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Low-income usage patterns counsel against approval of "Weather Normalization Adjustments"

Many public utilities today are seeking to minimize the risks they face through the adoption of various automatic adjustment clauses. Through such adjustment clauses, the utilities are allowed to change rates without subjecting those changes to a rate case proceeding. In the absence of a rate case, the new rates go into effect never having been reviewed by other stakeholders and without explicit approval by a state utility commission.

One such rate adjustment mechanism commonly sought by utilities is called a Weather Normalization Adjustment (WNA). The discussion below uses the WNA proposed by Columbia Gas of Pennsylvania (CGPA) in its 2025 rate case[1] as an illustration of how and why such proposals should be resisted.

The WNA proposed by CGPA is a ratemaking mechanism that would adjust customer bills during the winter heating season (November through May) based on deviations from what the Company defines as "normal" weather. Specifically, it applies a formula using the ratio of normal heating degree days ("HDDs") to actual HDDs, multiplied by a customer-specific heating usage factor, to generate either a credit or a surcharge on the bill. The WNA is limited to weather-related usage changes and applies to residential customers only.

[1] The Columbia Gas WNA had been operated on a "pilot" basis. CGPA's proposal was to make the WNA permanent.

Utilities seek to justify weather normalization adjustments as a mechanism to reduce revenue volatility that results from fluctuations in weather which can lower customer gas usage and thus reduce a utility's recovery of fixed costs through volumetric rates. The stated intent is to provide more predictable revenues for the utility while smoothing customer bills.

This goal, however, must be balanced with customer protections to ensure the mechanism does not systematically overcharge customers or remove all utility risk.

The Customer Impacts of CGPA's WNA.

The actual impact of the WNA on CGPA's residential customers has been consistently negative, resulting in substantial bill surcharges. The Company has filed annual WNA reports since 2014 with the Commission that summarize the total dollar amount of WNA charges and credits issued to residential customers during each heating season. One witness testifying for the state Office of Consumer Advocate (OCA) examined the over/under collections for each of the past 12 heating season since the WNA's first year covering the 2013-2014 heating season. The Columbia WNA was adopted as a "pilot" in 2014.

That review revealed that Columbia's WNA Pilot has systematically overcharged customers without providing commensurate benefits to customers, extracting approximately $74 million in additional revenues for Columbia from customers subject to the WNA in the five most recent heating seasons. During this period, the Company *never* issued a refund to consumers under the WNA despite claiming that the mechanism is symmetrical. This pattern reveals that the WNA has functioned as a one-sided charge, imposing consistent financial burdens on ratepayers while failing to deliver measurable bill stability or balance.

The OCA witness acknowledged that the WNA had produced benefits to residential customers, "but only in earlier years." According to this witness (Michael Deupree), the WNA produced net credits in four of the first seven heating seasons it was in effect, specifically 2013-2014, 2014-2015, 2017-2018, and 2018-2019. However, for each year since the 2019-2020 heating season, the WNA has consistently resulted in net surcharges to customers every year. "In total," Deupree testified, "in only four of the 12 historic heating seasons for which the WNA has been in place did customers see net credits under the mechanism." Deupree noted:

> Regulatory policy disfavors mechanisms that allow utilities to recover lost revenues or costs from customers without also exposing the utility to comparable downside risk or performance standards. The WNA, as designed and applied by the Company, operates as a one-way ratchet: it imposes surcharges but has failed to provide meaningful refunds, due to its design. This violates basic ratemaking principles of fairness and reciprocity between ratepayers and shareholders.

While the Company points to year-over-year revenue under-recovery as justification for the WNA, the facts reveal a different story. The WNA has produced recurring surcharges, yet the Company continues to experience shortfalls in overall revenue recovery. This disconnect suggests that the WNA fails to do what it is intended to do, which is to stabilize revenue.

The Particular Adverse Impacts to Low-Income Customers

A WNA mechanism such as that proposed by Columbia Gas imposes particular adverse impacts on low-income customers. According to one Columbia witness, "The goal of the WNA

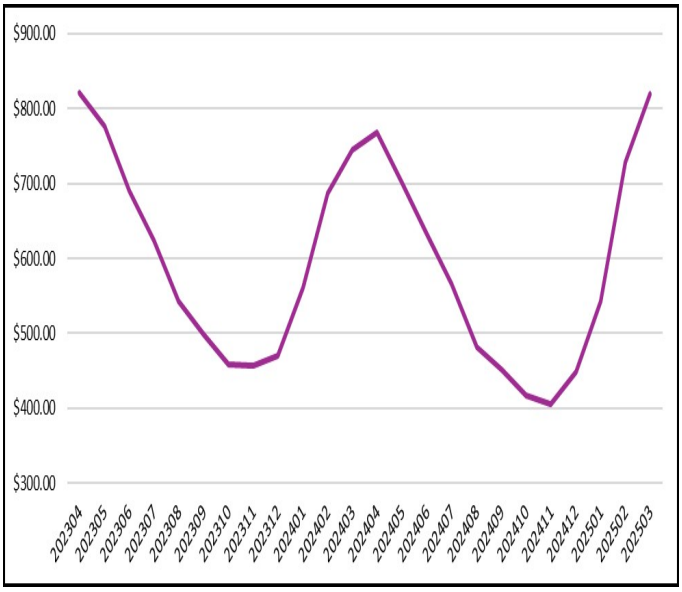
continues to be to improve predictability and stability of the customers' bills and to provide revenue stability." Yet another company witness asserted that the "goal of the WNA" is "to improve customer bill and revenue stability. . ."

Testimony by Roger Colton, filed on behalf of the OCA, found that the WNA adversely affects low-income customers in particular. That testimony continued to find that an increased use of budget billing represents a more effective way to serve the two goals expressed by Columbia's witnesses (i.e., to improve customer bill stability, to improve revenue stability).

Similar to OCA witness Deupres, Colton found that while Columbia asserts that its WNA can adjust rates either up or down in response to weather, the reality is that WNAs implemented in Pennsylvania have largely resulted in higher charges for residential consumers. For Columbia Gas, in virtually every year since the 2018 – 2019 winter heating season, the WNA has *not* produced a credit for customers. During the winter seasons 2018-2019 through 2022-2023, the WNA added $83.96 to customers' bills. During the period 2019-2020 through 2022-2023, the WNA has added $97.47 to customer bills.

Adding these additional dollars to low-income bills exacerbates an already large problem. CGPA's low-income customers already face substantial difficulties paying their unaffordable bills. The Figure below shows the dollars of arrears incurred by the Company's Confirmed Low-Income customers over the prior 24 months.

Figure 1. Average Arrears: Confirmed Low-Income (no-CAP)



The Columbia WNA proposal would increase bills even further and thus exacerbate these difficulties. In addition, to the extent that customers increase their arrears, the Company will also impose ever-increasing dollars of late payment charges to exacerbate the unaffordability even further.

The Significance of "Energy Limiting Behavior."

An additional important aspect of how Columbia's WNA disproportionately adversely affects low-income households involves an examination of what is technically referred to as "energy limiting behavior." While substantial survey research has been devoted to documenting the "heat-or-eat" aspects of this behavior, other recent research, applicable to the WNA, has been devoted to documenting the extent to which low-income households use their heating (and cooling) systems to create comfortable indoor environments. The difference in using heating and

cooling systems has been referred to as the "Energy Equity Gap."[2]

According to Huang (et al.), the Energy Equity Gap measures the extent to which "a household is unable or unwilling to consume sufficient energy to reach their desired level of comfort."[3] Some aspects of the Energy Equity Gap involve the need of low-income households to make trade-offs between their expenditures on household necessities when they lack sufficient income to pay their utility bill.

Even more applicable to the WNA, however, are those circumstances where households differ in the outdoor temperature at which households turn on cooling (and heating) units. On the cooling side, research has found that "in the high heat climates the gaps in [air conditioning] turn on points between low-income and high-income households were found to range between 4.7 and 7.5°F."[4]

The Energy Equity Gap, in other words, measures the temperature at which households start or end using heating units (heating balance point) in the heating season. The research examined the average temperature when a household turns on and turns off cooling or heating units. The research reported that:

> due to financial stress, the overall electricity consumption level of the lower-income is expected to be lower than that of the high-income groups. Furthermore, the energy limiting behavior in heating seasons can be identified in the heating slope: Low-income households are expected to consume less electricity per unit decrease in outdoor temperature (kWh/°F) than high-income households. These expected patterns regarding overall electricity consumption and heating slopes turned out to be true.[5]

The Energy Equity Gap research found that the lowest income group had the smallest absolute slope (0.99 kWh/°F) for heating, while the highest income group had the largest (1.74 kWh/°F). "The flatter slope and lower usage among low-income households," they reported, "indicate long-term energy limiting behavior across the entire. . .heating season."[6]

This "energy equity gap" research is of particular applicability to examining the impacts of a WNA on low-income households. That research found that even while the absolute slope for low-income heating usage was flatter, the gap between the outdoor temperature at which low-income households turn on their heating units, or turn off their heating, is 6°F.[7] In earlier, or colder, winter months, therefore, low-income households are denied their proportionate share of the WNA credits that would reflect their overpayment of revenue. In warmer winters, low-income households are denied their fair share of the credits which will be distributed to other customers since they can be expected to turn on

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[2] See generally, Huang, Nock, Cong, and Qiu (2023). "Inequalities across cooling and heating in households: Energy Equity gaps," Energy Policy, 182L113748 (hereafter, Energy Equity Gap).

[3] Id.

[4] Energy Equity Gap, supra, citing Cong, et al. (2022). Unveiling hidden energy poverty using the energy equity gap, Nat. Commun 13, 2456.

[5] Id.

[6] Id.

[7] Id.

their heating units earlier in the season and keep those units running until later in the season.[8]

The research above demonstrates that low-income households respond less to cold weather than do higher income households (i.e., they have a flatter absolute slope for heating, indicating "long-term energy limiting behavior"). Should winters consistently be colder-than-normal, this might indicate that low-income customers who receive WNA credits are being over-compensated. However, as discussed above, the more common occurrence is that winters are warmer than normal. Given their lack of response to outdoor temperatures, when winters are warmer than normal, low-income customers will not correspondingly adjust their indoor heating systems and will thus receive less compensation than that to which they would be entitled by their actual behavior.

In either instance, the underlying assumption of the WNA that all customers react similarly to changes in outdoor temperature has been shown to be in error.

A Better Way to Levelize Low-Income Bills.

Enrolling residential customers on budget billing would provide more transparent and consistent protections to residential customers from the volatility in home heating bills. Budget billing allows a customer to spread annual bills in equal installments over an 11-month period (with Month 12 being a reconciliation month).[9] By enrolling in budget billing, a customer will know from month-to-month what their natural gas bill will be. The bills become more predictable, and thus more payable.

Unfortunately, utilities such as Columbia Gas have adopted policies which impede rather than facilitate use of budget billing.

Columbia Gas has historically stated that its 12-month budget billing plan is available for residential customers with a zero/credit balance on their current bill due. Arrears must be paid in full prior to establishing a budget plan. However, low-income customers are likely to be in substantial arrears. Moreover, low-income households also have a substantial seasonality in their arrears. The very customers who would most benefit from budget billing, in other words, are those who would be excluded by the Company's budget billing restrictions.

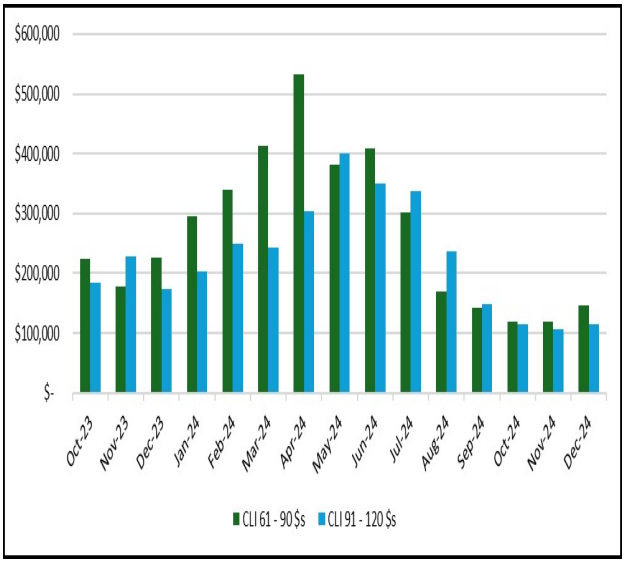
That conclusion is based on a comparison of the two Figures below. The first Figure shows the total dollars of arrears for aging bucket 61 – 90 days, and for aging bucket 91 – 120 days. This analysis selects these two aging ranges because they represent the aging buckets that might change seasonally. A shorter bucket would perhaps capture people who might miss an occasional bill, but not have a seasonal change in their payment patterns. A longer aging bucket would likely include arrears that are incurred outside of seasonal changes. The Figure documents how, for CGPA's Confirmed Low-

[8] While some believe this result to be "counter-intuitive" as being inconsistent with the concept of energy limiting behavior, others acknowledge the consistency of these results with the existence of less well-weatherized homes and less efficient heating systems.

[9] Budget bills may be re-calculated three times a year to prevent a substantial over- or under-payment by the end of the year. If the projected budget is (+ or -) $5.00, the budget will increase or decrease keeping the customer on track.

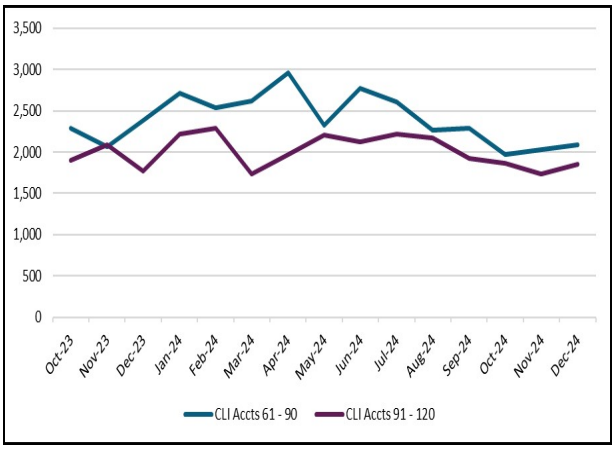
Income customers, there is a distinct change in seasonal arrears within these aging buckets.

Low-Income Dollars of Arrears by Aging of Arrears



In contrast, the second Figure shows the variability in the aging of arrears for low-income residential accounts by the number of accounts (rather than by dollars). The difference in the curve shape between the aging of accounts and the aging of dollars is evident. While there is some seasonal variability in the number of low-income accounts in arrears, the seasonal variability in the number of accounts in arrears is much flatter than the seasonal variability in the dollars of arrears. What occurs, it would appear, is that there are not substantially more customers in arrears during the cold weather months, but those who are in arrears, are further in arrears.

Low-Income Accounts by Aging of Arrears



While implementation of the Columbia Gas WNA would not address these problems, emphasizing a focus on enrolling low-income residential customers in budget billing would be much more likely to do so than the WNA.

Summary

Based on the data above, it can be seen that the Columbia Gas WNA does not increase the "stability" of natural gas heating bills to customers. Indeed, continuing the WNA will impose substantial harms on low-income customers in particular. The benefits of the WNA flow not to customers, and particularly not to low-income customers, but rather to the Company.

The existing Budget Billing program provides a more than satisfactory opportunity to customers who seek to use it. It provides greater benefits to customers without imposing the same risks. Moreover, Budget Billing has the effect of being able to address the volatility in bill payment that arises as a result of variations in cold weather monthly heating bills. The Budget Billing program would play that role in a much more efficient and effective fashion than would the WNA.

It is clear that, from the customer's perspective, the availability of budget billing accomplishes the purpose of stabilizing bills in light of volatile weather in a much more effective and efficient way than does a proposed WNA. That purpose is consistent with the Commission's regulations mandating the offer of budget billing, which according to the Commission, is "to eliminate, to the extent possible, seasonal fluctuations in public utility bills."

Persons interested in obtaining more information about assessing the issues associated with the use of a Weather Normalization Adjustment (WNA) clause can write:

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Fisher, Sheehan and Colton, Public Finance and General Economics (FSC) provides economic, financial and regulatory consulting. The areas in which *FSC* has worked include energy law and economics, fair housing, local planning and zoning, energy efficiency planning, community economic development, poverty, regulatory economics, and public welfare policy.