Building a Reliable System:

THE ROLE OF NATURAL GAS IN MINNESOTA'S CLEAN ENERGY TRANSITION

NorthStar
POLICY ACTION

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North Star Policy Action is an independent research and communications institute that is dedicated to improving the lives of everyday Minnesotans by advancing bold ideas that change the conversation and bring communities together. We develop and promote data-driven solutions to persistent problems that allow working people to thrive, no matter who they are or where they live

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Introduction

Minnesota has set ambitious goals for addressing climate change and reducing greenhouse gas (GHG) emissions. In 2007, the Next Generation Energy Act (NGEA) developed a series of goals to reduce GHG emissions incrementally, aiming for a reduction of 15 percent by 2015, 30 percent by 2025, and 80 percent by 2030 (all relative to 2005 levels). Minnesota is on track to meet these goals. Between 2005 and 2020, the state reduced emissions by 23%.

In 2022, state leaders recalibrated GHG emissions reduction goals to meet new realities. The Minnesota Climate Action Framework set two primary goals: 50% emissions reduction by 2030 (from 2005 levels) and net-zero emissions by 2050.[1] The State Legislature adopted these targets in 2023.[2]

The state cannot meet these goals without significant reductions in all seven major energy-consuming sectors of our economy: (1) transportation, (2) electricity generation, (3) agriculture, forestry, and land use, (4) industrial, (5) commercial, (6) residential, and (7) waste. In 2005, Electricity Generation was by far the largest source of GHG emissions in Minnesota. However, thanks to a concerted effort from policymakers and investor-owned utilities, total GHG emissions in this sector have fallen by 54%. Electricity generation is now the third-largest source of emissions, leaving industrial, commercial, and residential sectors as important venues for additional reductions.

To meet its GHG emissions reduction goals, Minnesota needs to substantially reduce its use of fossil fuel energy sources, including natural gas. Yet, Minnesotans rely on natural gas to economically heat their homes during the winter, and it is especially needed for the state's frequent extreme winter temperatures. Nearly 70% of heating energy comes from natural gas. One-fourth of all energy consumed in Minnesota comes from natural gas, with one-quarter of this consumption coming from residential users. Natural gas provides reliable heating to two out of every three homes.[3] While electrical heating sources like heat pumps have made significant technological advances, natural gas is still a vital heat source when temperatures fall below freezing.

A reduction in natural gas consumption must be done in a way that maintains a safe and reliable distribution system and protects lives. While long-term decreases in natural gas consumption are critical to GHG emission reduction goals, we know that natural gas is vital for keeping people's homes reliably warm and provides an essential bridge fuel to help us achieve our ambitious statewide goals. Ultimately, this report aims to provide analysis that can help inform a safe, reliable, equitable, and affordable path to Minnesota's GHG emission targets.

1 State of Minnesota. (2022). Minnesota's Climate Action Framework. https://climate.state.mn.us/sites/climate-action/files/Climate%20Action%20Framework.pdf

2 Minnesota Statute §61.216H.02.01. Utilities: Greenhouse Gas Emissions: Greenhouse Gas Emissions Control: Greenhouse gas emissions-reduction goal. https://www.revisor.mn.gov/statutes/cite/216H.02 (as amended in 2023: https://www.revisor.mn.gov/laws/2023/0/60/laws.12.61.0#laws.12.61.0)

3 Bob Eleff, "Natural Gas in Minnesota," Research Department, Minnesota House of Representatives, November 2018.

Section 1: Questioning the Need to Invest

A July 2023 report prepared for the Citizens Utility Board of Minnesota by DHInfrastructure (DHI) raises concerns about the pace of investments in our natural gas system.[4] The report "examined the drivers, trajectory, and household impact" of natural gas system investments through 2040 in Minnesota, focusing on current and future investments by Minnesota's three largest gas utilities: CenterPoint Energy (CPE), Xcel Energy, and Minnesota Energy Resources (MERC).

The authors found that "the combined annual investments have more than tripled, from $218 million in 2013 to $700 million in 2022."[5] They project that annual capital expenditures will top $1 billion by 2030 and $3 billion by 2040.

The authors question the need for these additional investments, arguing that Minnesota's gas distribution system is already among the safest in the country and that despite the relatively low risk of leaks in the distribution system, Minnesota's local distribution companies (LDCs) will continue to maintain accelerated levels of capital investment. They argue that an accelerated transition to electric heat sources will leave lower-income customers holding the bag for Minnesota's gas system's continued expansion and maintenance. The report casts doubt on the need for additional investments and raises concerns about expected capital investments.

Our analysis finds that the DHI projections are based on problematic assumptions and rely on inaccurate data, rendering the report an unreliable source for policymakers, regulators, and other stakeholders tasked with making decisions about the future of the gas system in Minnesota. We highlight three primary concerns with the DHI report.

First, the authors fail to adequately explain the drivers of gas system investments by CPE, Xcel Energy, and MERC. DHI researchers suggest that capital investments made by these three LDCs have largely been motivated by aspirations to increase revenues and shareholder returns "even if those investments may not be strictly necessary for maintaining safe and reliable operations."[6] By contrast, we find that the apparent motivators of investment were safety requirements imposed by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and public improvement work. In recent years, Minnesota's three largest gas utilities have made substantial progress in replacing leak-prone materials. Still, more investment is needed to replace legacy plastic and repair system leaks. As with previous investments, future investments are primarily allocated for system integrity and reliability.

Second, we highlight numerous concerns with modeling decisions utilized in the DHI analysis that seem designed to exaggerate future increases in gas utility capital expenditures. This includes basing projections on a compound annual growth rate (CAGR) rather than publicly available estimates put out by the utilities; extending projections beyond their intended scope; presenting changes in nominal dollars rather than adjusting projections for inflation; and relying on company-wide averages that do not account for variation in growth rates across states where the utilities operate. Any one of these methodological errors undermines the reliability of DHI's

4 Brendan larkin-Connolly and Christopher Parcels, "Investor-Owned Utility Gas Distribution Capital Expenditures: A Study of the Potential Bill Impacts of Business-as-Usual Investment in Minnesota," DHInfrastructure, July 2023, https://cubminnesota.org/wp-content/uploads/2023/07/Bill-impacts-of-MN-gas-utility-capital-expenditures-2023.pdf

5 Ibid.

6 Ibid, 7.

projections. Taken together, they suggest an analysis more concerned with supporting a predetermined conclusion than accurately assessing future cost impacts.

Third, we conclude with a brief description of an alternative path forward to reduce GHG emissions in Minnesota that is equitable, reliable, safe, and cost-effective. Following the example of other North American cold-climate areas seeking to reduce GHG emissions, we point to the value of a system that moves towards electrification while maintaining a gas backup, noting that other analyses have identified this blend as more reliable and less likely to uniquely burden low-income customers.

Climate change presents an unprecedented challenge to the future of Minnesota. Crafting policies capable of addressing this challenge at the necessary scale and speed, and with the proper attention to equity, safety, reliability, and cost-efficiency, requires prudent and accurate analysis. We hope this report helps inform such an analysis and guides policymakers toward a healthy and prosperous future for all Minnesotans.

Section 2: The Drivers of System Investments

Minnesotans rely on natural gas. The bulk of gas distribution serving this reliance in Minnesota comes from LDCs. These LDCs maintain a network of 58,000 miles of distribution and service pipelines.[7] The three largest LDCs in Minnesota are CPE, Xcel Energy, and MERC.

The primary organization regulating pipeline infrastructure is PHMSA, a division of the US Department of Transportation. PHMSA develops and enforces regulations to ensure the safe and efficient operation of natural gas transmission and distribution pipelines. At the state level in Minnesota, the Public Utilities Commission and the Office of Pipeline Safety, within the Department of Public Safety, also regulate pipelines.

PMHSA issued a Call to Action in 2011 in response to a series of high-profile pipeline safety incidents, including a major pipeline explosion in California in 2010.[8] Their fundamental goal was to prevent catastrophic incidents. This call established the Distribution Integrity Management Program (DIMP) and the Transmission Integrity Management Program (TIMP), which "require gas distribution and transmission operators to implement comprehensive safety plans aimed at identifying and mitigating risk, improving pipeline integrity, and preventing future accidents."[9] PHMSA has identified several *leak-prone materials*, including "unprotected steel, cast iron, wrought iron, copper and certain vintages of plastic pipe" which should be prioritized for replacement.[10]

Spurred by PHMSA's calls to replace leak-prone materials, gas utilities substantially increased gas distribution investments nationwide. Total investments increased 162% nationally, growing from $5.67 billion in 2010 to $14.88 billion in 2017.[11] These investments targeted the replacement of dated and leak-prone infrastructure. Minnesota's LDC's investments are consistent with this national trend.

Investments appear to have primarily been driven by PHMSA and public improvement projects. CPE, for example, has invested over $2.4 billion in Minnesota's gas distribution system since 2013. Nearly half, $1 billion, was spent on pipeline safety improvements, including replacing almost all leak-prone metal mains, while $600 million was invested in public works accommodation projects requested by the communities served by CPE. Combined, these investments account for two-thirds of all of CPE's investments in Minnesota.[12] Additional investments seem to be driven by general operation costs and customer growth.[13]

CPE "anticipates investing $1.8 billion in Minnesota from 2023 through 2027 [which] includes $0.5 billion of continued pipeline safety compliance and $0.4 billion of public

7 Ibid.

8 Letter from Cynthia R. Quarterman, PHMSA Administrator, March 18, 2011, available at https://www.phmsa.dot.gov/safe-transportation-energy-products/phmsa-call-action-letter-stateregulators-march-31-2011.

9 Brendan Larkin-Connolly and Christopher Parcels, "Investor-Owned Utility Gas Distribution Capital Expenditures: A Study on the Potential Bill Impacts of Business-as-Usual Investment in Minnesota," DHInfrastructure, July 2023, 6.

10 Ibid, 8.

11 Data available here from the Rocky Mountain Institute (citing American Gas Association data): https://rmi.org/insight/the-impact-of-fossil-fuels-in-buildings/.

12 Direct Testimony, Ms. Christe H. Singleton, "In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Rates for Natural Gas Utility Service in Minnesota," Docket No. G-008/GR-23-173 Exhibit ___ (CHS-D), 11/01/2023, 4.

13 Ibid, 4.

improvement projects."[14] It is important to note that CPE's anticipated capital additions for 2023-2027 are significantly less than CPE's investments projected by DHI during the same period. This discrepancy highlights our concerns with DHI's modeling decisions, which we detail in section 3.[15]

Investments made by CPE, MERC, and Xcel have significantly reduced the presence of leak-prone materials in mains and service lines. These LDCs have all reduced the share of leak-prone materials to under two percent.[16] Sustained investments have made Minnesota a national leader in both pipeline safety and low levels of leak-prone pipeline material. CPE, for example, has replaced most of their non-plastic leak-prone materials.

Minnesota's LDCs have made substantial progress, but more work must be done. Along with the leak-prone metal materials, PHMSA has identified certain plastics prone to cracking and failure, including vintages of Aldyl A pipe materials.[17]

Aldyl A pipe is a type of plastic pipe manufactured by DuPont. Specifically, "Aldyl® "A" is a trademarked name referring to a finished polyethylene pipeline product manufactured by the DuPont chemical company using DuPont's own proprietary Alathon® polymer resin."[18] Greater focus has been placed on replacing Aldyl A pipe

14 Ibid, 4.

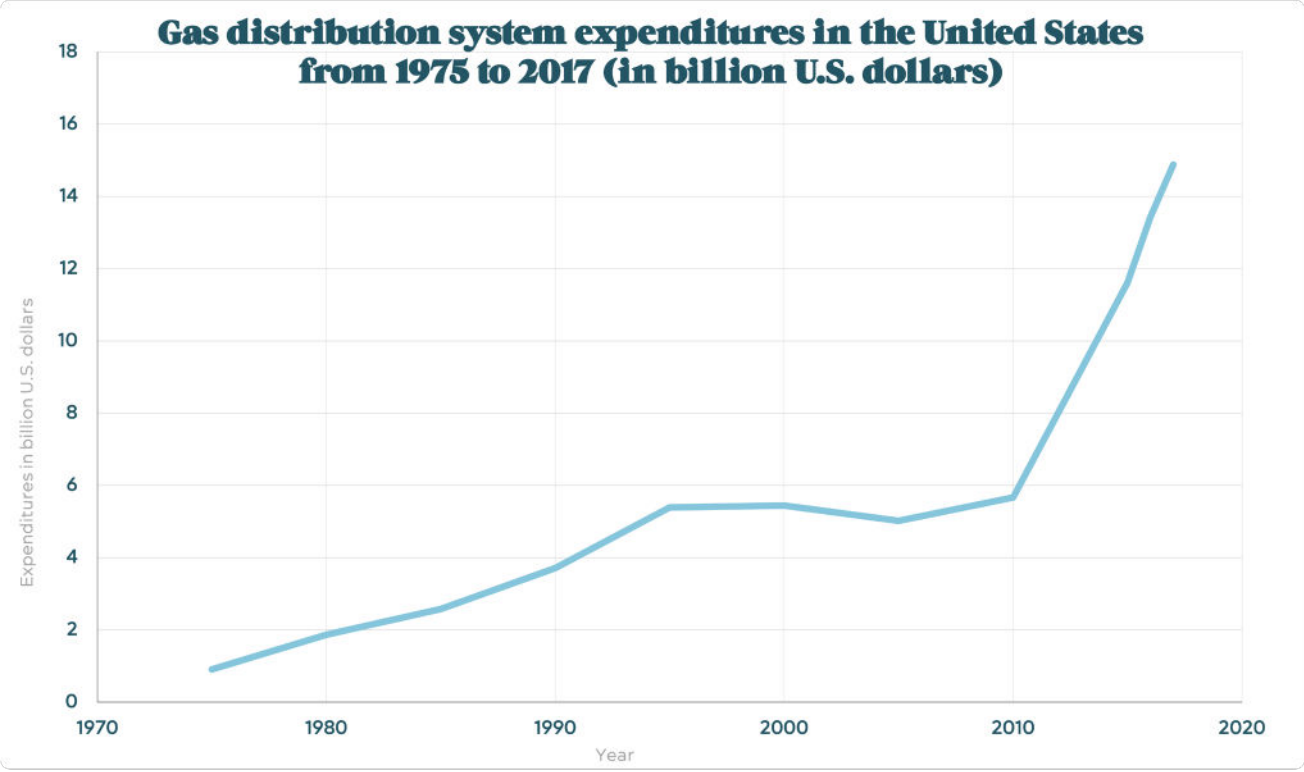
15 See Figure 2.1: CPE Historical and Projected Capital Additions in the DHI report on page 18: https://cubminnesota.org/wp-content/uploads/2023/07/Bill-impacts-of-MN-gas-utility-capital-expenditures-2023.pdf.

16 Ibid, 10.

17 Ibid, 10.

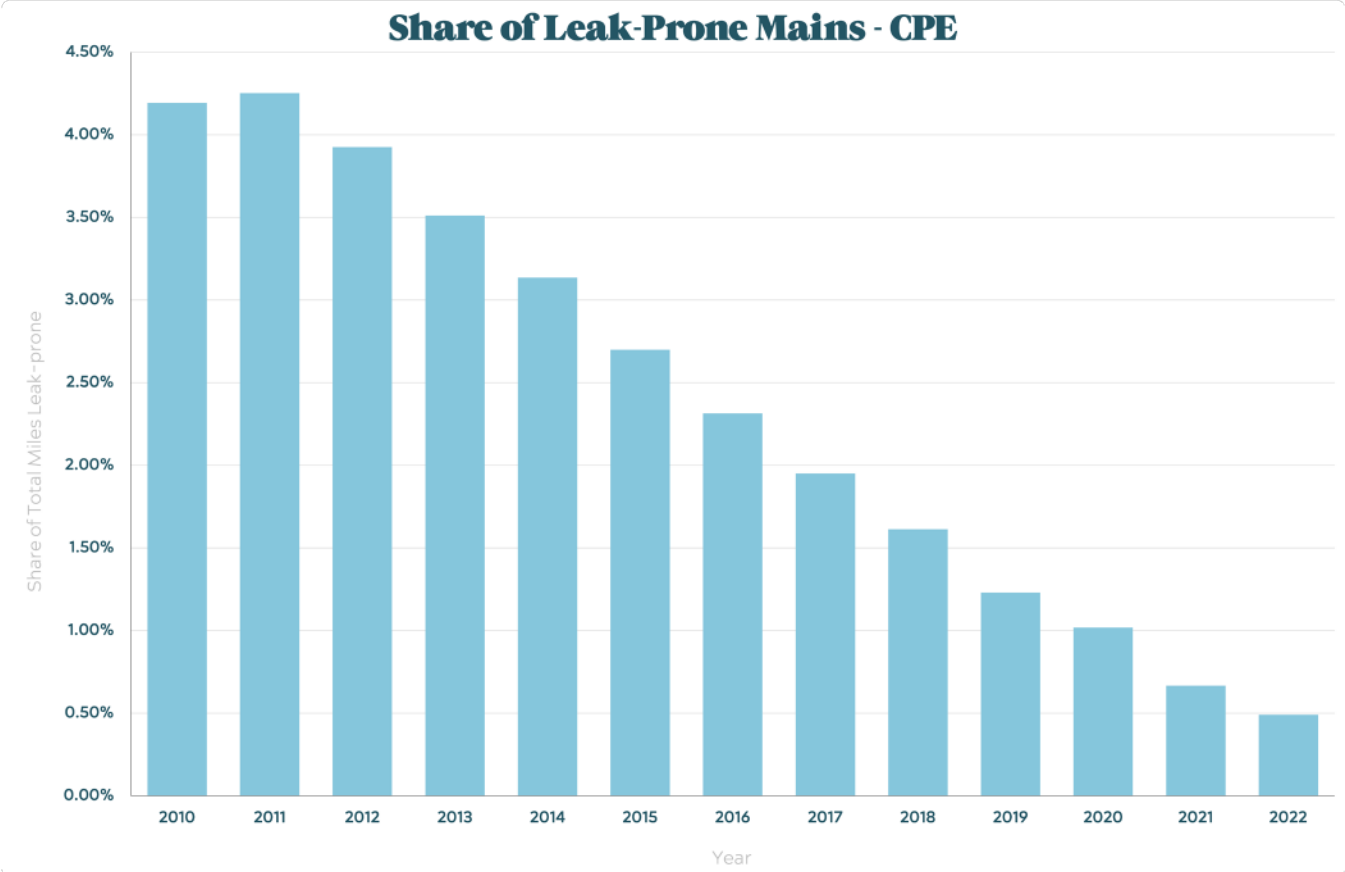
18 Steven Haine, "Hazard Analysis & Mitigation Report On Aldyl A Polyethylene Gas Pipelines in California," California Public Utilities Commission, 2014, 5-6.

FIGURE 1: NATIONAL GAS DISTRIBUTION INVESTMENTS



Data available here from the Rocky Mountain Institute (citing American Gas Association data): https://rmi.org/insight/the-impact-of-fossil-fuels-in-buildings/.

FIGURE 2: CPE REPLACEMENT OF LEAK-PRONE METAL MAINS



in response to high-profile pipe failures, including a 1996 explosion in San Juan, Puerto Rico, "caused by a small slit fracture on a small section of Aldyl A plastic gas service line."[19] Additional incidents in Cupertino, California (August 31, 2011) and Roseville, California (September 27, 2011) brought further attention to integrity issues with certain vintages of Aldyl A pipe.[20]

PHMSA has organized risk levels into two tiers based on the urgency of replacement. Minnesota LDCs have highlighted additional Aldyl A pipe that needs to be replaced. CPE, for example, has targeted Tier 1 Aldyl A service and main line pipe replacements.[21] The company has made progress, but at the end of 2022, CPE still had 318 miles of Tier 1 main lines and thousands of Tier 1 and Tier 2 service lines slated for replacement over the next decade.[22] All Tier 1 legacy plastic main pipe is scheduled to be replaced by 2034, while Tier 1 service line replacement is expected to be completed in 2028. Replacement of Tier 2 main lines is expected to begin in 2034, while Tier 2 service line replacement is forecasted to start in

19 Ibid, 4.

20 Ibid, 4.

21 Direct Testimony, Mr. John M Wiinamaki, P.E., "In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Rates for Natural Gas Utility Service in Minnesota," Docket No. G-008/GR-23-173 Exhibit ___ (JMW-D), 11/01/2023, 31-34.

22 Initial filings–workpapers–John Winamaki public part 1 of 2 as part of CPE's filings in Docket 23-173. Filed 11/01/2023. See workpapers six and seven for more detail on Aldyl A pipeline replacement.

2029.[23] The company has also identified PE 2306 plastic service lines that need to be replaced, which are also addressed in PHMSA guidance.[24] MERC and Xcel have similarly identified additional Aldyl A pipes in need of replacement.[25] Notably, replacing this kind of pipe material helps reduce the release of fugitive methane, an important method of curtailing GHG emissions.

CPE, MERC, and Xcel have all made substantial progress in replacing leak-prone pipes and addressing system leaks, but more investment is needed to replace additional Aldyl A pipe and address leaks as they arise. The available evidence suggests that these investments directly respond to PHMSA mandates rather than functioning as utility investment goals, as suggested by the DHI report. Minnesota LDCs make investments within a highly regulated framework. This framework has ensured system safety and reliability through prudent investment and should continue to do so with appropriate future investments.

23 Direct Testimony, Mr. John M Wiinamaki, P.E., "In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Rates for Natural Gas Utility Service in Minnesota," Docket No. G-008/GR-23-173 Exhibit ___ (JMW-D), 11/01/2023, 31-34.

24 Ibid, 34.

25 Brendan Larkin-Connolly and Christopher Parcels, "Investor-Owned Utility Gas Distribution Capital Expenditures: A Study on the Potential Bill Impacts of Business-as-Usual Investment in Minnesota," DHInfrastructure, July 2023, 10.

Section 3: Forecast Fallacies: Examining Problematic Assumptions in DHI's Projections

A vital aspect of the DHI analysis is a set of projections showing a marked increase in expected utility gas distribution capital expenditures in the coming years. Here, we explore several problematic assumptions built into the DHI analysis.

It is important to note that the DHI study is, in part, an extension of an analysis the firm conducted for the Maryland Office of the People's Counsel with one crucial difference. While the Maryland report was based on actual projections of future spending provided by the gas utilities,[26] the Minnesota analysis relies on the speculative use of projected compound annual growth rates (CAGR). Notably, these rates are based on growth across multiple states. Yet, the DHI analysis uses them to estimate future spending on a singular type of investment (pipe replacement) in a single state (Minnesota) – a highly unorthodox method that raises many concerns.

DHI could have replicated the Maryland methodology by relying on publicly available data or filing information requests with utilities to obtain realistic estimates of future expenditures in Minnesota. Instead, the firm chose to treat corporate growth projections covering multiple states as reliable measures of investment spending in a single state. One problem with this approach is that the figures represent an enterprise-wide average that masks sharp divergence between geographic markets.

For example, CPE does business in Texas (a state with a rapidly growing population and energy demand) and Minnesota (a state with relatively flat population growth and energy demand). Rather than accounting for this difference in their analysis, the DHI analysis assumes that the global growth rate applies in each state (i.e., the growth rate in Texas is assumed to be equal to the growth rate in Minnesota).

Further, in some cases, DHI assumes that projected growth rates will continue for years outside the time frames for which they were intended. For example, DHI arbitrarily extends CPE's projected CAGR of 10.95%, intended to apply to the period from 2021 to 2026, out to 2031 to match the timeline of Xcel's projections. In doing so, their analysis mistakenly assumes that distribution system investments in Minnesota will match company-wide growth projections and that growth trajectories will continue for years beyond the provided forecast periods.

Beyond DHI's problematic use of enterprise-wide growth rates, it is also notable that they do not adjust their projections for inflation. Instead, DHI's estimates are given in nominal dollars, meaning they do not represent the real value of capital expenditures over time. As shown below, this decision paints an inaccurate estimate of capital expenditure trends.

Each of these methodological errors serves to exaggerate estimates of the future growth in capital expenditures and suggests an analysis more concerned with persuasion than accuracy. Taken together, they lead to estimates that are ill-suited for informing policy decisions, providing projections that overstate the future cost of gas distribution capital expenditures by anywhere from $813 million to $6.5 billion.

26 "Maryland Gas Utility Spending: Projections and Analysis". Office of People's Counsel, State of Maryland, and DHIfrastructure, October 2022.

DISCREPANCIES IN DATA

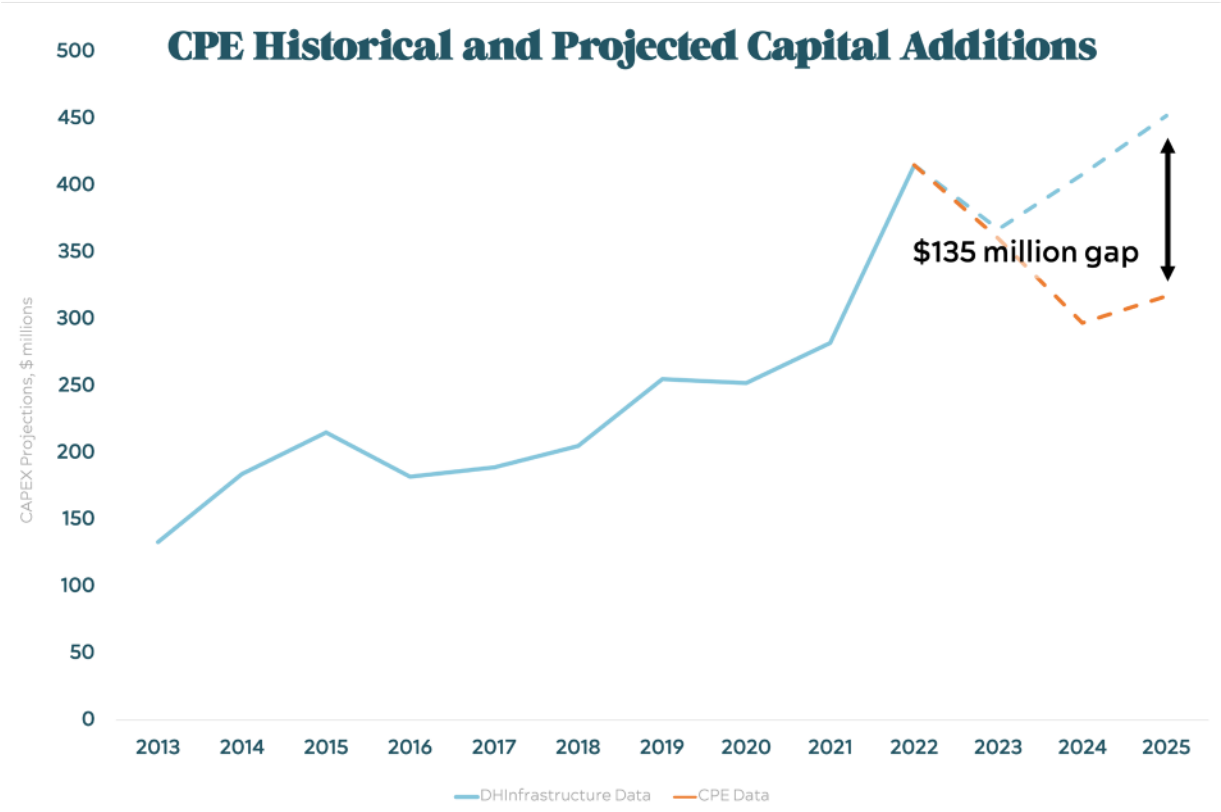
As noted above, the DHI analysis draws on global compound annual growth rates to project future spending from 2023 to 2031. In relying on these growth rates, DHI did not draw on projections from the utilities that estimate their capital expenditures for gas distribution in Minnesota through 2025.

The impact of this decision can be seen by comparing the CAGR-based DHI projections in blue with actual investment plans provided by CPE in their most recent publicly available rate case filing.[27] The solid lines represent historical data and the dashed lines indicate plans and projections.

Notably, the chart shows that the capital expenditure plans from CPE are much lower than the CAGR-based projections provided in the DHI analysis. This discrepancy peaks in 2025, when DHI's cost estimate is $135 million greater than the investment plan figure provided by CPE.

27 Initial Filing–Workpapers, Mr. Drew T Sudbury, "In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Rates for Natural Gas Utility Service in Minnesota," Docket No. G-008/GR-23-173 Exhibit ___(DTS-D), 11/01/2023, 2. https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={50848B8B-0000-C648-A539-024C14F39B56}&documentTitle=202311-200112-03

FIGURE 3: COMPARING DHI CAGR-BASED PROJECTIONS TO CPE'S INVESTMENT PLAN



Further illustrating this discrepancy, publicly available testimony from CPE indicates that the utility plans to invest $1.8 billion in Minnesota from 2023 to 2027,[28] a number that is $500 million lower than the $2.3 billion figure derived by DHI through their reliance on the CAGR. The following section explores why DHI's projections are so far off the mark.

ACCOUNTING FOR POPULATION GROWTH DIFFERENCES ACROSS STATES

An essential piece of context for evaluating the accuracy of growth rate projections is identifying the geography served by a utility, as these growth rate estimates must account for the utility's entire coverage area. For example, CPE operates in both Texas and Minnesota.[29] Importantly, data from CPE demonstrates that their efforts in these two states likely vary. Specifically, the share of CPE's national gas system investments devoted to Minnesota has shrunk in recent years, falling from 9.4% of their total investments in 2016 to 7.2% in 2020. Moreover, CPE's projections indicate that this investment is expected to continue to decline in the near future, dropping to 6.9% by 2025.[30]

Examining projected changes in Minnesota's population relative to other states served by CPE, such as Texas, may help to explain this declining investment share. As seen in the figure below, population projections put together by the Texas Demographic Center predict that the state's population will increase by between 13% and 22% by 2040 (roughly 4 to 7 million people).[31] By contrast, Minnesota's population is projected to increase by 7% over this same period (roughly 450,000 people).[32]

The significant difference between these population growth estimates creates an obvious complication in projecting capital expenditures for a utility operating in both states. To the extent that these expenditures rely on meeting the demand of a growing population, it seems clear that the investments needed in a state like Texas would be significantly larger than those required in Minnesota, as suggested by CPE's declining investment share in Minnesota.

That the DHI analysis did not account for this variation casts serious doubt on its conclusions and suggests that more confidence can be placed in the utility's plans shown in the previous section that are based on Minnesota only, as opposed to the DHI estimates that rely on an extrapolation from the broader CAGR projection.

ARBITRARY TIMELINE EXTENSION

The CAGR statistics utilized by DHI come from investor presentations put out by the utilities. Here, CPE estimates a 10.95% compound annual growth rate through 2026, MERC estimates a 7.4% rate through 2027, and Xcel Energy estimates a 6.5%

28 Direct Testimony, Ms. Christe H. Singleton, "In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Rates for Natural Gas Utility Service in Minnesota," Docket No. G-008/GR-23-173 Exhibit ___ (CHS-D), 11/01/2023, 4. https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={50518B8B-0000-C91F-9831-1611AA75D95A}&documentTitle=202311-200106-02

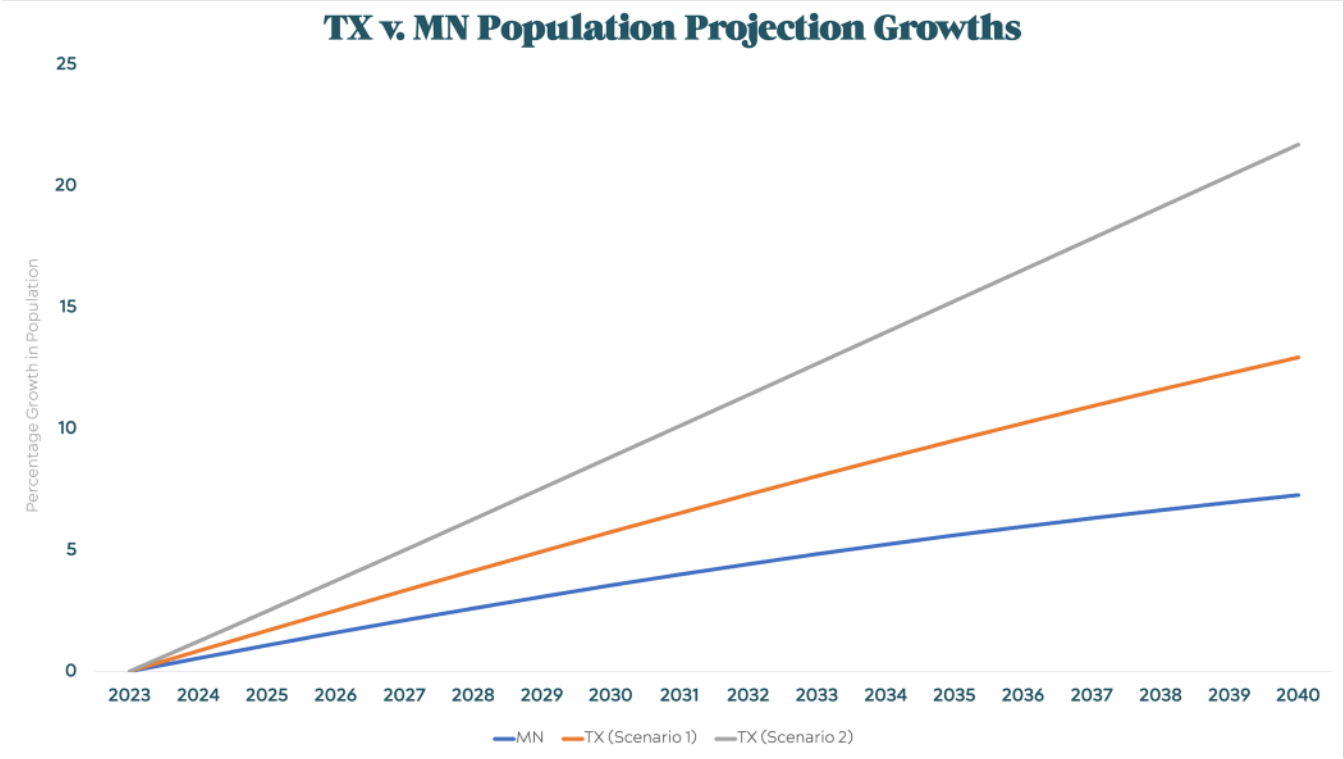
29 In addition to Minnesota and Texas, CPE provides natural gas in Indiana, Louisiana, Mississippi, and Ohio. Similarly, MERC also delivers natural gas to Wisconsin, Illinois, and Michigan, while Xcel operates in Colorado, New Mexico, North Dakota, South Dakota, Texas, and Wisconsin.

30 Direct Testimony, Ms. Christe H. Singleton, "In the Matter of the Application of CenterPoint Energy Resources Corp. d/b/a CenterPoint Energy Minnesota Gas for Authority to Increase Rates for Natural Gas Utility Service in Minnesota," Docket No. G-008/GR-21-435 Exhibit ___ (CHS-D), 11/01/2021, 31. https://www.edockets.state.mn.us/edockets/searchDocuments.do?method=showPoup&documentId={C09EDC7C-0000-CF12-92B1-F7A8000A47E5}&documentTitle=202111-179373-01

31 Notably, the Texas Demographic Center projects two possible growth scenarios, explaining the different estimates provided here and graphed in figure 4. Data taken from https://demographics.texas.gov/Projections/2022/.

32 Data taken from https://mn.gov/admin/demography/data-by-topic/population-data/our-projections/#:~:text=-FAQ-,Key%20Findings,our%20previous%20set%20of%20projections.

FIGURE 4: POPULATION GROWTH PROJECTIONS



rate through 2031.[33] To account for the differences in time frames across the utilities, DHI arbitrarily extends the growth rate projections for CPE and MERC from 2026 and 2027, respectively, to 2031 to match the projection length estimated by Xcel. In doing so, the DHI analysis not only mistakenly assumes that distribution system investments in Minnesota will match company-wide growth projections, as highlighted in the previous section, but also that the growth trajectories will continue for years beyond the forecast periods.

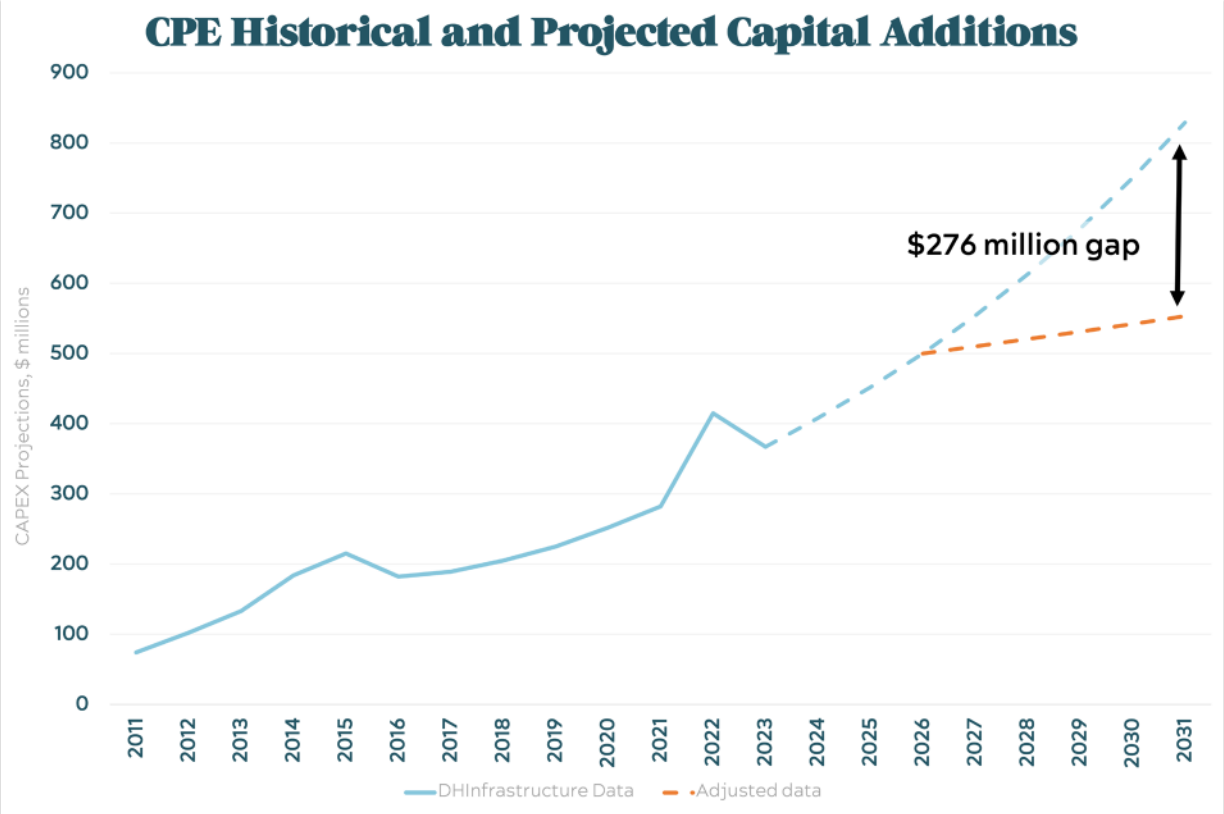
We make two critical changes to DHI's projections to correct this assumption. First, we stop using the compound annual growth rate in the year provided by the utility (i.e., 2026 for CPE and 2027 for MERC) rather than arbitrarily extending it to 2031. Second, to allow for the projections to reach 2031 after the utility-provided CAGR timeframe ends, the expenditures are estimated to grow by 2.04% annually.

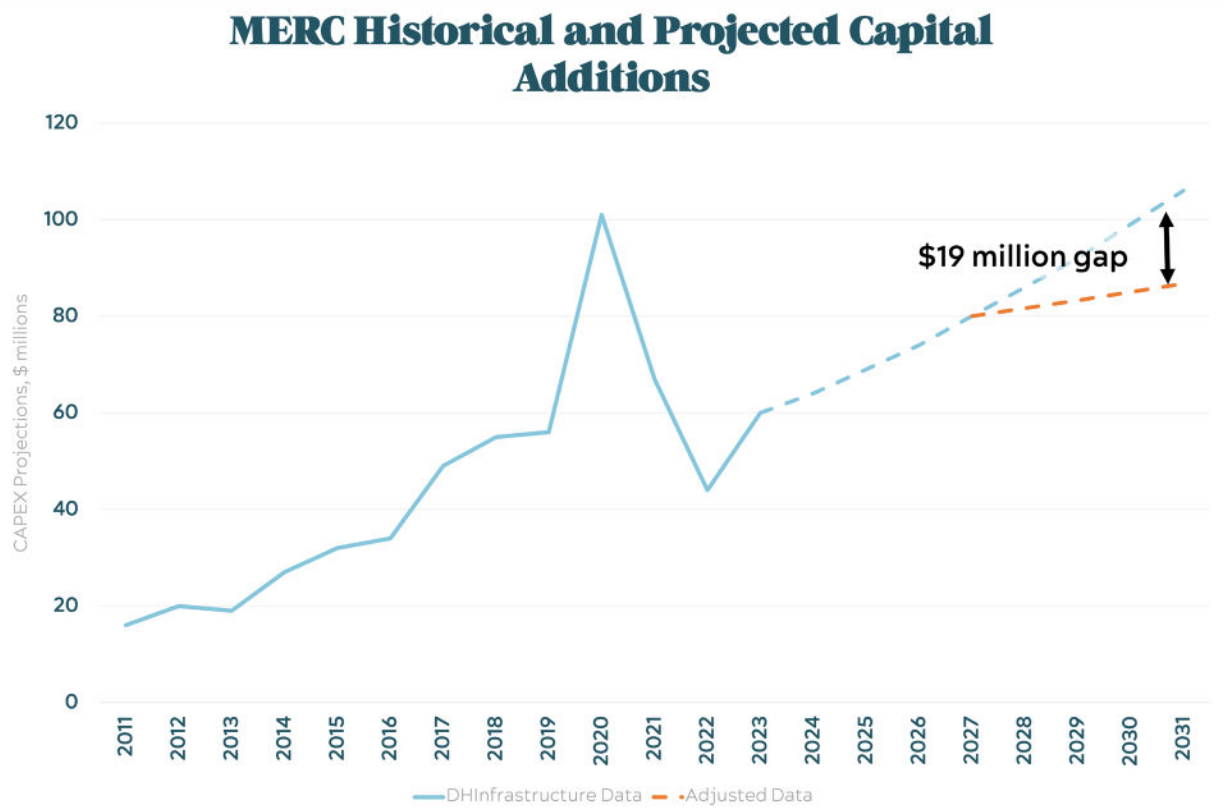
The use of the 2.04% statistic is informed by DHI's analysis, wherein they assume a 2.04% growth rate for 2031-2040, the period following their utilization of the CAGR. For these years, DHI recognized that there was no clear guidance for projecting change and settled on allowing the projections to grow by 2.04% to align with the estimated rate of inflation put out by the International Monetary Fund (IMF).[34] Therefore, this

33 CenterPoint Energy, "Establish a Path Towards Premium through Sustainable Growth: Third Quarter 2022 Investor Update," November 1, 2022, available https://investors.centerpointenergy.com/static-files/f889e263-29dc-4531-bed8-11d34defb3d6.
WEC Energy Group, "Our 'ESG' Progress Plan Update: Investing in Efficiency, Sustainability, and Growth," January 2023, available https://s22.q4cdn.com/994559668/files/doc_presentations/2023/01/01-2023-January.pdf.
Xcel Energy, "Essential: Investor Meetings, August 8–11, 2022," August 2022, available https://s25.q4cdn.com/680186029/files/doc_presentations/2022/08/Current-IR-Presentation-August-2022.pdf.

34 See IMF inflation estimates here: https://www.imf.org/en/Publications/WEO/weo-database/2022/October/weo-report?c=111,&s=PCPIPCH,&sy=2020&ey=2027&ssm=0&scsm=1&scc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1

FIGURE 5: RESTRICTING COMPOUND ANNUAL GROWTH RATE PROJECTIONS TO THE UTILITY-PROVIDED TIMELINE





piece of our analysis largely mirrors DHI's assumptions, with the only distinction being that our use of CAGR matches the timeframe provided by the utilities rather than arbitrarily extending to 2031.

While it may seem that DHI's arbitrary extension of the growth rates for a handful of years is a minor assumption, these charts show this choice has a significant impact. In the case of MERC, the gap between DHI's projection and one that properly stops the use of the growth rate in 2027 reaches $19 million by 2031. For CPE, this gap peaks at $276 million in 2031.

Taking these differences into account for both utilities from the years 2026-2031, the projections from DHI are $813.11 million greater than they would have been if the annual growth rates had been stopped in the years specified by the utilities.

ADJUSTING FOR INFLATION

When making projections about future costs, inflation adjustment is essential. Doing so ensures that comparisons between different periods are not misleading and that the projections reflect real value. Without this adjustment, budgeting, planning, and policy decisions may be made using inaccurate estimates, leading to troubling consequences.

For example, a failure to adjust for inflation paints a distorted picture of the real value of the minimum wage over the last several decades. Similarly, not adjusting for inflation would suggest that revenue being provided to Minnesota school districts from 2003 to 2023 was steady, while adjusting for inflation correctly shows that revenue declined substantially during that time.[35]

Notably, in projecting the increase in utility gas distribution capital expenditures, the DHI analysis does not adjust for inflation, choosing instead to provide estimates in nominal dollars.

Identifying this issue in DHI's analysis is not simple. While the analysis does not adjust for inflation, it does allow its projections to increase from 2031-2040 based on a 2.04% inflation rate, as noted above. This distinction between *allowing for an increase based on inflation* and *adjusting for inflation* is important. For example, *allowing a projection to increase based on an estimated inflation rate of 2.04* means that the value of $1 in 2031 increases to $1.024 in 2032 due to inflation. By contrast, *adjusting for inflation* allows for an apples-to-apples comparison of spending patterns across years despite changes in currency values.

Below, the impact of this choice is made clear. DHI's historical and projected capital additions data for CPE are shown in blue, where no adjustment for inflation is made. By contrast, the orange line reflects inflation-adjusted values holding constant to 2023 dollars.

This inflation adjustment is done in two ways. First, for the historical data from 2011-2022, inflation rates from the consumer price index (CPI) were used. Second, from 2024-2040, the projections are adjusted using the same inflation rate assumed in the DHI analysis (i.e., 2.04%). Once again, the solid line shows actual money spent, while the dashed line demonstrates future projections.[36]

As seen in the chart, the initial inflation adjustment for the historical data (2011-2022) lifts the cost of CPE's capital additions above the estimate provided by DHI, demonstrating

35 See https://northstarpolicy.org/losing-ground/

36 Our analysis extends projections out to 2040 to match the timeframe in DHI's analysis. Doing so is a relatively risky endeavor due to the substantial variability that can occur when forecasting capital expenditures beyond five years. Thus, our analysis is much more about identifying issues in DHI's methodology, as opposed to offering a set of projections that we believe accurately predict future spending.

that the real value of a dollar in 2011 is greater by 2023 (e.g., a dollar is worth more in 2011 than it is in 2023). As the data turns to future projections, this shifts, with the adjustment for inflation now leading to a lower estimated cost due to the declining real value of future dollars (e.g., a dollar in 2040 is worth less than it is in 2023).

From 2024 to 2031, all cost projections continue to increase, indicating that CPE's CAGR estimate (10.95%) upon which DHI's projections are based during this period is greater than the assumed inflation rate (2.04%). As can be seen in the graph, however, adjusting for inflation does flatten this increase considerably, such that DHI's projected cost for 2031 is $126 million greater than the inflation-adjusted estimate.

From 2031 to 2040, the DHI projections continue to increase, while the 2.04% inflation-adjusted projections level off. This difference reflects the fact that DHI's projected increase during this time stems solely from inflation. As a result of this divergence, the DHI projection is $293 million greater than the inflation-adjusted projection by 2040.

Taken together, when accounting for inflation in both historical and projected spending, the trend line is substantially flatter, starting at a higher point in 2011 due to an upward adjustment from past inflation and ending at a lower point in 2040 due to a downward adjustment for future inflation. As a point of comparison, the DHI-estimated increase in CPE expenditures from 2011 to 2040 without

FIGURE 6: CPE INFLATION ADJUSTMENTS

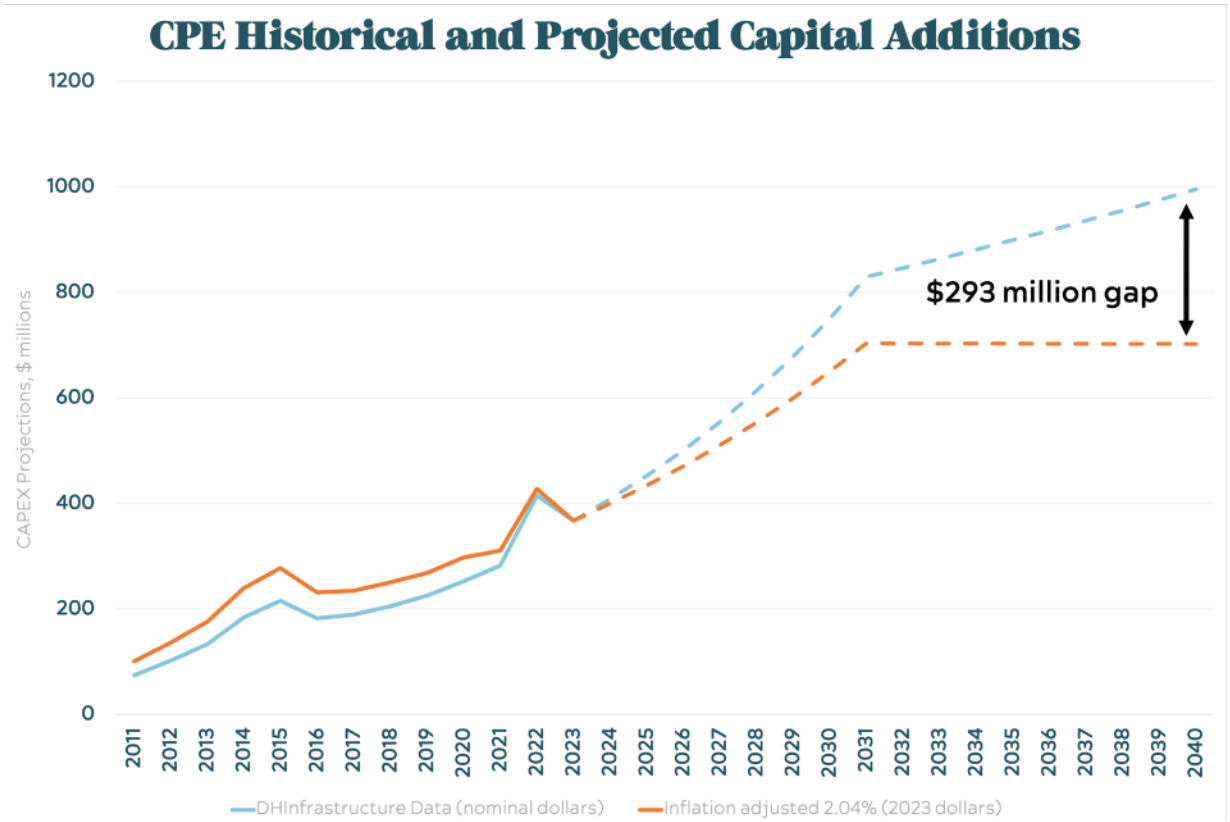
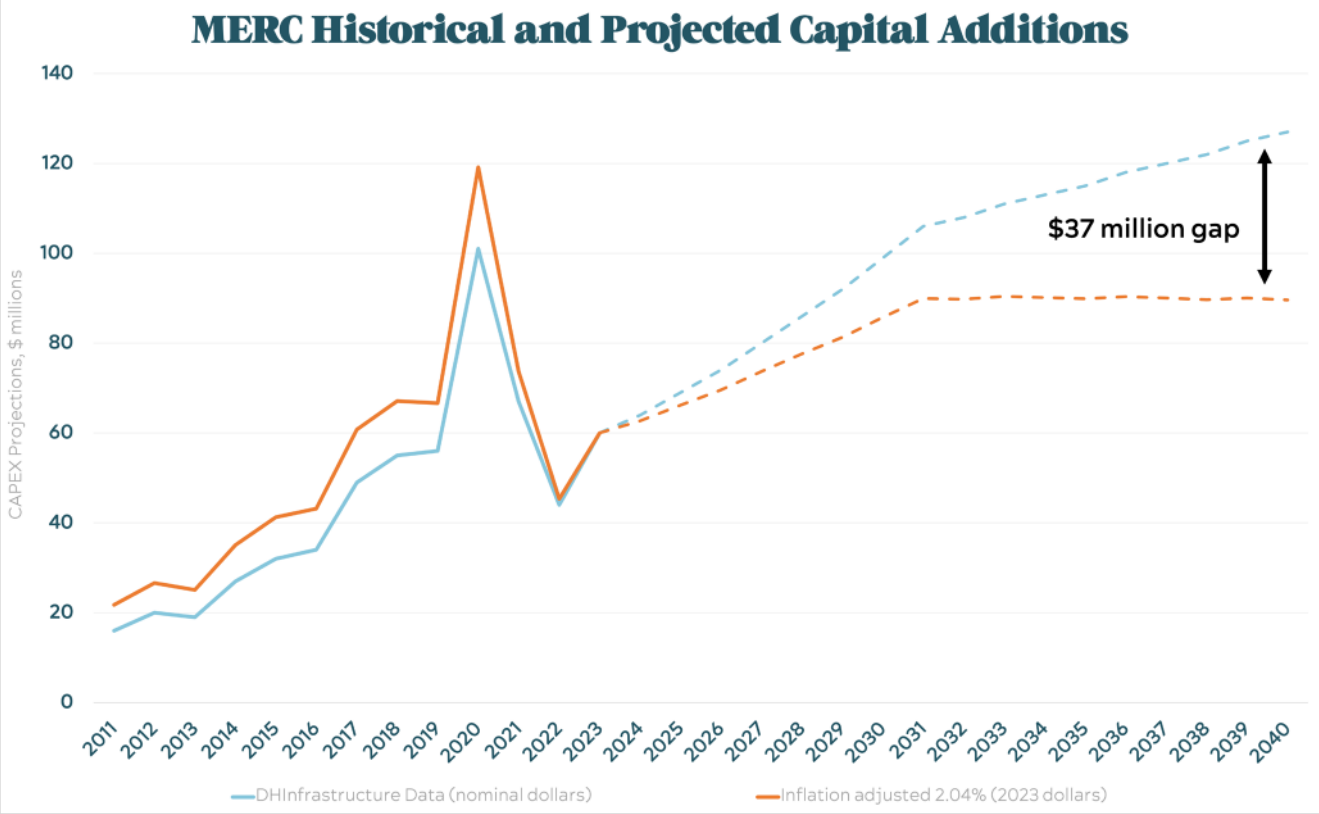
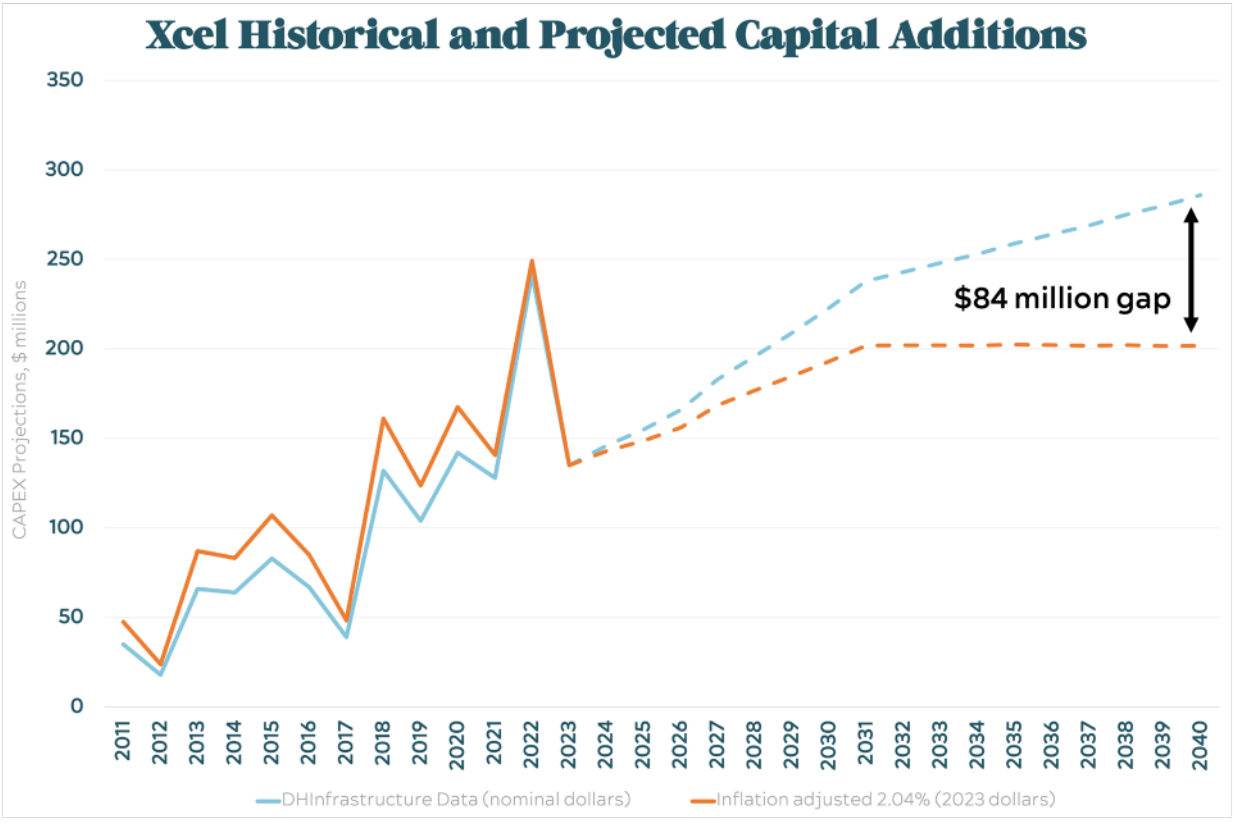


FIGURE 7: MERC AND XCEL INFLATION ADJUSTMENTS





accounting for inflation is 1,245%, while the increase after adjusting for inflation is 598%.

The charts above illustrate this same general pattern when applying an inflation adjustment to the data for MERC and Xcel. For MERC, the 2011-40 increase without an inflation adjustment comes to 694%, while the inflation-adjusted increase is 312%. Similarly, the inflation-adjusted increase for Xcel is 324%, or less than half of the increase found when failing to adjust for inflation (717%).

In sum, following the best practice of adjusting spending data for inflation paints a different picture of the increase in utility gas distribution capital expenditures. Where the original DHI analysis suggests that these expenditures would cost over $1.4 billion by 2040, adjusting this estimate for inflation to keep it in 2023 dollars brings the cost down to $994 billion, a difference of more than $400 million.

Taking this difference into account for every year from 2024 to 2040 reduces the total projected amount spent by nearly $3.5 billion ($15.2 billion, down from an original estimate of $18.7 billion).

COMBINING INFLATION AND CAGR TIMELINE ADJUSTMENTS

Having now adjusted the data to deal with the separate issues of arbitrarily extending CAGR timelines and inflation, we now combine these corrections. The charts below reflect the projections for CPE and MERC when their compound annual growth rates are stopped in 2026 and 2027, respectively, AND when the data is adjusted for inflation to stay in real 2023 dollars. Xcel is excluded here, as their growth rate projections went through 2031, meaning we would only be adjusting for inflation in this section, matching the graph for Xcel provided in the previous section.

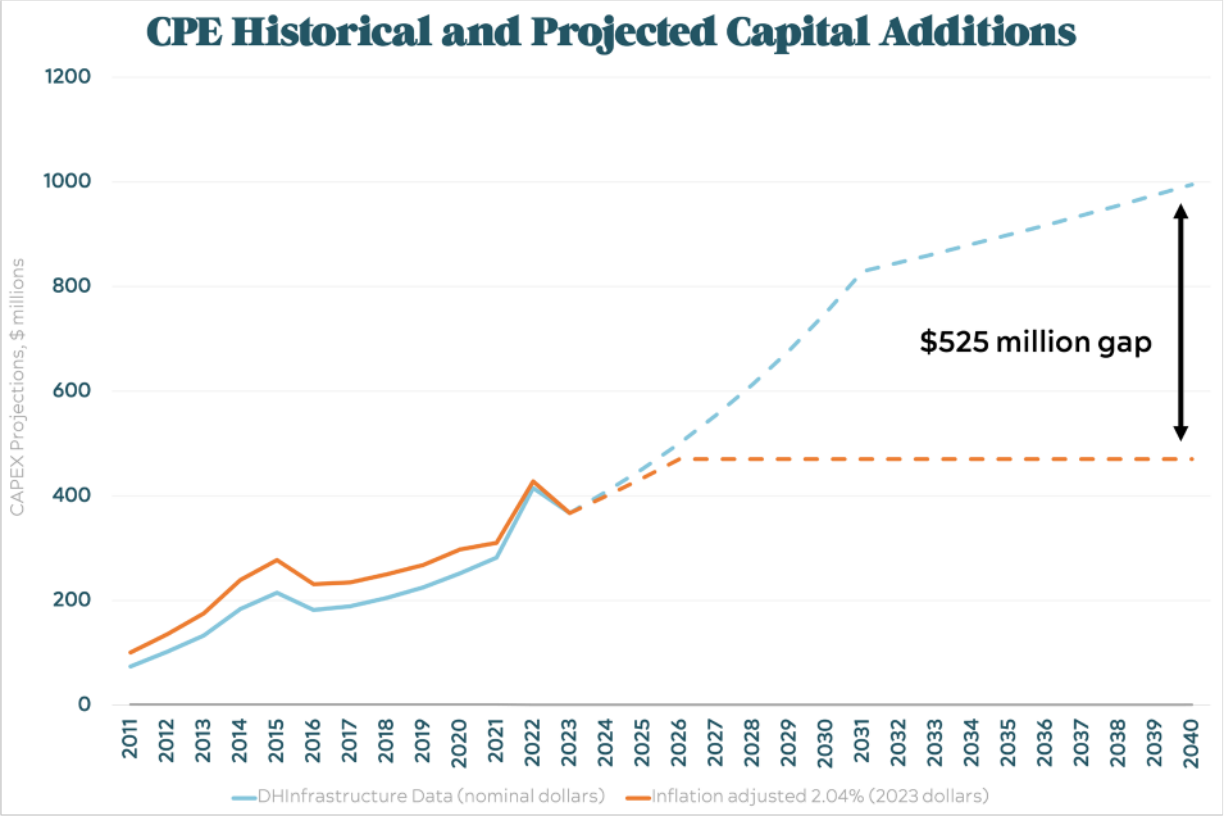
A critical difference between these charts and those from the previous section is that the complete flattening out of spending begins when the compound annual growth timeframe stops, as that is the point at which the cost growth is only due to inflation.

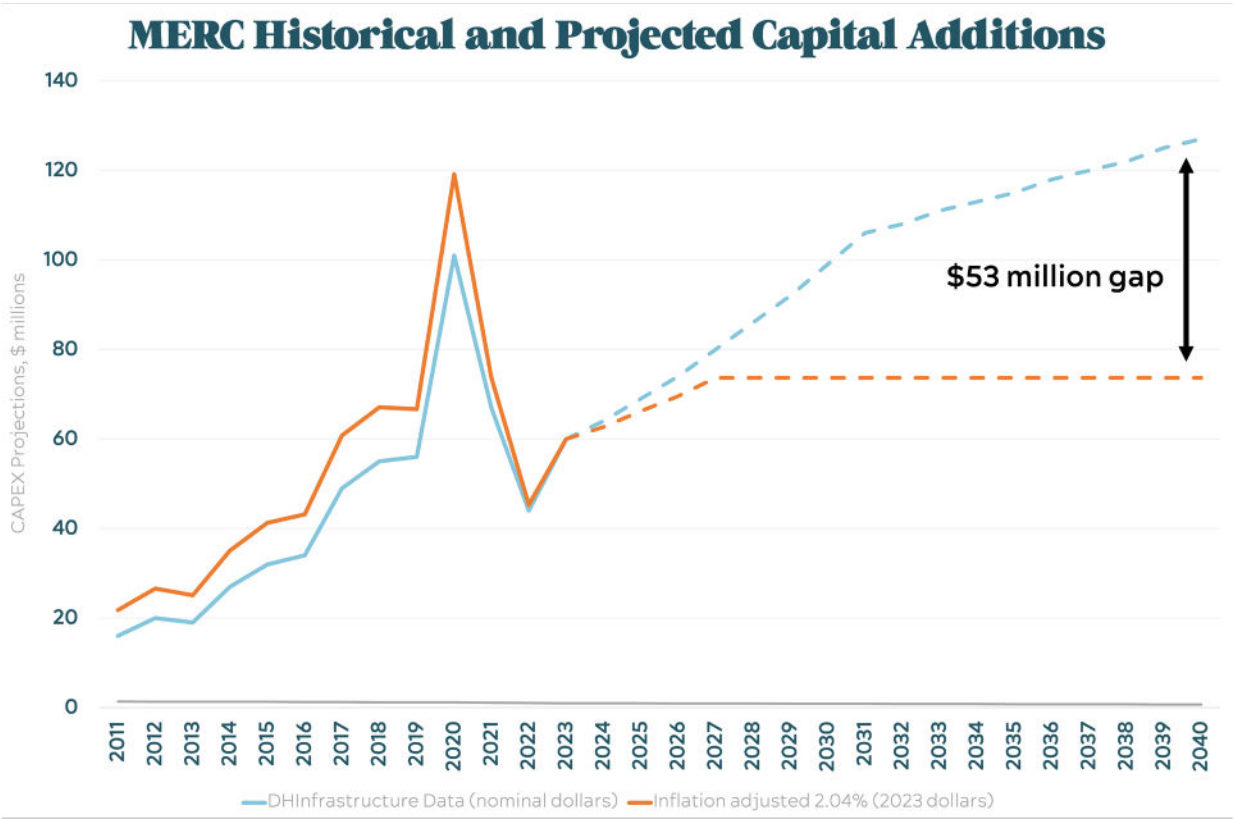
Notably, this makes the gaps between the projections significantly larger and the rate of growth in the adjusted data considerably flatter. The increase from 2011 to 2040 is now 365% for CPE and 236% for MERC, down from the 1,245% and 694% estimates provided by DHI, respectively. Moreover, the gap between the projections in 2040 increases to $525 million for CPE and $53 million for MERC. If that is added to the $84 million gap from Xcel found after adjusting for inflation, the total difference between the estimates in 2040 is $662 million.

Taking this difference into account for every year from 2024 to 2040 reduces the total projected amount spent by over $6.5 billion ($12.1 billion, down from an original estimate of $18.7 billion).

By bringing these two corrections together, the estimates in this section provide the most comprehensive sense of projected spending by these utilities, correctly capturing the impact of inflation and aligning the use of growth rates to sync up with the intended timeline of the utilities.

FIGURE 8: CPE AND MERC INFLATION AND CAGR TIMELINE ADJUSTMENTS





PROJECTING AN IMPACT ON CUSTOMER COSTS

The DHI analysis relies exclusively on their projections and associated assumptions in making the case that customer costs will increase substantially in the coming decades. As discussed above, four critical issues are created by this reliance:

1. The reliance on projecting costs through broader growth rates is unnecessary. Investment plans from the utilities provide data tailored to the subject of DHI's analysis. Rather than using this data or putting in a request to access it, DHI drew on compound annual growth rate estimates to inform its projections from 2023 to 2031. Comparing estimates from these two sources illuminates the problem, with projections derived from growth rates outpacing those tied to actual utility investment plans.
2. Projections based on enterprise growth rate estimates are inaccurate. The utilities in DHI's analysis operate in different states, with the growth rate estimates providing a sense of how the utility expects the value of assets to change across all states. With different population changes in these states, assuming that investment rates in each state will change equally is not realistic. Rather, if a utility must invest more in one state to serve a growing population, we can expect enterprise-wide growth rates to reflect trends in those high-growth markets disproportionately.
3. Growth rate timelines are arbitrarily extended: DHI relies on CAGR estimates to produce its projections for 2023-2031. While the growth rate estimate from Xcel aligns with this period, the estimates for CPE and MERC do not, with CPE's estimate concluding in 2026 and MERC's ending in 2027. Rather than following this time frame, DHI arbitrarily extended the CAGR growth rate projections for these two utilities to 2031 without a methodological justification.
4. The projections do not adjust for inflation. Failing to adjust for inflation is misleading in modeling the cost of the investments and the cost to customers. If one wanted to avoid adjusting for inflation and provide an accurate estimate of how much the rise in cost will impact customers' financial security, they would also need to account for changes in wages and other prices during the same period, as increased wages would necessarily indicate greater purchasing power. For example, if energy costs were to increase by 10% over the next five years, while average wages and the Consumer Price Index increased by 12% during that same time, the average customer would be devoting less of their income and household budget to energy costs. By failing to account for inflation, the DHI analysis paints a distorted picture of how Minnesotans will experience changes in the cost of natural gas utility services.

Taken together, these analytical flaws compromise the reliability of the projections provided in the DHI report and ultimately suggest methodological choices more concerned with persuasion than accuracy. The DHI analysis likely overstates the future costs of gas distribution capital expenditures by anywhere from $813 million to $6.5 billion. The movement to clean energy is a monumental task and must be guided by prudent analysis. The next section gives a broad overview of a more responsible path toward the goal of decarbonization in Minnesota.

Section 4: An Affordable, Safe, Equitable, and Reliable Path to Decarbonization

While there are no explicit recommendations made in the DHI analysis, its critique of gas utility capital expenditures appears designed to make the case against further investment in gas distribution infrastructure, which the authors seem to believe will inevitably be made obsolete by rapid electrification. However, existing analysis casts considerable doubt on the feasibility and affordability of a rapid transition to an energy system that relies exclusively on clean electricity.

A recent group of stakeholders representing environmental and clean energy advocates, utilities, regulators, consumers, workforce advocates, and state and local governments put together a set of recommendations for decarbonizing Minnesota's natural gas end uses.[37] To inform these recommendations, the group called for the modeling of three scenarios that would lead to decarbonizing natural gas end use by 2050 in Minnesota: 1. a high electrification scenario, 2. a decarbonized gas scenario (wherein natural gas is replaced with a more sustainable blend of biomethane, synthetic natural gas, and hydrogen), and 3. an electrification with gas backup scenario (wherein electricity becomes a primary fuel source with a gas system kept in place to meet peak energy demand, especially during the winter).

While the stakeholder group opted not to pursue just one of these scenarios, recognizing the importance of having flexibility in the future, the modeling did show that the electrification with gas backup system "would be the lowest cost option."[38] Notably, the group also found that this option would specifically avoid some of the worst consequences for low-income customers. In the high electrification scenario, the stakeholder group worried that only low-income households who could not afford electrification modifications would remain connected to natural gas, meaning higher costs as these households uniquely shouldered the burden of paying for natural gas. By contrast, "this effect is mitigated in the electrification with gas backup scenario, as all existing customers remain connected to the gas system. This means that the costs of the gas system continue to be spread over a large number of customers, mitigating impacts on the delivery component of gas bills."[39]

Illustrating the practicality and utility of this scenario, the province of Quebec, Canada recently implemented a hybrid gas-electric approach to decarbonizing building space heat. In doing so, it specifically pointed to the high costs associated with moving to all-electric space heating in cold climate areas in North America and the way in which these costs are likely to fall disproportionately onto customers who are not able to afford a quick transition to electric heating.[40] As a result, they are pursuing a hybrid gas-electric pathway, seeing it as a more equitable and affordable approach.

37 See https://betterenergy.org/blog/report-decarbonizing-minnesotas-natural-gas-end-uses/.

38 See page 58, https://betterenergy.org/blog/report-decarbonizing-minnesotas-natural-gas-end-uses/.

39 See page 42, https://betterenergy.org/blog/report-decarbonizing-minnesotas-natural-gas-end-uses/.

40 See https://www.spglobal.com/commodityinsights/en/ci/research-analysis/quebecs-hybrid-gaselectric-approach-to-decarbonizing-building.html

The consensus recommendations from the Minnesota stakeholder group provide several important ideas for taking on the electrification with gas backup approach, including the allowance of gas utilities to begin integrating low-carbon fuels into their gas system, reducing methane leakage, and advancing research and development for natural gas decarbonization. As this work is taken on, the recommendations further note the importance of taking action to ensure decarbonization is done by a robust workforce with family-sustaining jobs.[41]

Finally, there are alternative mechanisms to avoid shifting infrastructure cost burdens onto low-income households due to electrification by high-income households. While DHI is right to point to this issue, the Minnesota Public Utilities Commission ultimately has the authority to restructure how rates are paid to ensure equity across the state. This authority should be utilized if high-income households move towards electrification in a way that would raise prices for low-income households who remain dependent on gas.

Taken together, these cost scenarios and recommendations point towards a decarbonizing future that maintains a natural gas system rather than pushing too quickly towards electrification in a way that sacrifices affordability, safety, reliability, and equity.

41 https://betterenergy.org/blog/report-decarbonizing-minnesotas-natural-gas-end-uses/.

Conclusion

The imperative for a safe, reliable, equitable, and affordable energy transition to meet Minnesota's GHG reduction goals is at the forefront of North Star Policy Action's mission. This report emphasizes the need for unbiased and transparent analyses in pursuit of that mission, drawing attention to several issues in the report compiled by DHInfrastructure that we argue fail to live up to that standard.

LACK OF CONTEXT:

The DHI report does not place the growth of Minnesota's capital expenditures into the broader context of these expenditures throughout the country, nor does it account for their importance. In doing so, it paints these investments as driven by the profit motives of Minnesota utility companies rather than as part of a broader nationwide effort primarily focused on the safety of the gas distribution system. Notably, this effort was motivated by a gas line explosion in California in 2010, underscoring the importance of making proactive investments that keep Minnesota's proven gas distribution system as one of the nation's safest.

PAINTING A BIASED PICTURE:

The DHI report makes several assumptions that suggest the analysis is designed to be persuasive rather than accurate. In particular, these decisions each operate to overstate future increases in investment cost.

- **Failing to adjust for inflation:** Contrary to best practices, the DHI report provides investment growth in nominal dollars, making it more difficult to understand the change in the real value of these investments over time. In doing so, it exaggerates the real increase in these investments by nearly $3.5 billion.
- **Arbitrarily extending timeframes:** DHI relies on compound annual growth rates to project expenditures from 2023 to 2031. Notably, only one of the utilities (Xcel) provides a compound annual growth rate for that period. The other two (CPE and MERC) provide growth rates through 2026 and 2027, respectively. Rather than ending their use of growth rates in these years to match the utilities' timelines, DHI instead chose to extend their use of these rates out to 2031 to match Xcel, inflating their estimate by $813 million over the next nine years.
- **Failing to account for geographic variation:** The DHI report treats the utility's projections as homogenous across the various states in which they operate rather than accounting for differences in growth rates across the states. A quick scan of utility data suggests there is likely to be geographic variation, wherein the utilities will shrink their investments in states with relatively steady population growth (e.g., Minnesota).
- **Failing to draw on pertinent data:** Rather than utilizing data sources from the utilities that are specific to the subject matter, DHI chose to extrapolate from broader annual growth rate projections, ensuring that the increases it found would be substantial.
- **Taken together, these problematic methodological assumptions suggest that DHI's analysis exaggerates the future cost of gas distribution capital expenditures in Minnesota by between $813 million and $6.5 billion.**

In promoting this biased perspective, DHI pushes Minnesota to sharply restrict expenditures on distribution system maintenance and safety improvements, a policy shift that could endanger public safety and unduly burden the low-income households likely to rely more heavily on continued safe and reliable gas utility service. Moreover, such a move does not account for the specific nature of this shift in a cold North American climate, ignoring evidence from other areas in the region that have found that a hybrid gas-electric approach is more affordable, reliable, and equitable. This hybrid approach provides a strong foundation for the state's transition to a decarbonized future.

Any energy transition that is not safe, reliable, equitable, and affordable puts this entire transition at risk. Policymakers need to carefully consider the next steps that Minnesota will take in moving toward a decarbonized future, and they need to have the most accurate information available to do so. We hope this report aids them in that effort.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