is correlated with greater demand and demand-related costs, I recommend that the revenue requirement associated with approved increases in revenue requirement for distribution and delivery service be exclusively allocated to the demand or energy

---

[33] *See* Exhibit KRR-4 at 38.

[34] *See* Jim Lazar, *The Specter of Straight Fixed/Variable Rate Designs and the Exercise of Monopoly Power*, RAP, at 6 (2015) (Attached as Exhibit KRR-5), http://www.raponline.org/wp-content/uploads/2016/05/appendix-d-smart-rate-design-2015-aug-31.pdf.

functions. I provide three options for allocating the revenues proposed for recovery through both the proposed increase in the fixed customer charge and the ill-conceived residential member demand charge in Table KRR-2. These options are (1) allocating the revenue requirements to summer residential usage greater than 800 kWh per month, (2) allocating them to summer residential usage greater than 800 kWh per month and to all non-summer usage, and (3) allocating them to all residential usage.

Table KRR-2: Per kWh Increases in Distribution Delivery Charge of Reallocation of Fixed Customer Charge and Demand Charge Revenue

Current Proposed Distribuion Delivery Charge = $0.01965

	Fixed Charge Revenue	Demand Charge Revenue	Fixed Charge and Demand Charge Revenue	Percent of Usage Reflected in Each Option
Proposed Revenue Requirement	$ 4,794,120	$ 943,875	$ 5,737,995	
Option 1: Increase with Revenue Requirement Assigned to Distribution Delivery Charge Only for Usage > 800 kWh/month in Summer	$ 0.03157	$ 0.00622	$ 0.03778	19%
Option 2: Increase with Revenue Requirement Assigned to Distribution Delivery Charge for Usage > 800 kWh/month in Summer and All Non-Summer Usage	$ 0.00524	$ 0.00103	$ 0.00627	87%
Option 3: Increase with Revenue Requirement Assigned to Distribution Delivery Charge for All Usage	$ 0.00425	$ 0.00084	$ 0.00508	100%

Q. What issues are raised by the Options you suggest for reallocation of revenue requirement currently proposed for recovery through the fixed customer and demand charges to the distribution delivery charge?

A. Recovering the revenue requirement through the volumetric delivery charge improves the price signal supporting efficient use of electricity, reduces the regressive burden on low-income members and other populations of concern, and will help the Coop improve its spending discipline. Option 1 creates a strong price signal to reduce peak summer use and avoids burdening low users of electricity but allocating all revenue requirements to 19% of usage results in high increases in the distribution delivery charge for high summer users and does not address high demand use in the winter. Option 2 spreads the increase across more usage and results in a very modest increase to the delivery charge but burdens all winter usage. Option 3 further spreads the revenue requirements across all usage, but minimizes the price signal that could be communicated to cost causers with high usage.

Q. What approach in reallocating the fixed customer and demand charge revenue do you recommend?

A. Ideally, because the costs that the Coop incorrectly allocates to the fixed customer charge and proposes to recover through the unreasonable demand charge are caused by energy use and demand, they should be allocated to cost causers—likely the higher users of electric services. And the allocation should be informed by a study of demand elasticity—the extent to which consumption of electricity is impacted, over the short- and long-term, by changes in prices. But the Coop has not prepared a bill frequency analysis,[35] a demand elasticity analysis,[36] or other analysis that would allow me to construct an option allocating the revenue requirement to both higher usage in the summer and in the winter, which would likely be the most economically efficient approach. I therefore recommend Option 2 until the Coop develops better data and understanding of its members and how they use electricity.

III.D. HOW CHANGING THE VOLUMETRIC RATE COULD IMPACT USAGE

[35] Coop response to SUN-VA 2-15. In Coop response to SUN-VA 3-47, the Coop asserts that it has prepared "bill frequency analysis sufficient to identify the kWh by rate blocks as needed for the Schedule 15B revenue proof."

[36] Coop response to SUN-VA 2-5.

Q. How would assignment of the requested additional revenue requirement to the volumetric charge impact energy consumption?

A. There are some customers that will not change their energy usage levels in response to price changes. Extremely poor customers often use a survival level of electricity, and very wealthy customers are somewhat indifferent to rate changes. However, taking into account customers who fall somewhere between those two extremes, studies show near- and long-term consumption changes will result from volumetric price changes for electricity.[37] Increases in volumetric rates drive reductions in energy usage and encourage energy efficiency, conservation, and self-generation—all of these will reduce costs for all Coop members. One of the most pernicious effects of loading costs onto the fixed customer charge is that it reduces or eliminates the price signal that customers receive by changing consumption levels. This weakening of the consumption price signal drives greater use and greater costs for all Coop members.

Q. What is the Coop's position on the impacts of its proposed fixed customer charge and rate design on the level of energy usage by members?

A. The Coop takes the unreasonable view that the way in which the fixed customer charge impacts the level of energy usage by members is irrelevant to this proceeding.[38]

Q. Do you agree with the Coop on this issue?

A. No, and I think the Commission should disagree with the Coop's position as well. It is

---

[37] *See* Paul J. Burke & Ashani Abayasekara, *The Price Elasticity of Electricity Demand in the United States: A Three-Dimensional Analysis*, Int'l Ass'n of Exhibitions and Events (2018) and references cited therein, https://ideas.repec.org/a/aen/journl/ej39-2-burke.html; EIA, *Price Elasticity for Energy Use in Buildings in the United States* (Jan. 2021), https://www.eia.gov/analysis/studies/buildings/energyuse/pdf/price_elasticities.pdf ("EIA Price Elasticity Report").

[38] Coop response to SUN-VA 3-43.

fundamental to the sound principles of rate making that rates should encourage the efficient use of energy—this is fundamental to just, reasonable, and non-discriminatory rates. The Commission should reject the Coop proposal and direct it to reconsider its rate proposals in light of this basic principle.

Q. Are there other reasons to ensure that members have clear price signals that increased volumetric use results in increased costs?

A. Yes. Conservation and usage reduction resulting from volumetric rates give members the opportunity to immediately reduce their next bill by reducing usage and to reduce long-term wholesale supply and infrastructure costs associated with electric service. Increased usage, especially during peak demand periods, drives the greatest costs for many utilities because it drives the need for larger, more expensive infrastructure to handle increased peaks and because wholesale supply agreements specifically charge buyer like the Coop for their demand based on wholesale market peak prices.

Q. Is the Coop aware of these cost impacts?

A. Yes. The Coop advertises a free and voluntary program for members to "Beat the Peak," by reducing use during peak cost hours.[39] In addition, the Coop obtains wholesale power service from the Old Dominion Electric Cooperative ("ODEC"), which charges for these services under a formula rate.[40] The ODEC formula rates charges the Coop for energy and for demand. Demand charges under the formula rate include both actual costs and a margin collected by ODEC and can be adjusted as costs change.[41] That means that Coop members can reduce wholesale price costs and their bills in the relatively short term by

[39] Coop "Beat the Peak" program information on Coop website, at https://www.svecbeatthepeak.coop/whats-a-peak/.
[40] Old Dominion Electric Cooperative Form 10-K (FYE Dec. 31, 2020), at 29-30.
[41] *Id.*

reducing usage, especially during periods that ODEC experiences high demand.

Q. **Does the Coop's proposed rate structure support members reducing their monthly and long-term bills by reducing usage and demand?**

A. No. The Coop's loading of costs onto the fixed customer charge sends a contradictory price signal to members that disincentivizes the very behavior that would save them money. It is almost as if the Coop management was expressing a preference for higher ODEC revenues and member bills than for lower Coop costs and lower member bills.

Q. **Can you quantify the consumption impact that would result from allocating the costs currently proposed for recovery through the increased residential fixed customer charge to the volumetric rate instead?**

A. Yes. Allocating the proposed costs to the volumetric distribution delivery rate instead of the fixed customer charge and a new demand charge would increase the effective volumetric charge seen by residential members by about 5.9%.[42] This change incentivizes reduced consumption, energy efficiency, and investment in other distributed energy resources for the majority of customers. Conversely, allocating those costs to the fixed customer charge means lower volumetric rates, which increases the payback period for investments in energy efficiency and other distributed energy resources. This also incentivizes increased consumption and dependence on delivered energy, with higher bills over the long run.

The extent of the changes in consumption behavior is a function of the elasticity of demand demonstrated by residential and small commercial customers. The Coop has

[42] Coop Sched. 6. Calculated by allocating the proposed fixed customer charge increase ($5) and demand charge (9.84 kW x $0.10) for an average residential member (1,177 kWh/month, 9.84 kW peak) to proposed volumetric rates (summer, 4 mos., $139.13 – ($30 + $0.984; Non-summer, 8 mos., $129.17 – ($30 + $0.984)), using a weighted average for summer and non-summer months.

conducted no study or analysis of the elasticity of demand for electric service by its residential members.[43] In the absence of such Coop-specific data, there are numerous studies that provide estimates that indicate that it is entirely reasonable to expect a negative demand elasticity coefficient for the Company's electric and gas customers.[44] When a study finds a negative coefficient of -.20, that means that for every 1 percent increase in the volumetric price of electricity, demand is expected to decrease by .2%. I am aware of no studies finding zero or positive coefficients, and the coefficients are larger over the long run. This all means that any change in the proposed rate design that collects more of the revenue requirement through volumetric charges will produce some increase in efficiency, conservation, or customer-owned distributed renewable generation over the short term, and greater increases over the long term.

Q. Have you calculated the consumption impacts using non-Coop studies?

A. Yes. I calculated the expected increase in efficiency, conservation and/or distributed renewable generation that could be expected from a 5.9% increase in volumetric rates using results from studies by the National Renewable Energy Laboratory ("NREL")[45] and the EIA.[46] The results of this calculation point to a small but significant opportunity to achieve reductions in usage through conservation and efficiency simply from a redistribution of proposed increased and new charges from fixed to volumetric rate elements. These studies suggest reduction in the range of about 1.2% in the short run (3 years) and between 1.9% and 3.0% in the long run (30 years) among residential

[43] Coop response to SUN-VA 2-5.
[44] *See* EIA Price Elasticity Report, *supra note 37.*
[45] M. Bernstein & J. Griffin, *Regional Differences in the Price-Elasticity of Demand for Energy*, NREL (Feb. 2006), https://www.nrel.gov/docs/fy06osti/39512.pdf.
[46] EIA Price Elasticity Report.

members. The results of my calculation are in the table below. Even greater impacts could be obtained by phasing in the allocation of revenue requirements to high-usage tiers in both the summer and non-summer months.

Table KRR-3: Expected Consumption Response Due to Higher Marginal Rates

	NREL 2006		EIA 2021	
	Short-Run	Long-Run	Short-Run (3 yr. avg.)	Long-run (30 yr)
Residential Elasticity	-0.20	-0.32	-0.20	-0.50
Decreased Use Due to 5.9% Price Increase for kWh over 800 kWh/month	-1.2%	-1.9%	-1.2%	-3.0%

Q. What are the rate making benefits of such an approach?

A. Prices that increase bills based on increased use reflect the sound rate making principle of reflecting cost causation in rates. Incentivizing efficiency, conservation, and customer-sited renewable generation (like rooftop solar) through revenue-neutral rate design is "cost effective" under any accepted meaning of that term. Alternative rate designs do not change the revenue requirement and, therefore, do not produce a "cost" or class-wide "cost shift" relative to any other rate design. Instead, they are alternate ways to collect the same amount of revenue from customers in the class as a whole. Accordingly, the alternative rate design that I calculated should be cost effective compared to the long run marginal costs of energy, production capacity, transmission, and distribution avoided by the resulting energy efficiency, conservation, and customer owned renewable generation. Moreover, from a societal cost perspective, it is well established that the system- and society-wide benefits of clean energy resources exceed the incremental cost, benefiting participating and non-participating customers alike.

Q. If higher volumetric rates would result in reduced consumption and encourage

greater use of energy efficiency and distributed generation and other distributed energy resources, what impact does the Coop's approach of loading costs into the fixed customer charge have on energy efficiency uptake by customers?**

A. All things being equal, demand elasticity works in both directions. Just as increasing per unit prices leads to decreased consumption, so do *decreased* prices increase consumption over both the short and long term. So, the lower volumetric charge the Company is proposing could increase consumption by about 1.2% in the short run (3 years) and between 1.9% and 3.0% in the long run (30 years) among residential members, undoing a significant amount of the energy efficiency that Virginia policy prioritizes in policy.[47]

Q. What do you recommend that the Commission do in light of this evidence regarding how rate design choices impact consumption levels?

A. The Commission should find that a Coop-specific study of elasticity of demand for its member base is a requisite foundation for just, fair, and reasonable residential member rates, and order the Coop to conduct and analyze such a study in support of setting reasonable fixed customer charges and volumetric distribution delivery charges. In this case, the Commission should deny any proposal by the Coop to further increase its fixed customer charge for residential members.

III.E. HOW CHANGING THE VOLUMETRIC RATE COULD IMPACT PAYBACK ON ENERGY EFFICIENCY AND OTHER DER INVESTMENTS

Q. How else does the Coop's proposed rate structure impact uptake for energy efficiency, distributed generation, and other distributed energy resources?

A. The second way the Coop's proposed rate structure impacts energy efficiency and

[47] A comprehensive list of energy efficiency policy in Virginia is available at the "DSIRE" database, at https://programs.dsireusa.org/system/program?state=VA.

distributed energy resource uptake is by increasing the simple payback period on such investments. While these effects are most pronounced with large investments, a simple example with a single light bulb demonstrates the impact of increased payback period. Simply stated, each kilowatt-hour saved by energy efficiency investments is worth less when the volumetric rate is suppressed by loading costs into the fixed customer charge. In this example, I assume a 10 watt-hour LED that costs $1.50 replaces an incandescent bulb that costs $1.00, and that the customer operates the bulb for three hours each day. I first calculated the daily cost to operate using only the base volumetric charge as proposed by the Coop, based on an effective volumetric rate ($.09024 per kWh) and a rate that is 5.9% higher, as described previously ($.09136 per kWh). I then calculated the simple payback period at each rate level. The payback period is 5.9% longer under the Coop rate as compared to the rate that I propose. Even greater impacts from phasing in the allocation of revenue requirements to high-usage tiers in both the summer and non-summer months.

Table KRR-4: Payback Calculations for One Efficient LED Bulb

Daily Cost to Operate

	LED	Incandescent
Bulb Wattage	**10**	**60**
Daily Watt-Hours (3 hrs/day)	**30**	**180**
Daily Cost to Operate (SVEC Rate)	**$ 0.0026**	**$ 0.0155**
Daily Cost to Operate (Rábago Proposed)	**$ 0.0027**	**$ 0.0164**

Payback Calculation

	SVEC Proposed	Rábago Proposed
Effective Volumetric Rate	**$ 0.08627**	**$ 0.09136**
Daily Savings	**$ 0.0129**	**$ 0.0137**
Days to Pay Back First Cost Difference	**38.64**	**36.49**
Days to Pay Back Total Cost	**115.91**	**109.46**
Increase in Payback Period		**5.9%**

While the difference in payback period is a matter of days in this simple, single lightbulb example, the difference in payback becomes much more significant for larger investments like whole-house retrofits or rooftop solar systems. In my experience, payback period, along with first costs, is one of the single-largest factors impacting customer investment in distributed energy resources.

Q. What is the Coop's position on the impacts of its proposed fixed customer charge on the economics of investments in energy efficiency, distributed generation, and other distributed energy resources?

A. The Coop takes the unreasonable view that the way in which the fixed customer charge impacts the economics of member investment in energy efficiency, distributed generation, and other distributed energy resources is irrelevant to this proceeding.[48]

Q. Do you agree with the Coop on this issue?

A. No, and I think the Commission should disagree with the Coop's position as well. It is fundamental to the sound principles of rate making that rates should encourage the efficient use of energy—this is fundamental to just, reasonable, and non-discriminatory rates. The Commission should reject the Coop proposal and direct it to reconsider its rate proposals in light of this basic principle.

III.F. IMPACTS OF HIGH FIXED CHARGES ON COOP FISCAL DISCIPLINE

Q. Does the Coop proposal to dramatically increase the fixed customer charge raise any other equity and energy justice concerns?

A. Yes. I have explained how the increased fixed charge and companion lower base volumetric rate is economically regressive and sends price signals that disincentivize

[48] Coop response to SUN-VA 3-39.

investment in energy efficiency and distributed generation. They also send the wrong price signal *to the Coop*. Loading up the fixed charge component tells the Coop that it can overspend on investments and operations and maintenance ("O&M") that it classifies as and seeks to recover in the fixed customer charge while escaping any financial consequence in revenues collected from members. That is, a higher fixed customer charge encourages economic waste by the Coop. The Coop already proposes to accelerate spending on distribution infrastructure. Coop management proposes to increase average annual spending in the years 2022 through 2024 to $48.9 million per year.[49] This level of spending is $19.8 million or 66% higher than the average level of spending for the years 2016 through 2020.[50] This is not a good time to weaken the price signals to the Company to be prudent in that spending.

III.G. FLAWS IN THE COOP'S COST OF SERVICE AND RATE DESIGN METHODOLOGIES

Q. What are your concerns about the Coop's approach to the way in which it uses cost of service data to develop its fixed customer charge proposal?

A. The fundamental problem with the Coop's approach is that it has adopted a fundamentally flawed method for classifying costs as customer costs that (1) over-allocates costs to the customer cost classification and (2) relies on the minimum system and minimum intercept methods.

Q. Before elaborating on these concerns with the Coop approach, please describe your understanding of how the Company builds its customer charge.

---

[49] Coop Application at 5.
[50] *Id.*

A. Coop witness Gaines explains the Coop's cost of service study and cost allocation approaches. In its cost of service study, the Coop establishes a range of functions that capture all the business functions it performs in providing electric service. It then assigns or "classifies" costs as customer costs against that range of functions—some costs are not customer costs, some are exclusively customer costs, and some are joint or common costs that are partly demand-related and partly customer costs. For costs that are classified as both demand- and customer-related, the Coop relies on subjective and unreasonable methods—the minimum system and minimum intercept methods—to allocate costs to the demand and customer categories. As I will discuss further, the minimum system and minimum intercept methods use data and analysis to hypothesize the size of an electric system that would be built to serve customers that never demanded any electric service—an illogical precept.

Q. Why does proper cost classification to the customer, demand, or commodity energy cost categories matter?

A. Assigning a given cost to the customer category makes it more likely that it will be collected from a residential member, because the number of residential customers is vastly greater than the number of commercial or industrial members. In addition, costs assigned to the customer category are used as the basis for building class rates, including the customer charge, so that the more costs are classified as customer costs, the higher the customer charge that the Coop will seek to charge.

Regardless of the method used to classify and allocate distribution costs, there is no principle that states that the classification and allocation methods should determine rate design or dictate the size of the fixed customer charge. Cost allocation and rate design are separate rate making processes. While there is no requirement that costs assigned to the customer costs category be collected solely through a per-customer fixed charge, the Coop in this proceeding seeks to collect $30.00 in the customer charge out of the $32.32 that it assigns to the single-phase residential member category.[51]

Q. **Please explain what costs the Coop includes in its customer charge calculations.**

A. The Coop includes a wide variety of customer service-related costs, meter costs, primary distribution system costs, and secondary distribution system costs in its calculation of the customer charges.[52] The customer cost category is made up of costs which are directly classified, without modification, to the category. The Coop also classifies a portion of costs related to a hypothetical minimum system built for customers who use no electricity, as I explain below, or estimated using a minimum intercept method. Taken together, these costs classified as customer costs amount to almost $2.6 million in total monthly revenue requirement, with margin,[53] or about $31 million in annual revenue requirement.[54]

Q. **Are the costs that the Coop classifies as customer costs a significant portion of the Coop's total proposed revenue requirement from jurisdictional residential members?**

A. Yes. The Coop classifies about $31 million, or 24%,[55] of the total jurisdictional residential revenue requirement of about $130 million for recovery through the customer charge.

[51] Coop Sched. 15E.
[52] *Id.*
[53] *Id.*
[54] Calculated as $2,583,079 x 12 = $30,996,948
[55] Calculated as $31 million / $130 million = ~24%

Q. How would you describe the key components of the Coop's customer charge calculation and its approach to proposing the customer charge?

A. The Coop's approach to calculating customer costs for residential members rests on two foundations: (1) its definition of customer costs, and (2) its use of the minimum system and minimum intercept methods to assign fixed and demand-related distribution costs to the customer cost category. Almost all the costs that the Coop assigns to the customer costs category end up in the fixed customer charge.[56] The Coop assigns a great many costs that are driven by demand and energy use, rather than by customer count or connection, to the customer cost category.[57] The Coop offers no detailed justification for using the minimum system and minimum intercept approaches[58] or for using these methods instead of other methods that would produce a much lower customer charge and has not even considered such alternatives.[59] Rather, the Coop summarily states that its methodology "is principally based on the general concepts and guidelines stated in the *Electric Utility Cost Allocation Manual,* as prepared by the National Association of Regulatory Utility Commissioners ("NARUC"),[60] and that is has used the same approach in prior rate applications.[61] In response to discovery on this issue, the Coop offers only the additional conclusory assertion that the methods it uses "provide a fair and reasonable allocation of costs to the customer cost category."[62] This testimony later addresses in some detail why this conclusion by the Coop is wrong.

---

[56] $30.00 per customer per month out of $32.32 per customer per month.
[57] Coop Sched. 15E.
[58] Coop responses to SUN-VA 2-6, 2-7, 2-8, 2-12.
[59] Coop responses to SUN-VA 2-13, SUN-VA 3-45.
[60] Coop witness Gaines direct testimony at 12, lines 18-20.
[61] Coop response to SUN-VA 2-6. Referencing PUE-2000-00747, PUE-2013-00132.
[62] Coop response to SUN-VA 3-40

Q. Are those justifications for the Coop's use of its cost of service and customer charge methods sufficient and reasonable?

A. No. First, the NARUC Cost Allocation Manual is descriptive and not normative; it does not serve as justification for use of the minimum system and minimum intercept methods.[63] Second, there was no discussion of the minimum system or minimum intercept methods in the testimony or hearing documents in Case No. PUE-2013-00132.[64] No electronic documents are available for Case No. 2000-00747. The cited prior cases do not stand, therefore, as precedent for the use of the minimum system and minimum intercept methods in this case.

Q. How does the Coop use customer costs to calculate the fixed customer charge?

A. All of the costs that are classified as customer costs are combined to calculate class customer costs. Total costs are divided by customer-months to produce a monthly customer charge. The Coop's calculations yield the result of $32.32 per customer per month for rate class A-12.[65] The Coop proposes to recover $30.00 of this amount through the fixed customer charge, and the balance through the volumetric distribution delivery charge.

Q. How does the Coop define customer costs for cost classification purposes?

A. The Coop offers no definition for customer costs in its testimony, and seems to rely only on its classification methods to determine what will and will not be classified as customer costs.[66]

---

[63] "The [Manual's] writing style should be non-judgmental; not advocating any one particular method but trying to include all currently used methods with pros and cons." NARUC, *Electric Utility Cost Allocation Manual* at ii (1992), http://www.pub.gov.mb.ca/pdf/cos_review/exhibits/mipug-28.pdf.
[64] Based on witness' search of SCC Docket Search website.
[65] Coop Sched. 15E.
[66] Coop witness Gaines direct testimony at 14, line 21 through 17, line 5.

Q. Should the Coop adopt a definition for customer costs?

A. Yes. The classification of costs by choice of methodology—a combination of subjective direct classification decisions and application of the minimum system and minimum intercept methodologies—elevates the method over the reasonableness of the outcome. Without a framework definition, such as customer costs are "those operating and capital costs found to vary with the number of customers regardless, or almost regardless, of power consumption,"[67] the utility will, like this Coop has, unreasonably inflate the fixed customer charge by choosing the method that produces the most inflated charge.

Q. Is there still room for debate under the kind of definition you cite from the Bonbright treatise?

A. Yes, and the challenge lies in application of the definition. It is critical that a utility adopt a reasonable and disciplined means for applying the definition—that a customer cost is a cost that varies "with the number of customers regardless, or almost regardless, of power consumption."

Q. In what ways can this definition of customer costs be applied?

A. There are two possible ways to apply the definition. One is an outcome-based path that aims to increase costs classified as customer costs, and thereby make a case for increased customer charges. Not surprisingly, this is the chosen path of the Coop management and board, because it increases the Coop's guaranteed revenue, or in the words of the Coop, "help[s] to stabilize and ensure recovery of fixed costs."[68] While this may be good for Coop earnings, it is demonstrably bad for members and for market participants and policy

[67] James C. Bonbright, *Principles of Public Utility Rates* 347 (photo. reprt. 2005) (1961), http://media.terry.uga.edu/documents/exec_ed/bonbright/principles_of_public_utility_rates.pdf ("Bonbright").
[68] Coop response to SUN-VA 2-8.

makers seeking to grow markets for distributed energy services and products, including efficiency, conservation, and distributed generation. The second option is to give reasonable and logical weight to the terms "caused" and "regardless," and to limit the characterization of customer costs to those costs that are directly caused by connecting customers to the grid. This is known as the basic customer method and is the dominant approach in the U.S.

Q. **Is there an objective and administratively simple way of characterizing customer costs?**

A. As I previously explained, a good rule of thumb is this: *If the cost disappears because the customer leaves the system, the cost is a customer cost.*

Q. **Is the Coop's approach to classifying customer costs and the resulting proposed rate structure cost-based?**

A. No, for two reasons. First, the Coop treats a huge amount of costs as customer costs without recognizing that these costs are heavily driven by demand or energy use—they are not caused by customer connection regardless of energy or demand usage. Transformer costs are a simple example. Transformers are sized to serve load. Their only function is to transform energy. If the customer were to leave the system, unless that customer was the only customer served by that transformer, the cost of the transformer would remain.

Q. **What is the second reason the Company's approach to classifying customer costs and the resulting proposed rate structure are not cost-based?**

A. Second, and as explained previously, the Coop expressly chose methods—direct assignment of certain costs and the minimum system and minimum intercept methods—

for classifying non-customer-related costs as customer costs. As I will explain, the methods used by the Coop for classifying costs are fundamentally flawed and not useful in identifying actual cost causation *except* as a method for predetermining the rate outcome that the Coop seeks. It appears that the Coop seeks to increase its fixed customer costs and charges simply because it has high fixed costs and has constructed an approach that serves that end.

Q. **Please list what the Coop treats as direct customer costs.**

A. The directly assigned customer costs include:

- Account 369, Services
- Account 370, Meters

Q. **Do you find any flaw in the Coop's classification of customer costs based on direct assignment?**

A. There is one major way in which I believe the Coop's methods are flawed and should be corrected. I find that the Coop significantly inflates customer costs relating to metering support in light of the advanced functionality associated with the meters and meter-related systems it is deploying, as well as with regard to the many functions the Coop performs or intends to perform in relation to its customers that go beyond basic service and consumption metering and billing. In the past, the assignment of the cost of a meter entirely to the customer category was appropriate because meters could really only do one thing—measure cumulative consumption over time. As explained in the RAP Cost Allocation Manual:

> [M]eters have been primarily treated as a customer-related cost in older methods because their main purpose was customer billing. However, advanced meters

> serve a broader range of functions, including demand management, which in turn provides system capacity benefits, and line loss reduction, which provides a system energy benefit. This means the benefits of these meters flow beyond individual customers, and logically so should responsibility for the costs.[69]

So, while the customer cost category properly includes some of advanced meter-related costs, it should not include them all. As detailed later in this testimony, I propose that 50% of the meter-related costs be removed from the customer cost classification.

Q. Please explain.

A. Today's advanced meters and associated distribution system infrastructure, customer service support and offerings, billing and data management systems, and other investments and expenses associated with a richer, more complex service environment can be used to serve a wide array of functions. These include helping the utility and customers manage demand, offering and participating in new versions of time-varying rates, enabling integration of distributed generation and electric vehicles, developing and participating in demand response programs, and other functions. The new AMI meter can do more than what is required to simply measure consumption, and it also costs more to deliver those added services. The assignment of meter and associated infrastructure and other costs should be subject to much more granularity in order to accurately track cost causation and ultimately send efficient price signals. In sum, the cost of advanced meters and associated services and infrastructure is related to customer count, energy use, and demand, as well as to a wide range of other more granular functions associated with the modern electric grid beyond the costs properly associated with a fixed customer charge.

[69] *Supra note 5* at 18.

Therefore, it is a classification error to assign all these costs to the customer cost category.

Q. **Is this increased diversity of function limited to meters?**

A. No. Customer billing systems, distribution automation and distribution management systems, mesh networks, and many other distribution-level investments associated with grid modernization similarly involve costs that can be classified in the customer, demand, and commodity energy categories.

Q. **Does your analysis therefore impact any other costs currently included in the customer costs category, and ultimately, the fixed customer charge?**

A. Yes. For the reasons cited, and because high-usage and high-demand customers make greater use of customer service, and because billing system costs increasing relate to functions relating to energy use and demand, it is unreasonable to assign all customer service and billing costs to the customer cost category.

Q. **Did the Coop perform any classification analysis on what it characterizes as direct customer costs to account for advanced functionality and increased range of functions performed by and through investments in modern distribution facilities, including advanced meters, DER, energy efficiency, and customer engagement systems?**

A. No.

Q. **What is the effect of this wholesale assignment of costs related to advanced functionalities to the customer cost category as direct customer costs?**

A. Because the Coop assigns costs related to advanced functionalities, such as costs for demand management and DER integration functions, entirely to the customer cost category, it unreasonably inflates customer costs and consequently, the customer charge.

Q. What do you recommend based on this changing reality associated with the functions performed by investments and infrastructure at the distribution edge?

A. Now is the time for the Coop to develop a more granular cost tracking system to enable more accurate characterization and classification of costs associated with AMI/AMF deployment, and with grid modernization in general. This data will be essential for improved cost of service analysis. The Coop should develop a set of subaccounts and cost categories for tracking grid modernization-related investments that includes the three basic cost categories of customer, demand, and commodity energy, as well as the many kinds of specific functions—such as demand response, portal costs, third-party engagement, and electric vehicle interface, among others—performed by the modern and future distribution service provider.

Q. What costs does the Coop classify as customer costs using the minimum system and minimum intercept methods?

A. The Coop uses the minimum system and minimum intercept methods to classify as customer costs a portion of the costs related to the following cost categories:

- Account 364, Poles
- Account 365, Overhead Wires
- Account 366, Underground Conduit
- Account 367, Underground wires
- Account 368, Line Transformers, Capacitors, and Voltage Regulators

Q. Should any of the costs in these categories be classified as customer costs?

A. Not as a general matter. To the extent the Coop can identify line extension costs to individual residential members that have not been recovered through contribution-in-aid-of-construction charges, those costs could be reasonably classified as customer-related. Absent any showing on that issue, the costs in Accounts 364-368 should all be assigned to demand.[70]

Q. How does the Coop make the fundamental error of assigning these costs as customer related?

A. The foundational flaw in the Coop's approach to the customer charges is that it includes hypothetical infrastructure costs and not actual costs. The Coop uses the minimum system and minimum intercept methods to imagine the costs that it would have incurred to serve customers with no demand for electricity.

Q. Can you elaborate further?

A. The Coop wants to increase fixed customer charges and the certainty of revenue recovery, so it applied a definition of customer costs that requires one to ask the fantastical question: "What system would the Coop be required to build if it served all of its current customers, but they used no energy at all?" In the flawed logic of the Coop's definition, the answer to the hypothetical question is the "minimum system," and the cost numbers that appear through a graphing exercise known as the minimum intercept method.[71] In this hypothetical world, transformers and conductors with very specific capacity sized to meet very real demand are presumed to be part of a system that would have been built to serve no demand at all. The Coop sums all the system component costs

[70] *See* RAP Cost Allocation Manual at § 11.2, at 145 et seq.
[71] Coop witness Gaines direct testimony at 15, line 11 through 16, line 10.

that it believes would be required even if every customer unplugged every appliance and turned off every switch. This dark, silent hypothetical system is the Coop's minimum system that it wants to charge customers for. At its heart, the Coop's approach is nothing more than result- or outcome-based rate making; it is not cost of service rate making.

Q. What are the main problems with the minimum system and minimum intercept methods?

A. A great deal of data and analysis and expense can go into creating the minimum system and minimum intercept methods justifications, but at heart they are a subjective exercise. This is because there is no such thing as a minimum electrical system that would be built to serve one or any number of customers with absolutely no demand for energy. As the previous explanation shows, the first major problem is that the minimum system method is based on subjective assumptions about system costs and not on cost-causation. It ignores very real differences in the cost to connect and serve different kinds of customers, even customers in the same class, because it assigns to them a per-customer share of the minimum system, not their actual costs. Second, the method results in higher customer charges.

Q. Have the problems associated with the minimum system approach been previously studied or analyzed?

A. Yes. The problems inherent in the minimum system approach have been well understood for decades.[72] Indeed, James Bonbright addressed the issues head on in 1961:

---

[72] *See* Jim Lazar, *Dividing the Pie: Cost Allocation, the First Step in the Rate Design Process* at A-5 (2015), https://www.raponline.org/wp-content/uploads/2016/05/appendix-a-smart-rate-design-2015-aug-31.pdf.

"[T]he really controversial aspect of customer-cost imputation arises because of the cost analyst's frequent practice of including, not just those costs that can be definitely earmarked as incurred for the benefit of specific customers but also a substantial fraction of the annual maintenance and capital costs of the secondary (low-voltage) distribution system—a fraction equal to the estimated annual costs of a hypothetical system of minimum capacity. This minimum capacity is sometimes determined by the smallest sizes of conductors deemed adequate to maintain voltage and to keep from falling of their own weight. In any case, the annual costs of this phantom, minimum-sized distribution system are treated as customer costs and are deducted from the annual costs of the existing system, only the balance being included among those demand-related costs to be mentioned in the following section. Their inclusion among the customer costs is defended on the ground that, since they vary directly with the area of the distribution system (or else with the lengths of the distribution lines, depending on the type of distribution system), they therefore vary indirectly with the number of customers.

What this last-named cost imputation overlooks, of course, is the very weak correlation between the area (or the mileage) of a distribution system and the number of customers served by this system. For it makes no allowance for the density factor (customers per linear mile or per square mile). Indeed, if the company's entire service area stays fixed, an increase in number of customers does not necessarily betoken any increase whatever in the costs of a minimum-sized distribution system.

> While, for the reason just suggested, the inclusion of the costs of a minimum-sized distribution system among the customer-related costs seems to me clearly indefensible, its exclusion from the demand-related costs stands on much firmer ground. For this exclusion makes more plausible the assumption that the *remaining* cost of the secondary distribution system is a cost which varies continuously (and, perhaps, even more or less directly) with the maximum demand imposed on this system as measured by peak load.
>
> But if the hypothetical cost of a minimum-sized distribution system is properly excluded from the demand-related costs for the reason just given, while it is also denied a place among the customer costs for the reason stated previously, to which cost function does it then belong? The only defensible answer, in my opinion, is that it belongs to none of them. Instead, it should be recognized as a strictly unallocable portion of total costs. And this is the disposition that it would probably receive in an estimate of long-run marginal costs. But the fully distributed cost analyst dare not avail himself of this solution, since he is the prisoner of his own assumption that 'the sum of the parts equals the whole.' He is therefore under impelling pressure to 'fudge' his cost apportionments by using the category of customer costs as a dumping ground for costs that he cannot plausibly impute to any of his other cost categories."[73]

Q. Has the more recent RAP Cost Allocation Manual addressed these minimum system and minimum intercept methods?

[73] James C. Bonbright, *Principles of Public Utility Rates* 347–49 (photo. reprt. 2005) (1961), http://media.terry.uga.edu/documents/exec_ed/bonbright/principles_of_public_utility_rates.pdf ("Bonbright").

A. Yes, and the RAP Cost Allocation Manual proposes rejection of the methods for general application, and absent demonstration of the otherwise unrecovered customer-specific costs. I reprise the discussion in great detail because of the thoroughness of its explanation:

> [M]ore general attempts by utilities to include a far greater portion of shared distribution system costs as customer-related are frequently unfair and wholly unjustified. These methods include straight fixed/variable approaches where all distribution costs are treated as customer-related . . . and the more nuanced minimum system and zero-intercept approaches included in the 1992 NARUC cost allocation manual.
>
> The minimum system method attempts to calculate the cost (in constant dollars) if the utility's installed units (transformers, poles, feet of conductors, etc.) were each the minimum-sized unit of that type of equipment that would ever be used on the system. The analysis asks: How much would it have cost to install the same number of units (poles, feet of conductors, transformers) but with the size of the units installed limited to the current minimum unit normally installed? This minimum system cost is then designated as customer-related, and the remaining system cost is designated as demand-related. The ratio of the costs of the minimum system to the actual system (in the same year's dollars) produces a percentage of plant that is claimed to be customer-related. This minimum system analysis does not provide a reliable basis for classifying distribution investment and vastly overstates the portion of distribution that is customer-related. Specifically, it is unrealistic to suppose that the mileage of the shared distribution

system and the number of physical units are customer-related and that only the size of the components is demand-related, for at least eight reasons.

1. Much of the cost of a distribution system is required to cover an area and is not sensitive to either load or customer number. The distribution system is built to cover an area because the total load that the utility expects to serve will justify the expansion into that area. Serving many customers in one multifamily building is no more expensive than serving one commercial customer of the same size, other than metering. The shared distribution cost of serving a geographical area for a given load is roughly the same whether that load is from concentrated commercial or dispersed residential customers along a circuit of equivalent length and hence does not vary with customer number . . .

2. The minimum system approach erroneously assumes that the minimum system would consist of the same number of units (e.g., number of poles, feet of conductors) as the actual system. In reality, load levels help determine the number of units as well as their size. Utilities build an additional feeder along the route of an existing feeder (or even on the same poles); loop a second feeder to the end of an existing line to pick up some load from the existing line; build an additional feeder in parallel with an existing feeder to pick up the load of some of its branches; and upgrade feeders from single-phase to three-phase. As secondary load grows, the utility typically will add transformers, splitting smaller customers among the existing and new transformers. Some other feeder construction is designed to improve reliability (e.g., to interconnect feeders with automatic

switching to reduce the number of customers affected by outages and outage duration).

3. Load can determine the type of equipment installed as well. When load increases, electric distribution systems are often relocated from overhead to underground (which is more expensive) because the weight of lines required to meet load makes overhead service infeasible. Voltages may also be increased to carry more load, requiring early replacement of some equipment with more expensive equipment (e.g., new transformers, increased insulation, higher poles to accommodate higher voltage or additional circuits). Thus, a portion of the extra costs of moving equipment underground or of newer equipment may be driven in part by load.

4. The "minimum system" would still meet a large portion of the average residential customer's demand requirements. Using a minimum system approach requires reducing the demand measure for each class or otherwise crediting the classes with many customers for the load-carrying capability of the minimum system.

5. Minimum system analyses tend to use the current minimum-sized unit typically installed, not the minimum size ever installed or available. The current minimum unit is sized to carry expected demand for a large percentage of customers or situations. As demand has risen over time, so has the minimum size of equipment installed. In fact, utilities usually stop stocking some less expensive small equipment because rising demand results in very rare use of the small equipment and the cost of maintaining stock is no longer warranted. However, the

transformer industry could produce truly minimum-sized utility transformers, the size of those used for cellular telephone chargers, if there were a demand for these.

6. Adding customers without adding peak demand or serving new areas does not require any additional poles or conductors. For example, dividing an existing home into two dwelling units increases the customer count but likely adds nothing in utility investment other than a second meter. Converting an office building from one large tenant to a dozen small offices similarly increases customer number without increasing shared distribution costs. And the shared distribution investment on a block with four large customers is essentially the same as for a block with 20 small customers with the same load characteristics. If an additional service is added into an existing street with electrical service, there is usually no need to add poles, and it would not be reasonable to assume any pole savings if the number of customers had been half the actual number.

7. Most utilities limit the investment they will make for low projected sales levels, as we also discuss in Section 15.2, where we address the relationship between the utility line extension policy and the utility cost allocation methodology. The prospect of adding revenues from a few commercial customers may induce the utility to spend much more on extending the distribution system than it would invest for dozens of residential customers.

8. Not all of the distribution system is embedded in rates, since some customers pay for the extension of the system with contributions in aid of construction, as discussed in Section 15.2. Factoring in the entire length of the

system, including the part paid for with these contributions, overstates the customer component of ratepayer-funded lines.

Thus, the frequent assumption that the number of feet of conductors and the number of secondary service lines is related to customer number is unrealistic. A piece of equipment (e.g., conductor, pole, service drop or meter) should be considered customer-related only if the removal of one customer eliminates the need for the unit. The number of meters and, in most cases, service drops is customer-related, while feet of conductors and number of poles are almost entirely load-related. Reducing the number of customers, without reducing area load, will only rarely affect the length of lines or the number of poles or transformers. For example, removing one customer will avoid overhead distribution equipment only under several unusual circumstances. These circumstances represent a very small part of the shared distribution cost for the typical urban or suburban utility, particularly since many of the most remote customers for these utilities might be charged a contribution in aid of construction. These circumstances may be more prevalent for rural utilities, principally cooperatives.

The related zero-intercept method attempts to extrapolate from the cost of actual equipment (including actual minimum-sized equipment) to the cost of hypothetical equipment that carries zero load. The zero-intercept method usually involves statistical regression analysis to decompose the costs of distribution equipment into customer-related costs and costs that vary with load or size of the equipment, although some utilities use labor installation costs with no equipment.

The idea is that this procedure identifies the amount of equipment required to connect existing customers that is not load-related (a zero-kVA transformer, a zero-ampere conductor or a pole that is zero feet high). The zero-intercept regression analysis is so abstract that it can produce a wide range of results, which vary depending on arcane statistical methods and the choice of types of equipment to include or exclude from an equation. As a result, the zero-intercept method is even less realistic than the minimum system method.[74]

Q. **What should the Coop do to determine customer-related costs?**

A. The Coop should use the basic customer method. The RAP Cost Allocation Manual provides additional explanatory detail that the Coop should consult.[75]

Q. **Are the minimum system and minimum intercept methods common practice in the majority of states?**

A. No. The minimum system method is out of step with practice in the majority of states.[76] The RAP Cost Allocation Manual cites several regulatory decisions that have rejected the methods.[77]

Q. **Does any credible economic policy dictate that high fixed cost businesses like electric distribution utilities should adopt rate structures with high fixed charge components in rates?**

---

[74] RAP Cost Allocation Manual at 146-148 (citations omitted).

[75] RAP Cost Allocation Manual at 148.

[76] *See* Frederick Weston, *Charging for Distribution Utility Services: Issues in Rate Design* at 30 (2000), https://www.raponline.org/wp-content/uploads/2016/05/rap-weston-chargingfordistributionutilityservices-2000-12.pdf (citing the "basic customer" method as the method in use in more than 30 states).

[77] RAP Cost Allocation Manual at 145, notes 141-148 and accompanying text.

A. Absolutely not. There is no economic theory that supports a rate design principle that cost structure should be mimicked in rate structure. Moreover, high fixed costs drive high rates in general, whether collected through fixed or volumetric charges. Rate structures with high fixed charges send perverse price signals to customers and utilities that changes in usage will not affect bills or revenues.

Q. If, as Bonbright suggests, some of the costs that the Coop's minimum system method allocates to the customer cost category are not customer costs or demand-related costs, then how do you propose that the Company recover those costs?

A. First, it is important to recognize that there is no general principle of rate making that requires a cost to be recovered through a particular kind of charge solely because of the category to which the cost is assigned. Rate design is a separate rate making step following cost of service analysis, functionalization, and classification. Given the important policy, equity, and market issues that I discuss in this testimony, prudent distribution system costs properly allocated to residential customers that may not neatly fit in the customer or demand category should be recovered through the volumetric delivery charge. The typically high correlation between energy use and demand means that assignment of transmission and distribution costs (other than the costs to connect) to volumetric rates creates a more efficient price signal than assigning those costs to fixed customer charges.

Q. Why do volumetric charges send a better price signal to residential customers than fixed customer charges?

A. I have addressed this more fully already in this testimony, but it bears repeating that simply stated, volumetric charges send better price signals because with volumetric charges, customers can impact their bill by changing their usage. This is not the case with fixed customer charges.

Q. What do you recommend that the Commission require the Coop to do?

A. I recommend that the Commission direct the Coop to abandon the deeply flaw methods that it uses to determine its proposed fixed customer charge. The Coop should be directed to make fundamental changes in the way it calculates and designs residential rates in order to align with best practices and with Commonwealth policy that favors efficient use of electricity, growth in distributed generation, and rational price signals for essential services. These recommendations will require a new approach by the Coop to how it does its cost of service analysis, and separately, to how it approaches the design of rates for residential members.

Q. Your proposals will take some time to accomplish. What do you recommend that the Coop do now?

A. I recommend that the Commission deny the Coop's proposal to increase the fixed customer charge for residential members and take up a step-wise reduction toward no higher than a $15 per customer per month fixed customer charge for residential customers. Adopting my recommendations relating to cost of service and rate design methods will yield revenue requirements in line with this recommendation.

Q. How do you propose to change the way costs are assigned to the customer cost category, and ultimately, to the fixed customer charge for the Coop's members?

A. I recommend that all costs associate with the primary system and transformers be excluded from the customer cost category. Further, I recommend that only 50% of currently proposed costs for meters, billing, and customer service be classified as customer costs until the Coop conducts a new cost of service analysis.

Q. Please show how the classification approach that you recommend impact the customer cost calculation.

A. The table shows the revised customer cost calculation consistent with my recommendations.

Table KRR-5: Recalculated Fixed Customer Costs with Corrected Cost Treatment

Account	Coop A-12	Rábago A-12	Difference	Comment
Primary	$ 9.42	$ -	$ (9.42)	Excluded from customer costs as demand related
Transformers	$ 1.08	$ -	$ (1.08)	Excluded from customer costs as demand related
Secondary and Services	$ 6.10	$ 6.10	$ 0.00	
3 Phase Meters	$ 0.00			
1 Phase Meters	$ 5.16	$ 2.58	$ (2.58)	Reduced by 50% due to demand and energy functionalities
Metering	$ 0.02	$ 0.01	$ (0.01)	
Billing	$ 9.01	$ 4.51	$ (4.51)	Reduced by 50% due to service costs related to demand and energy use
Consumer Ser 1	$ 2.37	$ 1.19	$ (1.19)	Reduced by 50% due to service costs related to demand and energy use
Total Distribution	$ 33.17	$ 14.38	$ (18.78)	
Less: Direct Fees	$ 0.27	$ 0.27	$ -	
Weighted Cost per Consumer per M	$ 32.90	$ 14.11	$ (18.78)	
Number of Single Phase Cust.	79,606	79,606		
Number of Three Phase Cust.	22	22		
Total	79,628	79,628		
Class Customer Cost/Mo.	$ 2,619,448	$ 1,123,799	$ (1,495,649)	

As these adjustments demonstrate, a just, reasonable, and fair fixed customer charge for the Coop's residential customers should not exceed $15 per customer per month.

Q. What do you recommend regarding the Coop's fixed customer charge for residential members until such time as the Coop conducts a new cost of service study and develops a new fixed customer charge proposal?

A. In the interests of fairness and gradualism, I recommend that the proposed increase to $30 per customer per month be denied, and that the Coop be required to reduce its fixed customer charge by $5 per year until the charge equals $15 per customer per month. At that time, the results of an improved cost of service study and better rate design can be used to develop a fair, just, and reasonable fixed customer charge.

IV. THE COOP'S PROPOSAL FOR A RESIDENTIAL DEMAND CHARGE

Q. What does the Coop propose for a demand charge on its residential members?

A. The Coop proposes to "introduce" a demand charge on its residential members in the amount of $0.10 per kilowatt based on the maximum demand of the member regardless of when that demand occurs.[78]

Q. Is the proposed $0.10 per kilowatt of demand the final word in what the Coop management and board intends to charge its residential members through the demand charge?

A. No. The Coop intends to use its discretion to modify and increase the demand charge in future years, taking care to stay below the level of modifications that would trigger Commission review.[79]

Q. Is the Coop residential demand charge proposal cost based?

A. No. The proposed rate appears to be intended to recover demand-related costs through a separate charge that does not reflect the actual contribution of individual residential members to cost causation.

Q. Why do you say that the proposed residential member demand charge is not cost based? Isn't it intended to recover actual demand related costs?

A. The costs may be real, but charging residential members for their peak demand, regardless of when it occurs, means that the proposed rate is not based on cost causation. The installed residential member meters cannot currently distinguish the time of

---

[78] Coop witness Gaines direct testimony at 27, lines 12-15.

[79] Coop witness Gaines direct testimony at 28, lines 1-20.

demand,[80] so the Coop has no way of knowing whether the demand it proposes for billing actually causes costs or, instead, adds valuable cost-reducing load diversity.

Q. Does the Coop plan to determine whether individual member demand (non-coincident customer demand) or member class demand (class non-coincident demand) contributes to system peak demand (coincident peak demand) in the future in order to align the proposed demand charge rate with cost causation?

A. The Coop asserts that "rebalancing" of charges is part of its plans but provides no specifics regarding such changes.[81]

Q. Is the proposed \$0.10 per peak kilowatt charge meaningful in terms of sending a price signal to high-demand customers?

A. No. By the Coop's own terms, the proposed residential demand charge is "insignificant," and does not expect any response from residential members, [82] even though it is designed to recover nearly \$1 million dollars each year from residential members.[83] I understand that to mean that the proposed rate is not designed or expected to yield any response from residential members in terms of reductions in cost-causing peak system demand.

Q. Is the Coop's proposed demand charge likely to be effective in reducing member and Coop demand costs, including the wholesale demand charges paid to ODEC?

A. No. The Coop's proposal will collect an additional \$1 million from residential members but won't have any significant impact on member usage or demand.[84] Because members have received no education or support relating to the proposed demand charge, there is

[80] Coop response to Information Requested by SCC Staff Member Kelli Gravely – 1.
[81] *Id.*
[82] Coop response to SUN-VA 2-25.
[83] Coop Sched. 15B.
[84] Coop response to SUN-VA 2-25.

even less reason to expect any level of response to the rate. The rate does not target coincident peak or aim for reductions during periods of high-cost service from ODEC. The Coop's proposed demand charge is, practically speaking, just a fixed charge adder denominated in cents per customer-specific monthly demand.

Q. **If the proposed residential member demand charge is expected to have an insignificant impact on over 98% of residential members,[85] what is a fair characterization of the proposed rate?**

A. The Coop's proposed residential demand charge is nothing more than a fixed customer charge of about $1 per customer per month for the average residential member. It will increase residential member bills by about $1 per month,[86] but will yield no benefits in terms of price signals or customer usage response. Nor is it likely that residential members will be able to cost-effectively avoid the demand charge through changes in behavior or consumption patterns.

Q. **Did the Coop management consider elasticity of demand and the extent to which residential members would adjust their usage based on the proposed demand charge?**

A. No.[87]

Q. **Did the Coop management or board consider fairness to low-income members, impacts on racial and ethnic minority members, impacts on fixed income and elderly members, member feedback on demand charges, or impacts of the proposed demand charge on energy efficiency, distributed generation, and other distributed**

[85] Coop response to SUN-VA 2-25.
[86] Coop Sched. 6.
[87] Coop response to SUN-VA 2-24.

energy resources and technologies in the design of and decision to propose the residential demand charge?

A. No.[88]

Q. Did the Coop management and board consider how the proposed demand charge is expected to change the coincident and non-coincident peaks served by the Coop?

A. No.[89]

Q. Has the Coop management educated its members or its board about the demand charge?

A. No. The Coop states that "it intends to."[90] That is, the Coop management intends to start charging customer under a demand charge before it has done any education of its board or members at all.

Q. Did the Coop management consult any academic or industry studies or literature in developing its proposal to institute a residential member demand charge?

A. No.[91]

Q. Is the Coop management's proposed demand charge reflective or the product of Coop member democratic control?

A. No, and the Coop management believes that both democratic control and member education, principles of the Seven Cooperative Principles, are irrelevant to the residential demand charge proposal.[92]

---

[88] Coop response to SUN-VA 2-23.
[89] Coop response to SUN-VA 2-26.
[90] Coop witness Rogers direct testimony at 5, line 20 through 6, line 11.
[91] Coop response to SUN-VA 2-35.
[92] Coop response to SUN-VA 2-38

Q. Are residential demand charges a reasonable rate design for residential electricity customers?

A. No, and especially not compared to time-of-use or other rate designs that target coincident system peak costs. The ostensible purpose of a demand charge is to align rate structure with cost causation. That is, to send customers a price signal that their higher levels of demand caused cost increases during certain time periods, and that paying an increased share of those costs through a time- and demand-differentiated rate would inspire more economic use of the electric utility system. The Coop proposal is not limited to charging for residential member demand that adds to coincident peak system costs for the Coop. The Coop member that increases their demand and moves their time of use to off peak hours spreads system costs, improves system asset utilization rates (overall system load factor), and still would be penalized with higher monthly charges than if they simply aligned their usage with system peak hours.

Q. Have the problems with residential demand charges been addressed in professional literature?

A. Yes. In 2020, Mark LeBel and Frederick Weston authored an examination of the effectiveness and fairness of traditionally designed residential demand charges, such as the one proposed by the Coop, that concluded that the rate design is ineffective, unfair, and inefficient.[93] As stated in the executive summary of the report:

> Traditional monthly demand charges have always provided a perverse incentive that does not reflect cost causation for shared system costs. Individual customer

[93] M. LeBel & F. Weston, *Demand Charges: What are They Good For?*, Regulatory Assistance Project (Nov. 2020), available at: https://www.raponline.org/wp-content/uploads/2020/11/rap-lebel-weston-sandoval-demand-charges-what-are-they-good-for-2020-november.pdf.

noncoincident peaks (NCPs) do not reflect the coincident peaks that drive *shared* generation and delivery capacity costs. The price signal that demand charges send — to lower individual customer NCP and to level a customer's load over time — is substantially different than a price signal to reduce usage at the time of coincident peaks. As a result, demand charges penalize customers for usage at times that do not impose particularly high costs and encourage them to waste effort and money shifting loads off their own maximum hour (and sometimes onto high-load system hours).

The historic exception to this rule is a customer that has a nearly 100% coincidence factor with the relevant peaks. The prototypical example of this in the mid-20th century was an industrial customer with very high load factors. Demand charges could be reasonable in the past only as applied to this specific category of customers. But, in today's electric system, even this justification for demand charges falls away. High penetrations of nondispatchable but variable renewable generation means that a 100% load factor is unlikely to be, from a system perspective, the most desirable load shape. Rather, flexible load — load that can respond to swift changes in the availability of supply, perhaps in the middle of the day for solar and late at night with wind — becomes cheaper to serve than unvarying loads in systems marked by high penetrations of variable supply.

Historically, demand charges have frequently been sized to recover most or all shared system capacity costs. Again, this may have been reasonable enough in the mid-20th century for certain customers, but it does not reflect the economics and engineering of a modern electric system. The choices that system planners make are trade-offs between different types of costs. Much "capacity" investment today aims to reduce energy costs and is not incurred to meet peak reliability needs. This means that a significant portion of investment in generation, transmission and distribution plant (and the associated operation and maintenance expense) cannot be reasonably described as demand-related or driven by peak reliability needs. Any pricing structures that reflect the marginal costs of peak system capacity should be sized properly to reflect these distinctions. That includes demand charges, if appropriate, as well as time-varying energy pricing.

A few analysts and economists have identified several narrower applications where pricing structures akin to demand charges could be appropriate and reasonably efficient: (1) site infrastructure for individual customers, (2) risks related to customer variability at peak times and (3) timer peaks. While more research into these applications might be merited, demand-based pricing would only be a second-best approximation of a more efficient but potentially more administratively complex time- and location-based pricing system.[94]

Q. What do you conclude from this assessment of residential demand charges as relates to the Coop's proposal in this case?

A. Even if the Coop had designed a better demand charge for residential members, it is unlikely that the approach would have represented a sound approach to rate design or the most efficient way to address the ostensible purpose of the rate—to encourage residential

[94] *Id.* at 4-5.

members to reduce system costs by changing the level and timing of their demand. There are better ways.

Q. How would you describe the proposed residential member demand charge?

A. The residential member demand charge proposed by the Coop management and board is a Trojan Horse rate—it is not what it appears to be and will actually have an adverse impact on the members on whom it would be imposed. It is dishonest, not fully developed, and deceptively designed to serve an entirely different purpose than appearances would suggest. It is, in effect, a way of increasing fixed charges collected from residential members.

Q. What do you recommend that the Commission do regarding the Coop's demand charge proposal?

A. The Commission should deny the proposal by the Coop to institute a residential member demand charge with prejudice. That is, if the Coop wants to develop rate structures that are effective in reducing system peak and that are fair, reasonable, and just, it should be able to do so, as long as a traditional demand charge approach is not used.

V. SUMMARY OF RECOMMENDATIONS

Q. Please summarize your recommendations to the Commission.

A. I recommend that the Commission:

- Deny SVEC's proposal to increase its fixed customer charge to $30 per member per month and instead order the Coop to incrementally reduce the charge by an amount of $5 per year until such time as the charge is set at $15 per member per month for rate A-12/A-13.
- Deny SVEC's proposal to impose demand charge on residential members.

Q. **Does this conclude your testimony?**

A. Yes.