Consumers Energy Gas Bill Impact Analysis:

A Case Study of the Effects of Planned Capital Expenditures and Electrification Trends

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ADVANCED ENERGY UNITED™ STRATEGEN

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Executive Summary

The analysis in this report demonstrates that over the next several decades, Consumers Energy's residential customer gas rates will steadily increase due to projected utility capital expenditures and electrification trends. **The total potential bill increases that Consumers' residential customers may experience, due to capital expenditures and electrification, trends up to approximately 49% by 2030.**[1]

This rate increase can be understood in two parts:

1. Because of exorbitant capital expenditures that total around $1 billion annually through 2030, **residential customers will shoulder an approximate 29% increase in their gas bill from 2023 through 2030, and a roughly 43% increase through 2033.**

2. Given the proliferation of emissions reductions policies, increasingly volatile natural gas prices, and the cost-effectiveness of electric heating appliances, **customer attrition and reductions in consumption due to electrification and energy efficiency could lead to an additional 15% increase in residential bills between 2023 and 2030.**

Translated into real dollars, the average monthly residential customer bill was approximately $75 in 2021 and is expected to increase to around $114 by 2030 based on the status quo – the Company's existing capital investment plans – alone. In reality, electrification and energy efficiency pose threats to gas utilities operating under traditional cost of service regulation as both can erode demand for the utility's gas. After accounting for those factors, it is possible that monthly customer gas bills could increase to $131 per month in 2030, a nearly 75% increase over the average 2021 bill.

In light of these trends, to safeguard the public interest and protect vulnerable customers from being unduly burdened by an overbuilt gas system, public policy must evolve to adequately scrutinize new capital investments in the gas distribution system.

[1] In the 9-year span from 2021 to 2030, residential customer rates may increase by more than 51%. The analysis uses conservative assumptions – discussed in greater detail below - and therefore, applied impacts may result in greater rate increases than presented in this report.

Context

Consumers Energy, a subsidiary of CMS Energy, is an electric and natural gas utility providing service to 1.8 million gas and 1.9 million electric customers.[2,3] In December 2020, Consumers Energy released its 10-year Natural Gas Delivery Plan (NGDP),[4] which identifies the capital investments the Company intends to make in its natural gas distribution system through 2030. The NGDP identifies $11 billion in capital investments additions to the rate base from 2020 – 2030,[5] despite the rate base totaling only $6.8 billion in 2020.[6] This means that the value of Consumers Energy's infrastructure, called the "rate base," will nearly double between 2021 and 2030 despite the Company projecting almost no customer growth. In other words, although the size of the gas system will remain relatively unchanged, the cost of the system – borne by customers - will nearly double.

To pay for this ambitious investment plan, the Company is forecasting annual rate increases of 4-5% through 2025 and 5-6% each year from 2026 through 2030.[7] The Company writes in its NGDP that "the time to invest in the gas system is now" because the Company is forecasting low natural gas prices through 2040.[8] Consumers Energy's plan for controlling customer bill impacts is premised on an extremely risky forecast that gas prices would remain historically low. Recent gas price increases and volatility, as seen in Figure 2, have demonstrated that such assumptions no longer apply to the current market.

[2] https://www.consumersenergy.com/company/natural-gas-operations/natural-gas-operations-statistics
[3] https://www.consumersenergy.com/company/electric-generation/electric-operations-statistics
[4] https://advancedenergyunited.org/hubfs/2023%20-%20Misc/Consumers%20Energy%20Natural%20Gas%20Delivery%20Plan.pdf
[5] https://www.prnewswire.com/news-releases/consumers-energy-announces-major-new-investment-in-natural-gas-system-improves-reliability-for-customers-301582622.html
[6] U-21148, Direct Testimony of Heather L. Rayl, at 9.
[7] Page 23.
[8] Page 120.

Figure 1: Modeled Impact of Consumers' Capital Investments on Residential Customer Bills and Rate Base

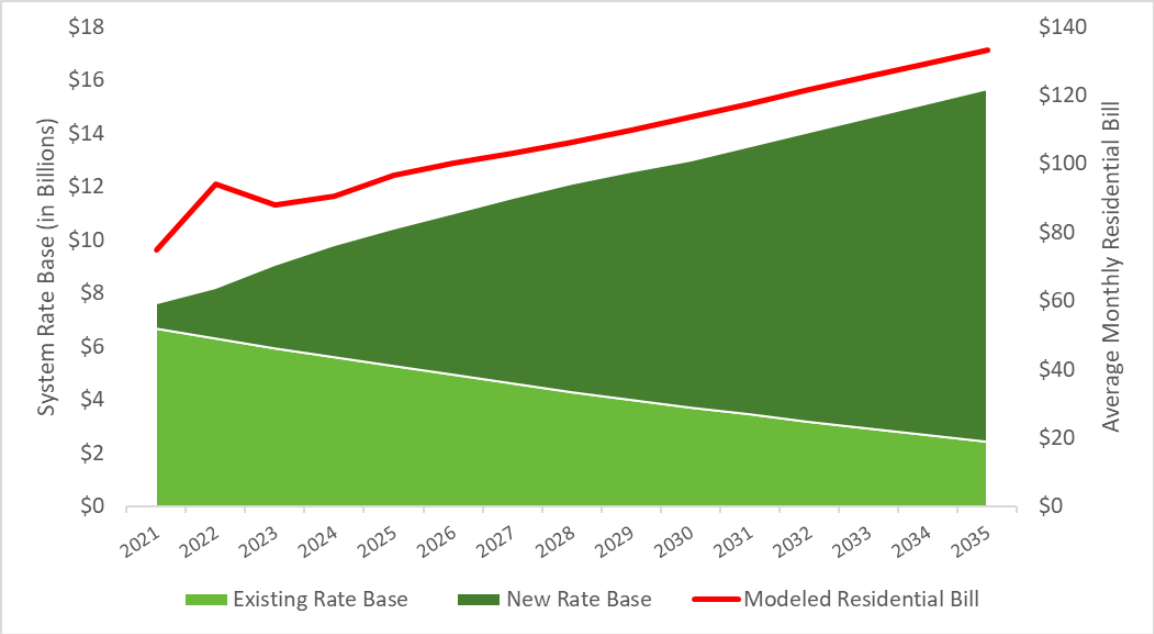
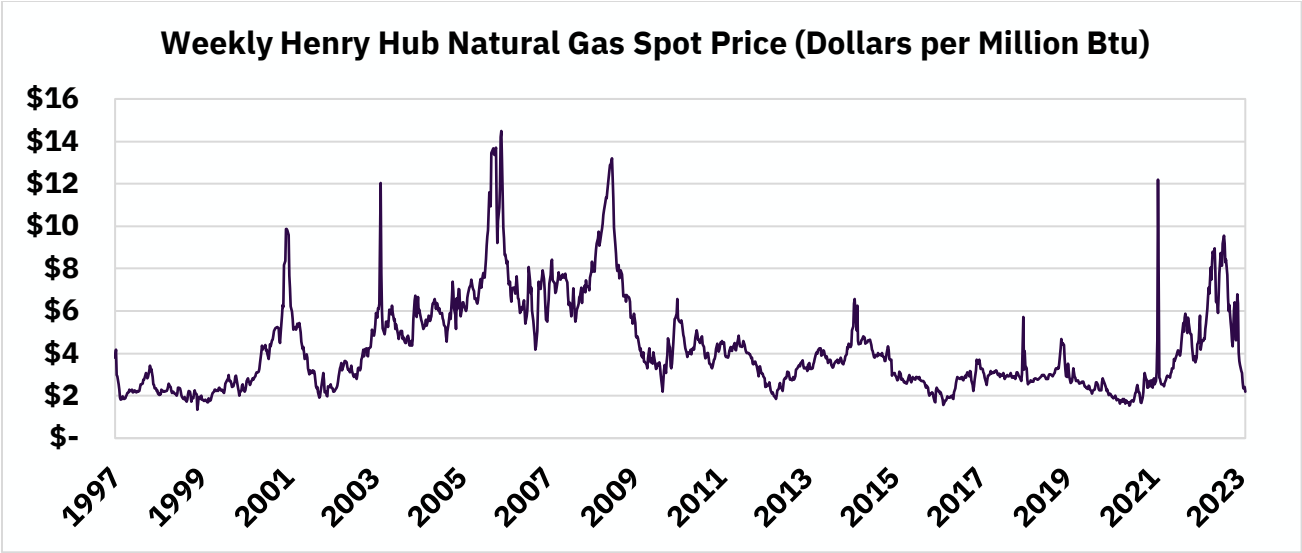


Figure 2: Henry Hub Gas Prices 1997-2022



Consumers Energy's capital spending on new infrastructure will put significant upward pressure on rates, but the Company's aggressive capital investment plan and customer growth assumptions are especially risky due to the rise of electrification. Electric air and water heating appliances are increasingly cost competitive, or in many cases cheaper, than traditional fossil

fuel heating appliances.[9] In 2022, heat pump sales exceeded that of fossil fuel furnaces in the United States,[10] and the pace of building electrification is expected to accelerate as the incentives for energy efficient electric appliances through the Inflation Reduction Act begin later in 2023.

Given the proliferation of emissions reductions policies, increasingly volatile natural gas prices, and the cost-effectiveness of electric heating appliances, it is reasonable to assume that customers will continue to convert from natural gas to all-electric assets. As gas customers convert to electric assets and new construction trends toward all electric appliances – even in cold climates[11] –, a smaller proportion of remaining customers will be responsible for a rapidly expanding gas system carrying less gas.

Utility Businesses and Regulator Models Need to Evolve to Address Industry Trends to Avoid Significant Negative Ratepayer Impacts

Utility Businesses Are Incentivized to Spend on Capital Projects

Traditional utility financial incentives do not always align with optimal customer outcomes or policy objectives. Operating as a natural monopoly, investor-owned utilities (IOUs) are profit-motivated enterprises subject to regulatory oversight. The total revenue utilities seek to collect through variable and fixed charges to sustain their business is called the "revenue requirement." There are several components of the revenue requirement: operational expenses, depreciation, taxes, and rate of return. Operational expenses, such as direct fuel costs, labor costs, and infrastructure maintenance, as well as depreciation costs, are passed through to customers at cost. IOUs earn a rate of return, approved by the regulatory commission, on capital investments, typically called the "rate base."

[9] Determined though a comparison of similar models (i.e. heating capacity and tank size for water heater) on homedepot.com. HVAC heat pumps should be compared to gas furnaces and AC units.
[10] https://www.canarymedia.com/articles/heat-pumps/chart-americans-bought-more-heat-pumps-than-gas-furnaces-last-year
[11] https://www.mainepublic.org/climate/2023-02-13/maines-cold-snap-didnt-knock-out-heat-pumps-but-can-they-withstand-fossil-fuel-industry-pressure

Figure 3: Revenue Requirement Formula[12]

REVENUE FORMULA FOR "COST-OF-SERVICE" REGULATED UTILITIES

$$RR = r(C) + D + OE + T, \textit{ where}$$

RR	=	the annual "revenue requirement"
r	=	the regulator-authorized rate of return
C	=	"rate base," the total amount of undepreciated capital investment made by the utility
D	=	depreciation, or the return of the utility's capital investment
OE	=	operating expenses, such as labor, fuel, etc.
T	=	taxes, including all income taxes the utility will pay on its share holders' return

Traditional cost-of-service regulation allows utilities the opportunity to earn a profit, and thus generate shareholder returns, on the physical (capital) assets that the utility owns. In the case of a gas utility, the most common capital assets are distribution pipelines. Under the incentive structure inherent in traditional cost-of-service regulation, IOUs are incentivized to invest in capital projects to maximize earnings, benefiting shareholders. Such an incentive structure can influence utilities towards capital investment solutions over other potential options, leading to investments in projects that may not be efficient or in the best interests of customers. This aspect of the regulatory framework is referred to as a the Averch-Jonhson Effect or capital bias.[13] In the context of gas IOUs, capital bias can result in over-investment, such as an unnecessary magnitude or emphasis on pipeline replacement and system expansion.

The inherent bias for capital investments has generally resulted in the underutilization of demand-side solutions like energy efficiency and demand response as these types of resources do not typically earn an equivalent rate of return to capital assets. Yet, gas system studies suggest energy efficiency investments are highly cost-effective for customers and utilities.[14] The misalignment in priorities can result in adverse impacts for ratepayers, such as unnecessarily high bill increases.

[12] Julia Pyper, "Why There's No Such Thing As a Free Market for Electricity." Green Tech Media. May 23, 2017. https://www.greentechmedia.com/articles/read/why-theres-no-such-thing-as-a-free-market-for-electricity

[13] Averch, Harvey, and Johnson, Leland R., "Behavior of the Firm under Regulatory Constraint," *American Economic Review*, December 1962, 52, 1059– 69.

[14] Steve Schiller, et al. "Cost of saving natural gas through efficiency programs funded by utility customers: 2012-2017." Lawrence Berkeley National Laboratory. May 2020. https://eta-publications.lbl.gov/sites/default/files/cose_natural_gas_final_report_20200513.pdf

Traditional Utility Business Models Must Adapt to the Energy Transition

Traditional cost-of-service regulation is increasingly misaligned with delivering the outcomes needed to meet modern energy challenges. Gas utilities, including Consumers Energy, must prepare for customer attrition and emissions reductions through short- and long-term planning. Utilities should be looking for least-cost, lowest risk opportunities to reduce pressure on the rate base, such as energy efficiency. Yet, traditional regulatory models do not typically reward gas utilities to the same extent for investments in energy efficiency, conservation, and electrification when compared to capital investments.

Regulatory rules frequently match the recovery of an asset most accurately to its lifespan, such that customers who benefit from the infrastructure pay for it. This concept is called **intergenerational equity**. It would not be fair for one generation of customers to entirely pay for a system that is expected to be used by subsequent generations. Infrastructure investments are durable and therefore, utilities recover the costs of new capital over several decades. For example, Consumers Energy recovers the cost of plastic distribution main pipelines over 50 years, beginning after the project recovery costs are approved by regulators and the assets are in service.

Given the energy transition, however, the traditional approach to gas utility regulation may no longer be sustainable. It is likely that methane gas delivery will decline due to gas customer exits, driven, in large part, by cost-effective electrification and public policies requiring emissions reductions. Under traditional depreciation schedules, most capital investments placed in service today will not be fully paid off until 2070 or beyond. Current rate design practices recover the costs associated with utility investments through volumetric sales. If gas throughput and the number of customers decline, a smaller set of gas customers would be shouldering the burden of a rising revenue requirement, leading to bill increases. Furthermore, it is also possible that certain assets built today will not be well-utilized in the future. Such investments are typically called **stranded assets**. Ultimately, customers that remain on the gas system, who are disproportionately likely to be low income or renters, would bear the burden of paying for stranded assets.

Consumers Energy's Delivery Plan suggests that the utility is not accounting for the challenges that the energy transition imposes on gas systems and their customers. The utility is operating as if the status quo will continue in perpetuity and seeks to continue a material system buildout, an approach consistent with an underlying capital investment preference. Furthermore, the Delivery Plan suggests that the utility is seeking to maximize shareholder returns at the potential expense of customers' bill stability. Without sufficient regulatory oversight, Consumers Energy customers face rising bills and exacerbating energy burdens.

Utilities that continue to plan capital projects in a business-as-usual fashion risk significantly overburdening customers with high rates. Public Utility Commissions must critically analyze the necessity and prudency of capital-intensive pipeline replacements and expansions and consider least-cost alternative methods of maintaining safe and reliable gas service.

The Benefit of Infrastructure Investments vs Alternatives Remains Unquantified

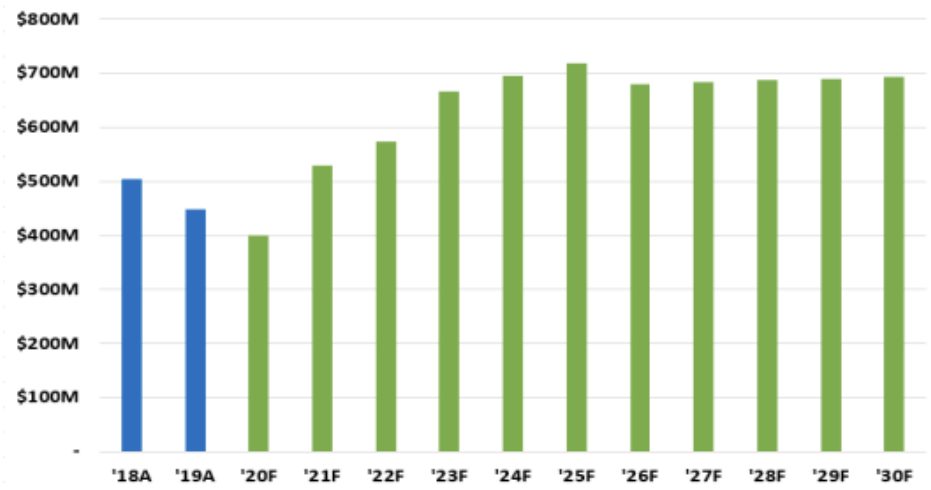
Consumers Energy's Delivery Plan forecasts distribution expenditures of approximately $700 million every year from 2023 to 2030, in addition to smaller investments in transmission, storage, and compression that total approximately $400 million each year. It is unclear whether these investments are necessary for maintenance or projected growth. To fully capture the benefits of distribution system investments, and to spread out their cost recovery over their useful life, new assets should be in service for decades. In Michigan, 2023 investments already extend beyond milestones for policy goals such as a 52% reduction in 2005 Greenhouse Gas (GHG) emission levels by 2030 and carbon neutrality in 2050.[15]

There is a likely mismatch between the cost recovery, service life, and customer benefits associated with new assets. If the evolving energy landscape encourages rapid electrification and decarbonization, gas customer attrition should be expected, resulting in a dwindling customer base paying for rising fixed costs. This scenario could result in stranded distribution assets that are either underutilized or decommissioned. Yet, leading up to this, Consumers Energy's customers will have endured annual rate increases for years to pay for the exorbitant distribution capital investments.

To elaborate, customers are becoming increasingly interested in the source of their energy, and are making informed decisions about how, when, and what energy resources they should use to best fit their lifestyle. Customers are electrifying their buildings, which eliminates or reduces natural gas as a fuel source, adopting alternative technologies like heat pumps, and installing energy efficient technologies and appliances.[16] This transition will likely reduce - not increase, as assumed by the utility - the number of Consumers' customers, shrinking the population of remaining customers that pay their gas bills. As a result, the declining number of gas customers must pay increasing rates to cover the costs of the Companies' approved capital investments and satisfy the Companies' approved revenue requirement.

[15] "MI Healthy Climate Plan." Michigan Department of Environment, Great Lakes, and Energy. April 2022.
[16] Jeff Deason, et al. "Electrification of buildings and industry in the United States." Lawrence Berkeley National Laboratory. Page 11. https://eta-publications.lbl.gov/sites/default/files/electrification_of_buildings_and_industry_final_0.pdf

Figure 4: Consumers Energy's Distribution Investment Plan (2021-2030)[17]



Michigan Residents are Already Suffering from High Energy Costs

The residential sector in Michigan is heavily dependent on natural gas, with more than three-fourths of Michigan households using natural gas as their primary source for home heating.[18, 19, 20] According to the US Census Bureau, 27% of Michigan residents are living under 200% of the Federal Poverty level.[21] This indicates that over a quarter of residents in the state of Michigan are struggling to make day to day ends meet. In cases of extreme poverty in Michigan, residents face extremely high energy burdens. Recent research has found that Michigan households below 50% of the Federal Poverty Level are paying 34% of their annual income for their home energy bills, way above the nationally recognized 6% target threshold.[22] In fact, all customers living under the 200% poverty level threshold face energy burdens that are higher than the 6% target threshold for affordability, as shown in Table 1.[23] Often, customers that are

[17] Consumers Energy, "Natural Gas Deliver Plan." December 11, 2020. Page 93.
[18] The data reports on the entire state of Michigan, not just Consumers' service territory.
[19] U.S. Census Bureau, House Heating Fuel, Table B25040, 2020 ACS 5-Year Estimates Detailed Tables, Michigan.
[20] U.S. EIA, Natural Gas Consumption by End Use, Michigan, Annual, 2015-20.
[21] https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pov/pov-11.html#150175
[22] Fisher, Sheehan & Colton, Home Energy Affordability Gap Data, 2021. http://www.homeenergyaffordabilitygap.com/03a_affordabilityData.html
[23] The data presented in Table 1 reporting poverty levels and the paragraph above is for the entire state of Michigan, not just Consumers' service territory.

living in poverty are forced to make decisions on whether to keep the lights and heat on or to buy food or medicine.[24]

Table 1: Home Energy Burden by Poverty Level Category

Poverty Level	Home Energy Burden
Below 50%	34%
50 – 100%	18%
100 – 125%	12%
125 – 150%	10%
150 – 185%	8%
185% - 200%	7%

If Consumers Energy's planned natural gas distribution capital investments are approved by the Michigan Public Service Commission, the significant bill impacts resulting from the new capital investments will negatively impact the financial conditions of at least the 27% of customers living in poverty, ultimately harming their quality of life. Additionally, because of the financial constraints that these customers experience, the majority have few or no resources to modify consumption patterns with options like fuel switching, electrification, or energy conservation investments.

Unless Consumers Energy's residential customers can afford to invest in and adopt alternative technologies or fuel types for heating, they will be forced to pay significantly higher bills due to the planned capital investments. The rate hikes resulting from the roughly $11 billion in capital costs through 2030 in Consumers Energy's Delivery Plan will adversely affect its 1.8 million Michigan households.[25] The financial burden for nearly all of Consumers Energy's residential

[24] Chip Berry, et al. "One in three U.S. households faces a challenge in meeting energy needs." U.S. Energy Information Administration. *Today In Energy*. September 19, 2018. https://www.eia.gov/todayinenergy/detail.php?id=37072

[25] https://www.consumersenergy.com/company/what-we-do#:~:text=We%20work%20for%20you.,customers%20in%20Michigan's%20Lower%20Peninsula.

customers could become prevalent and significant enough to require corrective policy intervention to prevent or mitigate these exorbitant gas utility capital investments.

Modeling Bill Impacts of Consumers Energy's Delivery Plan

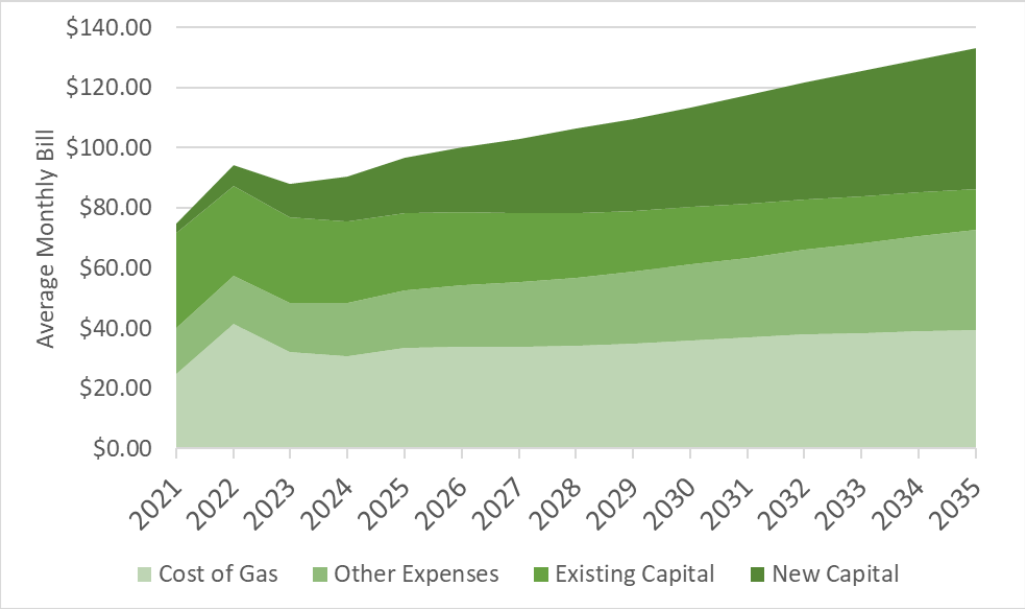
To determine the customer bill impact of Consumers Energy's Delivery Plan, we developed a model that accounts for utility costs, including capital investments, costs of gas, and operations and maintenance (O&M) costs. Despite a conservative approach to modeling,[26] the significant planned capital expenditures, if approved, are expected to increase customer rates substantially over the next decade. The model projects a 0.5% annual residential customer count increase and a 0.63% annual decrease in residential gas throughput per customer, in line with Consumers Energy's estimates in its current rate case.[27]

Our results show that residential customers can expect a 29% increase in rates between 2023 and 2030 and 52% increase in rates between 2021 and 2030. Other than a fuel price spike in 2022, most cost increases are due to new capital investments, as shown in Figure 5. Our model demonstrates that residential bills will continue to rise steadily through 2035 and beyond. Future gas price volatility and upward gas price pressures would exacerbate these modeled trends.

Because of the traditional cost-of-service utility business model structure, Consumers Energy has little incentive to reduce capital costs. Currently, the utility is authorized to earn a 9.70% return on equity, and achieving that return requires the Company's planned investments to be incorporated into the rate base (Consumers Energy proposed a return on equity increase to 10.25% in its current rate case). Consumers Energy's Delivery Plan provides the utility with an immense opportunity to earn a profit by incorporating those capital costs into the approved revenue requirement, then applying customer rate increases for decades. These rising bills will pose significant challenges for Michigan residents already overburdened by high energy costs.

[26] The model does not capitalize software costs and underestimates the depreciation and salvage cost of existing investments due to lack of precise asset data. New general plan investments are not included in this model since Consumers Energy does not provide projections. As of year-end 2021, Consumers Energy had roughly $140 million in undepreciated general plant investments.
[27] U-21308-0013. Schedules E.

Figure 5: Projection of Average Monthly Residential Bills[28]



Residential Customers Will Bear the Brunt of Rate Impacts

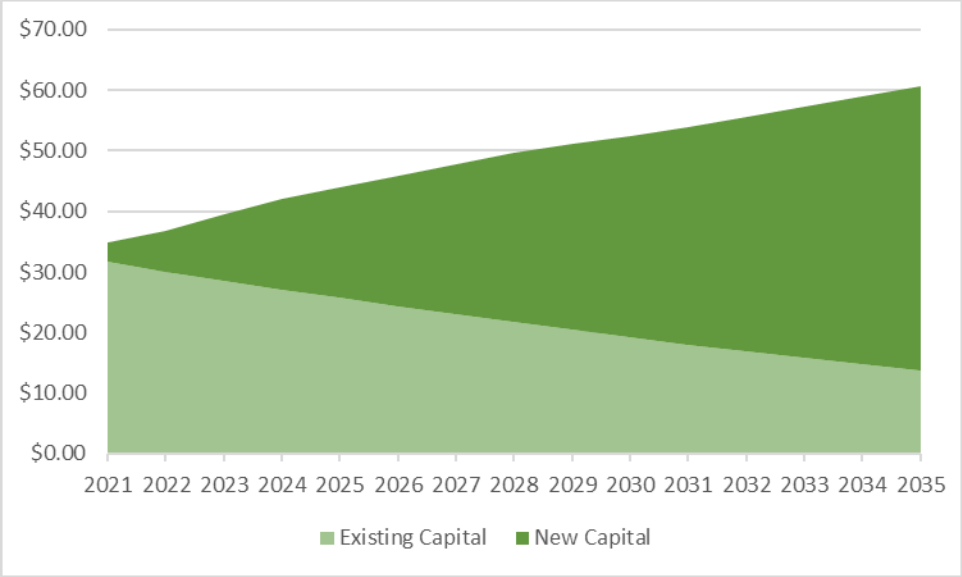
The analysis confirms that Consumers Energy's investments will have a significant bill impact for residential customers. Residential customers are typically more impacted by utility capital investments; they pay higher rates for gas service, in part because their loads are more variable than commercial and industrial loads. Furthermore, the relative allocation of distribution investments to each customer class (i.e., residential, small, medium, large commercial, and industrial) is heavily slanted towards residential.[29] Thus, distribution capital projects more substantially impact residential customers.

As shown in Figure 6, by 2030, residential customer monthly bills tied to capital investments will have increased by nearly $20 per month. In 2035, residential rates associated with capital investments will be over $25 more per month than in 2021 and continuing to climb. Over this period, distribution system investments account for about 65% of total capital increases for residential customers. Projecting Consumers Energy's expansion through 2035 results in a revenue requirement of nearly $2 billion, up from roughly $800 million prior to the new capital investments beginning in 2020. If Consumers Energy's capital investment continues as

[28] This represents the average monthly residential customer bill. Actual monthly bills depend on gas consumption and customer charges. Monthly gas bills are typically low during the warm summer months and high during the cold winter months.
[29] U-21308-0013, Schedule F1.

planned, residential customers will soon face hundreds of dollars in additional gas service costs annually.

Figure 6: Average Residential Monthly Bill Tied to Capital Investments



Volatility in Fuel Prices Could Compound Issues

Natural gas fuel costs contribute significantly to customers' overall energy costs and are subject to sudden spikes that further threaten to raise customer bills. The utility does not earn a return on the cost of the natural gas commodity – those costs are a direct pass through to the customer on their bill. However, this is not to imply price stability. Natural gas commodity costs are subject to extreme price volatility. Consumers Energy is somewhat more insulated from this volatility than most gas utilities due to its unusually large natural gas storage capacity, which provides a buffer between the prevailing market prices and the average pricing of stored retail natural gas. However, it does not protect customers from price volatility. For example, the cost of gas Consumers Energy charged customers was $7.43 Mcf in October 2022, 110% greater than six months later.[30]

Consumers Energy's rationale for doubling the size of its rate base relies on its prediction of low fuel costs for the next decade – a curious assumption and risky proposition.[31] In the 2020 Natural Gas Delivery Plan, Consumers Energy argues that it must take advantage of a period of low gas prices to invest in its infrastructure. The Company states that expected residential bills

[30] https://www.consumersenergy.com/residential/rates/gas-rates/gas-charges-explained

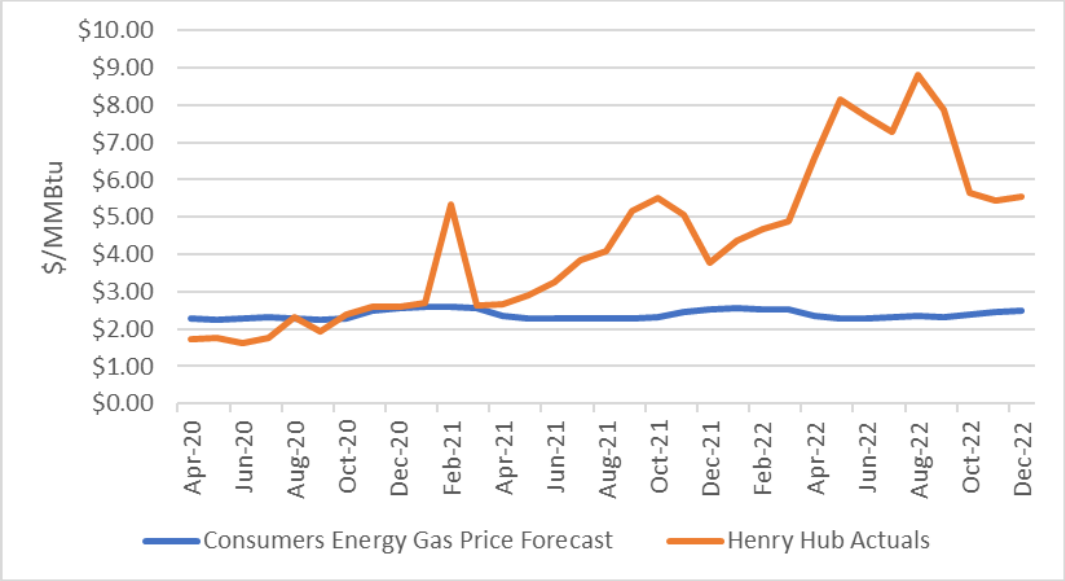
[31] In their long-term plan (page 30), the Consumers Energy base scenario assumes gas prices do not rise above roughly $3.2/MMBtu through 2035 in nominal dollars.

in 2030 will still be less than they were in 2008. Our analysis suggests otherwise; 2030 bills may exceed 2008 bills.

Additionally, Consumers' Energy fails to account for the risk that this strategy poses to ratepayers. Customers, not the utility, pay for the cost of natural gas, and the company has little control over the future price of natural gas. In recent years, domestic natural gas prices have been increasingly suspectable to global market conditions because of liquified natural gas (LNG) export to Europe and elsewhere. **If gas prices were to return to 2008 levels,[32] the average residential bill in 2030 would increase by an additional 26% to $143 per month.**

Unfortunately, early evidence shows that the Company's gas price forecast has significantly differed from actual prices. Published at the end of 2020, the NGDP's base case natural gas price forecast estimates that natural gas prices would stay below $2.50/MMBtu until 2024, increase to between $2.50 and $3/MMBtu from 2025 until 2027, and level off at approximately $3.25/MMBtu from 2030 through 2040.[33] In Figure 7, we compare the Company's gas price forecast to actual prices through the end of 2022. Actual prices in 2021 and 2022 have been, on average, more than double Consumers' forecast during that time frame.

Figure 7: Consumers Gas Price Forecast Compared to Actual Prices



[32] Data sourced from average Henry Hub spot prices in 2008, see: https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm

[33] Figure 9 and https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000008vN6uAAE p. 221-225.

Fewer than two years after Consumers' Delivery Plan, gas prices significantly deviated from the utility's forecast; Con Citygate prices averaged under $2/mmbtu in 2020 then rose to an average of over $5/mmbtu in 2022. Price reached a peak of $8.3/mmbtu in 2022, causing rate shocks. Consumers' Energy did not expect this volatility, in fact, it projected almost no price increases for the entire decade.

It is impossible to predict the future price of natural gas. However, Consumers Energy's justification for the timing of its massive capital investment is predicated on its assumption that historically low natural gas prices, a factor outside its control, will continue through 2030. As we have witnessed thus far, the Company's prediction has been wrong, to the detriment of customers. Consumers Energy's customers, not the Company, ultimately bear the risk and impact of the Company's bet. Tailoring an investment strategy around the expectation that gas prices remain low shifts all the risk onto customers. If gas prices spike, customers have few to no options, in the near term, to avoid significant bill increases. And as previously discussed, low-income households face a greater relative share of this burden.

Consumers Energy's 2023 rate case demonstrates how quickly assumptions can change. Published in December 2022, the costs of gas in their 2024 revenue forecast assumes continued high prices.[34] This assumption exceeds Consumers Energy's projections in 2020 and the Henry Hub data used as a basis for the model. To demonstrate the inherent volatility in fuel prices, we modeled the impact of Consumers Energy's December 2022 cost of gas estimates, adding a 2% annual increase and keeping all other values constant.

[34] U-21308-0013, Schedule F-1.

Figure 8: Average Monthly Residential Bill Using Consumers Energy 2024 Test Year Gas Cost

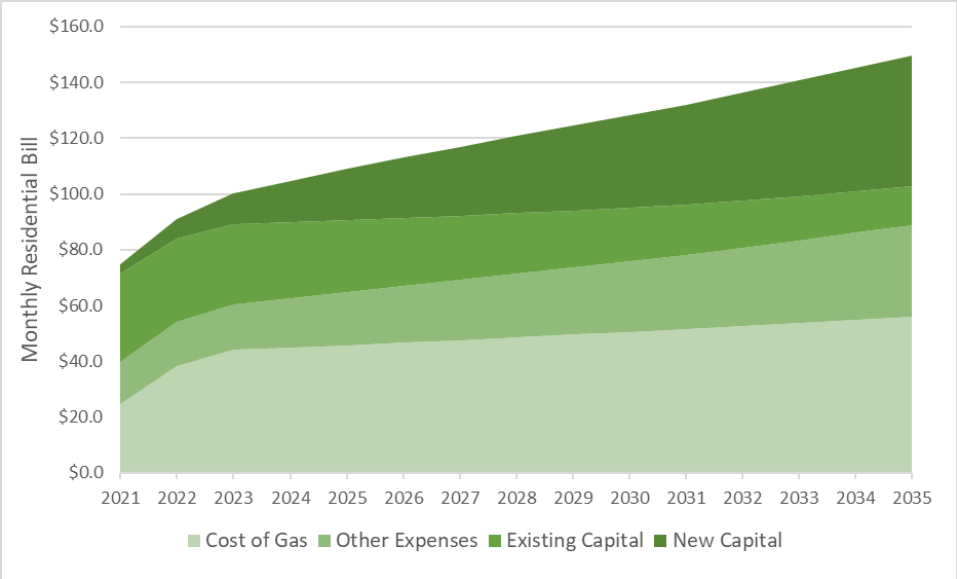


Figure 8 shows that this more current assumption would cause residential customer bills to increase from $75 per month in 2021 to $128 in 2030. If gas prices were to follow this trajectory, bill impacts could result in pernicious impacts for low-income and vulnerable populations.

Furthermore, the analysis assumes that economic and policy conditions remain the same. Yet, electrification and energy efficiency have the potential to further disrupt the utility's forecasts, which in turn could raise gas bills. The Company's forecast fails to recognize that customers are starting to adopt electric heating alternatives, and that the pace of building electrification could cause a rapid increase in its rates. The Company's analysis also assumes that it will continue to add new customers to its system who will help pay for the utility's investments. Consumers Energy recovers fixed system costs from all ratepayers, so if the number of customers on the system remains flat or decreases while capital expenditures increase, remaining customers will pay a higher share of fixed costs. Similarly, if customers electrify some of their gas appliances or invest in energy efficiency, energy demand will drop, forcing Consumers Energy to recover costs by increasing rates. In both cases, low-income customers will face the greatest burdens since they are the least able to electrify or invest in energy efficiency.

Finally, the Company justifies the cost increases by pointing to high gas bills in 2008.[35] This is highly misleading, as gas prices were at their zenith in 2008, as depicted earlier in Figure 2.

Consumers Energy defends the Delivery Plan by saying that 2030 rates will be slightly cheaper than the Company's highest rates. As the model demonstrates, forecasted residential customer bills will eclipse 2008 bills before 2030 *without accounting for economic disruptions and commodity volatility*. If gas prices were to return to 2008 heights, 2030 residential customer bills could jump another 26% and exceed $143 per month.[36]

Electrification Is Likely to Have a Profound Impact of the Gas Industry

To model the impacts of electrification, this study focused on analyzing changes in the number of customers and throughput per customer. Customer attrition is a concern, especially as customers balk at high bills and make lifestyle changes to address their emissions. The electrification of building heating sources is increasingly economically viable. Studies show that all-electric new buildings can already be more cost effective.[37] Residential energy efficiency retrofits, supported by funding from the Inflation Reduction Act (IRA), are likely to accelerate over the next decade. Policy and economic conditions will enable potentially significant decreases in customer counts[38] and throughput per customer. Further analysis that examines the attrition of gas customers due to the conversion to all-electric and grid integrated buildings is warranted, considering state goals for carbon neutrality.

This analysis shows that electrification will further increase residential gas rates and Table 2 displays the result of the sensitivity analysis. The base scenario, which models Consumers Energy's published forecasts, assumes an annual 0.5% increase in customer counts and a 0.63% decrease in gas use per customer. Electrification and energy efficiency will reduce customer counts and decrease use per customer further than what the utility predicts. Thus, our analysis models scenarios in which throughput per customer and customer counts decrease more significantly.

Table 2 shows that a modest 0.5% annual decrease in customer counts and 1.5% annual decrease in throughput per customer will increase 2030 residential bills, on average, by another 4% annually.

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[35] Natural Gas Delivery Plan, Page 23.
[36] Data sourced from average Henry Hub spot prices in 2008, see: https://www.eia.gov/dnav/ng/hist/rngwhhdm.htm
[37] McKenna, Claire, et al. "All-Electric New Homes: A Win for the Climate and the Economy." Rocky Mountain Institute. October 15, 2020. https://rmi.org/all-electric-new-homes-a-win-for-the-climate-and-the-economy/
[38] Customer counts refer to the number of active meters on the utility system.

The 4% annual increase is in addition to the 29% bill increase between 2023 and 2030. However, if policies such as the Inflation Reduction Act spur rapid electrification, a scenario in which a 2.5% annual customer count decrease and a 3% annual throughput per customer decrease becomes more likely. In that scenario, 2030 customer bills will be 15% greater than in the base scenario and 49% greater than residential bills in 2023.

Table 2: 2030 Residential Monthly Bill Sensitivity Analysis

		Change in Annual Throughput per Customer		
		-0.63%	-1.5%	-3.0%
Change in Annual Customer Count	0.5%	$114	$111	$106
	-0.5%	$121	$118	$114
	-2.5%	$138	$135	$131

Bill Impacts Could Become Increasingly Inequitable Without Intervention

Energy efficiency and conservation are cost-effective measures to reduce customer bills and emissions. A National Laboratory study found that the reduction in gas use from energy efficiency investments resulted in greater residential customer savings.[39] Similarly, Table 2, which displays three columns with incremental throughput decreases, demonstrates that a reduction in gas usage per customer leads to lower bills. With a 0.5% change in customer counts, average bills would become cheaper if throughput per customer were to decrease from -0.63% to -1.5% and also if throughput per customer were to decrease from -1.5% to -3.0%. Efficiency programs are underutilized mechanisms that provide recipients with affordable bills and should be supported.

However, the cost recovery of capital investments and utility expenses is a zero-sum proposition. The utility must recover capital costs from all its customers, and the less one customer contributes to the utility's capital cost recovery the more others must contribute. Table 3 illustrates the zero-sum element of the revenue requirement. In Example 1, ten customers use natural gas each at 7 Mcf/month and pay an average monthly bill of $104. Example 2 splits these ten customers into two groups: two customers invest in efficiency measures in Group 1 and the eight customers in Group 2 make no investments. Group 1 customers experience a $61/month decrease in gas bills as a result of their energy efficiency

[39] Steve Schiller, et al. "Cost of saving natural gas through efficiency programs funded by utility customers: 2012-2017." Lawrence Berkeley National Laboratory. May 2020. https://eta-publications.lbl.gov/sites/default/files/cose_natural_gas_final_report_20200513.pdf

investments, while Group 2 customers experience a $9 increase in monthly bills, despite not changing their consumption patterns. As fixed system costs increase, the bill differences between the two groups will magnify.

Table 3: Impacts of Energy Efficiency and Electrification on Customer Bills[40]

Example 1	Customer Group
Customer group count	10
Monthly gas use (mcf)	7
Monthly Bill	$104

Example 2	Group 1	Group 2
Customer group count	2	8
Monthly gas use (mcf)	2	7
Monthly Bill	$43	$113

The disparity between Groups 1 and 2 highlights the importance of equitable energy efficiency and conservation programs. Appliance retrofits and home insulation require significant up-front capital, even with existing incentives. High-income households are better able to afford these upgrades and are thus much more likely to represent Group 1 customers in Example 2 above. Group 2 is far more likely to consist of low-income and historically disadvantaged populations that are already burdened by energy costs. For energy efficiency and conservation to be equitable, low-income, and historically disadvantaged populations must be provided access to resources and must share in the benefits. Without support, vulnerable populations will face increased burdens from Consumers' significant, and mounting, system fixed costs.

Conclusion

Consumers Energy's Natural Gas Delivery Plan does not align with optimal customer outcomes or policy objectives. While infrastructure replacements are undoubtedly necessary to maintain safe and reliable service, doubling the Company's rate base over the next decade is unjustifiable. If Consumers Energy invests according to its Delivery Plan, customers will experience significant rate hikes.

[40] This is an illustrative table that models 2030 revenue requirement and gas prices. This analysis includes a $15.60 customer charge, consistent with data from Consumers Energy's current rate case (U-21308, Schedule F-2.1).

The average monthly residential customer bill was approximately $75 in 2021 and is expected to increase to around $114 by 2030. This increase assumes that the status quo will continue when, in reality, electrification and energy efficiency pose threats to gas utilities operating under traditional cost of service regulation. After accounting for those factors, it is possible that monthly customer gas bills could increase to $131 per month in 2030, a nearly 75% increase over the average 2021 bill.

Volatile natural gas prices and inequitable distribution of electrification and efficiency funding could further burden low-income and vulnerable populations. Customers ultimately bear the costs and risks of Consumers Energy's profit-motivated Delivery Plan. If the utility does not equitably account for the energy transition, public policy must intervene to protect customers from harmful outcomes.

The legislature should mandate public policy that requires utility regulators to implement a transparent stakeholder process that examines each of the assumptions and inputs used in its Delivery Plan forecast *before* publication. Policy mandates should require a submission to the Commission, as described above, to shed light on Consumers' motivation for profit and return on capital investments and allow for modifications based on the input of stakeholders. Furthermore, the legislature could require that the Public Utility Commission initiate an investigatory proceeding into the changing market conditions related to the delivery and use of natural gas, along with cost recovery mechanisms for large capital expenditures that could mitigate adverse customer impacts. This includes developing a special process for reviewing proposed projects before and after completion to determine the best mechanism for cost recovery on prudent investments that ultimately protect the interest of gas utility ratepayers.

Appendix

This Appendix details the data sources and assumptions that informed this analysis. Consumers Energy recovers prudent capital investment costs through depreciation expenses and is entitled to earn a fair return on its investments. This model calculates annual depreciation expenses included in customer rates projecting impacts on residential rates up to 2035.

The calculations focus exclusively on the impacts on residential customers, because, as explained in the corresponding section of the whitepaper, residential customers will bear the brunt of rate impacts. As is the case with residential customers, commercial and industrial customers will also face higher rates due to Consumers Energy's capital plans. Due to different cost allocations, delivery charges, and fuel rates, the net impact of capital investments varies with each customer type, but directionally conclusions remain the same.

Model Inputs and Assumptions

Table 4, below, summarizes the assumptions used to develop this model. Three key data sources provided the majority of inputs to the model: Consumers Energy's "Natural Gas Delivery Plan" or "the Plan," their current rate case filing (U-21308), and their most recent depreciation rate case (U-21176).

The "Natural Gas Delivery Plan" published in December 2020 details capital expenditure projections from 2020 through 2030. The information is displayed in a series of bar graphs without numerical values; therefore, we estimate Consumers Energy's Plan based on the visuals. The Plan breaks down investments in transmission, distribution, storage, and compression. Since the plan provides no information about General Plant investments, the revenue requirement associated with existing and future General Plant investments are omitted, with the exception of digital investments, which are included as O&M costs. This assumption leads to a conservative assessment of the growth in revenue requirement. Furthermore, since the Delivery Plan does not specify whether the capital costs include salvage value, which typically increases the depreciable costs of the asset, the model assumes that it does. If the plan omits salvage expenses, accounting for those costs would further increase rates.

To calibrate data across several sources needed to develop the model, we use the latest data that reflect the most updated information. As a result, the model begins in 2021.

At the time of this analysis, Consumers Energy rate case filing (U-21308) is ongoing. Data from the rate case informs model inputs including the rate of return, the gas use per customer

(historical and forecasted), the residential customer count (historical and forecasted), and the cost allocation by rate class.

Finally, Consumers Energy's most recent depreciation case filed in December 2021 (U-21176) provides data for the current plant in service, estimated service life and salvage characteristics, and other depreciation inputs.

Depreciation of new capital investment costs

Capital investment in transmission, distribution, storage, and compression assets for 2021-2030 is based on the Company's Plan. A key facet of this model is the assumption of capital investments from 2031 through 2035. The model averages Consumers Energy's capital investments from 2021 through 2030 and applies that, plus a 2.0% escalation, to every subsequent year, allowing us to extend modeling projections.

Using data published in Consumers Energy's latest depreciation rate case (U-21176), the model further subdivides general transmission, distribution, storage, and compression costs into specific equipment costs to more accurately project depreciation expenses. The useful life of investments varies based on the equipment and is derived from depreciation case data.

The model applies straight-line depreciation, which evenly distributes depreciation expenses over the course of an asset's life.

The results published in the figures in this whitepaper display nominal values. The model pulls capital investment data from Consumers Energy's Delivery Plan, and we assume that their values are not adjusted for inflation.

Additionally, this model treats capital expenditures as immediate, "Plant in Service" values. Consumers Energy's filings indicate that 2020 investments were comparable to those in subsequent years, therefore, we believe sensitivities on the assumptions do not materially impact the outcomes of the analysis.

Allocation of new capital investment costs

Consumers Energy's current rate case (U-21308) provides several inputs that allow for the accurate allocation of costs across customer types. Specifically, Consumers Energy proposes a rate design that subdivides costs into categories, including by customer type. The model uses these values to project the impact of future capital costs by customer type. This, in combination with published "End Year Customer" counts, allows us to determine the impact of capital costs per residential customer.

Depreciation of existing assets

The focus of this paper is to understand the rate impact of new costs associated with Consumers Energy capital investments. However, to predict customer rate impacts more accurately, it is essential to include the existing rate base in the model and calculate the net impact. Existing equipment that reaches its useful life will be decommissioned and no longer result in depreciation expenses. Thus, reductions in the existing rate base will offset some of the rate increases associated with new capital projects. Digital investments are not capitalized in the model due to uncertainty related to the accounting of cloud-based software.

To understand the net impact on rates, the model treats the existing rate base separately. This exercise seeks to understand how changes to existing assets impact the utility's revenue requirement. Assets lose value as they age, which lowers the rate of return that a utility can claim from the assets. Additionally, when an asset fully depreciates and is no longer counted as an expense, the utility's revenue requirement further diminishes. Conceptually, a lower revenue requirement results in lower customer rates. Rate decreases from existing assets serve to offset the cost of new investments.

Without the benefit of data that identifies the exact value of existing assets, initial plant values, asset ages, asset conditions, and other factors, we make several simplifying assumptions. Due to this uncertainty, the model only includes depreciation expense for the current rate base (data as of 2021). In reality, theoretical reserve and salvage costs would increase the depreciation expense, and thus the revenue requirement. The modeling approach is thus highly conservative. To calculate the depreciation on the existing rate base, the model assumes that all existing assets fully depreciate over a length of 35 years, which equated to a 2.86% rate of depreciation. The model assumes that all existing assets were placed in service in equal increments over the last 35 years. Consequently, we assume an asset service age of 17.5 years for existing assets, with the oldest assets retiring within a year and the newest (from the existing assets) retiring in 35 years. This assumption means that a set of assets will retire (and drop from the revenue requirement) annually.

The model uses the 2020 year-end rate base provided in U-21148 (A-2, page 1) to project revenue requirements by asset. The model projects rate base values by the Federal Energy Regulatory Commission (FERC) accounts from Consumers Energy's latest depreciation case.

Rate of Return

Consumers Energy earns a rate of return on their rate base, calculated by subtracting accrued depreciation from the total value of capital investments in service. The rate of return is added to customer rates as long as capital assets continue to have value. Each year that a piece of

equipment remains in service reduces the total customer expense related to the utility's rate of return. The model uses the Company's proposed required rate of return from their 2023-2024 cost of service study, published in their most recent rate case (U-21308) at 10.25%.[41]

Fuel, Digital Investments, and O&M Cost

The model calculates not just capital cost changes, but expected customer bills, as does Consumers Energy's Natural Gas Plan. Fuel and O&M costs are two other factors that influence customer bills.

Using the 2023-2024 Test Year revenue requirement from filings in U-21308, we calculated Consumers Energy's O&M costs for 2023. We assume that those costs increase by 4.5% annually, matching the growth in revenue requirements from capital investments, and added digital investments forecasted in Consumers' Plan.

Fuel costs are derived from historical prices at Con Citygate through 2022 and forecasted prices after that. For the years 2023 and 2024, we used the Energy Information Administration (EIA) price forecasts at Henry Hub and applied basis values to adjust for the lower historical rates at Con Citygate. Beyond 2024, we used S&P Capital's forecast for Michcon and CityGate, which models gas forecasts from NYMEX and applies a basis value. We believe that the moderate fuel price increases presented in the model are more accurate than Consumers projections in their Plan due to two additional years of information. Since Consumers Energy published their Plan, gas prices have soared due to the war in Ukraine and economic conditions. The S&P Capital forecast projects a drop in prices from the 2022 peak then moderate increases over the next decade.

[41] https://s26.q4cdn.com/888045447/files/doc_downloads/MPSC/2022/12/U21308_Investor_Summary_Initial_Filing.pdf

Table 4: Base Model Assumptions

Utility Data Inputs	Assumption	Source
Capital Forecast 2021-2030	Estimate of values used in Delivery Plan charts	Consumers Energy's Natural Gas Delivery Plan 2020
Customer Count by Type	End-year totals from the latest rate case	U-21308-0013
Allocation by Customer Type	Percentage allocation by class from the proposal in the current rate case	U-21308-0013
Depreciation Rate by Account	Settlement rates from the latest depreciation case	U-21176-0040
Depreciation Schedule	Straight line	U-21176
Salvage Rate	Latest approved rates	U-21176
Capital Cost Allocation by Account	New investments reflect existing plant in service allocation, mimicking asset replacements	U-21176
Required Rate of Return	6.09%	U-21308-0013
Existing Rate Base	2020 Year-end historical value	U-21176
Total Tax Rate	25.32%	U-21308-0013
Model Data Inputs	**Assumption**	**Reasoning**
Rate of Inflation	0.00%	Assuming Consumers Energy's Capital forecast is not adjusted for inflation, all estimates reflect nominal dollars

O&M Increase	4.50%	Adjusted to match growth in the revenue requirement
Change in Customer Counts	0.50% annual increase	Modeled increase predicted in U-21308-0013
Average Change in Residential Throughput Per Customer	0.63% annual decrease	Modeled increase predicted in U-21308-0013
Capital Forecast 2031-2045	Average of 2021-2030 applied annually with a 2.0% cost escalation	Allows for modeling through 2035
Existing Rate Base Depreciation Rate	2.86%	Projects existing rate base retirements
Fuel Prices 2021-2022	Historical values at Con Citygate	Best available estimates
Fuel Prices 2023-2035	Projections from EIA and S&P Capital at Michcon Citygate	Best available estimates