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June 25, 2024

Ms. Lisa Felice
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, Michigan 48917

RE: In the matter of the application of **DTE GAS COMPANY** for authority to increase its rates, amend its rate schedules and rules governing the distribution and supply of natural gas, and for miscellaneous accounting authority
MPSC Case No. U-21291

Dear Ms. Felice:

The following is attached for paperless electronic filing:

Official Exhibits of the DTE Gas Company admitted into the record:

Exhibit A-12, Schedules B5.6 thru B5.7

If you have any questions or concerns with this filing, please contact me at the above referenced number.

Respectfully Submitted,

Estella R. Branson

Digitally signed by Estella R. Branson
Date: 2024.06.25 14:53:59 -04'00'

Estella R. Branson
Senior Paralegal

Enclosure

Case No.: U-21291
Exhibit: A-12
Schedule: B5.6
Witness: K. M. Fedele
Page: 1 of 69

DTE Gas Delivery Plan

2024-2033

DTE

Table of Contents

Case No.: U-21291
Exhibit: A-12
Schedule: B5.6
Witness: K. M. Fedele
Page: 3 of 69

The DTE Gas Company ("DTE Gas" or the "Company") has been operating for more than 170 years and currently serves approximately 1.3 million customers across the state of Michigan. To help communicate long-term capital investment plans to the Michigan Public Service Commission (MPSC) and other interested parties, the Company has updated the initial version of its 10-year Gas Delivery Plan (GDP), which was submitted with the Company's last rate case in February 2021. This plan is grounded in the DTE Gas vision to prioritize safe and reliable natural gas service and maintain that service in an affordable and environmentally responsible way for generations of Michiganders to come. As a 10-year plan, however, many of the longer-term projections within are estimates and will necessarily evolve to reflect changing opportunities and challenges in the system, industry, and communities.

This updated plan presents the Company's economic development plans with an energy and environmental justice perspective and includes enhancements to the Company's Pipeline Safety Management System (PSMS) and cyber-security initiatives.

The three key objectives of the DTE Gas plan are:

Safety and Reliability:
To have zero safety or system reliability incidents

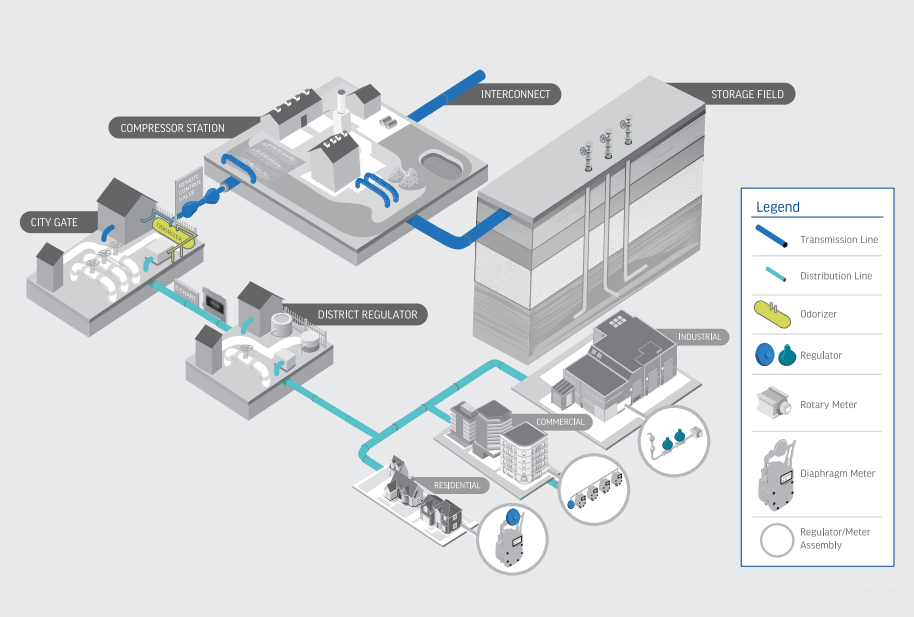
Affordability:
To maintain affordable natural gas service for customers

Environmental Responsibility:
To make measurable progress toward the Company's 2050 net zero target for upstream and internal (utility distribution) related activities and reduce customer-use emissions by approximately 35% by 2040

The DTE Gas System

DTE Gas delivers natural gas through approximately 23,000 miles of pipeline, which includes approximately 2,000 miles of transmission and 21,000 miles of distribution pipeline. The Company also owns and operates seven compressor stations and four underground storage fields. These storage fields contain 165 active (injection, withdrawal, and observation) wells, hold up to 139 Bcf (billion cubic feet) of working gas, and are located throughout the state. Each storage field has unique operating characteristics that are explained further in this plan. The Company also has multiple points throughout the transmission system where it can receive gas supply including more than 30 major interconnects with nine different pipeline companies. An illustrative diagram of the natural gas system can be seen in Figure 1.

Natural Gas System – Illustrative – Figure 1



Gas Safety

DTE Gas is proud of its long-standing, 174-year history of operating safely which is supported by a strong safety culture and robust pipeline safety programs. The Company is committed to continually identifying and mitigating system risk and improving its pipeline safety programs. One mechanism DTE Gas utilizes to identify and mitigate risks is through a Pipeline Safety Management System (PSMS), a structured industry best practice.

The first step in mitigating risk is to identify and assess potential risks to the system. DTE Gas completes a comprehensive pipeline safety review of its system annually, incorporating risk modeling results, recommendations from the PHMSA (Pipeline and Hazardous Materials Safety Administration), NTSB (National Transportation Safety Board), MPSC (Michigan Public Service Commission), AGA (American Gas Association), TSA (Transportation Security Administration), and subject matter experts. As a result of this work, the Company has developed a prioritized list of known industry risks and associated threats that could impact the safety and reliability of the DTE Gas pipeline system (See Table 1 on next page). The Company recognizes the importance of reducing overall risk to the DTE Gas system through robust countermeasures and, while the Company's 10-year capital investment plan includes system-critical routine projects and system expansion, most of the capital investment is driven by the risk mitigation countermeasures detailed in this plan.

Top Industry Risks and Associated DTE Gas Countermeasures – Table 1

Industry Risk	DTE Gas Countermeasures
Gas Supply & Deliverability	Belle River Dehydration Unit Redundancy
	Installation of Additional System Interconnects
	Transmission Renewal Program: Van Born Project
	Implementation of a Distribution System Planning Team
	Implementation of a Probabilistic Risk Assessment Model
	Compressor Renewal Program
Transmission Pipeline Failure	Transmission Renewal Program
	Records Management Program
	Transmission Maximum Allowable Operating Pressure (MAOP) Records Remediation
	Class 1 and Class 2 Facility Integration into GIS and the Probabilistic Risk Model
	ILI Expansion Program
Distribution Gas Leaks	Gas Renewal Program
	Meter Assembly Check – Meter Move Out (MAC MMO) Program
	Leak Remediation
	Ground Movement Mitigation Program
	Distribution Renewal Program
	Distribution MAOP Records Remediation
	Cross Bore Inspections
System Overpressure	Risk-Based Overpressure Protection Program
	Legacy Regulator Remediation/Replacement
Storage Well Unintended Gas Release	Well Renewal Program
	Well Pad Expansion Program
Cyber/Physical Security	DTE Gas Site Security Program
Excavation Damage	Damage Prevention Field Team

Demand and Supply

The focus of the 10-year demand and supply plan is to successfully execute key strategies that support the Company's commitment to safe, reliable, and affordable natural gas service along with environmental stewardship. Three key strategies to support this commitment are: (1) Utilize storage assets to manage system demand during the winter heating season, (2) Ensure reliability of supply through interconnects and transport agreements from multiple supply basins, and (3) Execute a purchasing strategy to minimize price volatility associated with extreme weather events.

In addition to these three strategies, the expansion of the DTE Gas natural gas service territory supports both the affordability to new customers who connect to the Company's system and to existing customers by providing an avenue for the Company to spread its fixed costs over a larger customer base. The Company also plans to further enhance its energy waste reduction (EWR) programs to help customers better manage their gas usage.

The Company's environmental responsibility focus includes working with its suppliers to lower their carbon footprints, reducing emissions through internal gas operations, and reducing customer gas emissions. DTE Gas has a 2050 net zero goal for upstream and internal emissions and a 2040 goal of a 35% reduction from 2005 levels in customer gas emissions.

The Distribution System

The DTE Gas distribution system consists of more than 21,000 miles of main, approximately 1.2 million service lines, approximately 2,500 regulator stations, and over 1.3 million customer meter sets. Leaks in the distribution system are a top industry risk that the Company has prioritized. The factors that drive this risk include pipeline age, pipeline material type, and the presence of inside meters. The DTE Gas key countermeasures to mitigate distribution gas leaks are the Gas Renewal (GRP), Meter Assembly Check Meter Move Out (MAC-MMO), Leak Remediation, Distribution Renewal, Ground Movement Mitigation, and Cross Bore Inspection Programs. It is important to note that the GRP, which includes main renewal projects and meter move out grids, is the Company's largest capital initiative and accounts for approximately 40% of the DTE Gas capital expenditure over the next 10 years. The Company's Distribution Integrity Management Program (DIMP) risk model is utilized to prioritize distribution risk mitigation projects.

The Transmission System

The Company's transmission system consists of approximately 2,000 miles of pipeline spanning the Upper and Lower Peninsula. There are two key industry risks associated with transmission assets – Gas Supply and Deliverability and Transmission Pipeline Failure. The main drivers of these risks are a lack of system redundancy and potential integrity issues. The key countermeasures for mitigating these risks are the Transmission Renewal Program (TRP), additional system redundancy, additional interconnects, an In-Line Inspection (ILI) Expansion Program, Stress Corrosion Cracking (SCC) pipeline assessments, and a Maximum Allowable Operating Pressure (MAOP) Records Remediation and Records Management Plan. The Company's Transmission Integrity Management Program (TIMP) risk model is utilized to prioritize transmission risk mitigation projects.

The Storage System

DTE Gas owns four underground natural gas storage facilities with 165 active storage wells in the Lower Peninsula. These storage facilities can hold a total of 139 Bcf of natural gas (working gas), which is critical to support DTE Gas system resiliency and reliability during summer and winter operations. To ensure the gas supply is uninterrupted, DTE Gas utilizes its underground natural gas storage integrity management plan to identify and prioritize risks to storage assets, including another top industry risk – storage well unintended gas release. Potential contributors to this industry risk include well entry loss of control, wellhead shear, and well casing mechanical failure. The Company has three key countermeasures to mitigate these industry risks, which include well entry preventative maintenance, a Well Pad Expansion Program, and a Well Renewal Program (WRP).

The Compression System

DTE Gas has seven compressor stations throughout the state featuring 47 compressor units totaling approximately 180,000 horsepower (HP). The Company's compression assets provide critical compression necessary to inject and withdraw gas from storage and move gas across the system, ensuring reliable gas deliverability to customers. DTE Gas has strong preventative maintenance programs to enable sustained equipment reliability, however, nearly half of the Company's compressor units were put into service over 40 years ago. As a result, DTE Gas is developing a Compression Replacement Program (CRP) to replace older assets.

KEY COUNTERMEASURE MILESTONES

This 10-year Gas Delivery Plan will allow the Company to manage the top industry risks while meeting its objectives of providing safe, reliable, affordable, and environmentally responsible natural gas service. By 2033, DTE Gas expects to have achieved the following key countermeasure milestones:

1. **Distribution:** Moved most inside meters outside and remediated over 2,000 additional miles of legacy pipeline
2. **Transmission:** Single-source risk mitigated for more than 300,000 customers and the ability to assess 99% of HCA (High Consequence Areas) pipeline mileage with ILI
3. **Storage:** Expansion of well pads to mitigate wellhead shear risk for 134 well pads and renewal of 20 low cement top wells
4. **Compression:** Continuation of the preventive maintenance program and the development of the Compression Replacement Program

Case No.: U-21291
Exhibit: A-12
Schedule: B5.6
Witness: K. M. Fedele
Page: 7 of 69

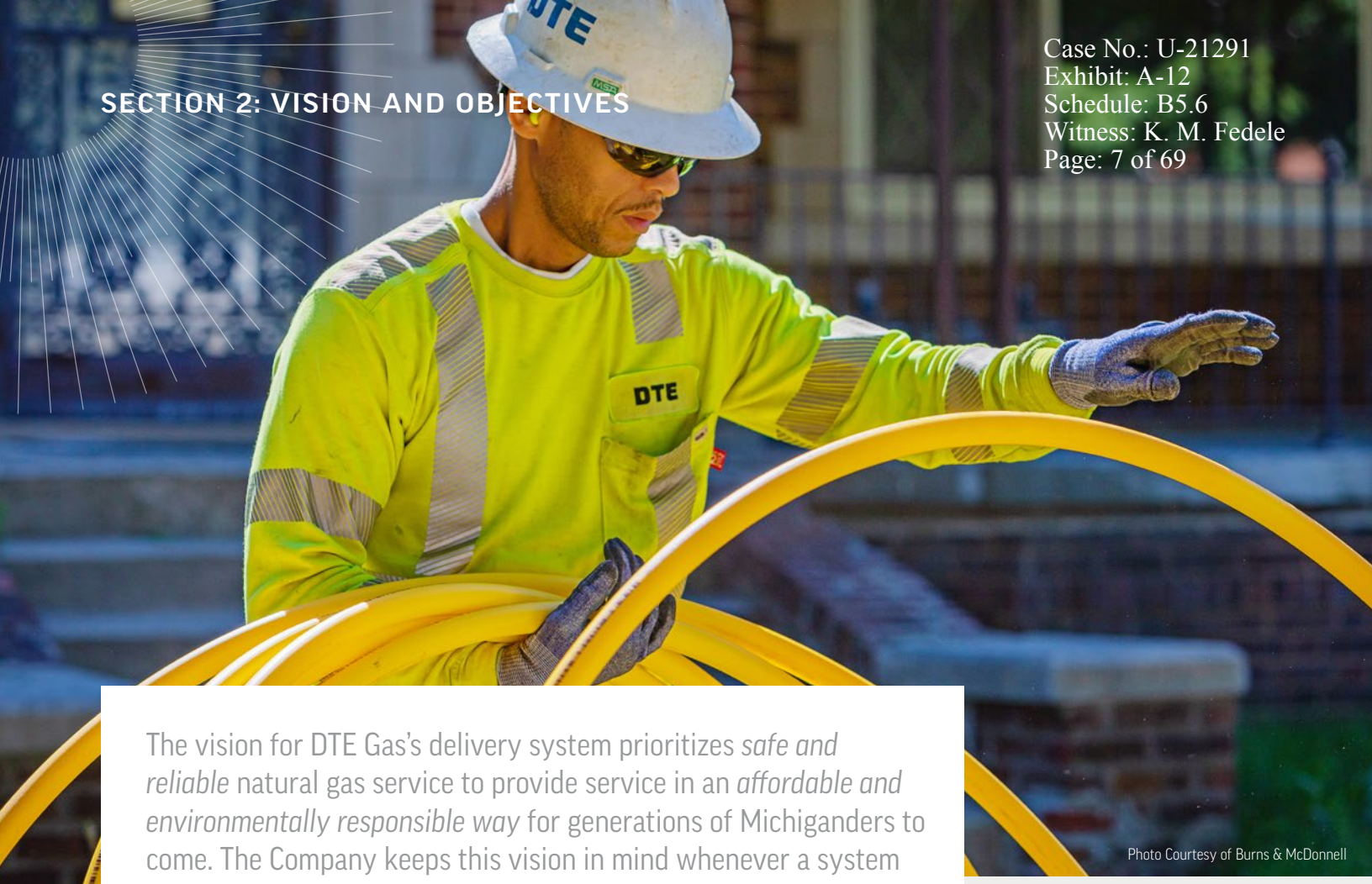


Photo Courtesy of Burns & McDonnell

The vision for DTE Gas's delivery system prioritizes *safe and reliable* natural gas service to provide service in an *affordable and environmentally responsible way* for generations of Michiganders to come. The Company keeps this vision in mind whenever a system risk or enhancement opportunity presents itself and seeks a path forward that delivers the best outcomes for its customers.

Safety and Reliability

The safety and reliability of the DTE Gas system are top priorities for the Company.

Foundational to the Company's pipeline safety commitment is its adoption of the American Petroleum Institute's Recommended Practice 1173, a Pipeline Safety Management System (PSMS). A PSMS is a scalable and flexible framework that applies a systematic approach to the management of the Company's pipeline safety programs and initiatives. The framework encompasses a continuous journey of pipeline safety improvement measured by five levels of organizational maturity (Planning, Developing, Implemented, Sustaining, and Improving).

The ultimate goal of the Company's PSMS is to ensure the safety and reliability of its system by identifying and mitigating pipeline safety hazards and effectively responding to unforeseen disruptions should they occur. This ensures the Company can continue to provide excellent service to the customers and communities it serves.

Core to a PSMS are its 10 key elements, such as risk management, record keeping, and safety assurance, as illustrated in Figure 2. Continued implementation of a PSMS both strengthens the programs and initiatives that DTE Gas already has in place, as well as surfaces new areas of opportunity. The Company's implementation will include the deployment of robust Information Technology (IT) and Operational Technology (OT) solutions as necessary.

PSMS Maturity levels

Planning
Level 1

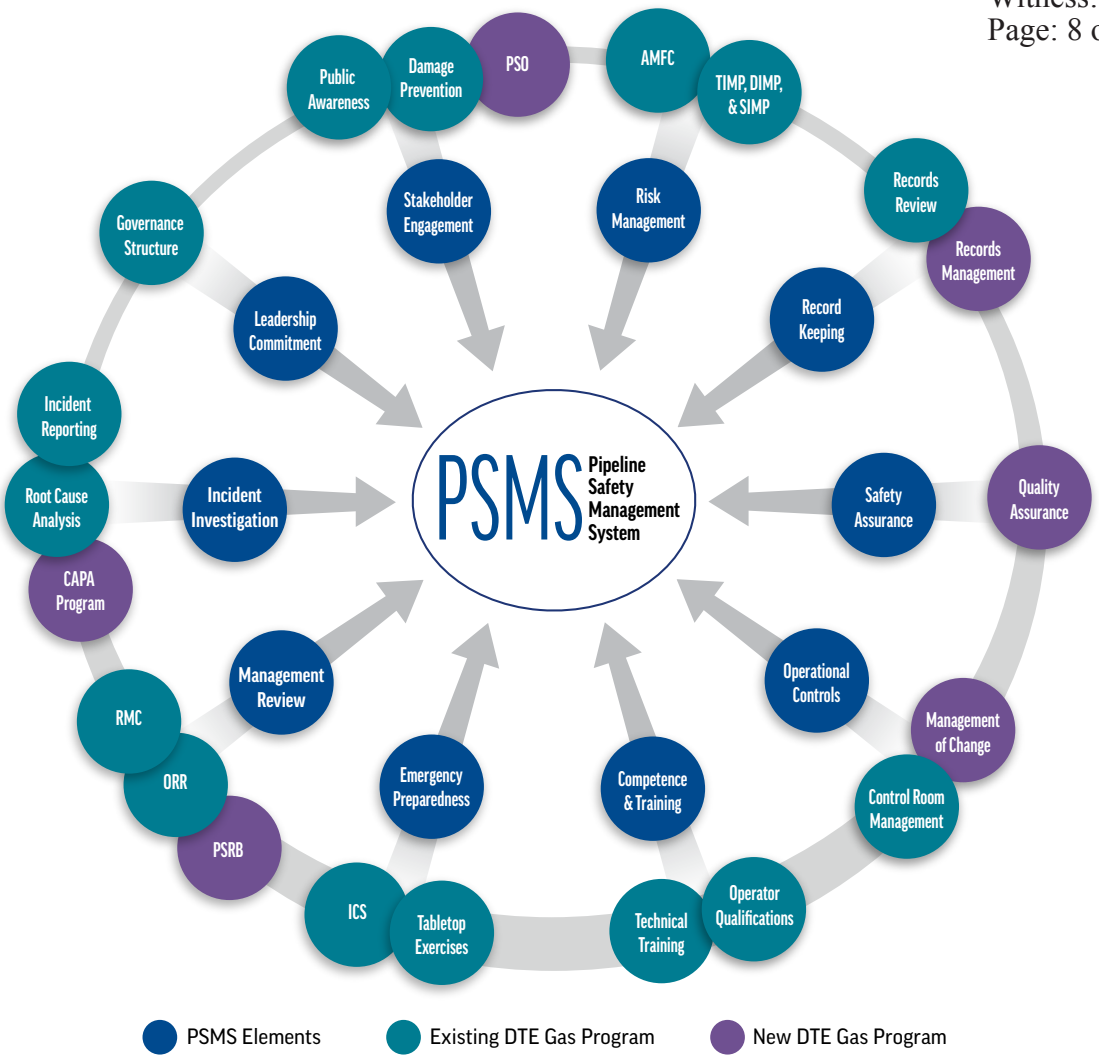
Developing
Level 2

Implemented
Level 3

Sustaining
Level 4

Improving
Level 5

PSMS Key Elements and DTE Gas's Programs – Figure 2



DTE Gas's PSMS is anchored by three key areas: Governance, Culture, and Risk Management. Each area plays a key role in the program's success.

DTE Gas follows a comprehensive approach to identifying and prioritizing known industry risks to natural gas systems based on the probability of occurrence and potential consequence. The recommendations from the MPSC's State Energy Assessment (SEA) report have been included in the DTE Gas risk assessment, and countermeasures for each risk have been developed and prioritized to reduce the overall risk to the system. The top industry risks to be addressed within the Company's Gas Delivery Plan are:

- Gas Supply/Deliverability
- Transmission Pipeline Failure
- Distribution Gas Leaks
- System Overpressure
- Storage Well Unintended Gas Release
- Cyber/Physical Security
- Excavation Damage

The execution of DTE Gas safety and reliability initiatives is measured via metrics reviewed and assessed as part of the PSMS governance. The integration of the 10 PSMS elements within existing programs helps accelerate and advance the Company's existing pipeline safety culture.

The DTE Gas PSMS Key Areas
Figure 3

Governance

Culture

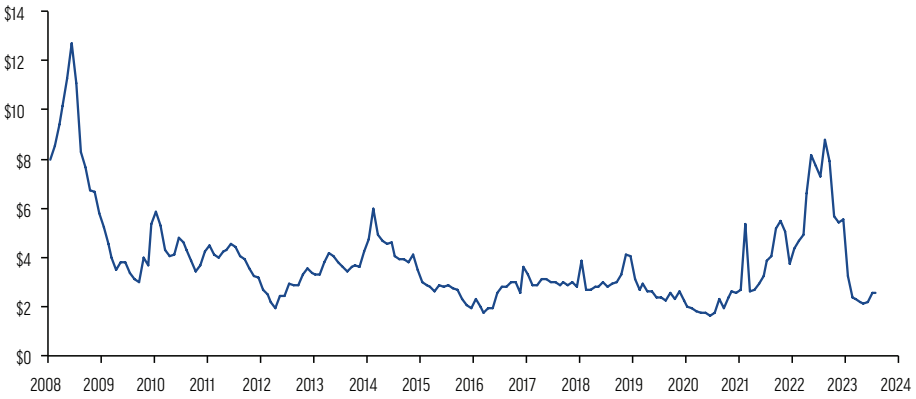
Risk Management

Affordability

The affordability of delivered natural gas is a key priority for the Company and is top-of-mind for customers. The cost of delivering natural gas consists of two elements – the cost of the natural gas commodity and the cost to deliver it safely and reliably.

Michigan experienced a significant decrease in natural gas costs over the last decade through 2021, which was associated with an increase in shale gas production (See Figure 4). This phenomenon provided the opportunity for DTE Gas to make strategic investments in the natural gas delivery system to improve both safety and reliability, while also reducing average residential monthly bills (See Figure 5 - Average customer bills dropped more than 30% from 2008 to 2021). In August of 2022, due to higher demand, the Henry Hub natural gas price was $8.81/MMBTU, the highest commodity cost since 2009. After a warmer winter and a significant increase in production, the April 2023 Henry Hub natural gas price was $2.16/MMBTU (which was the lowest since September 2020). With global gas supply and demand uncertainty and repeated severe winter events causing disruptions in gas markets, volatility is expected to continue to impact pricing.

Henry Hub Natural Gas Historic Prices ($/MMBTU) – Figure 4

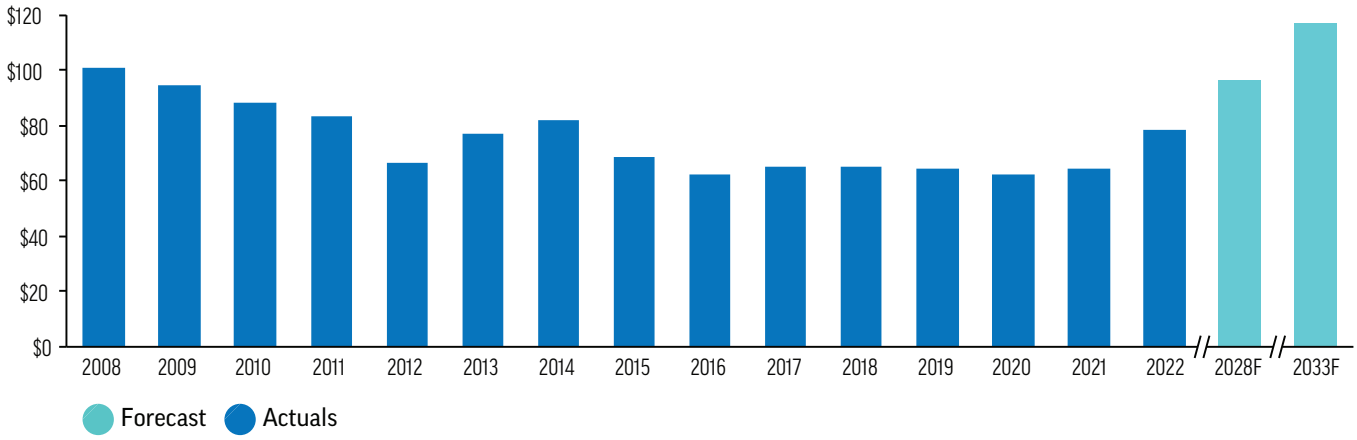


The Company's primary mechanism to mitigate the impact of volatile commodity costs on customer bills continues to be its purchasing strategy, which ensures the Company has secured 75% of its requirements at the beginning of each year.

As DTE Gas looks toward the next 10 years, the Company expects continued pricing volatility. These swings combined with investments to maintain the safety and reliability of the system are expected to drive modest increases in the average monthly customer bills (See Figure 5). These necessary investments will be made at a measured and risk-based pace to ensure monthly bills remain affordable for customers.

DTE Gas employs multiple strategies to help ensure the Company's products and services are affordable. One such effort is the Company's new customer attachment work, which will utilize funds from the Low Carbon Energy Infrastructure Enhancement and Development Fund to expand natural gas infrastructure to underserved communities in the villages of Mesick and Buckley in 2024. This fund is at no direct cost to DTE customers but rather supported by federal funds granted to the state of Michigan.

DTE Gas Average Residential Monthly Bills – Figure 5



Additionally, DTE Gas continuously adds customers to its system, allowing the Company to spread fixed delivery costs over a larger customer base, thereby lowering costs for all customers. As an added benefit, natural gas system expansion often enables local increases in economic development as natural gas typically lowers the overall energy bill for new residential customers and facilitates commercial development through the increased availability of more affordable natural gas within communities.

In addition, DTE Gas has developed low-income customer programs that improve affordability through Energy Waste Reduction (EWR) measures that reduce consumption and improve access to payment assistance and affordable payment plans. These programs include the Company's Low-income Self-sufficiency Program (LSP), the Low-Income Assistance Credit (LIA), and the Residential Income Assistance Credit (RIA).

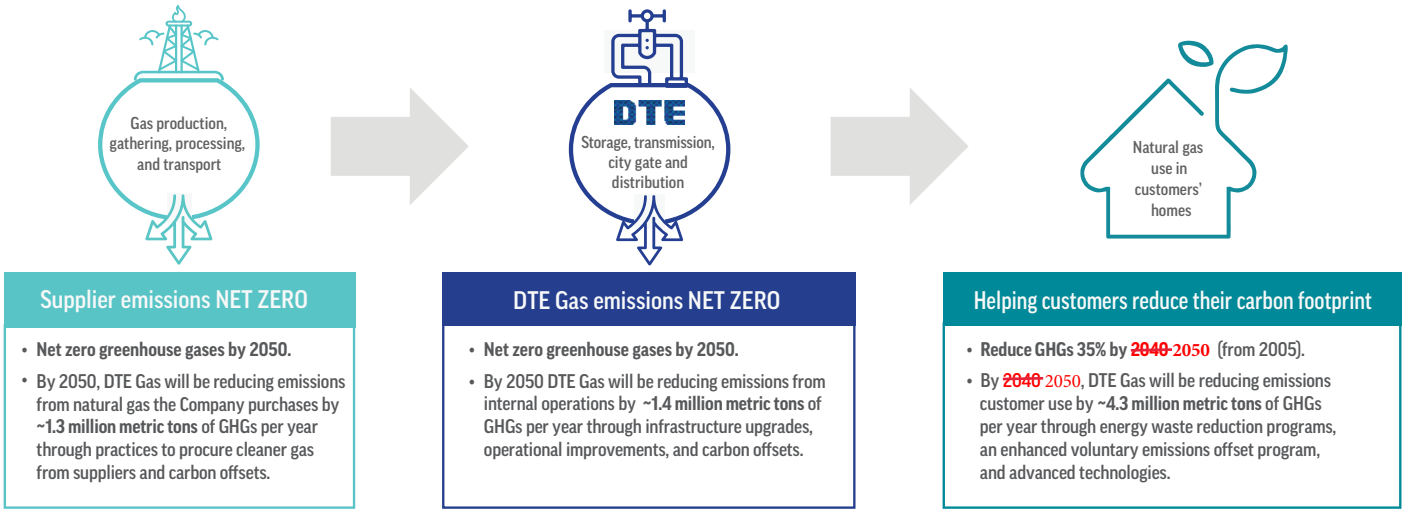
Environmental Responsibility

The DTE Gas environmental responsibility journey took a major step forward in 2011 when the Company outlined several initiatives to safeguard the environment and reduce emissions.

In 2020, the Company took another significant step when it committed to further emission reductions: (1) Net zero emissions by 2050 for its internal gas utility operations, (2) Net zero emissions by 2050 for all the natural gas DTE Gas purchases, and (3) Achieve a 35% reduction in emissions by 2050 for the natural gas used by the Company's customers (updated to 2040 the following year). In totality, these commitments are estimated to reduce more than seven million tons of CO_2e (CO_2 equivalent) emissions annually by 2050 (compared to 2005 levels). This aggressive approach not only reduces methane and carbon dioxide emissions from DTE Gas operations but also extends to cut emissions across the entire natural gas delivery system (See Figure 6).

Additionally, DTE Gas has made improvements in its construction practices beyond carbon reduction. One of the major additions that reduced environmental risk during horizontal diagonal drilling (HDD) was to complete a geotechnical study on the proposed HDD soil before work begins. The geotechnical studies have significantly reduced inadvertent releases of drilling mud in and around the waters of the state. The Company's new process is to complete a geotechnical study before all HDD's.

DTE Gas Value Chain Sustainability Approach – Figure 6

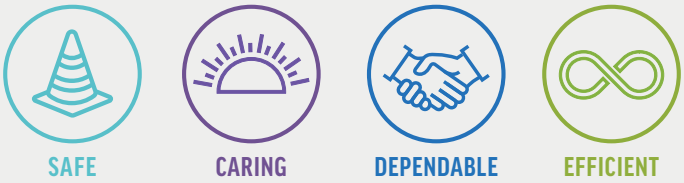


Measuring progress towards the Company's Vision and Objectives

DTE Gas has established objectives and goals within each of the three key areas of its vision. The Company will continuously measure its progress towards this vision to ensure it is on track to achieve the desired 10-year outcomes in each area.

Table 2

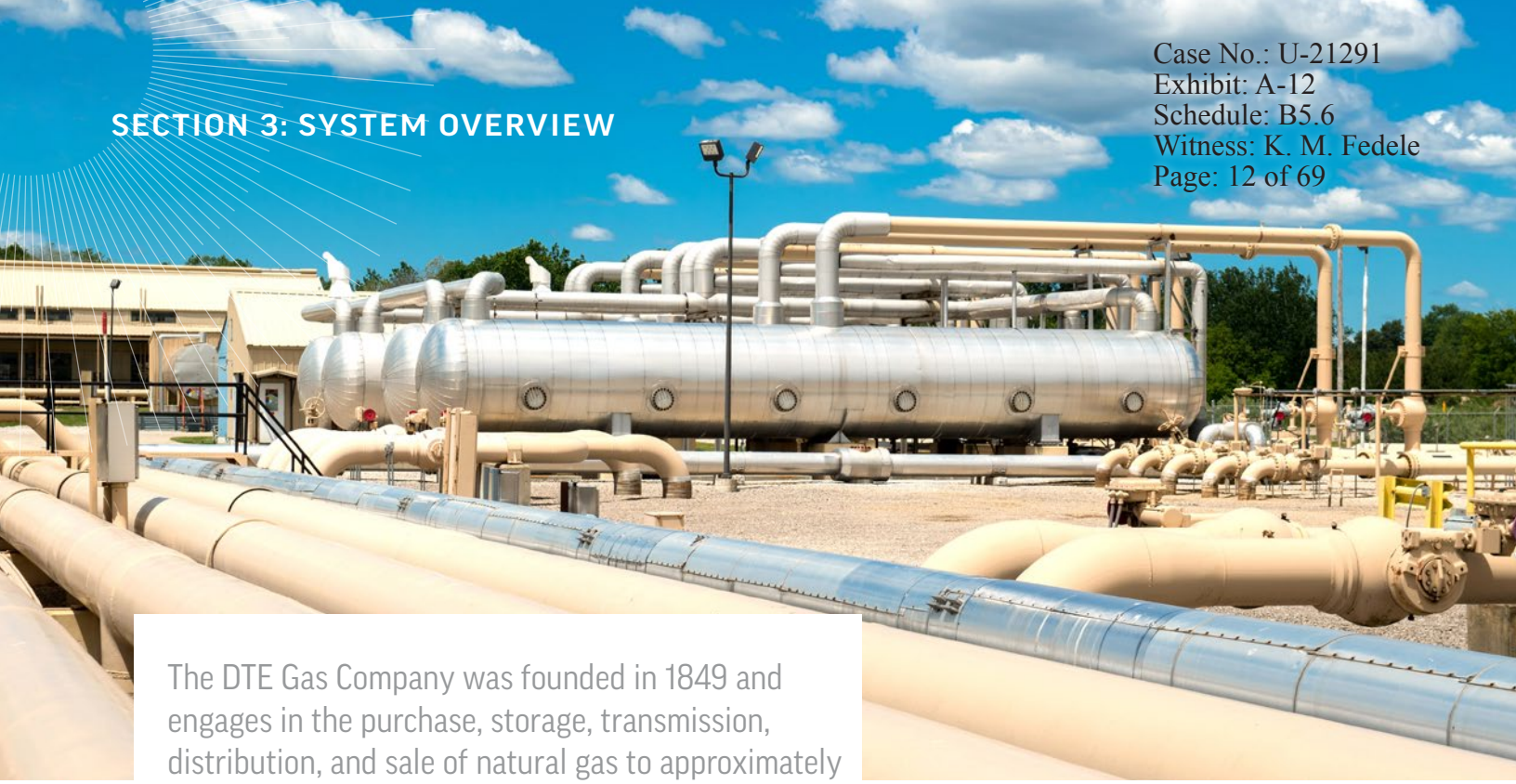
	Safety & Reliability	Affordability	Environmental Responsibility
Objective	Zero safety or system reliability incidents	Maintain affordable natural gas service for customers	Make measurable progress toward the Company's 2050 net zero emissions target
Strategies	• Continue renewal of higher-priority distribution and transmission assets • Utilize system-wide probabilistic risk assessments • Implement and continue to mature PSMS to prioritize and minimize industry risk	• Prioritize customer affordability as the Company evaluates future capital investments • Offset affordability pressures through customer growth and operational efficiency programs	• Achieve net zero for both internal (scope 1) and natural gas supplier-related carbon emissions by 2050 (scope 3 categories 1, 3, and 4) • Reduce customer carbon emissions by 35% by 2040 (scope 3 category 11)
10-year Outcomes	Achieve PSMS maturity of 4.5	Deliver a safe and reliable natural gas product to customers at an affordable price	Achieve a 40% reduction in scope 1 emissions towards the DTE Gas 2050 net zero goal for internal emissions



Service Keys

DTE Gas is leveraging its "Service Keys" to demonstrate that the Company will always strive to keep customers and its employees *Safe*, be *Caring* in everything the Company does, and deliver products and services in a *Dependable* and *Efficient* manner. This document highlights major processes that demonstrate these Service Keys to show the commitment DTE Gas has to Service Excellence.

Case No.: U-21291
Exhibit: A-12
Schedule: B5.6
Witness: K. M. Fedele
Page: 12 of 69

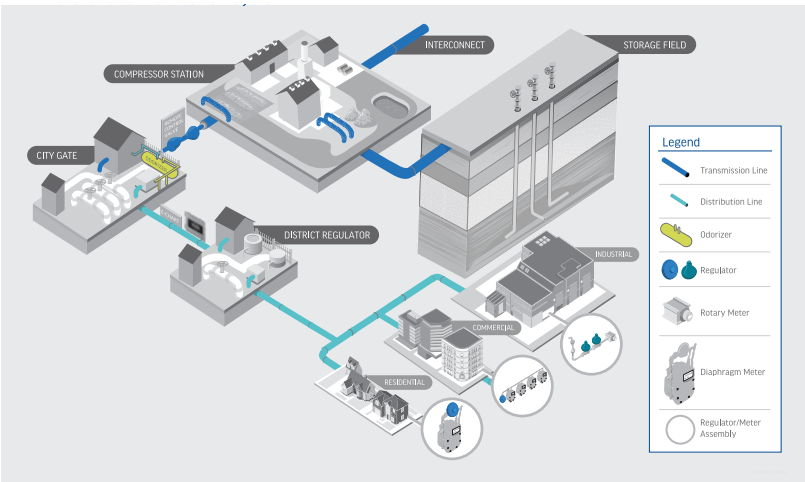


The DTE Gas Company was founded in 1849 and engages in the purchase, storage, transmission, distribution, and sale of natural gas to approximately 1.3 million customers spread between Greater and Southeast Michigan.

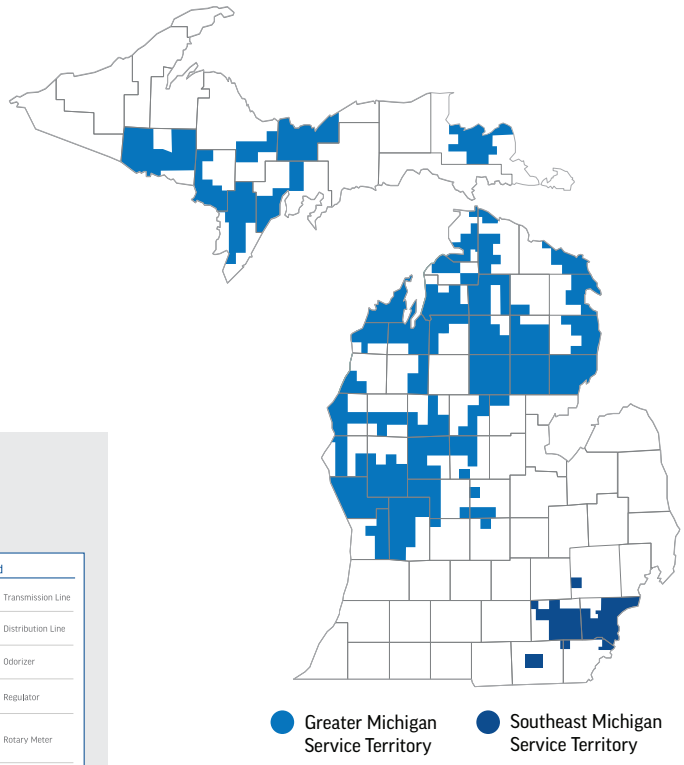
DTE Gas System Overview

DTE Gas delivers natural gas through approximately 23,000 miles of pipeline, which includes approximately 2,000 miles of transmission pipeline and 21,000 miles of distribution pipeline. The company owns and operates seven compressor stations totaling approximately 180,000 HP, as well as four underground storage fields with 165 active storage wells and a working gas capacity of 139 Bcf (See Figure 9).

Natural Gas System – Illustrative – Figure 8



DTE Gas Service Territory – Figure 7



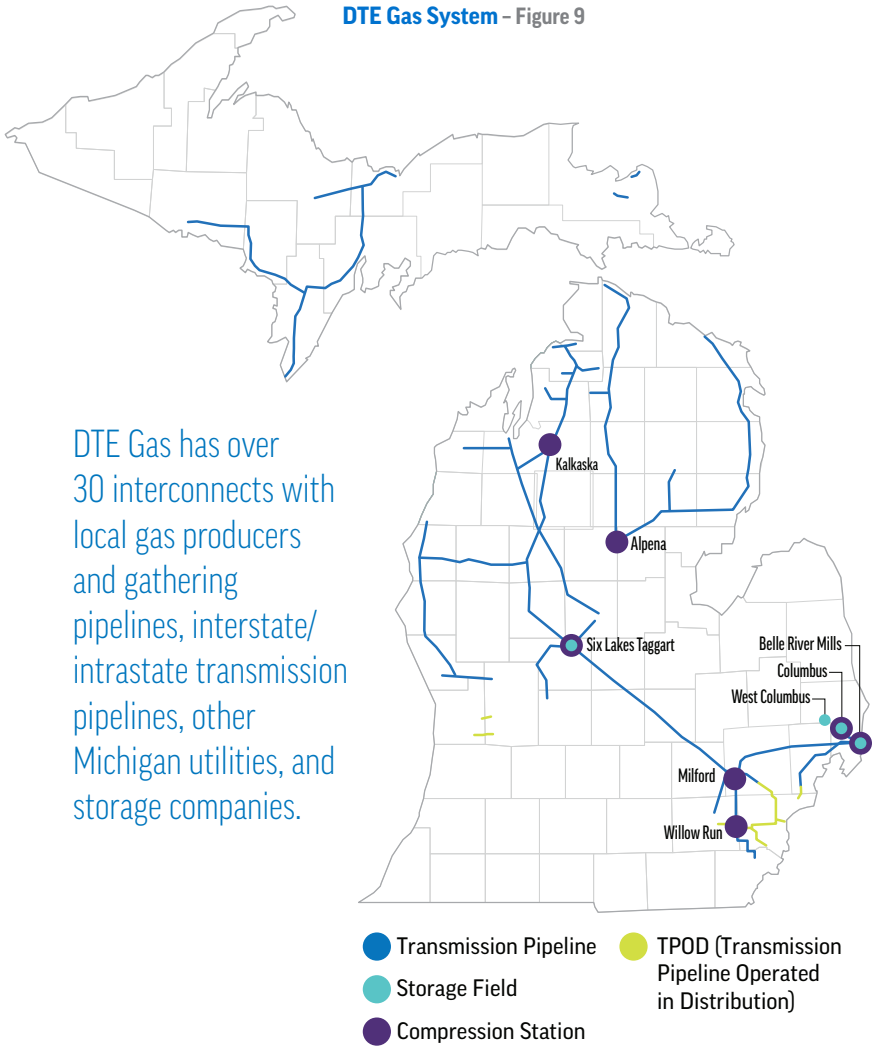
DTE Gas has more than 30 interconnects with local gas producers and gathering pipelines, interstate/intrastate transmission pipelines, other Michigan utilities, and storage companies. The Company's transport contracts and interconnections enable a diverse supply of gas into its system, which helps provide reliable service to its customers. The DTE Gas transmission system generally operates between 300 and 1,000 pounds per square inch gauge (psig) but can operate as high as 1,800 psig in storage complexes. The transmission system operates with pipelines up to 36" in diameter and carries large volumes of natural gas around the system for the purposes of:

- Supplying natural gas to or from interconnecting parties
- Injecting natural gas into and withdrawing from storage fields
- Delivering natural gas to DTE Gas and other companies' distribution systems for delivery to residential, commercial, and industrial customers

The DTE Gas compressor stations provide additional pressure for storage operations and deliverability to gate stations. Gate stations reduce pressure from the transmission system to the distribution system (generally operating between 2 and 300 psig), which supplies gas to customers at ¼ psig pressure for a typical residential home after further pressure reduction at the house regulator.

DTE Gas System – Figure 9

DTE Gas has over 30 interconnects with local gas producers and gathering pipelines, interstate/intrastate transmission pipelines, other Michigan utilities, and storage companies.

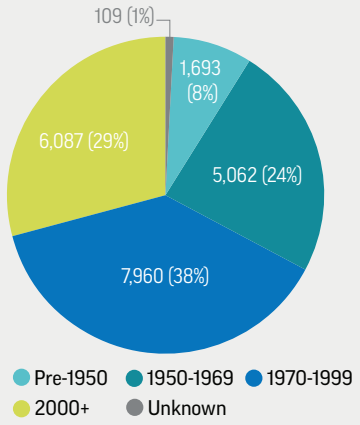


Distribution

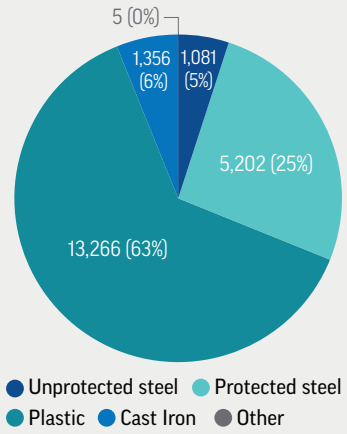
Approximately 32% of the Company's current distribution system mileage was installed before issuance of the federal pipeline safety standards in 1970 (See Figure 10). A majority of the distribution system mileage is comprised of modern plastic material but unprotected steel (approximately 5%) and cast-iron pipe (approximately 6%) still make up a significant portion of the system (See Figure 11). The Company's plan is to eliminate this aged portion of its system through the continuation of the Gas Renewal Program.

An even higher percentage (over 60%) of the Company's approximately 1,300 miles of high-pressure (≥100 psig) steel distribution main was installed pre-1970 (See Figure 12). As covered later in this document, DTE Gas is developing a Distribution Renewal Program to prioritize these high-pressure distribution pipelines for remediation.

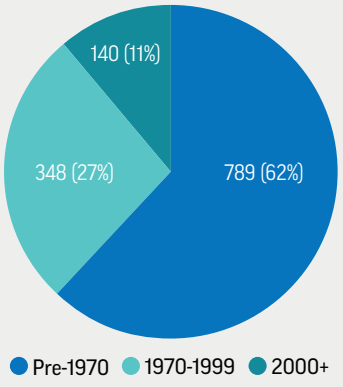
Distribution System Mileage by Installation Decade – Figure 10



Distribution System Mileage by Material – Figure 11



High Pressure Distribution Steel Main Miles (100 Psig or more) by Installation Year – Figure 12

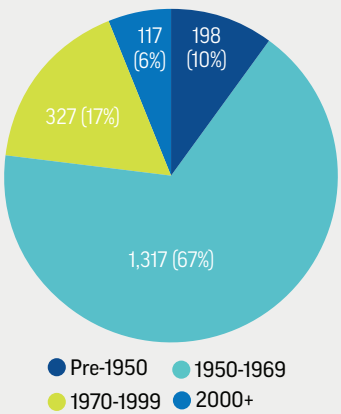


Transmission

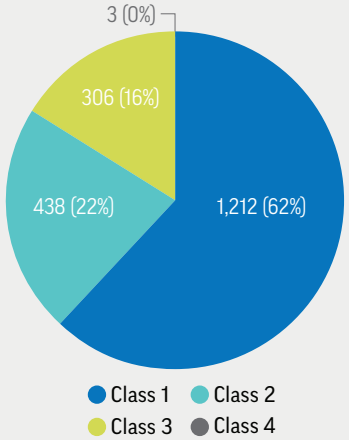
A large majority (77%, or 1,515 miles) of the Company's transmission system was installed before 1970, prior to the issuance of the federal pipeline safety standards (See Figure 13). DTE Gas has implemented an In-Line Inspection (ILI) Expansion Program to increase the coverage of transmission integrity assessments utilizing the best available tools to detect pipeline anomalies. Additionally, DTE Gas has developed a Transmission Renewal Program to prioritize pipelines that need upgrading or replacement.

Approximately 18% (344 miles) of the DTE Gas transmission system mileage is located in highly populated areas, which includes 12% (235 miles) in High Consequence Areas (HCA), and 6% (109 miles) in Class 3 and Class 4 locations that are not HCA. The DTE Gas transmission system also contains 9% Moderate Consequence Areas (MCA) (167 miles). (See Table 3 for class definitions and Figure 14 for the breakdown by class location).

Transmission System Mileage by Installation Decade – Figure 13



Transmission System Mileage by Class (1,2,3, and 4) – Figure 14



Pipeline Class Definitions – Table 3

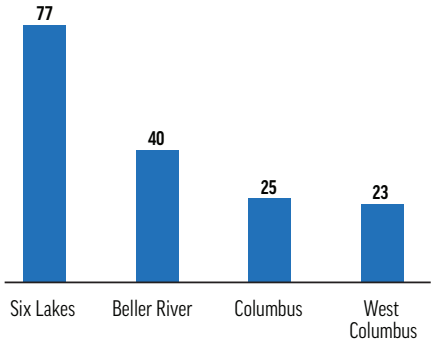
Classes	Definition
Class 1	Any class location unit* that has 10 or fewer buildings intended for human occupancy
Class 2	Any class location unit* that has between 11 and 45 buildings intended for human occupancy
Class 3	Any class location unit* that has 46 or more buildings intended for human occupancy, or An area where the pipeline lies within 100 yards (300 feet) of either a building or a small, well-defined outside area (such as a playground, recreation area, outdoor theater, or other place of public assembly) that is occupied by 20 or more persons on at least five days a week for 10 weeks in any 12-month period
Class 4	Any class location unit* where buildings with four or more stories above ground are prevalent

*An onshore area that extends 220 yards (200 meters) on either side of any continuous one mile (1.6 kilometer) length of pipeline

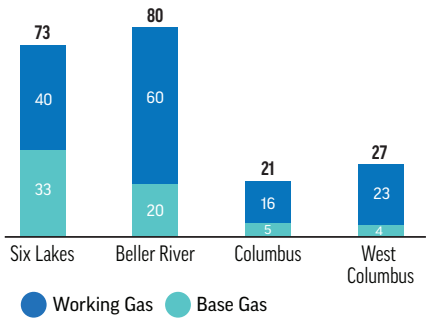
Storage

DTE Gas has operated natural gas storage since 1953 and currently owns four natural gas underground storage fields in Michigan: three in Southeast Michigan and one in Central Michigan. Each storage field has unique operating characteristics. The Six Lakes (Taggart) field, located in Montcalm County (Central Michigan), is operated in a base load manner. The other three fields – Columbus, Belle River Mills, and West Columbus – are located on the east side of the state in St. Clair County. Columbus is a base load field, Belle River is an intermediate field, meaning that it can operate as a base load or peaker field, and West Columbus is operated as a peaker field. When full, these four fields hold a combined 139 Bcf of working gas (customer gas). All four fields utilize depleted natural gas reservoirs that originally held gas for millions of years and this geology makes them ideal for gas storage service as it prevents them from leaking and allows for all the customer gas to be withdrawn in the coldest of winter seasons. The four DTE Gas storage fields contain 165 active storage wells connecting the transmission piping at the surface to the underground reservoirs. Each of the DTE Gas storage fields has been operating for 50 years or more.

Active Wells by Storage Field – Figure 15



Storage Field Working Capacity and Base Gas (Bcf) – Figure 16



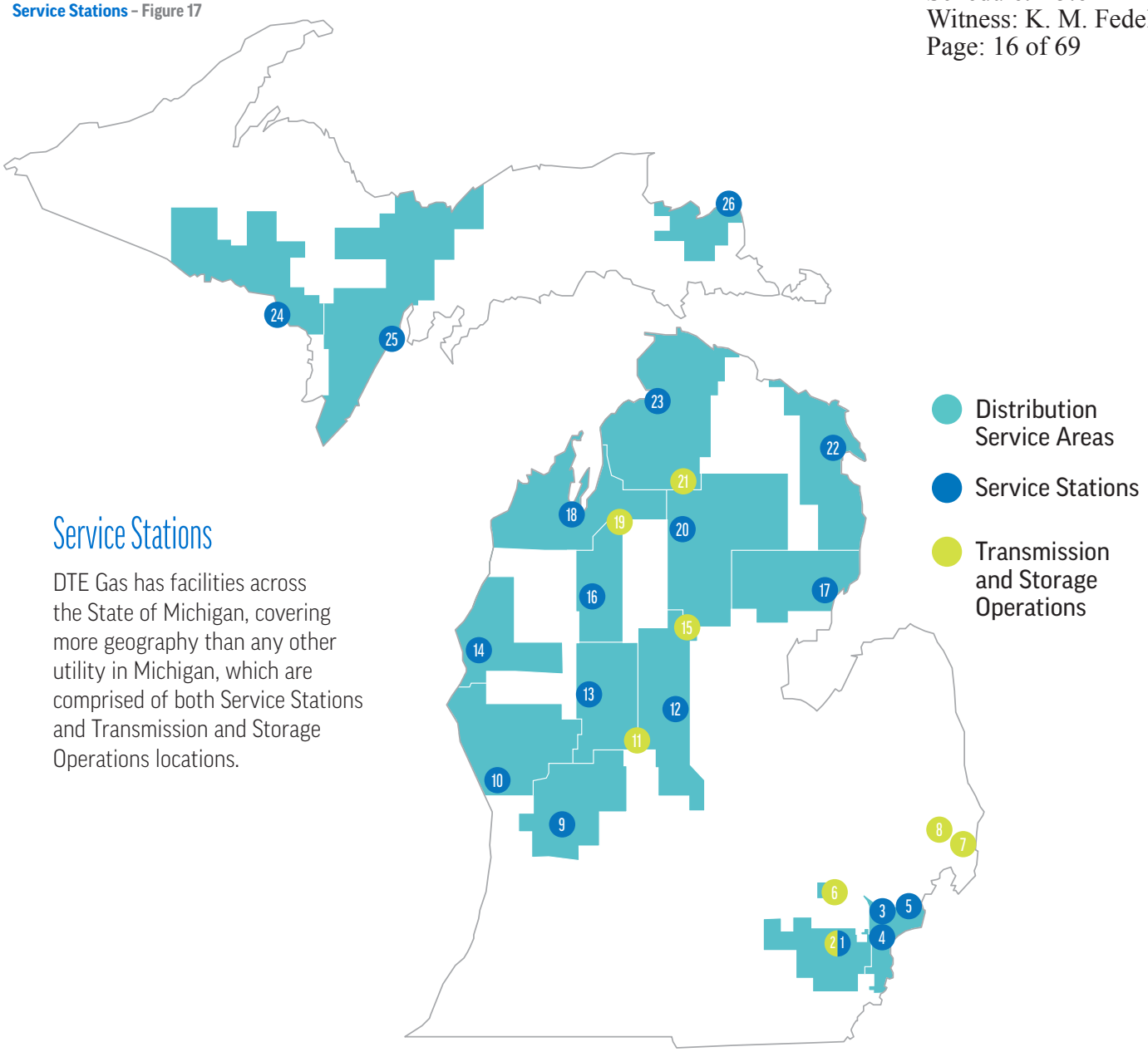
Storage Field Attributes – Table 4

Storage Field	Six Lakes	Belle River	Columbus	West Columbus
Base Gas (Bcf)	33	20	5	4
Working Gas (Bcf)	40	60	16	23
Active Wells	77	40	25	23
Field Storage Year	1953	1965	1971	1973

Compression

DTE Gas has approximately 180,000 horsepower (HP) of compression distributed across seven compressor stations around the state. Compressor stations are used to increase the pressure of natural gas for transportation on the system and for withdrawal from or injection into storage fields. When gas in a pipeline reaches the same pressure as a storage field or adjoining pipeline, compression is used to enable the continued flow of gas.

Service Stations – Figure 17



Service Stations

DTE Gas has facilities across the State of Michigan, covering more geography than any other utility in Michigan, which are comprised of both Service Stations and Transmission and Storage Operations locations.

1. Michigan Avenue
2. Willow Run
3. Coolidge
4. Allen Road
5. Lynch Road
6. Milford
7. Belle River Mills
8. Columbus
9. Wealthy Sation
10. Muskegon
11. Six Lakes (Taggart)
12. Mt Pleasant
13. Big Rapids
14. Ludington
15. Alpena - TSO
16. Cadilac
17. Tawas
18. Traverse City
19. Kalkaska
20. Grayling
21. Gaylord
22. Alpena
23. Petoskey
24. Kingford
25. Escanaba
26. Sault Ste. Marie

As discussed in the *Vision and Objectives* section, the safety and reliability of the gas delivery system are top priorities for the Company. DTE Gas has a long-standing, 174-year history of operating safely, aided by a strong safety culture and robust pipeline safety programs. The Company continually reinforces this culture and strengthens its programs to mitigate risks, such as those recently faced by industry pipeline operators in the U.S. To further deliver on the Company's commitment to pipeline safety, DTE Gas has implemented and continues to mature its Pipeline Safety Management System (PSMS).

Pipeline Safety Management System (PSMS) Overview

In 2015, the American Petroleum Institute (API) issued Recommended Practice (RP) 1173 called "Pipeline Safety Management Systems," which outlines a systematic approach to managing pipeline safety.

In 2019, the American Gas Association (AGA), recognizing a PSMS as an industry best practice, approved a resolution recommending that all members implement a PSMS within three years. The MPSC also extended its support of pipeline safety management systems in 2019 by recommending, through the State Energy Assessment, that natural gas utilities continue to develop and enhance Safety Management Systems to support and prioritize safety programs. DTE Gas is committed to pipeline safety, recognizes the importance of safety management systems, and has adopted API RP 1173: PSMS.

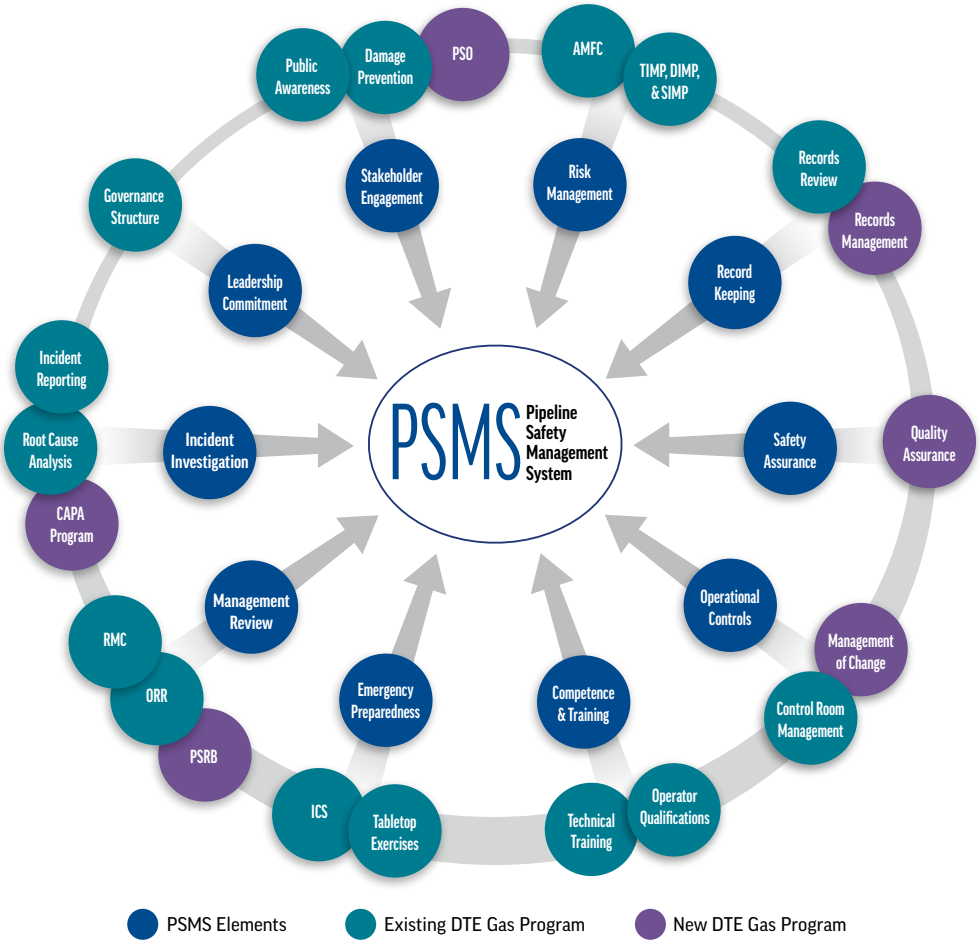
Figure 18 displays the 10 key elements of a PSMS. DTE Gas has many aspects of these elements already in place through various initiatives and programs, such as Damage Prevention, Asset Maintenance Foundational Capabilities (AMFC), and the Transmission, Distribution, and Storage Integrity programs. Adoption of a PSMS enhances and strengthens the Company's existing programs and identifies opportunistic areas for improvement through Records Management, Quality Assurance, Management of Change, the Pipeline Safety Review Board (PSRB), Pipeline Safety Observations (PSO), and a Corrective and Preventative Action (CAPA) Program.

DTE GAS WILL CONTINUE TO MAKE IMPROVEMENTS TO ITS PIPELINE SAFETY PROGRAMS AND ADVANCE THE MATURITY OF ITS PSMS AS DESCRIBED BELOW.

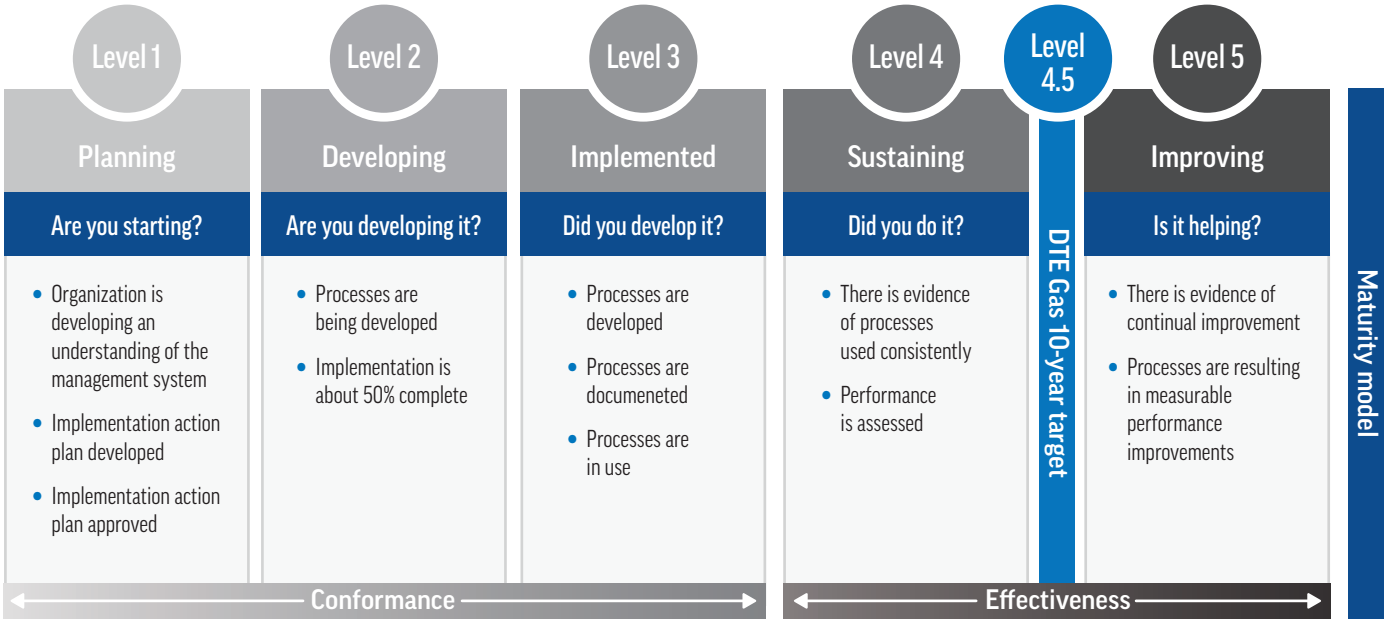
PSMS Maturity

DTE Gas utilizes a maturity model to assess its progress against API 1173 requirements. A PSMS is a journey of continuous improvement in pipeline safety measured by five levels of organizational maturity: Level 1-Planning, Level 2-Developing, Level 3-Implemented, Level 4-Sustaining, and Level 5 Improving (See Figure 19). DTE Gas has a 10-year vision to reach a minimum maturity Level of 4.5 by demonstrating continual and measurable performance improvements.

PSMS Key Elements and DTE Gas's Programs – Figure 18



Pipeline SMS Maturity Model and Tools – Figure 19



DTE Gas PSMS Areas

The DTE Gas PSMS is anchored by three key areas: Governance, Culture, and Risk Management.

Governance

The Company's governance is defined by the direction, oversight, and focus on activities and metrics within a PSMS program. Leadership commitment is a key element of a PSMS, and DTE Gas recognizes that success in continually improving pipeline safety requires a strong leadership presence that sets expectations, demonstrates commitment, and establishes accountability throughout the organization.

As DTE Gas continues to mature its PSMS, governance guides progress through multiple avenues, such as executive governance reviews that evaluate the progress of top PSMS risk mitigation projects and pipeline safety meetings where key industry and company events and lessons learned are shared.

Culture

The DTE Gas pipeline safety culture is strengthened through PSMS activities. The path forward is aligned with the Company's employee safety culture and built from the deployment of intentional actions, employee engagement, and leadership commitment. DTE Gas incorporates the principles of a PSMS throughout the organization and in its processes and procedures.

A critical component to advancing the DTE Gas safety culture is the establishment of the DTE Gas Pipeline Safety Excellence Program (PSEP), which includes Pipeline Safety Observations (PSO), Corrective And Preventative Actions (CAPA), and Incident Investigations. PSO is a system that enables employees to surface potential pipeline safety hazards for Company prioritization and follow-up. The Incident Investigation process has been updated to ensure the appropriate level of analysis is performed based on the severity of the event. The CAPA program tracks all corrective actions resulting from PSO and Incident Investigations, ensuring timely and effective completion of action items. These items are all reviewed and approved by the established PSRB.

DTE Gas is actively involved in various industry groups and initiatives, providing the opportunity to learn and evaluate best practices on building a strong pipeline safety system and culture. Active participation in the American Gas Association's (AGA) various committees and workshops keeps the Company close to industry trends and emerging technology. DTE Gas is also an active participant in an industry Safety Management System (SMS) Collaborative, a group of peer natural gas utilities sharing best practices and providing guidance and insights.

Risk Management

The third key area of the DTE Gas PSMS is Risk Management. This element requires that a pipeline operator analyze existing pipeline safety risks considering the likelihood and consequence of occurrence, and then evaluate how to manage the risks through preventative controls, monitoring, and mitigation measures.

RISK IDENTIFICATION AND ASSESSMENT

DTE Gas utilizes an annual review process to ensure industry risks are regularly evaluated and incorporates risk model results and recommendations from PHMSA, NTSB, MPSC, AGA, the MPSC SEA Report, TSA, and subject matter experts. A risk matrix (Figure 20) is used to analyze the risks based on the potential frequency and consequence of occurrence. The result is a list of DTE Gas pipeline system safety risks categorized by top industry risks with related countermeasures.

Risk Matrix Example – Figure 20

Consequences (1 to 7)	HAZARD SEVERITY OUTCOME	FREQUENCIES						
		Almost Impossible	Rare	Possible	Likely	Very Likely	Highly Likely	Almost Certain
Health & Safety		1A	1B	1C	1D	1E	1F	1G
Customer Impact		2A	2B	2C	2D	2E	2F	2G
Financial Loss and Regulatory Response		3A	3B	3C	3D	3E	3F	3G
Environmental Impact		4A	4B	4C	4D	4E	4F	4G
		5A	5B	5C	5D	5E	5F	5G
		6A	6B	6C	6D	6E	6F	6G
		7A	7B	7C	7D	7E	7F	7G

RISKS AND COUNTERMEASURES (TABLE 5)

While the potential for incident is remote, DTE Gas recognizes the importance of reducing overall risk to its system by prioritizing a series of robust countermeasures, which are the primary drivers of the Company's 10-year capital investment plan. Specifically, DTE Gas is investing more than $4.5B on PSMS risk mitigation projects in its 10-year plan to ensure the safety and reliability of its system. These countermeasures are described within their respective asset plan (distribution, transmission, storage, and compression) sections in this Gas Delivery Plan, with the exception of the system-wide countermeasures that are described below.

SAFE

DEPENDABLE

Top Industry Risks and Associated DTE Gas Countermeasures – Table 5

Industry Risk	DTE Gas Countermeasures
Gas Supply & Deliverability	Belle River Dehydration Unit Redundancy
	Installation of Additional System Interconnects
	Transmission Renewal Program: Van Born Project
	Implementation of a Distribution System Planning Team
	Implementation of a Probabilistic Risk Assessment Model
	Compressor Renewal Program
Transmission Pipeline Failure	Transmission Renewal Program
	Records Management Program
	Transmission Maximum Allowable Operating Pressure (MAOP) Records Remediation
	Class 1 and Class 2 Facility Integration into GIS and the Probabilistic Risk Model
	ILI Expansion Program
Distribution Gas Leaks	Gas Renewal Program
	Meter Assembly Check – Meter Move Out (MAC MMO) Program
	Leak Remediation
	Ground Movement Mitigation Program
	Distribution Renewal Program
	Distribution MAOP Records Remediation
	Cross Bore Inspections
System Overpressure	Risk-Based Overpressure Protection Program
	Legacy Regulator Remediation/Replacement
Storage Well Unintended Gas Release	Well Renewal Program
	Well Pad Expansion Program
Cyber/Physical Security	DTE Gas Site Security Program
Excavation Damage	Damage Prevention Field Team

System Wide Countermeasures

Probabilistic Risk Model

DTE Gas is implementing a probabilistic risk model to improve the process of prioritizing risk mitigation projects across natural gas systems (storage, transmission, and distribution). A probabilistic risk model calculates risk by multiplying the frequency of failure (for example, leaks per mile per year) by the consequence of failure (effects on people, property, the company, and the environment) and expresses the risk output in dollars per year. The quantitative output enables risk comparison across gas systems for a more objective, prioritized remediation. Probabilistic modeling is an industry-leading best practice for managing pipeline safety.

The DTE Gas implementation of a probabilistic risk model is consistent with recommendations in the MPSC SEA final report issued on September 11, 2019. In this report, as part of the Natural Gas Recommendation, specifically section 9.3.1.2 Natural Gas, Natural Gas Recommendation G-2, the Commission recommended that "utilities work towards incorporating the use of probabilistic risk models to prioritize system investments."

The Company's 10-year plan includes capital expenditures of approximately $1.3M in 2023 for completion of the Underground Natural Gas Storage Integrity Management Program (UNGSIMP) probabilistic risk model and software licensing renewals, which re-occur every three years, but excludes potential future risk model enhancements which are yet to be identified.

Once the probabilistic risk models are completed, DTE Gas will utilize the results to update the prioritization of PSMS risks and countermeasures covered by the models. This will allow the Company to update the 10-year capital investment plan and focus the Company's capital investments on the highest-priority mitigation projects.

Transmission MAOP Records Remediation and Records Management Plan

Traceable, verifiable, and complete (TVC) records are essential in ensuring pipelines currently in service meet federal and state safety requirements. Through benchmarking performed with several operators, DTE Gas has determined that a pipeline facility records vision must be created as a path forward to mature its records management.

Based on benchmarking, DTE Gas has selected the Association of Records Managers and Administrators (ARMA) Generally Accepted Recordkeeping Principles (GARP) model as a foundation for this vision to mature in information management. ARMA is an industry-leading information management body recognized for records management best practices.

To develop this vision, the Company has established a dedicated records management department to drive the adoption and deployment of the ARMA model. This department is responsible for records management initiatives such as the review and remediation of record defects. In addition, DTE Gas has created a central database to house all gas facility records and a workflow system to track records from creation to storage.

The records management group is focused on four core aspects of the Company's records vision:

1. Develop the DTE Gas vision for records management and develop plans to mature the utilization of the GARP principles
2. Continuously enhance the central database and processes established in the record management platform D2 (also known as Documentum). This includes incorporating new technologies to further streamline gas facility records workflow and document storage for transmission and distribution facility records
3. Support the remediation of legacy record defects to ensure identified records gaps are remediated as required by federal and state requirements
4. Develop and execute training and communications to build a culture of effective records management

The overall goal of the records management group is to create and implement strategies to ensure gas facility records are TVC. Effective records management reduces risk by increasing accuracy, accessibility, and resource efficiency, and by improving public, employee, and environmental safety.

The 10-year capital plan includes $4M in capital expenditures to support records management.

TRANSMISSION RECORDS

There are several ongoing transmission records initiatives within DTE Gas. The biggest focus for transmission records is the review and remediation of records defects as required by new federal rules.

Part 1 of the PHMSA new MEGA rule (49 CFR (code of federal regulations) 192.624), which became effective on July 1, 2020, requires operators to develop an MAOP reconfirmation plan by July 1, 2021, for piping in HCA, Class 3, and Class 4 areas without TVC records. DTE Gas has developed this detailed plan and is currently in the execution phase.

Although the rules require remediation of half of these defects by 2028 with the remaining half by 2035, DTE Gas intends to remediate these records ahead of the required timeline. Currently, the Company has budgeted $4M per year in operations and maintenance (O&M) for records defects remediation.

Regarding the transmission non-HCA record defects that have been identified, the Company will address these defects once the defects in HCA, Class 3, and Class 4 areas are addressed.

Lastly, DTE Gas has chosen the records management software, D2 (or Documentum), as its central database for storing, securing, and maintaining all MAOP records. Technical solutions and processes for managing records from creation to storage were developed and implemented at the end of 2021. These solutions are broken down into a records workflow solution, which includes utilizing tools to create, review, and approve records with built in Quality Assurance (QA) and Quality Checks (QC) in the process. Related to the central database, DTE Gas is also working on a project starting with HCA, Class 3, and Class 4 areas records to collect, sort, scan, and upload them in one location. This project began in 2022 with the remaining non-HCA transmission records to follow.

DISTRIBUTION RECORDS

Although DTE Gas has been reviewing transmission records since 2011, the review was extended to higher pressure distribution piping (≥100 psig) in 2013 based on the 2011 PHMSA advisory bulletin. Given the importance of ensuring adherence to the MEGA rules for new projects to have TVC records and to focus the Company's attention on the remediation of records defects as required by the new rules, DTE Gas paused the legacy distribution records review efforts in 2021 to reallocate resources to the aforementioned transmission initiatives.

Regarding the distribution record defects that have been identified to date, the Company will combine these defects with the defects in transmission non-HCA, Class 1, and Class 2 records to develop one risk-ranked list of records defects for remediation.

Quality Management System

Safety assurance is one of the 10 key elements of a PSMS and is an area of opportunity for DTE Gas. The Company is fully committed to pipeline safety and is initiating proactive steps to improve the operation, reliability, and safety of its system through the implementation of a Quality Management System (QMS). A QMS is a structured approach to ensuring process conformance and encompasses the totality of a process, rather than procedure adherence alone.

DTE Gas has established a QA department to perform quality audits of key safety processes. The Company has identified the following 13 initial workstreams where process adherence plays an important role in ensuring pipeline safety:

1. Construction/Inspection
2. Material Procurement
3. Staking
4. Leak Repair
5. Leak Survey
6. Pressure Control/Capacity Reviews
7. Records
8. Dispatch
9. Corrosion Control
10. Engineering Design (internal and external)
11. Material Handling (e.g., receipt, storage, etc.)
12. Gas Control
13. Integrity Management

The 10-year plan for QA includes, on average, $2M per year in O&M and capital expenditures.

Site Security Program

Within the U.S. and internationally, there have been recent reports of intentional and unintentional security events at natural gas facilities. As such, it is critical that the Company carefully mitigates the potential for physical damage, in addition to having robust plans in place to mitigate the potential of a cyber-attack.

To address these issues, DTE Gas has embarked on a multi-year site security program helping ensure the safety of employees and the public, reliability of service to customers, and avoidance of financial consequences to DTE Gas and its customers from a security-related incident.

Additionally, in 2021, the Transportation Security Administration (TSA) issued multiple Security Directives (SDs) for compliance by the top 100 pipeline operators to comply with, which included DTE Gas. DTE Gas has been working with the TSA to put in place the multiple required security enhancements for both its IT and OT systems.

The DTE Gas Site Security Program consists of three focus areas: physical security, cyber security, and facility security. Physical site security includes installation of new or upgrading of existing fences, automation and upgrading of main access gates, upgrades of egress gates, installation of cameras and alarms for intrusion detection, critical area access control through badging system installation, and new key control system for locking doors to critical buildings. Cyber Security measures include enhanced SCADA backup, improved log-in/access management systems, malicious threat protection, software for identifying unauthorized connections to OT networks, and identifying and mitigating security risks through software and hardware patching (vulnerability management). The third focus area is facility security/protection from vehicular hits. Upgrades in this category include the installation of crash-rated guardrails, bollards, interlocking concrete barriers, and fences for protection.

DTE Gas has invested $16M, from 2018 through 2022, and plans to invest up to an additional $9M by 2025, at which point the current scope of the Site Security Program will be complete.

DTE Gas expects it will be a multi-year effort, beyond completion of the Site Security Program, to fully comply with the TSA requirements based on the complex and substantial number of TSA requirements. DTE Gas will implement mitigations per the TSA approved Cybersecurity Implementation Plan (CIP). For TSA SD2 cyber security compliance, DTE Gas invested $1M in capital and $2M in O&M in 2023. Costs for 2024 and beyond are being evaluated and will be budgeted in DTE's Five Year IT Plan and included in future GDP updates.

Damage Prevention Program

To ensure the safety of the community, customers, and its employees, DTE Gas has a field team dedicated to the prevention of damages caused by excavation companies and homeowners. This team consists of Damage Prevention field liaisons in Southeast Michigan (SEMI) and a section of the Company's Greater Michigan (GRMI) service territory. Since its inception in 2016, the DTE Gas Damage Prevention team has been directly responsible for a 30% reduction of the DTE Gas annual damage rate. As damage to a gas facility could result in an injury or fatality, this reduction in damages has measurably improved the safety of the Company's gas operations for customers, employees, and the community at large.

The focus of the Damage Prevention Program is to protect public safety by reducing the frequency and severity of damages to the Company's underground infrastructure. The DTE Gas team of field liaisons provide education and guidance to excavation companies working around pipelines and responds to damages to assist with root cause determination. Because the team's strategy and performance resulted in a reduction in damages to the Company's gas facilities, the Company recently expanded this program in the Company's Greater Michigan service territories, with three liaisons located in Grand Rapids in 2022, its first full year of implementation.

The DTE Gas Damage Prevention Program consists of core field duties including:

- **Risk Analysis:** New locate requests are reviewed on a weekly basis, which includes ticket type (e.g., project tickets), work type (e.g., does the ticket involve water/ sewer replacement, fiber optics), number of natural gas facilities crossed, and type of work (e.g., boring, open trenching) to determine sites with higher risk of excavation damage. This review includes an analysis of excavation damages by excavator name, municipality, and root cause
- **Metrics and Analysis:** Damages and "near misses" are analyzed and root causes are determined. This information is shared throughout DTE Gas, as well as with excavators, in order to implement countermeasures to help prevent similar and future damages
- **Proactive Site Visits to the Highest Risk Excavation Sites:** Damage prevention field employees visit sites both prior to and during excavation to provide support, reinforce requirements for safe digging, observe behavior, and stop work as necessary
- **Excavator Safety Presentations:** Training is provided to excavators, municipalities, and first responders on both MISS DIG law and damage prevention strategies
- **Field Support:** Field Liaisons provide contact information to excavators and field incoming questions and concerns
- **Public Awareness Program:** Damage Prevention partners with the DTE Corporate Communications team to leverage physical and digital marketing materials to enhance the Company's customer outreach around the use of the MISS DIG system. Safe digging messaging targets customers as well as all Michigan homeowners

As the Damage Prevention team refines its proven strategy across the state of Michigan, the Company strongly believes this approach will continue to enhance the safety of all DTE Gas facilities for its customers, its employees, and the broader community in which it serves.

System Wide Countermeasures Capital Financial Summary

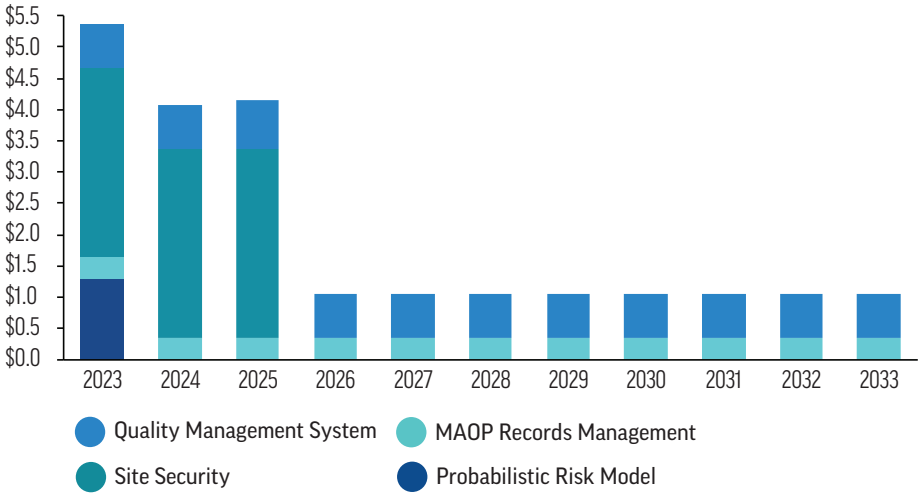
For the system-wide countermeasures previously described, DTE Gas plans to invest approximately $16M of capital from 2024-2033. The capital investment estimates for asset-specific countermeasures are included in each respective asset section.

Emergency Preparedness

With the Company's investment in its emergency preparedness program, the Company is developing and maintaining the capabilities required to ensure it can respond quickly, efficiently, and effectively to any incident to protect lives, the environment, and its assets.

While DTE Gas continually works to prevent gas safety incidents, the Company also has a robust emergency preparedness program in place to ensure it is ready to respond effectively to an incident. Since adopting an Incident Command System (ICS) in 2016, DTE Gas has continued to expand its ICS knowledge base and utilization of ICS as a true all-hazards incident management system. DTE incorporates the principles and framework of both the National Incident Management Systems (NIMS) and ICS into its emergency operating procedures and response plans. DTE Gas is also supported by the DTE Energy Corporate Emergency Management (CEM) team in both its preparedness planning and incident response when needed.

Risk Mitigation Capital System Wide Countermeasures ($M) – Figure 21



DTE Gas Emergency Preparedness continues to focus on its goal of continuous improvement. During 2022, Emergency Preparedness projects included:

- DTE Cyber Business Continuity Project: Full engagement across the business unit to ensure operational resiliency of DTE Gas Operations in the event of a cyber-attack. Key actions included: (1) Review & revision of all Tier 1 Business Continuity Plans, (2) Upgrades to emergency communication technologies, and (3) Real-time IT/OT isolation exercises at seven critical sites confirming capability for manual operations
- DTE Gas Radio Inventory: Statewide inventory of 800MHz radio assets to ensure readiness for use as a back-up communication system in the event primary methods of communication are unavailable
- Emergency Response Exercises: Gas Operations conducted and/or participated in multiple emergency response exercises, both internal and with external partners, including: (1) Loss of SCADA / manual pipeline operations, (2) Severe loss of gas supply, (3) Manual gas dispatch operations, and (4) American Gas Association - National Gas Exercise (NGX)

Projects from 2023 included:

- Continued engagement in DTE Cyber Resiliency Project and resiliency planning
- Participation in several national-level exercises, including (1) GridEx 2023 and (2) Mutual Aid Exercise (MEA)

Gas Demand and Supply Overview

Gas Demand

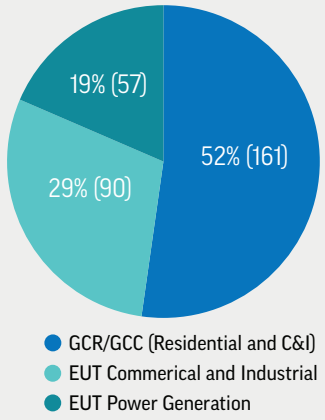
DTE Gas serves approximately 1.3 million Gas Cost Recovery (GCR) and Gas Customer Choice (GCC) customers and over 500 End User Transportation (EUT) customers. These homes and businesses rely on the Company's vast network of assets and purchasing strategies to deliver safe and reliable natural gas service and maintain that service in an affordable and environmentally-responsible way.

In 2022, approximately 52% of the gas consumed on the Company's system was supplied to GCR (customers sourcing gas from DTE Gas) and GCC (customers sourcing gas from alternative suppliers) customers, 29% was delivered to EUT commercial and industrial customers, and the remaining 19% was delivered to EUT power generation customers (See Figure 22). Including volumes transported for third-party Midstream customers and the NEXUS capacity lease, approximately 850-900 Bcf of natural gas flows across the Company's system on an annual basis.

Given recent environmental and policy trends, the Company expects the relative percentages for gas demand from these customer categories to evolve. Specifically, the Company expects the percentage of GCR/GCC customer demand to decline due to increased energy efficiency and the potential growth of electrification over the next 10 years. DTE Gas also anticipates power generation demand to increase due to the continued shift from coal to natural gas-fired power plants.

Considering these macro trends affecting natural gas demand, DTE Gas has several initiatives addressing gas consumption trends, including EWR programs and continually working to expand the availability of natural gas to new customers. Details on these efforts are below, though generally, GCR/GCC customer demand guides the Company's gas supply strategies.

DTE Gas 2022 System Demand by Customer Type (Bcf) – Figure 22



Gas Supply

DTE Gas deploys three key strategies to ensure reliability and price stability of supply to meet customer demand: (1) Utilize storage assets to respond to system demand during the winter heating season, (2) Ensure reliability of supply through a system of interconnects and transport agreements from multiple supply basins, and (3) Execute a purchasing strategy to minimize price volatility associated with changing market environments.

Another fundamental element of providing reliable service beyond securing adequate pipeline supply is ensuring sufficient deliverability across the customer demand curve, especially during critical peak time periods. DTE Gas models three key components of the system to develop the Company's peak day operations plan: (1) Forecasted gas demand (including weather extremes), (2) Compression and surface facility capabilities, and (3) Storage field balances.

An evolving element of the DTE Gas supply strategy is the Company's commitment to promoting a movement toward cleaner natural gas production. DTE Gas aspires to procure net zero natural gas to serve customers, as detailed below. In addition, the Company plans to increase the amount of Renewable Natural Gas (RNG) sourced as part of its voluntary emissions offset program (e.g., the DTE Gas CleanVision Natural Gas Balance program). While emission reductions from these programs are not specific to locations within DTE's service territory, both initiatives reduce the Company's overall impact on climate, and climate change has significant Energy and Environmental Justice (EEJ) implications because it disproportionately affects vulnerable communities. Therefore, both initiatives positively impact EEJ.

Gas demand efforts

Energy Waste Reduction (EWR) programs

The Company's EWR program launched in June 2009 as a result of the Clean, Renewable, and Efficient Energy Act, also known as 2008 Public Act (PA) 295. In 2016, PA 342 was signed into law, amending PA 295. The EWR standards in PA 342 maintained the minimum energy savings standards of 0.75% of total annual retail gas sales. DTE Gas increased the level of energy savings from 0.75% to 1.00% in 2018 as part of its commitment to reduce customer energy waste, and DTE Gas further expanded this commitment by increasing the energy savings target to 1.05% in 2023.

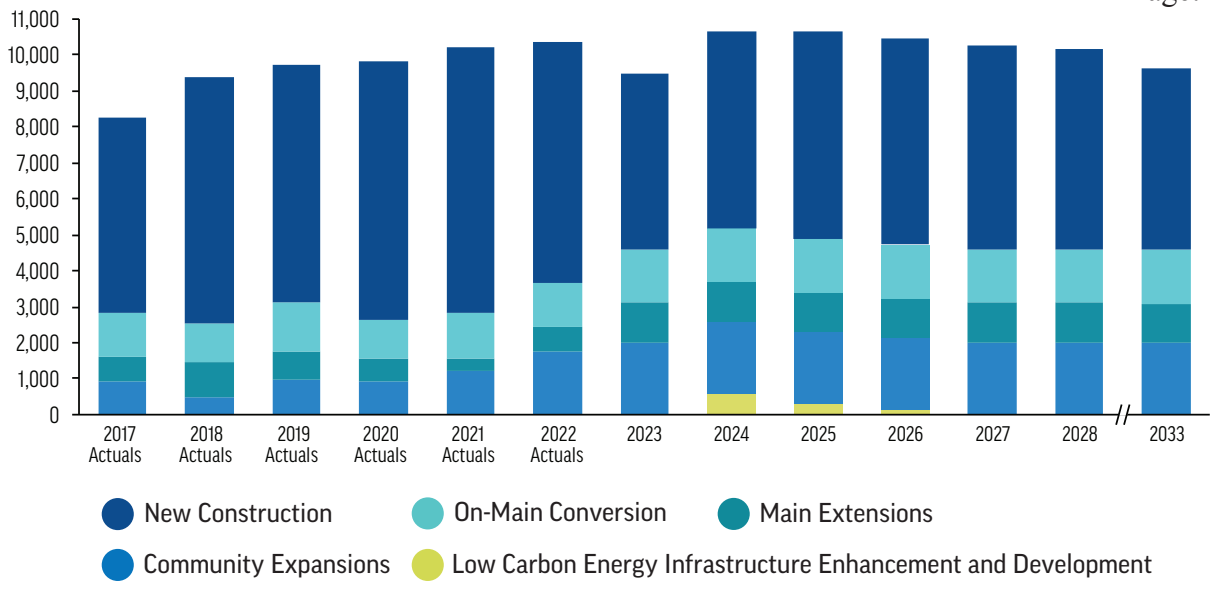
Lowering customer gas usage through EWR programs saves customers money and also reduces emissions. From its inception in 2009 through 2022, the DTE Gas EWR programs have saved over 21,661 MMcf of energy and had more than 4.5 million customer participations. The gas savings are equivalent to the energy required to power over 150,000 homes for one year. The commitment DTE Gas has for EWR programs is a critical aspect of its goal to assist customers with managing their energy use while also reducing CO_2e.

Expansion of DTE Gas natural gas service

Natural gas service expansion provides affordability benefits to all customers as it allows system operators like DTE Gas to spread fixed operating costs across a larger customer base. From 2018 through 2022, DTE Gas experienced a steady rate of new residential and small commercial customer attachments of approximately 9,800 per year (See Figure 23). New attachments are initiated both internally and externally:

- Internally initiated new attachments include on-main fuel conversions, main line extensions, and community expansion projects. Almost all internally initiated new attachments result in a customer converting from propane to natural gas. In addition to economic savings for the customer, this switch also benefits the environment, as natural gas combustion emits nearly 14% fewer pounds of CO_2 per million Btu than propane combustion
- Externally initiated growth is primarily driven by new home construction. This has been a historically consistent trend, and the Company expects this trend to continue for the next 10 years

Historic and Projected New Attachments by Category – Figure 23



Michigan's Low Carbon Energy Infrastructure Enhancement and Development Fund

The State of Michigan, in partnership with DTE Energy and other Michigan energy companies, recently created the Low Carbon Energy Infrastructure Enhancement and Development Fund to help expand natural gas infrastructure to underserved communities across the state and positively impact EEJ by assisting low-income residents to save on energy bills, bringing economic development to these communities, and reducing overall carbon emissions.

The Company partnered with legislators, civic and professional organizations, and other utilities to help support the expansion of the fund and it was signed into law on March 3, 2022. The infrastructure bill included $25M for the expansion of natural gas infrastructure in the state's 2021-22 fiscal year budget. In addition, the legislature appropriated an additional $25M in funding for the 2022-23 fiscal year budget. The fund also supports green technologies, including funding for RNG.

Any stakeholder was able to apply to use the funds. Applications for use of the funds were led by utilities in collaboration with municipalities, businesses, economic development groups, and others in the region(s) where the funds will be used. Proposals had to address three key impact areas: customers, the environment, and economic development.

- For impact on customers, it must have demonstrated, with as much rigor as possible, what reductions customers will realize in the cost of their energy bills
- For the environment, it must have demonstrated the anticipated reduction in carbon emissions
- For economic impact, it must have demonstrated the expected impact on a community's ability to attract and retain businesses and other economic benefits

The fund also set aside funding for the development of RNG, which could create significant potential benefits for the state. RNG will capture one of the state's most voluminous sources of emissions -- methane from dairy farms -- and repurpose those emissions into clean, pipeline-ready fuel. This would also create revenue and jobs in the agriculture sector.

DTE Gas identified five projects in rural Michigan that would bring natural gas to approximately 4,000 homes, all of which are in communities whose average income is at or below median average income, and the businesses in those communities. DTE Gas worked with these communities to apply for the use of the funds to lessen the energy burden on residents and support a more even playing field for economic development. On June 20, 2023, the MPSC awarded DTE $7.3M for the Mesick-Buckley portion of the Benzie-Manistee-Wexford Project, which will bring natural gas to approximately 1,000 new homes and over 100 businesses. DTE Gas is currently in the planning phase and will start the work April 2024.

Gas supply strategies, deliverability, and support of decarbonization goals

Supply strategies for reliability and price stability

DTE Gas is engaged in several strategies to ensure reliability and price stability of supply. The Company's overall system capacity, storage capabilities, and more than 30 interconnects, provide the ability to adapt to varying operational conditions and move significant volumes of gas across the system to deliver gas where it is needed.

The Company's supply strategies that leverage these inherent system characteristics include:

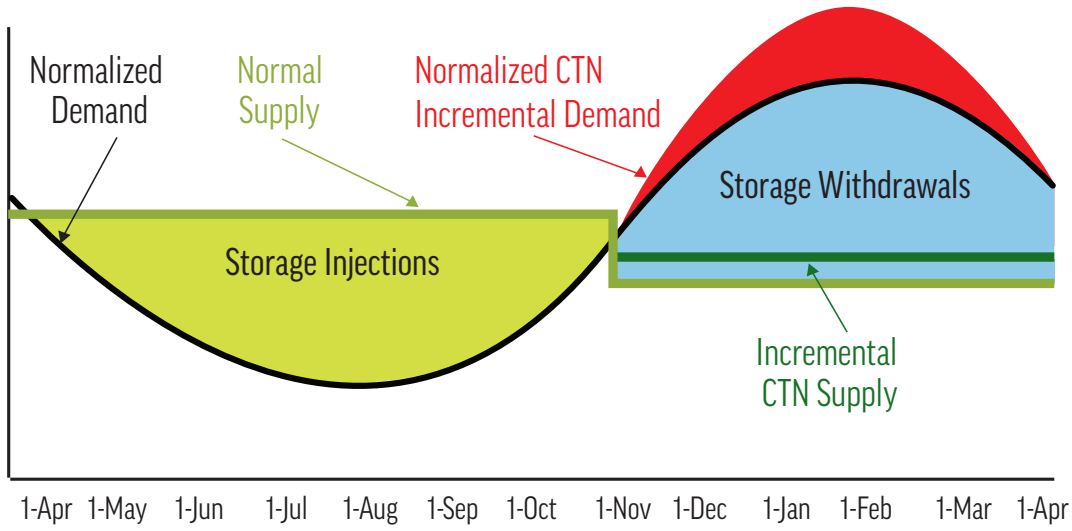
1. UTILIZE STORAGE ASSETS TO MANAGE SYSTEM DEMAND DURING THE WINTER HEATING SEASON

DTE Gas owns and operates four gas storage fields in Michigan. This storage capacity represents approximately 50% of expected winter GCR/GCC demand and plays a critical role in providing safe and reliable natural gas service in an affordable and environmentally responsible way. During the critical winter months, the Company fulfills customer demand by utilizing gas flowing onto the DTE Gas system on transportation contracts, as well as gas that is withdrawn from storage. Storage is the balancing mechanism that allows DTE Gas to quickly adjust to changes in daily requirements and provides the flexibility to quickly ramp up or down the amount of gas distributed to meet the needs of customers. For example, when temperatures drop and customer demand increases, storage allows for gas to be withdrawn and added to the system to meet this higher demand. Over the winter, DTE Gas maintains the required balance between flowing winter supply and storage withdrawals to meet customer needs.

Storage operations are especially important during the coldest months to protect for peak day operations and exposure to Colder-Than-Normal (CTN) weather. The GCR/GCC storage target is 70.1 Bcf at the start of the winter withdrawal season. On average, 59 Bcf of the GCR/GCC storage gas is withdrawn each winter while around 11 Bcf of gas remains in the ground from year to year based on weather conditions and customer behavior. Gas is injected during the summer injection season, defined as April through October, to meet the 70.1 Bcf GCR/GCC storage target (See Figure 24).

DTE Gas designed a supply plan to meet the required minimum storage inventory balances to ensure the Company can meet specific storage withdrawal rates necessary to meet peak day send out in combination with flowing supplies. On a January peak day, approximately 70% of GCR/GCC demand is served utilizing gas from storage. Storage also holds a portion of the CTN protection volumes and must be managed on both a seasonal and daily basis. This storage strategy allows DTE Gas to be prepared to reliably supply gas in CTN weather while minimizing costs. During the winter heating season DTE Gas maintains 8 Bcf of Colder-Than-Normal Protection (CTNP) gas in storage to be utilized if the service territory experiences CTN temperatures. Each month during the winter season, DTE Gas analyzes the levels of CTNP gas and replenishes it as needed, to ensure adequate protection of system reliability.

Illustrative DTE Gas Storage Annual Cycle – Figure 24



2. ENSURE RELIABILITY OF SUPPLY THROUGH A SYSTEM OF INTERCONNECTS AND TRANSPORT AGREEMENTS FROM MULTIPLE SUPPLY BASINS

The interconnectedness of the DTE Gas system allows the Company to utilize a diverse supply portfolio of primary firm interstate gas transportation contracts. DTE Gas purchases and delivers gas from multiple supply regions to manage system operating requirements and ensure reliable gas supply. DTE Gas has firm transportation contracts to meet requirements for normal weather, CTN weather, design day (detailed later in this section), and Supplier Of Last Resort (SOLR) for GCC customers. As a SOLR, DTE Gas will continue to provide natural gas service to GCC customers if any GCC supplier(s) fail to meet their obligations due to insolvency, loss of license, or other unforeseen circumstances. While MichCon City gate supply is an important portion of the DTE Gas supply portfolio (approximately 23% of the total GCR supply), to solely rely on it nullifies the diversity benefits that firm interstate transport capacity provides in managing systemic risks in meeting design day and CTN weather loads.

DTE Gas has multiple points where it can receive gas supply throughout the transmission system. This includes over 30 major interconnects with nine different pipeline companies. Receipt capacity at these interconnects total over 10 Bcf per day. In addition to comprising a diverse supply portfolio, these interconnects also contribute to the overall reliability and resiliency of the transmission system by providing gas supply flexibility should one of the interconnects lose supply. An example is Willow Station, which feeds the Southeast Michigan (SEMI) market and is connected to the DTE Gas primary transmission system. Willow Station is interconnected with three different interstate pipelines: ANR, Panhandle Eastern Pipeline Company (PEPL), and NEXUS. This station can be reconfigured to send supply to SEMI from any of these interconnects.

Additionally, if there was a significant operational emergency on the Company's system, supply diversity allows DTE Gas to communicate with interconnected pipeline companies and request assistance for additional flowing gas at other receipt locations where it would benefit operations and maintain reliability. As an example, when Consumers Energy had a fire at its Ray compressor station in 2019, DTE Gas provided additional supply at the Northville Interconnect, which benefited Consumers Energy and its customers. To further enhance the operational flexibility of the two systems, DTE Gas and Consumers Energy are collaborating on the addition of at least two other interconnects, which are described in further detail in the *Transmission Asset Plan* section.

DTE Gas's customers also benefit from a regionally diverse supply strategy through increased supply reliability and muted price volatility. Security of supply and increased options for supply sources are the primary reasons DTE Gas holds regional interstate transportation capacity (summarized in Table 6). Supply basin diversity helps the Company mitigate adverse effects of major disruptions in the industry and the possible exposure to high gas costs for customers. If upstream supply becomes constrained in a particular basin, the Company's diverse supply portfolio provides options to help insulate DTE Gas and its customers from the risk of potential supply disruptions in that area.

DEPENDABLE

EFFICIENT

3. EXECUTE A PURCHASING STRATEGY TO MINIMIZE PRICE VOLATILITY ASSOCIATED WITH EXTREME WEATHER EVENTS

DTE Gas mitigates price uncertainty by utilizing the Volume Cost Averaging (VCA) methodology of purchasing fixed-price supply. DTE Gas's supply pricing strategy is a mixture of both fixed-price supply, where the price is known months in advance of delivery, and indexed-price supply, where the price is uncertain until delivery begins.

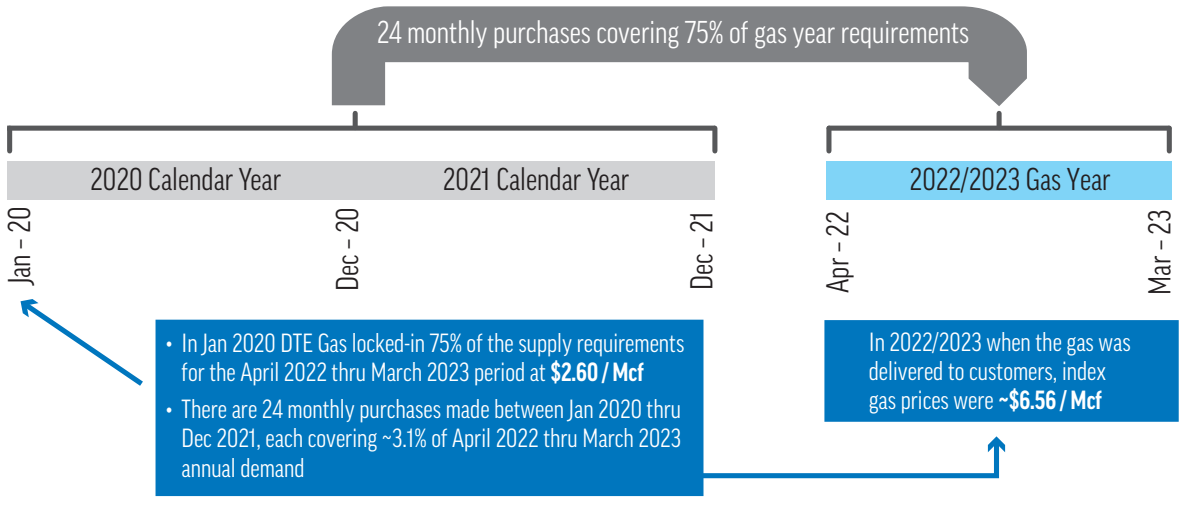
The VCA program is a methodology used to create price certainty for natural gas volumes that will be delivered at a future date. VCA provides upward price protection, downward price participation, and a year-over-year smoothing effect on the price GCR customers pay. Most importantly, it is also a simple and effective way to manage price fluctuations and dampen natural gas price uncertainty for GCR customers under a variety of actual and potential market conditions. In general, DTE Gas fixes the price of its future supply over a two-year period prior to the start of delivery during the GCR period. As a result, the price for 75% of DTE Gas's supply will be known before the start of the GCR period. It is imperative to leave 25% in an open position to provide flexibility to respond to changes driven by conditions such as weather and customer demand (See Figure 25).

DTE Gas employs a methodology allowing for continual market participation, consistent with the philosophy that one should not try to "beat the market," but instead regularly purchase volumes over an extended period, which is a reasonable and prudent method for mitigating price fluctuations or volatility.

DTE Gas Transportation Portfolio – Table 6

Supply Basin Percentage of Total	Winter 22-23
Canadian	
Great Lakes Gas	8.2%
Viking	5.2%
Vector	4.4%
Alliance	12.5%
	30.3%
Mid-Continent	
ANR Southwest	16.0%
Panhandle Eastern	16.2%
	32.2%
Appalachian	
PEPL Falcon	3.7%
Shelbyville	15.0%
NEXUS - Kensington only	9.4%
NEXUS - Clarington/Teal	9.4%
	37.5%
Total All Pipelines	**100%**

DTE Gas GCR Volume Cost Average Program Example – Figure 25



System deliverability as a key element of overall system reliability

Another fundamental element of providing reliable service beyond securing supply to meet demand is ensuring that sufficient gas pipeline pressure exists at any given time to safely deliver gas to the transmission and distribution system.

DTE Gas defines system deliverability as the ability to provide the appropriate pressure and supply to have gas flowing to customers when they need it. Gas flow needs vary throughout the year based on weather and other factors, so DTE Gas must ensure the system is ready to supply gas at any time regardless of weather and temperature conditions. In addition, considering the holistic interdependency of the Company's system, the concept of deliverability applies to each of its assets, which all play a key role in maintaining the ability to supply gas to customers.

When designing for winter operations, DTE Gas evaluates each aspect of system management to ensure that conservative assumptions are used. This ensures that there is enough supply to meet the highest forecasted demand during extreme cold weather, referred to as a winter design day. The inputs for a winter design day are defined to assure operational integrity even during extreme conditions. These inputs are reviewed each winter to reflect the most up-to-date design day scenario assumptions. DTE Gas models the following three components of the system to develop the Company's peak day operations plan:

1. FORECASTED GAS DEMAND (INCLUDING WEATHER EXTREMES)

Forecasted markets for residential and small commercial customers are driven by weather and expected economic conditions. Colder temperatures result in higher gas demand. Design day temperatures are derived by identifying the lowest historical temperatures experienced over the last 70 years, in 16 separate regions throughout DTE Gas's service territory. The Company then assumes that the coldest temperature in each of the 16 regions occurs on the same day. Temperatures are updated each time a new record is set, and the Company reviews the inputs annually. The relationship between temperatures and system-wide gas demand is developed by performing a predictive analysis based on customer usage and weather history. The resulting model then calculates corresponding markets at design day temperatures and is updated annually based on the most recent customer usage data available.

2. COMPRESSION AND SURFACE FACILITY CAPABILITIES

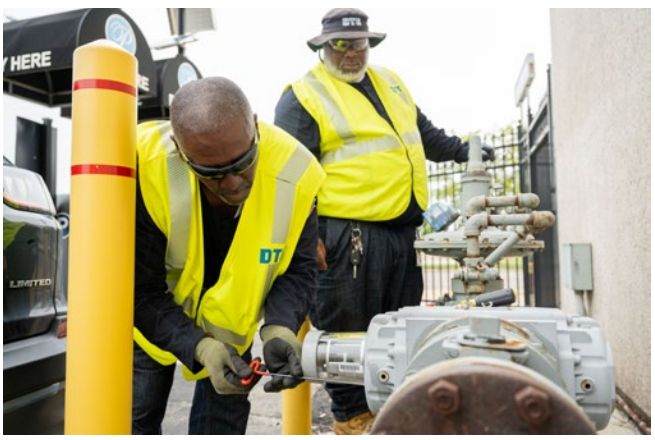
DTE Gas also models compressor units and surface facility capabilities (which include gas dehydration). Each component is then integrated into a single system-wide model to gain a sophisticated view of system capabilities under various conditions. To add to the conservativeness of a design day forecast, several compression assets are assumed in reserve to increase system resiliency during unexpected outages.

3. STORAGE FIELD BALANCES

The Company assumes storage field balances are set at minimum levels for all DTE Gas's customers. This ensures that the Company plans for sufficient storage deliverability on a design day, even at the lowest possible field balances.

The role storage plays in providing the deliverability needed to meet customer demand is paramount. During the polar vortex of 2014, DTE Gas assets were tested under unprecedented circumstances, which resulted in a robust evaluation of the assets under extreme conditions. The learnings from this experience resulted in capital improvements to the Columbus storage fields and surface facilities that were reviewed by the Commission in a previous DTE Gas rate proceeding (Case No. U-17999). Three new horizontal wells in the Columbus storage field, a liquid extraction unit, an additional dehydration unit at Columbus Compressor Station, and two new compressor units at Belle River Compressor Station were added to enhance storage deliverability. These facility enhancements mitigated deliverability shortages under similar conditions and enhanced the reliability and resiliency of the system.

By continually updating and reviewing the forecasts and planning for the scenarios listed above, DTE Gas ensures the reliability and resiliency of its transmission, storage, and compression systems for adequate deliverability that aligns with the seasonal needs and constantly fluctuating demands.



Long-term approach to support decarbonization goals

As mentioned in the *Vision and Objectives* section, the Company has taken significant steps forward in environmental responsibility by committing to reduce (internal) gas utility operation emissions to net zero by 2050, partnering with suppliers (upstream) to reach net zero by 2050, and working with customers (downstream) to reduce their emissions by 35% by 2040 (from 2005 levels). In total, these commitments are expected to drive more than seven million tons of CO_2e reductions annually by 2050.

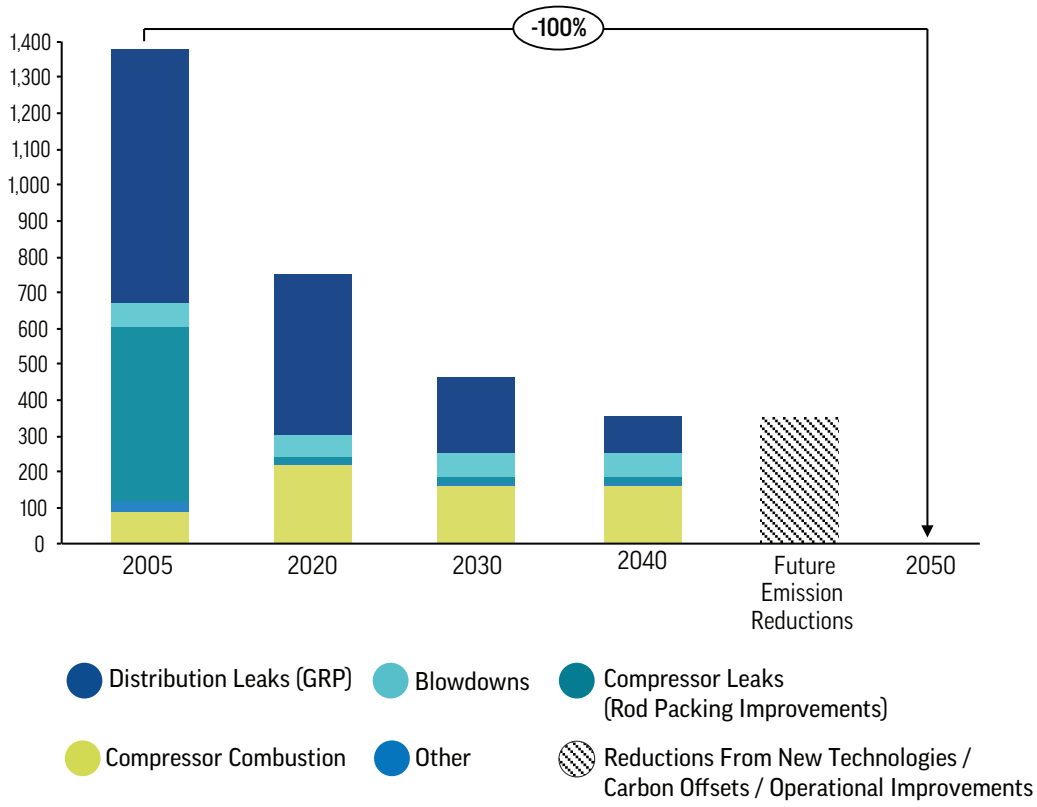
Upstream, through participation in an industry-wide collaborative, DTE Gas promotes a movement towards cleaner natural gas production. As such, in June 2020, DTE Gas announced its commitment to procure net zero natural gas (when there are zero net emissions from the production and delivery of the natural gas to the Company's system, which can include the use of offsets or other carbon-negative technologies) to serve the needs of its customers by 2050. The Company aims to purchase natural gas for its customers from those producers and basins that have the lowest methane intensity profiles. DTE Gas's strategy is to implement a long-term, phased approach to acquiring cleaner, responsibly sourced natural gas to mitigate the impact on customer affordability. Several critical early steps toward achieving this commitment include:

- For the first time, in 2019, DTE Gas surveyed its natural gas suppliers to identify their efforts to monitor and reduce methane emissions during production. DTE Gas also collected Environmental Protection Agency (EPA) emissions data from various production basins to estimate their methane intensity
- In 2022, DTE Gas purchased 1 Bcf of Responsibly Sourced Gas (RSG). In 2023, DTE Gas stepped up this purchase to 2 Bcf to support lower methane intensity production
- The Company continues to work with industry partners within the Natural Gas Supplier Collaborative (NGSC) to benchmark the environmental attributes of its natural gas supply portfolio, evaluate natural gas certification programs, better understand innovative methane measurement technologies, review regional policy solutions, and engage natural gas producers and marketers to address opportunities to increase the emissions reporting transparency throughout the gas purchasing process
- DTE Gas continues reporting its methane emissions under the Natural Gas Sustainability Initiative (NGSI) protocol. Additionally, DTE Gas encourages its natural gas suppliers and peers to report under this protocol to increase transparency and consistency in emissions reporting throughout the natural gas industry
- DTE Gas has also conducted a comprehensive assessment of its upstream value chain and engaged an external company to further quantify its emissions profile and support the establishment of strategies for further reduction

Internally, DTE Gas will reduce greenhouse gas emissions to net zero by 2050 through operational improvements, renewal of existing infrastructure, investments in renewable natural gas and carbon offsets, and implementation of advanced technologies. GRP alone will contribute more than 50% of the Company's total internal emissions reductions. Some additional technologies the Company is exploring include mobile compressor units and design configuration changes to reduce emissions during maintenance and construction, including the potential addition of electric compression to its fleet. Additionally, state-of-the-art technology will be utilized to detect and help prioritize the remediation of natural gas leaks on the system.

Downstream, through a combination of strategic initiatives such as a new voluntary carbon offset program, EWR efforts, and advanced technologies (e.g., RNG, Hydrogen, Gas Heat Pumps), the Company aims to reduce customer use emissions by approximately 35% by 2040 (from 2005 levels). DTE Gas launched its expanded voluntary program in 2021; through a combination of carbon offsets and RNG, the average customer will be able to offset up to 100% of their natural gas emissions. At the end of 2022, NGB had ~10,350 active customers, surpassing its two-year target. DTE Gas plans to continue focusing on using Michigan-based resources to fulfill the offset supply for its voluntary program to support the growing decarbonization industry in Michigan.

Internal DTE Gas Carbon Emissions Reduction Plan (Million tons of CO_2e) – Figure 26



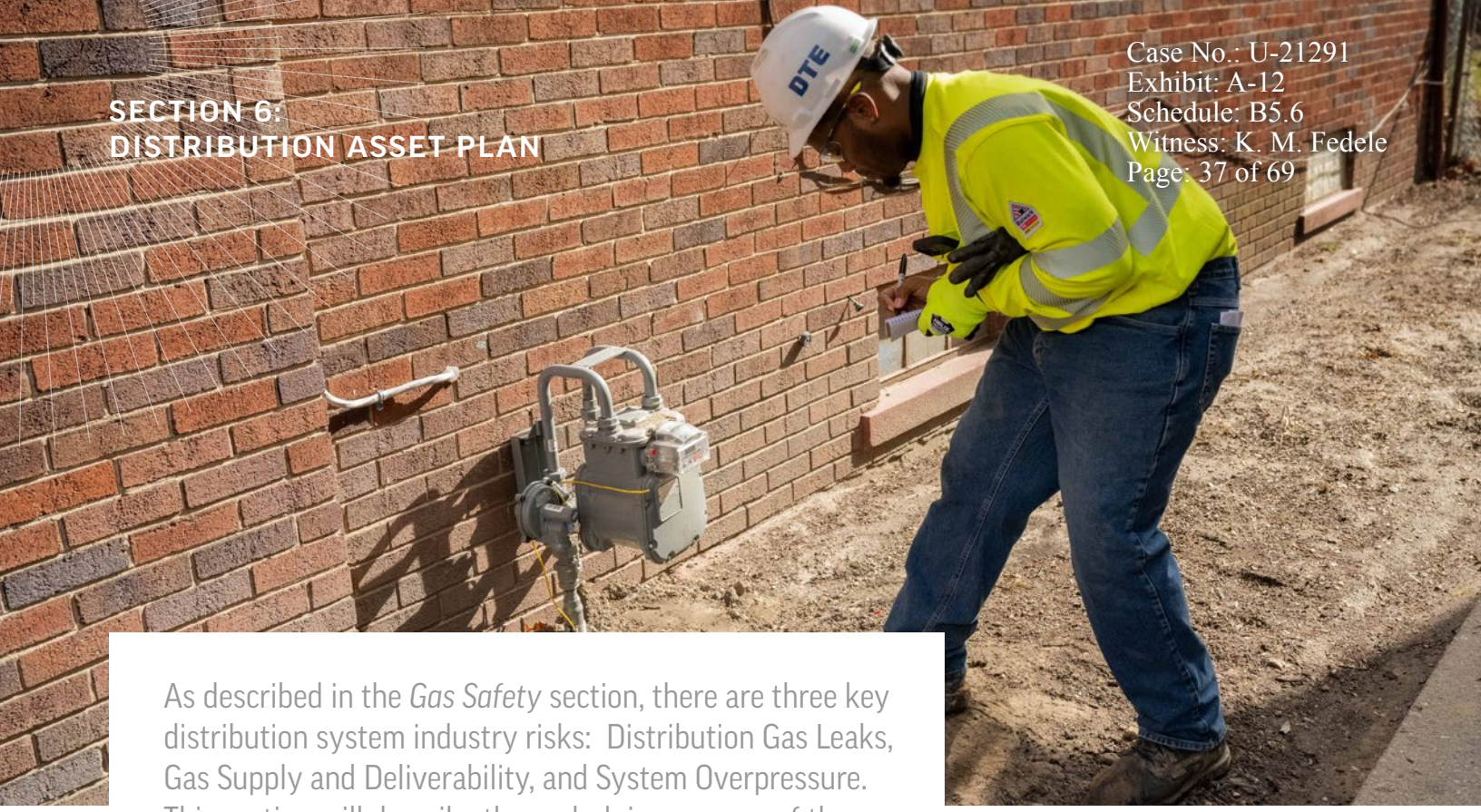
On December 27, 2021, PHMSA required natural gas operators to develop a Leak Detection and Repair (LDAR) Self-Executing Inspection & Maintenance Plan, per Sections 113 and 114 of the PIPES Act 2020. These sections relate to how operators will protect public safety and the environment by eliminating hazardous leaks and minimizing releases of natural gas from pipeline facilities. In response to the congressional mandate, DTE Gas developed its LDAR Plan in November 2021, which is aligned with the congressional mandate as well as the Company's decarbonization strategy. On May 18, 2023, PHMSA published a Notice of Proposed Rulemaking (NPRM) for the Gas LDAR Rule, per Sections 113-114 and 118 of the PIPES Act 2020. The NPRM outlines LDAR performance standards for distribution and transmission using commercially available advanced leak detection equipment, requires procedural updates on mitigating and eliminating fugitive and vented emissions (including leak prone pipe), and conveys PHMSA's commitment to addressing climate change by driving methane emission reductions. The final LDAR rule is expected to be published in 2024.

In total, these commitments are expected to drive more than seven million tons of CO_2e reductions annually by 2050.

Summary

By 2033, DTE Gas expects to further enhance its EWR programs to help customers manage their consumption, and the Company will continue its work on projects that enhance the reliability and deliverability of the system. By maintaining a diverse portfolio of transportation contracts and expanding interconnects, the Company will continue to focus on gas buying strategies that lead to stable commodity costs and dependable supply for customers.

Additionally, DTE Gas expects to source an increasing portion of its gas supply from producers with low to zero carbon profiles, reduce internal gas utility operation emissions, and reduce customer gas combustion emissions. These efforts will bolster DTE Gas's decarbonization objectives and bring the Company closer to its goal of procuring net zero natural gas and driving internal natural gas utility operation emissions to net zero by 2050, along with a 35% reduction in customer natural gas combustion emissions by 2040 (from 2005 levels).



As described in the *Gas Safety* section, there are three key distribution system industry risks: Distribution Gas Leaks, Gas Supply and Deliverability, and System Overpressure. This section will describe the underlying sources of those risks and DTE Gas's efforts to mitigate them.

Distribution Gas Leaks: Contributing factors are primarily pipeline age and material as well as the presence of inside meters. DTE Gas has six programs to help mitigate the risk of leaks, while also reducing fugitive emissions:

- Gas Renewal Program (GRP)
- Meter Assembly Check – Meter Move out (MAC MMO) Program
- Leak Remediation
- Ground Movement Mitigation Program
- Cross Bore Inspections
- Distribution Renewal Program

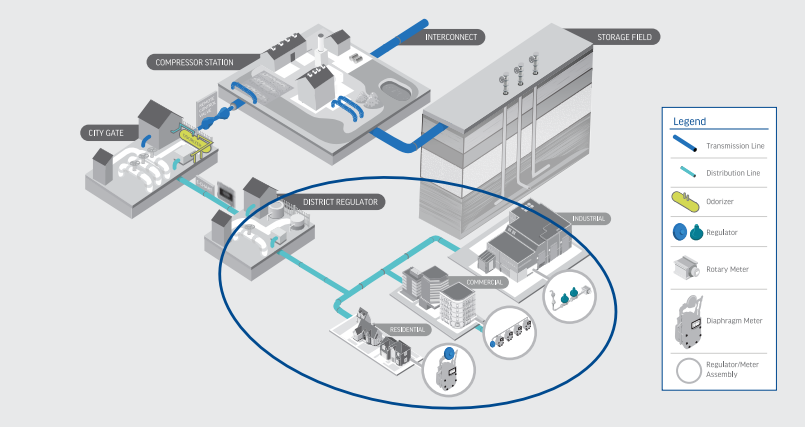
GRP, which includes main renewal and meter move out, is the Company's largest initiative and will account for approximately 40% of DTE Gas's capital expenditures over the next 10 years.

Gas Supply and Deliverability: The primary risk factor is a single distribution pipeline or regulator station supplying a distribution system.

To help mitigate this risk, DTE Gas created a Distribution System Planning team to update and maintain hydraulic system models to identify potential routine gas supply improvement projects through the System Reliability Program (which includes installation, replacement, uprating, or repair of regulator stations, valves, fittings, and mains to ensure safe and reliable gas supply to DTE Gas customers as a result of general growth, regulatory compliance, and obsolescence).

System Overpressure: The primary risk factors are failures of separation valves, regulators, and overpressure protection devices including common mode failure events for regulator stations. DTE Gas is developing a risk-based overpressure protection program and accelerating the Company's routine capital System Reliability Program to renew or upgrade district regulator stations to mitigate this risk.

Natural Gas System – Illustrative – Figure 27



Distribution Assets Overview

DTE Gas's distribution system serves more than 1.3 million customers throughout Michigan. The system consists of approximately 21,000 miles of main, 1.2 million service lines, 2,500 regulator stations, and 1.3 million customer meter sets.

Distribution Pipeline Age and Material Risk Factors

Approximately 32% of DTE Gas's existing distribution main was installed prior to the issuance of the federal pipeline safety standards in 1970 (See Figure 28). These older pipelines include more than 1,350 miles of cast iron and over 1,050 miles of unprotected steel, and lack protective coatings or cathodic protection, making them more prone to corrosion leaks after decades in the ground. Moreover, older construction practices often used mechanical couplings to join pipe segments and employed lower-quality welding techniques. Accordingly, replacing aging, low-pressure infrastructure through the GRP is a large part of the Company's investment plan to improve distribution system safety and reliability.

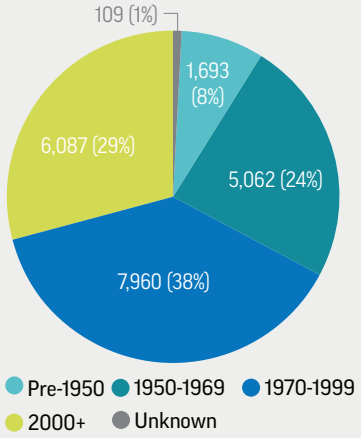
Similarly, more than 60% of DTE's approximately 1,300 miles of high-pressure (≥100 psig) steel distribution main was installed before 1970. A disruption event on these high-pressure pipelines, particularly in a populated area, could have a significant impact and consequence on both safety and reliability. DTE Gas is developing a Distribution Renewal Program, which is discussed later in this section, to identify and prioritize remediation of these high-pressure distribution pipelines (See Figure 30).

Inside Meter Risk Factors

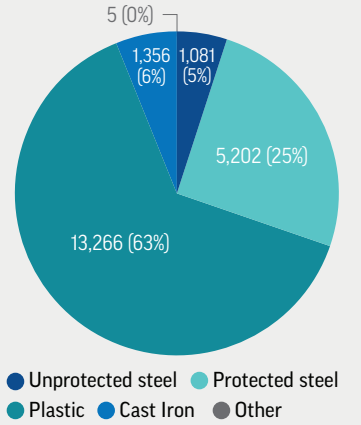
DTE Gas has approximately 148,000 inside meters remaining to relocate outside, which reduces the risk of gas leaks inside buildings.

DTE Gas has two dedicated programs which move meters and building wall regulation outside: (1) GRP which includes main renewal projects and meter move out grids and (2) Meter Assembly Check – Meter Move Out (MAC MMO) program.

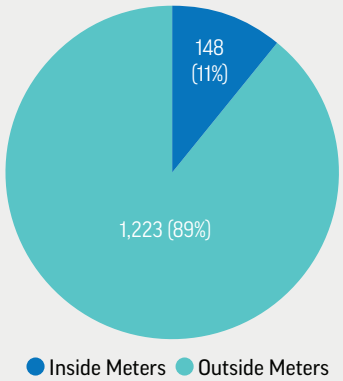
Distribution System Mileage by Installation Decade – Figure 28



Distribution System Mileage by Material – Figure 29



DTE Gas Meters by Location (in thousands) – Figure 31



High-Pressure Distribution Steel Main Miles (100 Psig or more) by Installation Year – Figure 30

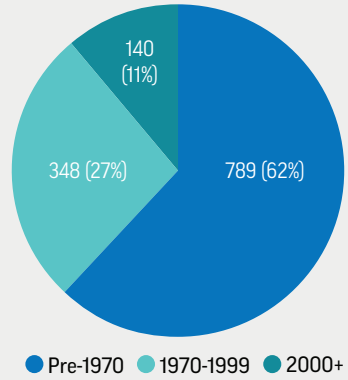
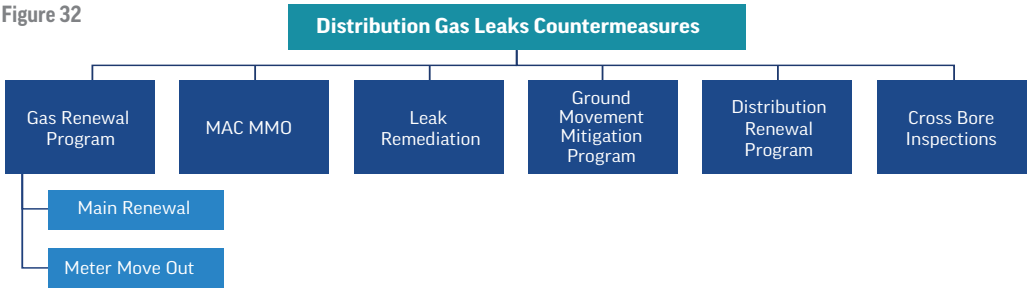


Figure 32



Distribution Risk Countermeasures

Gas Renewal Program

DTE Gas initiated the GRP in 2011 to modernize distribution infrastructure. The program targets the removal of legacy mains and inside meters from the DTE Gas distribution system.

Since 2011, DTE Gas has renewed over 1,500 miles of main and has moved more than 260,000 meters outside. The Company is on track to eliminate all wrought iron, cast iron, bare steel, and cathodically-unprotected coated steel main (e.g., "legacy" main), as well as relocate all feasible inside meters outside by 2035.

The Company plans to invest approximately $3B in the GRP over the next ten years.

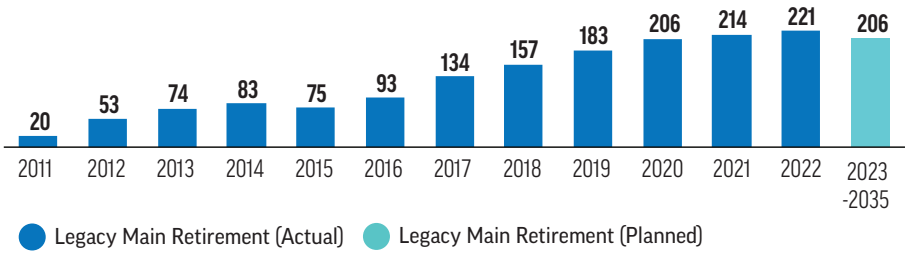
Since 2011, more than 40% of the Company's GRP infrastructure upgrades have been concentrated in Michigan's vulnerable and historically underserved communities, where some of DTE Gas's oldest infrastructure is located. While this naturally supports EEJ, the Company is beginning to look at how it can be more intentional about prioritizing EEJ throughout this work, by considering EEJ as a factor for project selection.

GRP - LEGACY MAIN RENEWAL (LEGACY MILES REMEDIATED)

DTE Gas has implemented a long-term strategy to reduce leaks and lost and unaccounted for gas (and associated emissions) through the renewal and retirement of legacy pipelines. DTE Gas uses a risk-based prioritization model, which allows for the systematic and efficient replacement of pipelines in large grid areas. This comprehensive, total-system approach strengthens the grid by replacing low-pressure distribution systems with new, higher-pressure plastic systems, starting in one area and advancing to adjacent targeted areas. As shown in Figure 33, DTE Gas intends to continue renewing approximately 200 miles per year.

DTE Gas GRP Main Renewal Miles* – Figure 33

Legacy Miles Renewed per Year



*Miles retired through the GRP program. Additional miles may be retired through routine work and other construction activities

The Company plans to invest approximately $3B in the GRP over the next ten years.

GRP - INSIDE METER MOVE OUT

The DTE Gas GRP relocates gas meters outside in a systematic, grid-based, cost-efficient manner. The GRP minimizes the potential for inside leaks and addresses the challenges of gaining access to inside meters to perform Meter Assembly Checks (MACs), which is a critical component of leak inspection.

DTE Gas plans to relocate, on average, more than 17,000 inside gas meters annually through 2027, at which point approximately 97% of meters will be outside. The remaining feasible inside meters will be moved outside by 2035.

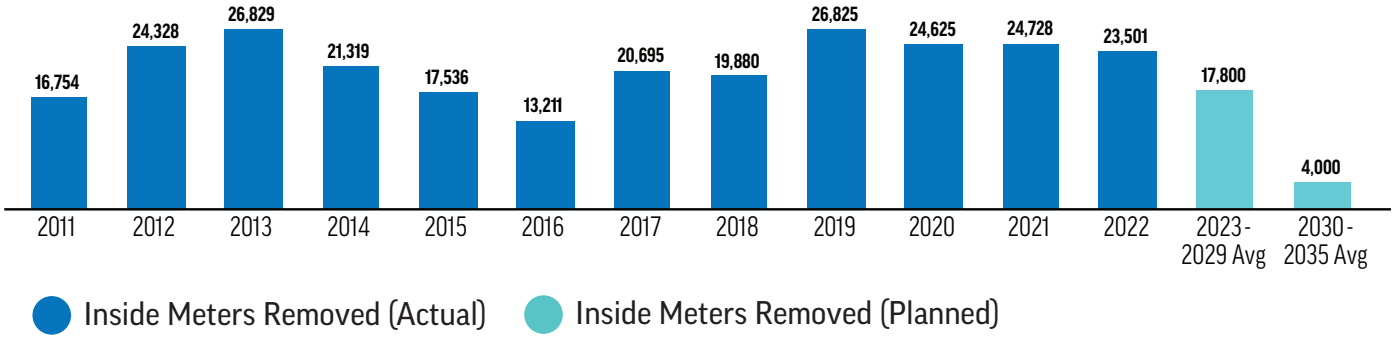
Meter Assembly Check – Meter Move Out (MAC MMO)

The MAC MMO program, initiated in 2018, relocates inside meters to eliminate the need for inside access to perform future MACs and meter work, reducing risk, and improving efficiency.

During a MAC, inside meters are checked for surface corrosion, leaks, and other conditions that might require attention or repair. To comply with 49 CFR Part 192, DTE Gas inspects all pipelines exposed to the atmosphere for corrosion at least once every three calendar years, but with intervals not to exceed 39 months. DTE Gas targets densely situated inside meters that require a MAC to efficiently impact as many meters as possible. Both the MAC MMO and GRP programs are coordinated.

After 2024, resources supporting MAC MMO will continue to move inside meters outside through the GRP, reducing the number of yearly MAC inspections required.

DTE Gas Inside Meters Removed[1] – Figure 34

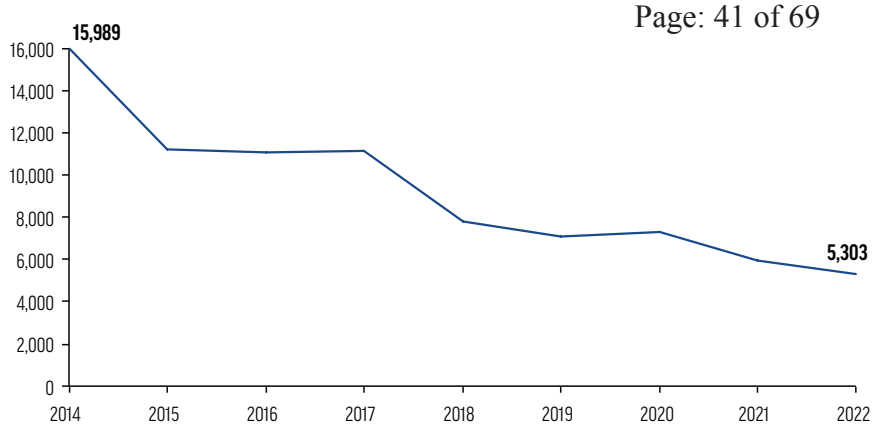


[1] Includes inside meters moved outside through Routine, MAC MMO, and GRP work

GRP LEAK REDUCTION RESULTS

Leak survey results demonstrate that infrastructure renewal is reducing leaks in the DTE Gas distribution system. The number of incoming leaks may be influenced by external environmental factors such as extreme cold, but the decrease has been consistent through the last three years. This trend supports the benefits of GRP and the need to continue to modernize the Company's infrastructure.

Incoming Leaks by Year – Figure 35



Leak Remediation

While GRP has demonstrated the benefits of eliminating leaks, the remaining aging infrastructure continues to be at risk for leaks. To help mitigate this risk and preserve safety and reliability for customers, DTE Gas actively identifies and remediates leaks. DTE Gas uses two methods to identify leaks:

- **Annual leak survey** – DTE Gas surveys all pipelines, service lines, and meters with leak detecting equipment. The Company conducts these surveys in accordance with regulatory requirements in the Michigan Gas Safety Standards. The Company surveys its cast iron pipelines and business district pipelines every year and residential area pipelines and services at least every five years
- **Reported leaks** – The public also identifies and reports potential gas leaks. DTE Gas takes leaks very seriously and investigates all reported leaks. In 2022, DTE Gas responded to leaks, on average, in 21.2 minutes

All natural gas leaks are graded to evaluate their severity and the requirements for remediation or monitoring are documented in DTE's Gas Distribution & Transmission Procedures. Hazardous leaks receive immediate action (Table 7 and Table 8).

Field Conditions for Leak Classification – Table 7

Grade	Field Conditions
1	• Any indication of combustible gas which has migrated into or under a building, or into a tunnel or other enclosed space • Gas ignition • Congested area where pedestrians could be in the leak area • Indication of combustible gas within 3' of a building wall • Any sustained reading of 4% combustible gas (80% of the Lower Explosive Limit (LEL)) or greater in small substructures • Any excavation-related damage resulting in a leak • Any leak that can be visually observed, heard, or felt, and is in a location that may endanger property or the general public
2	• Read of underground combustible gas greater than 3', and up to 20', from a building wall and the conditions dictate there will be no migration to the building wall • Reading of less than 4% combustible gas (80% of the LEL) in traffic control boxes, fire call boxes, or similar spaces • Reading of less than 4% combustible gas (80% of the LEL) in substructures such as water or sewer manholes, water services, gas services, telephone facilities, electric facilities, or other underground conduits
3	• Any sustained reading of less than 4% combustible gas (80% of the LEL) where the spread of gas is unlikely to migrate to a building wall or any underground in small gas-associated substructures, such as valve and tracing wire boxes • Any indication of underground combustible gas >20' from a building wall

Leak Classifications and Actions – Table 8

Grade	Classification	Action
1	Immediate Action	Leaks that represent an existing or probable hazard to persons and/or property. Grade 1 leaks require immediate repair or continuous action until the conditions are no longer hazardous
2	Scheduled Action	Leaks recognized as being non-hazardous at the time of detection but that requires or justifies a scheduled repair based on potential future hazard. Grade 2 leaks must be scheduled to be repaired or eliminated within one (1) year and must be rechecked after six (6) months if not repaired or eliminated
3	Deferred Action	Leaks that are non-hazardous at the time of detection and can be expected to remain non-hazardous. If not repaired or eliminated, Grade 3 leaks must be rechecked at least once each calendar year but not exceeding a 15-month interval

ADVANCED LEAK DETECTION

Picarro, a mobile leak survey system, is expected to improve the ability of DTE Gas to identify leaks. The Company expects to implement this program in two phases. The technology is comprised of high-resolution, vehicle-based equipment that captures methane.

The Picarro technology will enhance public safety and improve the reliability of the distribution system. Picarro utilizes more sensitive gas detection technology (parts per billion vs. parts per million), which will increase DTE Gas's ability to accurately identify existing leaks. By identifying leaks and quantifying emissions, Picarro will also enhance DTE Gas's environmental efforts.

The deployment and evaluation plan for Picarro involves using it to identify high methane emitting potential leaks in off-cycle routine survey areas. This will increase customer safety by the identification of potentially larger leaks within the DTE Gas service territory. Picarro identified 309 high-emitting leaks in 2022. The prioritization of leaks based on emission level supports the Company's environmental actions to minimize methane emissions due to leaks. Additionally, the Company plans to integrate the emissions data into its Distribution Integrity Management Program (DIMP) model to help prioritize infrastructure improvements. Additional use cases for Picarro include performing quality checks on traditional leak survey and conducting special surveys, such as high-consequence public events and when abnormal conditions are found.

Distribution Renewal Program (DRP)

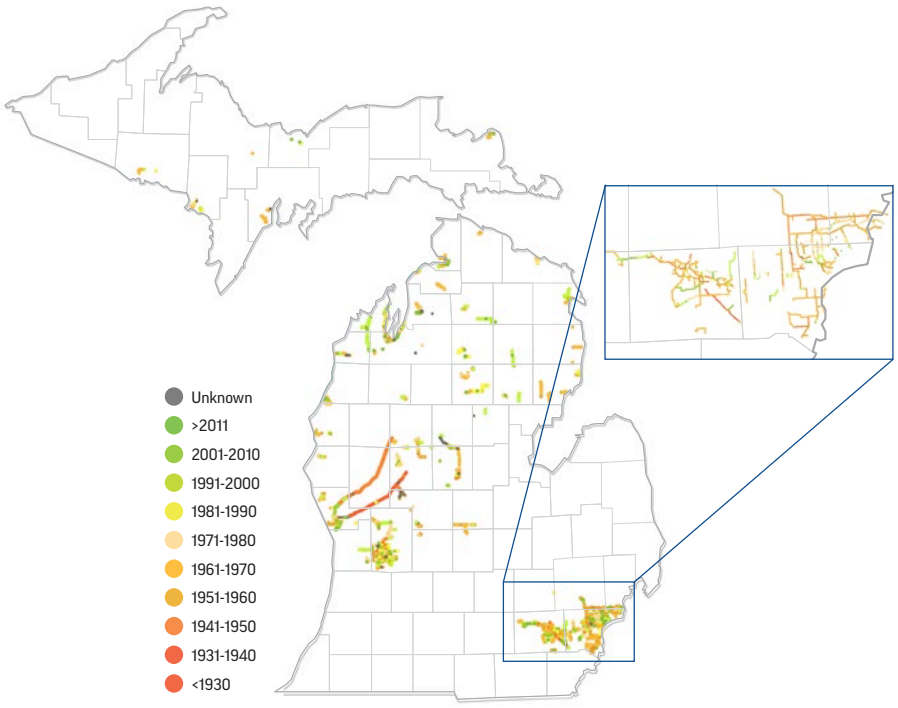
DTE Gas has approximately 1,300 miles of high-pressure (≥ 100 psig) steel distribution pipelines spread throughout the state. More than 60% of these pipelines were installed before 1970 (See Figure 36).

DTE Gas is developing a Distribution Renewal Program (DRP) to identify high-priority pipelines, based on integrity and reliability factors. Integrity factors include legacy welding practices, ineffective cathodic protection, poor coating quality or lack of coating, mechanical couplings, thin wall pipe, third-party damage, population density, and proximity of the pipeline to buildings. Reliability factors include single source pipelines with high customer outage potential. This program differs from the Company's GRP in that it is focused on high-pressure steel distribution pipelines, while the GRP focuses on predominantly lower-pressure cast iron and cathodically unprotected steel pipe.

DTE Gas will prioritize remediation of these DRP pipelines along with the TRP pipelines (discussed in the *Transmission Asset Plan* section) utilizing the probabilistic risk models (discussed in the *Safety* section) when they are jointly calibrated and able to compare risk across both asset types.

DTE Gas has created a Distribution System Planning team to (1) Support and continuously update hydraulic modeling tools consistent with the expectations identified in the MPSC's 2019 SEA report, (2) Develop an annual proactive distribution system planning process to identify potential customer deliverability and reliability risks, and (3) Provide optimization and efficiency analyses for major distribution capital infrastructure projects.

High Pressure Distribution Pipelines by Installation Year – Figure 36



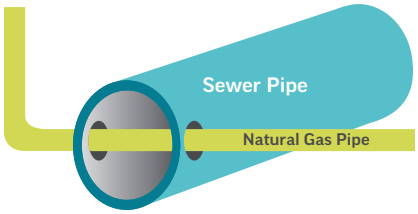
Fort Street Main Replacement Project

DTE Gas identified high-priority, high-pressure steel distribution pipelines for risk remediation based on integrity and reliability factors. The Fort Street main was identified as high risk based on this analysis, and the first two phases of the project were completed as a stand-alone project in 2019 by replacing 3,000 feet of mechanically joined main in Downtown Detroit. The other phases of the project include the installation of approximately 13 miles of main and abandonment of approximately 14 miles of main from River Rouge Station to Jefferson Station along Fort Street in Detroit. The Fort Street main replacement project is driven by several key factors. First and foremost, this project is needed to improve pipeline safety by retiring the 1940 and 1951 installed 24" mechanically coupled steel mains operating at 50 psig and 99 psig in a dense urban environment. Pre-1970 construction practices often used mechanical couplings that were not designed to withstand pullout forces to join pipe segments. These mechanically coupled joint segments are subject to a higher risk of leaks from third-party damage, corrosion, and ground movement due to natural forces or nearby construction activity. Second, completion of the entire project will mitigate the potential outage risk of approximately 15,000 customers in Downtown and Southwest Detroit by creating a looped supply at 145 psig. Finally, there is no high-pressure gas supply currently available in the area east of Downtown Detroit, and a high-pressure gas supply is needed to supply the East Jefferson municipal coordination project and future 60 psig GRP grid projects. Once the 145 psig high-pressure is complete, the Company will be poised to progress with these future GRP grid projects.

Cross Bore Inspections

DTE Gas began piloting cross bore inspections in 2017 and has now fully incorporated them into its procedures as a countermeasure to mitigate against leaks in its distribution system. A cross bore occurs when a natural gas main or service is installed through another utility. A natural gas line cross bored through a sewer creates an elevated risk (See Figure 37), where, for example, a mechanical sewer drain cleaner could puncture the natural gas line.

Cross bore example – Figure 37



DTE Gas performs cross bore inspections when trenchless methods are used to install distribution pipes to locate sewer laterals prior to construction to avoid creating interference, or to verify that damage from gas construction has not been created. The Company's goal is to either complete a pre- or post-construction sewer inspection for all distribution work utilizing HDD, to mitigate the risk of a cross bore damage.

Performing pre- or post-construction sewer inspections allows DTE Gas to find, remediate, and analyze cross bore risk within the distribution system. DTE Gas also performs targeted inspections in areas based on historical data as needed. In 2022, DTE Gas performed a pilot program targeting potential legacy cross bores through its risk assessment program and is continuing the pilot into 2023. In 2022, DTE Gas performed 36,391 sewer line inspections and plans to invest approximately $88M in capital on its pre- and post-construction cross bore inspections from 2024 to 2033.

Ground Movement Mitigation Program

DTE Gas has developed a state-wide plan to identify sites with risk of ground movement, evaluate the impacts on its pipelines, and remediate any detrimental conditions. To date, DTE has identified 46 sites and completed engineering field investigations to evaluate the conditions. Fifteen sites were identified that require periodic monitoring with the other 31 sites requiring no further action. Additionally, guidance has been provided to field employees to assist in identifying any other sites with ground movement risk.

Overpressure Countermeasures

In response to the Columbia Gas Merrimack Valley overpressure incident in 2018, DTE Gas has taken steps to enhance overpressure protection on its distribution system. This includes reviewing overpressure protection and renewing or upgrading legacy regulators.

Overpressure Protection

In preparation for upcoming regulation resulting from the Department of Transportation's Protecting Our Infrastructure of Pipelines and Enhancing Safety (PIPES) Act of 2020, the Company is performing an engineering study of distribution regulator stations and is developing a risk-based program to identify and remediate common mode failure threats on regulator stations. The Company has undertaken a pilot project evaluating 89 district regulator stations utilizing Failure Mode and Effects Analysis (FMEA) to identify potential common mode failure risks. DTE Gas has included approximately $76M in its 10-year capital plan for overpressure risk remediation.

Legacy Regulators

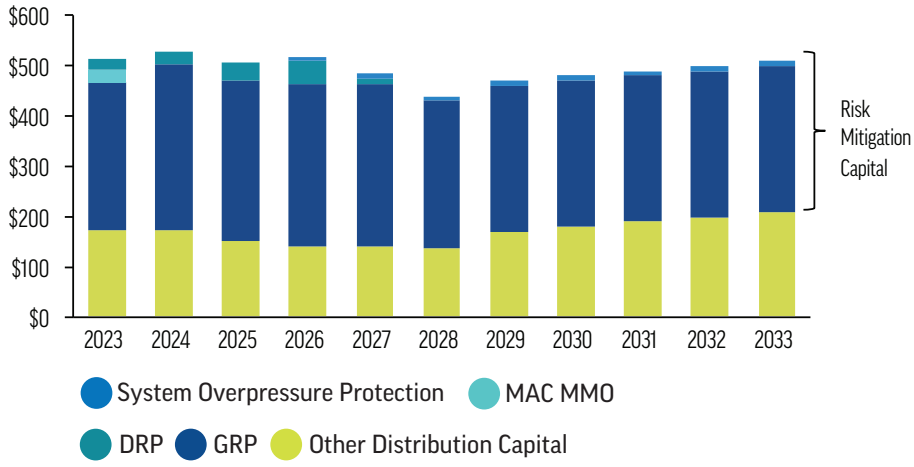
DTE Gas has approximately 1,800 legacy regulators present in its distribution system, representing roughly 23% of the total regulators. The Company plans to address legacy regulators through its routine System Reliability Program, which is the Company's program that prioritizes distribution facilities for renewal or upgrades. DTE Gas also efficiently addresses other needs of the station at that time to ensure the facility meets safety, reliability, and regulatory requirements. The timing and funding requirements will be determined after the evaluation of upcoming regulatory changes from the PIPES Act.

Distribution Capital Financial Summary

Over the next ten years, DTE Gas's largest distribution system capital investment will continue to be the GRP, which will have remediated more than 2,000 miles of legacy distribution pipeline by 2033. This effort will modernize distribution infrastructure to improve reliability and safety while also supporting the Company's environmental responsibility by significantly reducing methane emissions due to gas leaks. The GRP will continue through 2035, when all feasible inside meters will have been moved outside and legacy mains have been retired. The DRP will also be a priority area for distribution capital investment in the future with specific project expenditures prioritized by the Company's probabilistic risk model.

Overall, DTE Gas expects annual capital investment in the distribution system to remain between $435M and $525M per year, with 66% of this capital dedicated to risk mitigation activities. The remaining 34% is focused on other critical routine infrastructure projects such as service alterations and public improvement.

Distribution 10-year Capital Plan ($M) – Figure 38



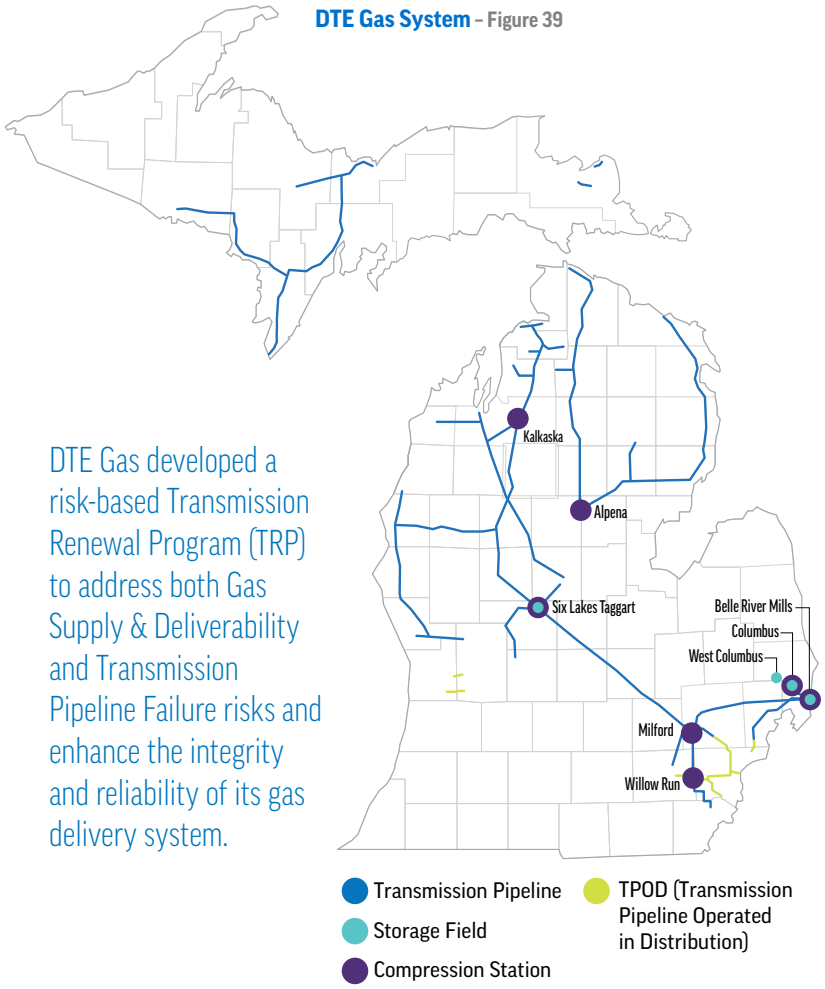
DTE Gas's distribution asset plan aligns with the Company's key objectives of mitigating risks for safety and reliability, avoiding future O&M expenses that would impact customer affordability, and reducing methane leaks to help achieve net zero emissions for the distribution system by 2050.

SAFE

DEPENDABLE

As described in the *Gas Safety* section, there are two key industry risks associated with transmission assets – Gas Supply and Deliverability, and Transmission Pipeline Failure. The main drivers for these risks are a lack of system redundancy and potential integrity issues largely due to the age of the transmission infrastructure (pre-1970).

DTE Gas System – Figure 39



DTE Gas developed a risk-based Transmission Renewal Program (TRP) to address both Gas Supply & Deliverability and Transmission Pipeline Failure risks and enhance the integrity and reliability of its gas delivery system.

The DTE Gas key countermeasures for these two risks are:

- Transmission Renewal Program (TRP)
- System redundancy
- Interconnects with other gas utilities
- In-Line Inspection (ILI) Expansion Program
- Stress Corrosion Cracking (SCC) pipeline assessments
- Class 1 and Class 2 facility integration into Geographic Information Systems (GIS) and the probabilistic risk model
- Transmission MAOP Records Remediation and Records Management Plan (previously discussed in the *Gas Safety* section)

DTE Gas is investing approximately $1.3B over the next 10 years to implement these countermeasures.

Transmission Assets Overview

DTE Gas's transmission system consists of approximately 2,000 miles of pipelines spanning the Upper and Lower Peninsula, as illustrated in Figure 39, and includes Transmission Pipelines that Operate within the Distribution (TPOD) system.

The function of the transmission system is to transport gas from interconnects and storage fields to city gate stations. Compressor stations, used in conjunction with the transmission system, increase the gas pressure for transport along the pipelines and inject into or withdraw gas from storage fields as needed.

Supply and Deliverability Risk

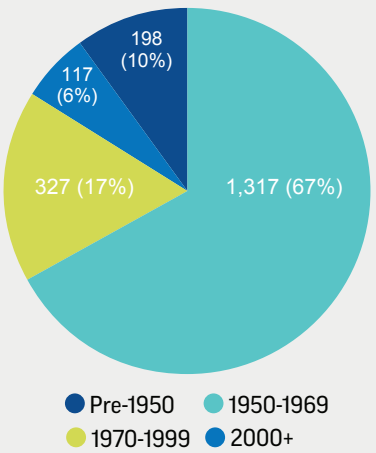
Two major factors impact supply deliverability. The first is the potential lack of supply due to a pipeline event. For example, when only one pipeline serves a region, referred to as a "single source" pipeline, and gas delivery is disrupted due to a pipeline incident, then there is potential for customer outages. Certain single source pipelines are at risk for significant customer outages. Alternatively, some pipelines are not single source, but the risk of high customer outages still exists because multiple sources are needed to supply the system during times of higher gas usage in the winter. In this case, an event on one of the pipelines in a multi-sourced area of the system creates the potential for customer outages during times of high gas usage. Redundant pipelines and alternate supply sources, including additional interconnects, effectively mitigate this risk by improving system resiliency and reliability. DTE Gas is addressing its highest-priority gas supply and deliverability pipelines through its TRP projects, such as the Traverse City Alpena Reinforcement and Van Born Projects (described below) and other similar projects.

The second factor posing a risk to deliverability is a potential supply disruption driven by the lack of system redundancy. When evaluating storage field deliverability, it is essential that field capabilities and corresponding above-ground equipment are designed to meet the highest customer demand. Like the need for transmission pipeline redundancy, equipment redundancy is equally important to address unexpected events and ensure reliability. DTE Gas reviewed several options regarding how to address this risk at the Belle River dehydration plant and determined the optimal mitigation strategy is to install a redundant dehydration plant, which is described in further detail below.

Transmission Pipeline Failure Risk

Approximately 77% (1,515 miles) of DTE Gas's transmission mileage was installed pre-1970, prior to the issuance of the federal pipeline safety standards (See Figure 40).

Transmission System Mileage by Installation Decade – Figure 40



Pre-1970 construction practices often employed welding techniques that are different from construction practices today. Additionally, pipelines manufactured pre-1970 could be vulnerable to seam quality issues whereas pipelines manufactured post-1970 are manufactured with more advanced methods and utilize steel with improved properties. Pre-1970 pipelines can be more susceptible to transmission events and are a main factor of transmission risk. As a preventative risk mitigation measure, DTE Gas routinely performs assessments of its transmission pipelines to identify and remediate any potential issues that could cause a pipeline event. However, the Company's system continues to age, and certain transmission lines will require remediation through the Transmission Renewal Program (TRP).

Transmission Risk Countermeasures

Transmission Renewal Program (TRP)

DTE Gas developed a risk-based Transmission Renewal Program (TRP) to address both Gas Supply & Deliverability and Transmission Pipeline Failure risks and enhance the integrity and reliability of its gas delivery system.

The Company implemented a new probabilistic risk model for Transmission Integrity Management Program (TIMP) to better model system risk as compared to the previous relative risk model. Using the new model, the Company prioritized pipelines that need upgrading or replacement based on the following main factors: pre-1970 installation, high stress in steel, corrosion growth rates, population density, customer outage potential, and comprehensive ILI data. Pre-1970 transmission pipelines were built before stringent federal codes were established. High stress in steel refers to pipelines that are operating near 50% of the Specified Minimum Yield Strength (SMYS). SMYS is the level of stress a pipeline can withstand before it deforms, and pipelines operating at stress levels 30% or greater are more likely to rupture rather than leak. DTE Gas is now utilizing corrosion growth rates to determine time-to-failure rates and ensure timely remediation.
A transmission pipe failure would be a significant event, which is why a pipeline failure within a densely populated area is an important factor in the Company's risk model. Lastly, customer outage potential directly contributes to the Gas Supply & Deliverability risk as was described previously. A major incident on a pipeline with high outage potential could disrupt gas supply to thousands of customers.

The top 10 priority transmission pipelines for remediation (Table 9) have been updated from the original relative risk model version utilizing the Company's new probabilistic risk model. The inputs for risk evaluation are constantly evolving, and therefore, the risk ranking of pipelines has and will continue to change accordingly. Lincoln-Traverse City, Alpena, and Van Born 36" pipelines have shifted risk ranking position utilizing the new probabilistic risk model but continue to be the focus of DTE Gas's current risk mitigation projects because potential customer outages from the failure of these pipelines are much higher than any other pipeline in the DTE Gas system and recovery of such outages would be unmanageable. Hence, the Company prioritized the mitigation of the Lincoln-Traverse City, Alpena, and Van Born pipeline risks based on a broader and more impactful consequence of failure than the overall risk output.

All three phases of the Traverse City Alpena Reinforcement Project (TCARP), which mitigates 91,000 potential customer outages, are complete and were in service as of February 2023. The Van Born Project, the mitigation for the potential outage of 160,000 customers, began construction in May 2023 and is scheduled to be in service in 2024.

Regarding the top 10 transmission pipelines prioritized for remediation, not all the pipelines are planned for replacement (see Table 9) due to segment replacement not being a viable option for risk reduction. This is due to the fact that the risk on some of these pipelines are more on the consequence side rather than the frequency of occurrence, and therefore replacement would not have any effect on the consequence if an incident were to occur. The Company's focus projects of TCARP, Van Born, and A&B Lines will be described further below.

Top 10 TRP Pipelines – Table 9

Rank	Pipeline / System	Risk Type	Customer Outage Potential	Mitigation
1	Milford – Belle River (E)	Integrity	–	Additional ILI and Defect Remediation, and Patrolling
2	Milford Loop (L)	Integrity	–	Additional ILI and Defect Remediation, and Patrolling
3	Austin – Detroit A	Integrity	–	Segment Replacement
4	Van Born 30"	Integrity	–	Segment Replacement
5	Evergreen	Integrity	–	Segment Replacement
6	Austin – Detroit B	Integrity	–	Segment Replacement
7	Belle River - Detroit	Outage and Integrity	70,000	Additional ILI and Defect Remediation, Patrolling, and Looping and Alternate Supply through Consumers Energy Interconnect or Distribution System Upgrades
8	Columbus (30)	Integrity	–	Segment Replacement
9	Austin – Detroit C	Integrity	–	Segment Replacement
10	Van Born 36"	Outage	160,000	Additional ILI and Defect Remediation, Patrolling, Regulation, and RCVs

TRAVERSE CITY ALPENA REINFORCEMENT PROJECT (TCARP)

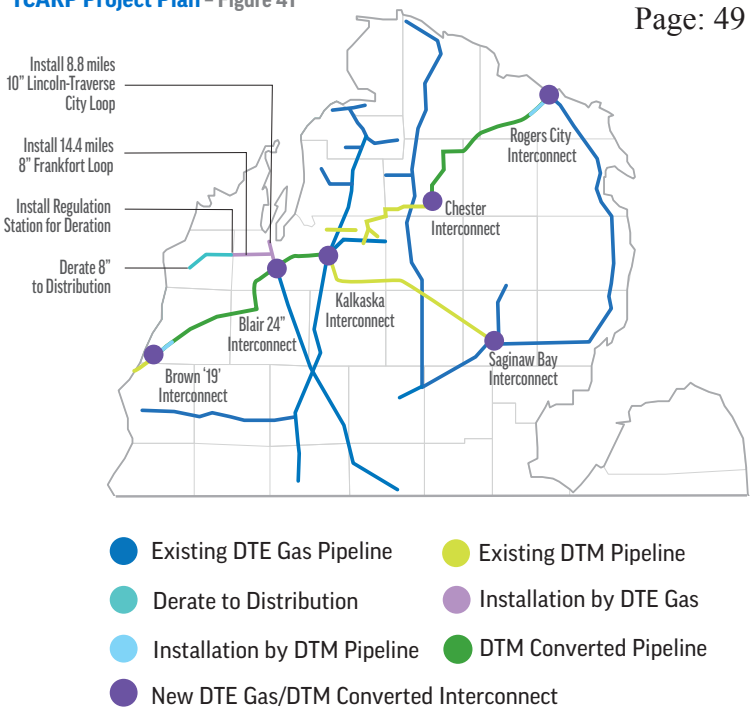
The Lincoln-Traverse City and Alpena systems were two of the top single-source pipelines requiring risk mitigation for both higher integrity concerns and high outage potential (these two systems had an outage potential of 86,000 customers). A major incident on either of these pipelines could have resulted in an unprecedented outage with unacceptable impacts on DTE Gas customers, and these risks were present throughout the year.

The TCARP project mitigated both risks by providing redundant gas supply and enabling pipeline integrity assessments utilizing the In-Line Inspection (ILI) method that is detailed later in this section.

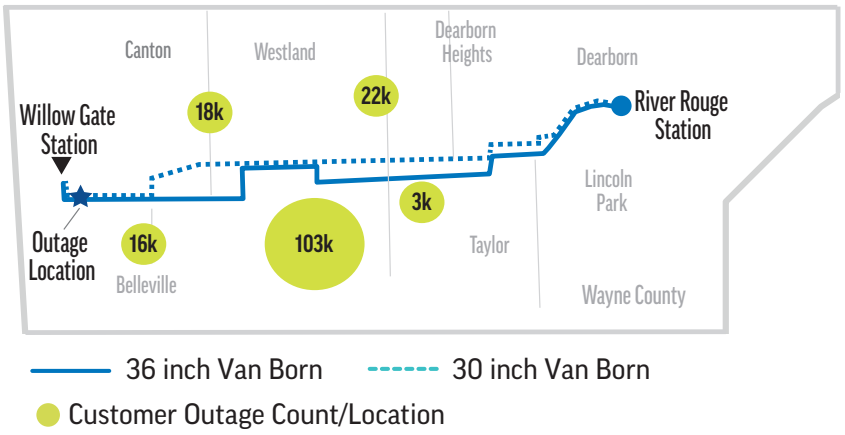
The TCARP project scope consisted of looping the existing Lincoln-Traverse City and Frankfort pipelines with approximately 8.8 miles of 10" diameter pipe and 14.4 miles of 8" diameter pipe, respectively, installation of six interconnects with DT Midstream (formerly DTE Michigan Gathering Holding Company) pipelines, installation of one new gate station, and modifications to 12 existing gate stations (see Figure 41). An added benefit of the TCARP project is that the location of the DT Midstream pipelines allowed DTE Gas to address another system requiring risk mitigation, the Manistee pipeline, which also had an outage potential of 5,000 customers. Collectively, the TCARP project mitigated integrity risks and outage potential for approximately 91,000 customers.

The project consisted of three phases. Phase 1, construction of 8.8 miles of the Lincoln-Traverse City 10" loop pipeline and associated stations, was placed into service in January 2021. Phase 2, construction of 14.4 miles of the Frankfort 8" loop pipeline and associated stations along the route, was placed into service in January 2022. The final phase, Phase 3, was the construction of interconnections with DT Midstream, and was placed in service in February 2023. DTE Gas invested approximately $115M in the TCARP project.

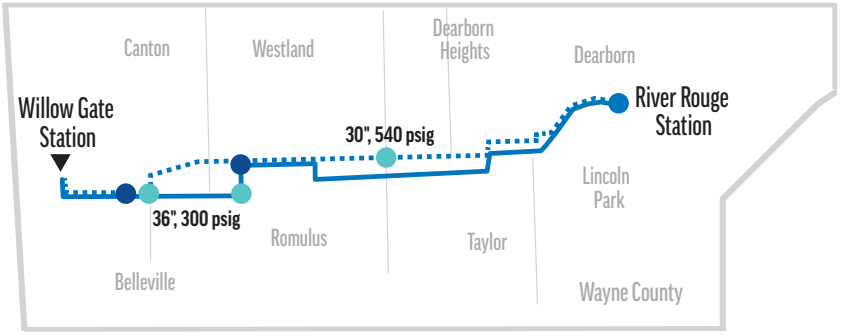
TCARP Project Plan – Figure 41



Van Born Customer Outage Potential – Figure 42



Van Born Project Plan – Figure 43



VAN BORN

The Van Born system consists of two pipelines. The first is a 30" 540 psig pipeline that supplies natural gas to two large industrial customers and the Miller Road District Regulation Station. The second is a 36" 300 psig pipeline that is a primary source of natural gas supply to the SEMI residential, commercial, and industrial market. A major incident on the 36" pipeline could result in an unprecedented outage with unacceptable impacts to approximately 160,000 customers during the winter heating season (See Figure 42).

The Van Born project (See Figure 43) consists of the installation of new regulation at the Rouge Station, the installation of new Main Line Valves (MLVs) on the 36", 300 psig system to sectionalize the pipeline, and the installation of Remote-Control Valve (RCV) operators to quickly reconfigure the system. These system modifications and upgrades will provide redundant gas supply to DTE Gas's SEMI territory and reduce the potential outage from 160,000 customers to less than 1,400 customers.

The new regulation at the Rouge Station will take gas from the 30", 540 psig system and reduce it to 300 psig for use on the 36" Van Born Pipeline. DTE Gas's cost estimate for this project is approximately $61M. The Company has completed the detailed engineering design, material procurement, and has awarded the construction contract. Construction began in May 2023 with an anticipated in-service date in 2024.

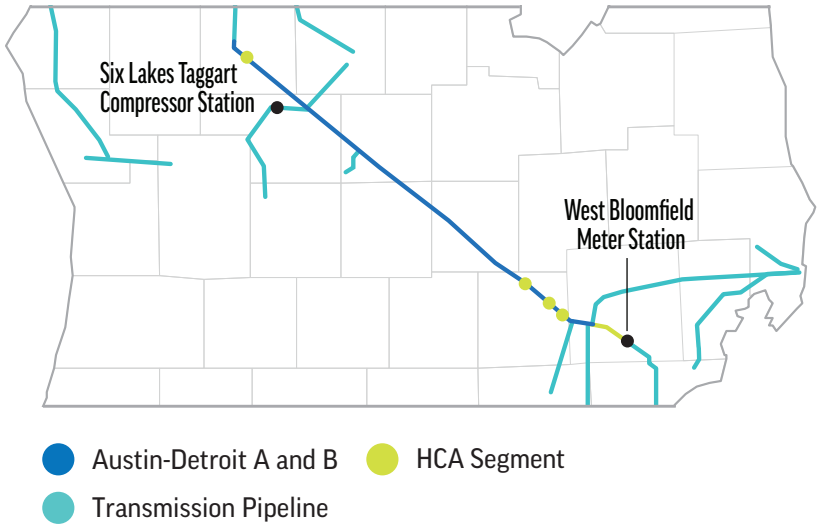
A & B LINES

DTE Gas's A&B Lines connect the Six Lakes (Taggart) storage field to the SEMI market at the West Bloomfield Station as illustrated in Figure 44. These pipelines were designed and installed in 1948 and 1951, respectively, for Class 1 locations. Since the lines were installed more than 70 years ago, high-density population areas have emerged along this route. As shown in Table 9, the A&B Lines rank in the top 10 risk-ranked pipelines. The potential risk is primarily due to the legacy manufacturing and construction practices at the time of installation.

Specifically, the A&B Lines include pipe manufactured by A.O. Smith, which may have potential defects on the long seam and "hard spot" defects, that have been alleged to be the cause of past industry pipeline failures. Some examples of industry failures that involve A.O. Smith pipe include a Panhandle Eastern failure in 2008 and Enbridge failures in 2003 and 2019.

Additionally, the construction practices of the Austin-Detroit A Line were not as robust as they are today. This pipeline is one of six transmission pipelines in DTE Gas's system that were constructed using "wrinkle bends" when the pipeline changed direction and contains thousands of such "wrinkle bends." This practice is no longer used when constructing pipelines today since "wrinkle bends" create potential high-stress areas on the pipeline and have been known to be the cause of industry pipeline failures in the past. Some examples of industry failures that involve "wrinkle bends" include a Southern Natural Gas failure in 2009 and a Kinder Morgan failure in 2010.

A&B Lines – Figure 44



The A&B Lines also require extensive remediation compared to the other pipelines in our system. This is due to the legacy manufacturing and construction methods mentioned above compounded by the additional assessment and more stringent remediation requirements from both the first and second MEGA rule implementations.

The A&B Lines project focuses on the high-population-density HCA areas (43 miles). To mitigate the potential integrity risks along these pipelines, DTE Gas plans to replace the sections of pipe that are currently in Class 3 and HCA locations.

Conceptual engineering for the project began in 2023 with detailed engineering planned for 2024 and material acquisition planned for 2025. Construction is planned to span the following three years (2026 through 2028) to allow for the sections of pipe to be strategically removed from service and replaced while maintaining the Company's ability to inject and withdraw gas from the Six Lakes Storage Field.

DTE Gas has estimated this project will require a capital investment of approximately $309M.

System Redundancy

To ensure pipeline gas quality standards are met, gas withdrawn from storage usually flows through processing equipment to remove excess moisture. Moisture is removed to comply with pipeline quality standards, meaning the gas is of the quality that can be delivered to customers and does not impair the integrity of the pipeline. Redundant backup processing equipment, which consists of filtration and dehydration equipment, is not typically installed at the majority of DTE Gas's storage facilities.

BELLE RIVER DEHYDRATION PLANT (DEHY)

As part of the results of the MPSC SEA, and following Consumer Energy's Ray Compressor Station incident, utilities were required to review system vulnerabilities and address system redundancy gaps. Currently, DTE Gas relies on dehydration plant equipment associated with storage gas withdrawals to operate at maximum capacity to meet peak day design conditions (the highest possible demand that is projected to occur during extreme cold weather). In 2020, an impact analysis was performed based on modeled outages at each individual dehydration plant, and the Company determined that should a failure occur resulting in a prolonged outage at the Belle River dehydration plant, there may be insufficient operational contingencies to cover the resulting loss of gas deliverability during peak market demand.

On a winter design day, without this dehydration unit to remove moisture from the Belle River storage field, only a portion of gas can be withdrawn from the field, which is then blended with gas coming from other storage fields to keep the moisture content below a specified level. Even when maximizing these blending capabilities, the loss of supply that could result from a Belle River dehydration plant failure has the potential to create a supply deficiency. Due to the significant reliance on supply from this field and the impact of losing the dehydration plant at Belle River, the Company determined that the optimal mitigation strategy is to install a redundant dehydration plant. The estimated cost for this project is approximately $29M. The preliminary schedule is to engineer and procure material in 2023 and construct it in 2024 to be prepared for the 2024-2025 heating season.

Interconnects

The interconnectedness of the transmission system and existing pipeline redundancies contribute to system resiliency by allowing for operational flexibility during planned and unplanned outages.

As mentioned in the *Gas Demand and Supply* section, DTE Gas has more than 30 major interconnects with nine different pipeline companies. These interconnects increase the Company's diversity of supply, as stated by the MPSC in their SEA report "Within the transmission system, interconnections allow for redundancy by having multiple sources of supply." DTE Gas's historical interconnection projects include NEXUS which, in addition to increasing security and diversity of supply, has lowered the cost of gas for GCR customers.

To further enhance operational flexibility and supply diversity, DTE Gas has collaborated with Consumers Energy to identify a mutually beneficial site for an interconnect between the two companies. The result of the collaboration was the identification of a location, in Oakland County's Orion Township, where the DTE Gas E-Line and the Consumers Energy Line 2700 are in very close proximity to each other. To improve resiliency, the strategy is to construct a bi-directional meter station at this location in 2025. Both companies have storage fields near the proposed new interconnect that make it an ideal location to help maintain reliable gas supply, especially during periods of high gas demand in winter. This interconnect will have the ability to flow up to 600 MMcf/d and can be used by either party to receive gas in the event of an operational emergency. In 2019, DTE Gas was able to provide emergency supply to Consumers Energy at Northville, during their Ray Compressor station outage; however, DTE Gas was limited in the volume that could be supplied at that location.

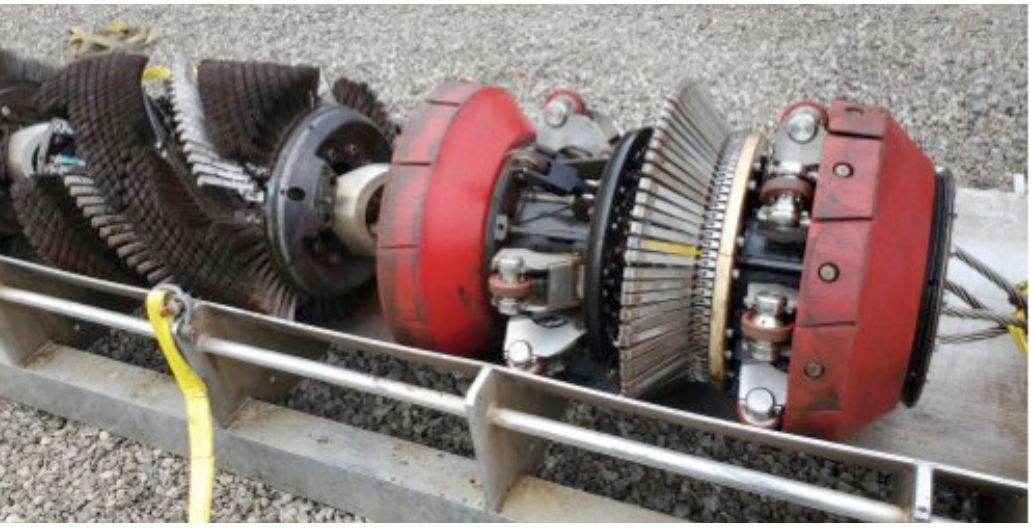
In addition, to provide redundancy for the northeast portion of the service territory, DTE Gas is planning to construct an interconnection with Consumers Energy, in Mt. Clemens, where their pipeline (Line 1700) and the 24" Belle River – Detroit Pipeline intersect. From that interconnection, DTE Gas will construct an approximate six-mile, 24" pipeline loop to the existing Northeast Gate Station in 2026. This project reduces the risk associated with the TRP project Belle River – Detroit (#7 in Table 9). Once constructed, DTE Gas will have the ability to receive between 200-300 MMcf/d from Consumers Energy in the event of an operational emergency.

In the event of an operational emergency, both these interconnects provide additional protection against customer outages by providing additional emergency supply options to the system.

The Company plans to invest $61M in these two interconnects and associated pipeline projects.

In-Line-Inspection (ILI) Expansion Program

The Company's ILI Expansion program is designed to increase the coverage of transmission integrity assessments beyond the minimum requirements specified in the Michigan Gas Safety Standards (MGSS), Subpart O, Pipeline Integrity Management. This program proactively addresses the risk of transmission pipeline failure by not only assessing the most densely populated (HCA) miles as required by regulations but also assessing the non-HCA companion miles with a tool that can identify potential pipeline anomalies and enable the Company to remediate necessary defects.



DTE Gas started implementing the ILI Expansion program following the completion of required baseline assessments in 2012. The ILI method was chosen for the integrity assessment expansion program because ILI gathers the most comprehensive data about pipelines, is the most versatile method in terms of coverage of pipeline threats, and therefore, is the method preferred by most operators. Further, assessment by ILI provides information beyond HCA to develop a full picture of the integrity of the assessed segment for continued service. Lastly, ILI is the most cost-effective assessment method based on normalized cost per mile. Once most of the HCA miles have been made assessable by ILI, the Company plans to address pipelines that do not currently have permanent launcher and receiver facilities and install this piping to reduce risks and eliminate annual costs associated with transportation, retesting, and installation of the portable traps.

In April 2012, the Interstate Natural Gas Association of America (INGAA), in response to an NTSB recommendation, responded with a white paper titled "Historical and Future Development of Advanced In-Line Inspection (ILI) Platforms for Natural Gas Transmission Pipelines." In this document, INGAA stated that "INGAA members recognize that improving technology is critical to achieving its commitments by making more of the [pipeline] system conducive to ILI." In addition, "ILI is our most predictive and preferred tool for determining fitness for service."

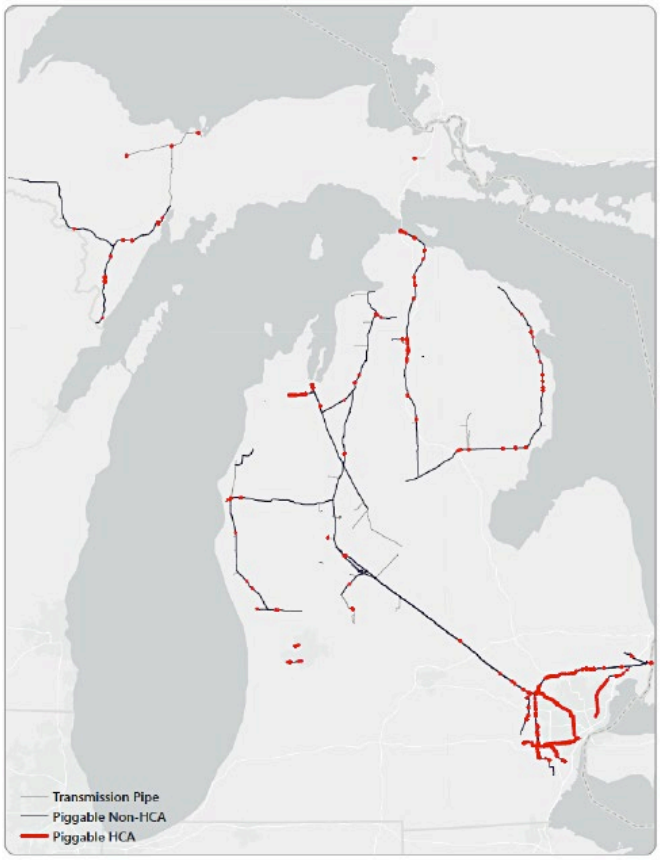
DTE Gas crew performing an ILI inspection – Figure 45

In addition, there is consensus amongst the industry regarding the superiority of ILI for assessing pipelines and the benefits of expanding its use. A January 2015 safety report by the National Transportation Safety Board (NTSB) (NTSB/SS-15/01, PB2015-102735) on "Integrity Management of Gas Transmission Pipelines in High Consequence Areas" stated that "ILI yields the highest per-mile discovery of pipe anomalies and the use of direct assessment (DA) as the sole integrity assessment method has numerous limitations." The NTSB recommends: (1) Expanding the use of ILI, especially for intrastate pipelines and (2) Eliminating the use of DA as the sole integrity assessment method for pipelines.

Under this program, pipelines previously assessed by methods other than ILI are retrofitted with the appropriate bends, barred tees, launchers, receivers, and valves to permit the passage of ILI tools. Selection of expansion candidate lines is based on a combination of risk ranking from risk assessments and the Company's reassessment schedule.

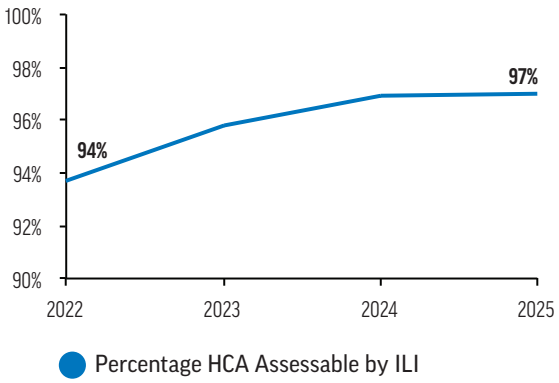
From 2012 to 2022, a total of 518 miles have been retrofitted for assessment by ILI, which has increased assessable HCA miles by ILI to 94% in 2022. As shown in Figure 47, from 2023 through 2025, DTE Gas's ILI expansion plan includes the retrofit of an additional 276 miles of pipeline for inspection by ILI. These retrofits will increase assessments of HCA to 97% in 2025. The remaining approximate 3% of HCA miles will not be assessable by ILI due to the lack of availability of commercial tools for the smaller pipeline diameter, too low of a gas flow rate to keep the tool moving, or the HCA miles being located in a station where ILI assessments are impractical. For this mileage, DA will be used to assess the condition of the pipelines to ensure the Company is assessing 100% of HCA as required by regulations. However, through planned pipeline abandonment and replacement of transmission pipelines with distribution rated pipelines, the percentage of HCA miles not assessable by ILI is projected to drop to about 1.2%, meaning about 99% of DTE Gas HCA miles will be assessable by ILI by 2028. The total capital investment for this program over the 10-year period is approximately $40M.

Current and Future ILI Pipelines* – Figure 46



*Includes TPOD lines

ILI Annual Targets – Figure 47



Class 1 and Class 2 facility integration into GIS and the probabilistic risk model

In order to perform risk assessments of DTE Gas's transmission stations in Class 1 and Class 2 locations, the information about these pipeline attributes data for these stations needs to be loaded into the Company's GIS system to allow the transmission probabilistic risk model to use that data to calculate risk and develop any potential countermeasures.

DTE Gas began executing a plan in 2022 by first locating and scanning the physical records related to these Class 1 and Class 2 stations. This plan continues in 2023 by incorporating these records into DTE Gas's central repository and beginning the development of Station Feature Lists (SFL), which create a record of the piping at these stations in Class 1 and Class 2. Once an SFL is created, it will go through a QA/QC process and then will be loaded into GIS to allow the transmission probabilistic risk model to use this data to calculate risk. The overall plan is to have all station piping in GIS by May 31, 2031, and perform risk calculations for the stations that are added every year with the ultimate goal of running risk for all station piping by June 30, 2031.

Stress Corrosion Cracking (SCC) pipeline assessments

A potential pipeline threat that the Company has been paying closer attention to is stress corrosion cracking (SCC). SCC is cracking that can be created from a combination of (1) Stress on the pipeline due to the pressure in the line and (2) A corrosive environment that could lead to a transmission failure.

Various factors are required to determine if a pipeline could be susceptible to SCC and these include operating pipeline stresses above 60% SMYS, operating temperatures above 100°F, pipelines operating within 20 miles of a compressor station, and the utilization of certain pipeline coating types. There are four pipelines on the DTE Gas system that meet this criterion and the Company is actively performing DA on these pipelines to look for any indications of SCC.

In addition, DTE Gas checks for SCC when performing remediation as part of regular pipeline assessment work (regular DA or ILI). The Company performs this additional check as a proactive step to minimize risk.

DTE Gas performed benchmarking with other utilities and found utilities that have previously had SCC-related failures are now utilizing Electro Magnetic Acoustic Transducer (EMAT) ILI tools, the best available technology to detect SCC, to ensure they detect any potential SCC on their pipelines. Typical ILI tools do not have the ability to detect SCC, and therefore, EMAT inspection is required for the purpose of detecting SCC.

Although DTE Gas has not had any incidents due to SCC and has not found any SCC on its system, the Company believes it is vitally important to proactively ensure it uses the best tools available to assess for possible SCC. Therefore, for the pipelines that could be susceptible to SCC, the Company commenced deployment of EMAT tools in 2022 for additional ILI assessments. The incremental O&M costs to perform these assessments will total approximately $7.6M over the 10-year period, including anticipated remediation costs.

Transmission Operations Environmental Responsibility

Blowdown emissions reduction

To enable the safe execution of pipeline construction activities, affected pipeline segments are isolated and gas is vented prior to construction. Under normal practice, venting typically occurs at pressures of approximately 200 psig.

To reduce overall emissions from gas venting, DTE Gas is utilizing portable compression equipment to move gas from the intended work segment to an adjacent segment of the pipeline and then venting the work segment at pressures lower than 50 psig. DTE Gas used portable and stationary compression to reduce vented gas by 81% in 2022. This reduction resulted in approximately 62,000 MT of CO_2e avoided in 2022. This avoided venting is driven by the size and nature of the projects year to year. DTE Gas continues to investigate other alternatives to minimize the venting of gas directly into the atmosphere.

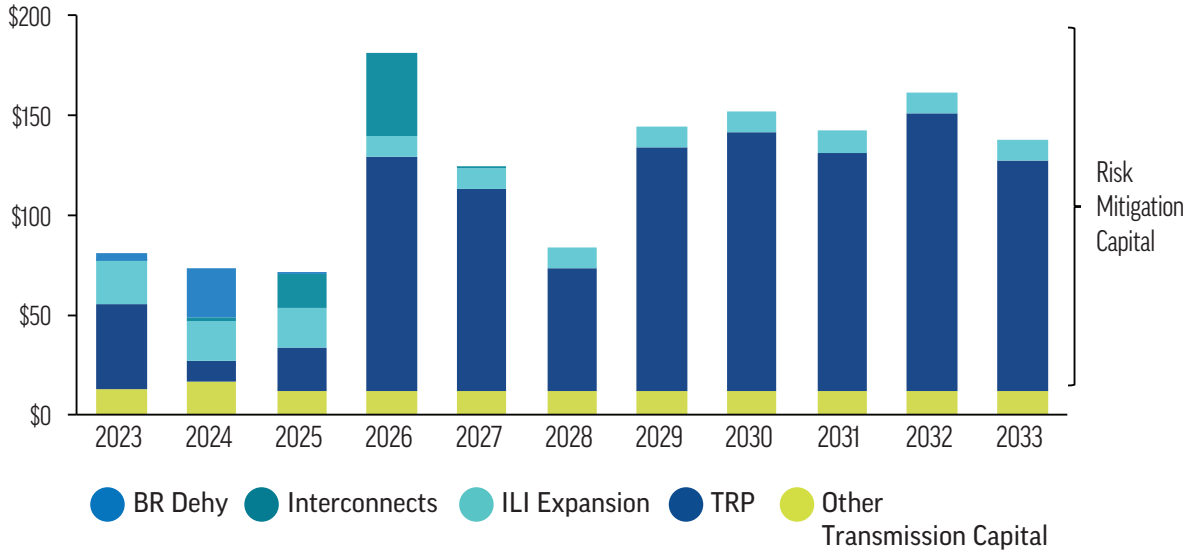
Additionally, the Company continues to monitor developments for the new proposed rules regarding emission reductions across the industry.

Transmission Capital Financial Summary

DTE Gas plans to more than double the capital investments in the transmission system over the next 10 years as it continues to implement the TRP. The A&B Lines project will drive most of the capital expenditure increase through 2028. Over the next 10 years, roughly 90% of DTE Gas's transmission capital expenditures will be focused on the top countermeasures described herein. The additional 10% of the capital investment will be dedicated to routine and special projects essential to the continued performance of the transmission system.

By 2033, DTE Gas expects to have completed four TRP projects, mitigating outage risks for more than 300,000 customers, increasing safety and reliability by further preventing potential transmission pipeline events. The Company will be able to utilize ILI to assess approximately 99% of its HCA mileage, while further increasing the interconnectedness of its system. DTE Gas's journey to modernize its transmission system will continue beyond 2033, however, and the Company will continue to prioritize future project needs based on its probabilistic risk model.

Transmission 10-year Capital Plan ($M) – Figure 48



DTE Gas plans to more than double the capital investments in the transmission system over the next 10 years as it continues to implement the TRP.

As described in the *Gas Safety* section, DTE Gas storage is a critical component to providing cleaner, safe, and reliable natural gas service for customers. To ensure gas supply is sustained and uninterrupted, DTE Gas utilizes its underground natural gas storage integrity management plan to identify and mitigate risks to its storage assets.

One of the top industry risks is a storage well unintended gas release. The likelihood of an unintended release of gas is very low but, due to the potentially severe consequences of such an event, the Company is working to mitigate any potential risk. Described in this section are the primary drivers of this potential risk, which are well entry loss of control, wellhead shear, and mechanical failure of the well casing. The three key countermeasures to reduce these risks are: (1) Well entry preventative maintenance activities, (2) the Well Pad Expansion Program, and (3) the Well Renewal Program (WRP). DTE Gas is allocating approximately $35M over the next 10 years to implement these countermeasures and reduce the risk of a storage well unintended gas release.

Storage Assets Overview and Location

DTE Gas owns four underground natural gas storage facilities with 165 active storage wells located in the Lower Peninsula. These four storage facilities hold a total of 139 Bcf of natural gas capacity (working gas) to support DTE Gas system reliability during summer and winter operations. As illustrated in Figure 49, DTE Gas has:

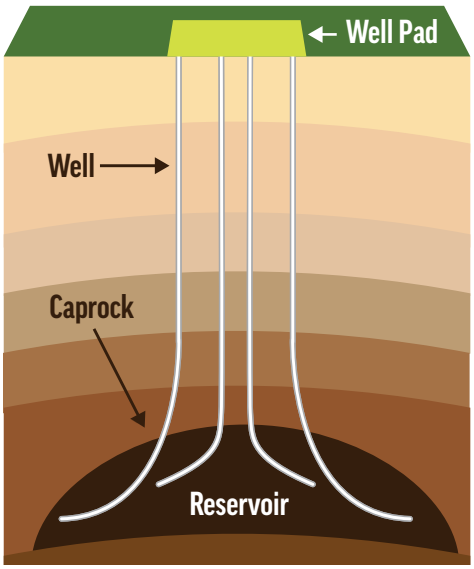
- One storage facility – Six Lakes – located in central Michigan
- Three storage facilities – Belle River Mills, Columbus, and West Columbus – located in southeast Michigan, where DTE Gas's largest market is located

SAFE

DEPENDABLE

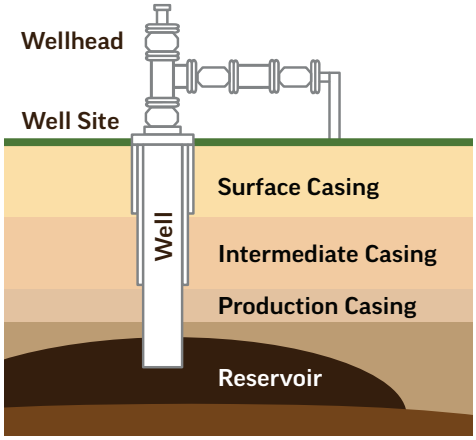
Michigan's geology is considered some of the most advantageous in the U.S. for underground natural gas storage operations due to the porous nature of the reservoir rock. DTE Gas storage facilities are sites that were once native natural gas production reservoirs that were repurposed in the 1950s, 1960s, and 1970s. They are ideally suited for gas storage due to their size, high deliverability, and tight sealing characteristics of the overlying caprock that held the native gas for millions of years (See Figure 50). Below is a picture depicting natural gas storage wells connecting with the deep subsurface natural gas storage reservoir underground.

Natural Gas Storage Well and Reservoir – Figure 50

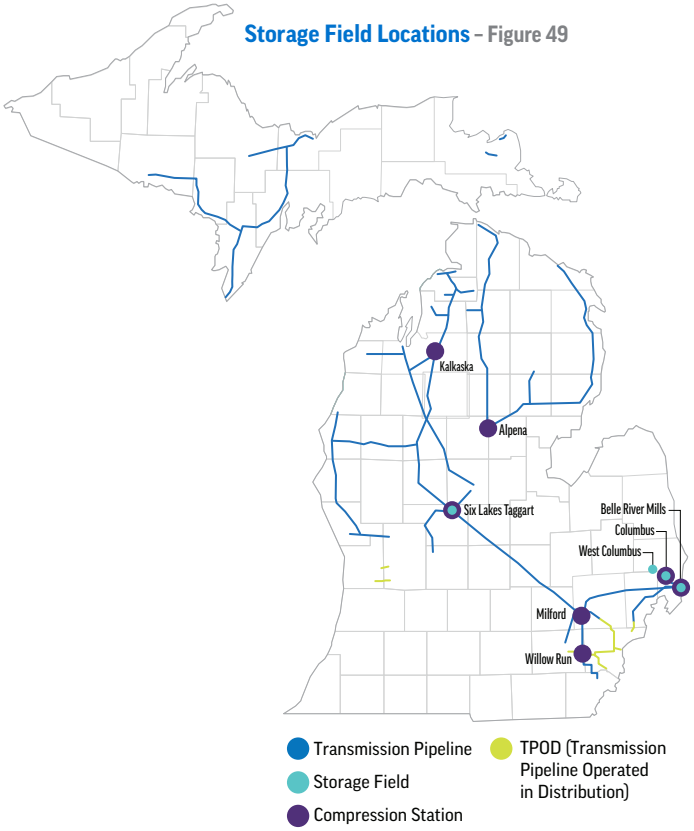


The wells at DTE Gas's storage facilities are constructed with concentric cemented casings. The innermost casing, the production casing, connects the surface transmission piping to the reservoir rock where natural gas is stored in summer months and withdrawn in winter months.

Natural Gas Storage Well and Reservoir – Figure 51



Storage Field Locations – Figure 49



The Role of Storage in Customer Reliability and Affordability

DTE Gas storage facilities play a critical role in ensuring reliable and affordable gas supply to customers. DTE purchases most of its gas supply from production basins outside of Michigan. The purchased gas is stored (injected into the reservoirs) in the summer and withdrawn from storage as needed during the winter. As mentioned in the *Demand and Supply* section, storage is the mechanism that allows DTE Gas to quickly adjust to changes in daily requirements and provides the flexibility to instantaneously ramp up or down the amount of gas that is being distributed to meet customer needs. This storage plan is key to ensuring customer affordability and minimizing price volatility.

The close proximity of the Company's storage facilities to customer demand locations is ideal to reduce the risk of supply interruption during times of peak winter demand, and their design and operability characteristics, as illustrated in Table 10, help ensure reliable supply under a 10-year worst-case weather scenario.

DTE Gas's Storage Facility Characteristics – Table 10

Storage Facilities	Maximum Delivery Rate (MMcf/d)	Working Gas (Bcf)	Winter Usage
Belle River	1,483	60.0	Intermediate
Columbus	501	16.3	Base Load
Six Lakes	658	40.0	Base Load
West Columbus	1,110	22.5	Peaker
Total Storage	**3,752**	**138.8**	

Baseload storage facilities withdraw gas consistently throughout the winter season to meet the minimum daily level of winter demand. Peaker storage facilities typically operate during colder weather periods when base load facilities cannot provide a sufficient delivery rate to meet demand. The intermediate Belle River storage facility can be operated interchangeably as it has enough working capacity to provide base load volumes and has high enough deliverability to serve as a peaking facility.

DTE Gas Routine Storage Program

DTE Gas employs a robust, routine storage program that has contributed to its long-standing safety and reliability record in storage operations. Key subprograms included in DTE Gas's routine storage program are:

- **Corrosion Logging** – Annual program to evaluate wells for metal loss that could potentially lead to integrity issues
- **Well Stimulations** – Annual program to improve well performance to maintain storage field deliverability requirements
- **Well Plugging** – Annual program to lower maintenance expenses and improve reservoir integrity by re-plugging and eliminating older wells
- **Wellhead Upgrades** – Annual program to replace old wellhead equipment and upgrade wells with annulus pressure measurement and electronic flow measurement to monitor for abnormal pressure and flow conditions
- **Geological Characterization** – Annual program to ensure adequate buffer zone size, completeness of mineral rights ownership, observation/edge well pressure management, and integrity of third-party well penetrations to ensure containment of the gas within the storage boundaries

DTE Gas plans to continue these routine O&M and capital programs into the future.

Storage Risk Factors

While DTE Gas is proud of its robust routine storage program, the nation's largest natural gas unintended well leak incident (SoCal Gas's Aliso Canyon facility in 2015) heightened the awareness and necessity for underground storage safety regulations. In December 2016, PHMSA published 49 CFR Part 192.12 Interim Final Rule (IFR) adopting the American Petroleum Institute (API) industry standard API RP 1171 and requiring the development and implementation of an integrity management program. PHMSA published the final rule in the federal register in February 2020. Specifically, API RP 1171 emphasizes the need for integrity management risk-based decision making in reservoir and well design, construction, operations, monitoring, and maintenance.

DTE Gas plans to ensure the health of gas storage reservoirs and wells through its Underground Natural Gas Storage Integrity Management Program (UNGSIMP). Through risk modeling, the Company has identified an unintended well gas release as one of the top industry risks to its system driven by three factors: (1) Well entry loss of control, (2) Wellhead shear, and (3) Mechanical failure of the well casing.

Well entry loss of control

The risk of an unintended gas release from a well is highest when work requires entry to the well. Loss of well control can occur during well entry operations, such as drilling, stimulations, corrosion logging, and plugging. While DTE Gas is proud of its long-standing safety record during its 70-year storage operating history, one well entry loss of control event occurred in 1974 during a re-plugging operation. No injuries or fatalities resulted, but the incident is a reminder of the potential safety hazards during storage operations and, more specifically, reinforces the potential risk associated with working directly on an active well.

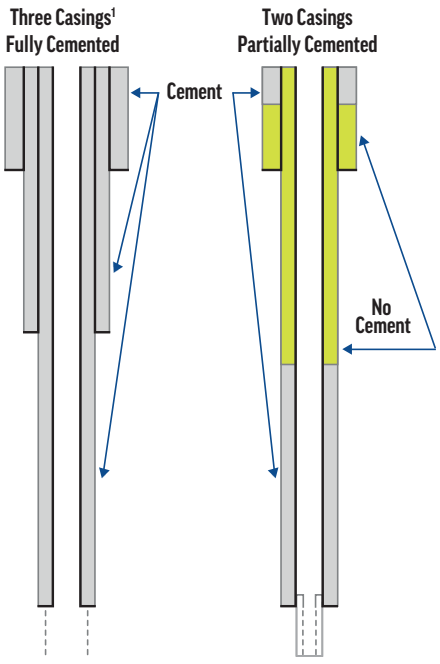
Wellhead shear

Loss of well control can occur as a result of a third party striking and shearing the wellhead below the master gate valve, causing an unintended release of gas. DTE Gas has never experienced a recorded wellhead shear event, but the Company continues to focus on reducing this risk where the wellheads are in close proximity to active farming areas.

Mechanical failure of the well casing

Loss of well control can occur as a result of mechanical degradation due to corrosion or fatigue. No mechanical failures have been recorded in the Company's history, likely due to DTE Gas's early adoption of corrosion logging technology and modern integrity monitoring practices, such as annulus pressure testing and real-time electronic pressure and flow monitoring. However, the direct cause of the Aliso Canyon well leak incident mentioned previously was corrosion of the surface and production casings that were not cemented to the surface (also referred to as low cement top wells). Low cement top wells lack a secondary containment barrier, and therefore, have a higher inherent risk for corrosion than wells with casings cemented to the surface. Low cement top well construction is an older design methodology that is no longer used by DTE Gas. Today, the Company's well casings are all designed to be cemented to the surface (per API RP 1171). In addition, current Michigan regulations require Niagaran wells, such as Belle River, Columbus, and West Columbus wells, to be designed with three casings providing an added layer of protection. Since DTE Gas's storage fields pre-date current well design standards, the Company has 28 older wells that have similar aspects to Aliso Canyon and are a primary focus of the risk mitigation efforts.

Example Well Designs – Figure 52



[1] Current Michigan regulation requires Niagaran wells (Belle River, Columbus, and West Columbus) to be designed with three casings and Mississippian wells (Six Lakes) to be designed with two casings.

Storage Risk Countermeasures

Well Entry Loss of Control Preventative Maintenance

The primary countermeasure to minimize the risk of well entry loss of control is preventative in nature, and focuses on limiting well entry work, ensuring on-site supervision, adherence to procedures, and training and preparation in emergency response. Preventative maintenance measures to reduce this risk include employee training, hiring additional staff, and emergency response training.

Well Pad Expansion Program

In 2018, DTE Gas developed and implemented a Well Pad Expansion program as a prevention measure to reduce the risk of an unintended well gas release due to wellhead shear, which targets the highest-risk storage wells located in farmlands, near highways, and near industrial operations. The program's main objective is to protect well sites that have a history of trespass by expanding the dedicated wellhead buffer clearance to 50-75 feet and if needed, adding fencing and protective barriers as illustrated in Figure 53, and reducing the count of vulnerable wells through plugging and abandonment.

Well Site Protective Barriers – Figure 53

A total of 134 wells have been identified for remediation in the program. The Company is in its sixth year of implementation and has a target to remediate all identified wells by 2024. The program will be completed in two phases. Phase I will include expanding the well pads, and Phase II will include the installation of protective barriers (See Figure 54 for the program plan for both phases). DTE Gas has included approximately $2M in its 10-year capital plan to protect its wells from the risk of wellhead shear.

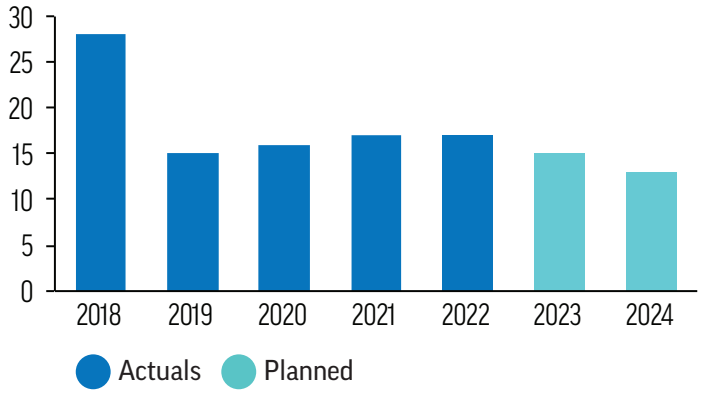
Well Renewal Program (WRP)

To address the risk of well unintended gas release due to mechanical failure, DTE Gas is developing a Well Renewal Program (WRP), that is preventive in nature. The program utilizes a risk-based approach to prioritize remediation of wells based on metal loss of the production casing and lack of secondary barriers, making low cement top wells a primary focus.

DTE Gas has 31 low cement top wells which have been prioritized for remediation as part of the WRP, and those planned to be remediated in the 10-year plan are listed in Table 11. Remediation will include one of three methods: (1) Plug and abandonment, (2) Plug and abandonment and replacement, or (3) Renewal. Until these wells have been remediated, as an added measure of protection, each well has been equipped with real-time annulus pressure measurement to monitor for leakage between the casings. In addition, the frequency of corrosion logging (evaluation of metal loss) has been accelerated to two to five years for all low cement top wells.

DTE Gas has included approximately $34M of capital for the implementation of the WRP in its 10-year plan.

Well Pad Expansion Program Plan (wells/year) – Figure 54



Storage Capital Financial Summary

The DTE Gas storage capital plan will remain stable through 2025. By 2026, the implementation of the Well Renewal Program will begin adding $3-7M per year. By the end of the 10-year period, the Company will be investing approximately 41% of its storage capital investments on key risk countermeasures to mitigate storage well risks. The remaining storage capital expenditures will be dedicated to other well integrity programs that also play a key role in the DTE Gas storage risk mitigation plan.

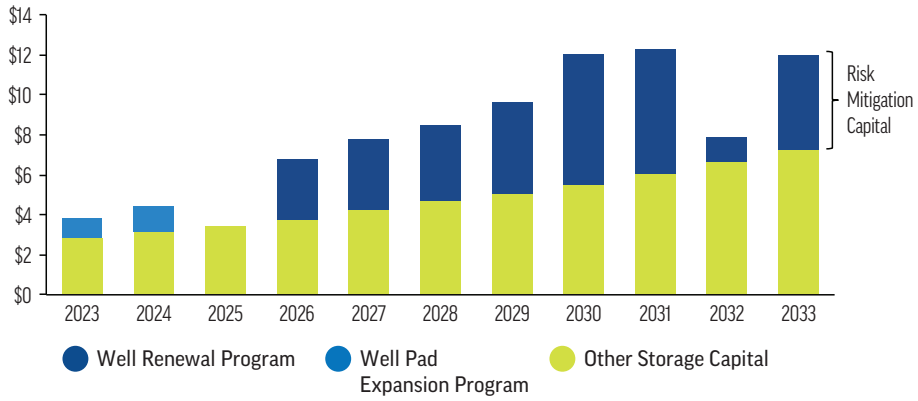
By 2033, DTE Gas expects to have completed all the well pad expansions and addressed 20 of its 31 low cement top wells through the Well Renewal Program. The remaining 11 low cement top wells are expected to be remediated by 2036. The Company also plans to continue its preventative maintenance measures reducing the risk of well entry loss of control.

Low Cement Wells Remediated in 10-Year Plan – Table 11

Low Cement Top Wells	Storage Field	Remediation Action	Anticipated Remediation Year
Fairbanks Est 1	Six Lakes	Renew*	2026
Jensen 1	Six Lakes	Renew*	2026
Nelson & Nielson 1	Six Lakes	Renew*	2026
SL 29	Six Lakes	Plug	2026
SL 420	Six Lakes	Renew*	2026
SL 6	Six Lakes	Renew*	2026
SL 91 (Houghton)	Six Lakes	Plug	2026
SL 290	Six Lakes	Renew*	2029
Ackerman-Novak 1	Columbus	Plug and replace	2027
Caughell-Campbell 1	Columbus	Plug	2027
Dupont 1	Columbus	Plug	2027
Parinello-Harvey 2	Columbus	Plug and replace	2027
F. Chase 1	Columbus	Plug and replace	2028
Zembol-Whitaker 1	Columbus	Plug and replace	2028
Rood Estate 1	Belle River	Plug and replace	2029
Shorat-Schunck 1	Belle River	Plug and replace	2029
BR 3	Belle River	Plug and replace	2030
BR 12	Belle River	Plug and replace	2031
BR 2	Belle River	Plug and replace	2032
BR 9	Belle River	Plug and replace	2033

* Renew options include: Lining, backing off, or perforating to eliminate the low cement top in the well

Storage 10-year Capital Plan ($M) – Figure 55



This storage plan is key to ensuring customer affordability and minimizing price volatility.

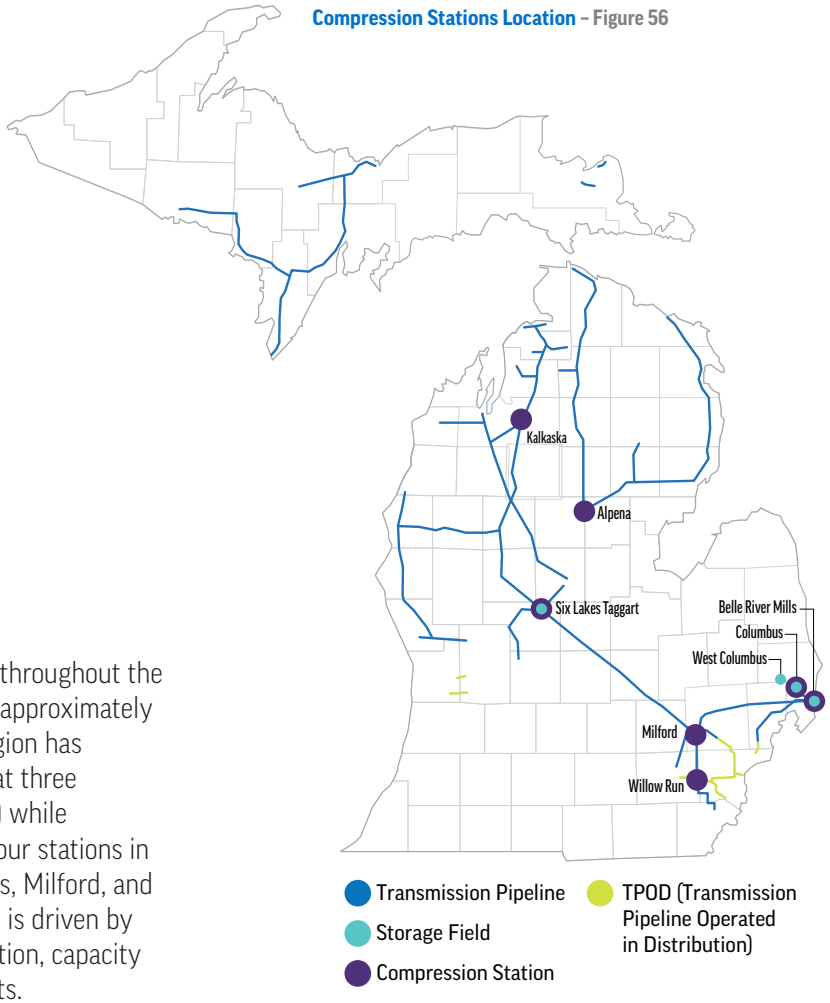
Case No.: U-21291
Exhibit: A-12
Schedule: B5.6
Witness: K. M. Fedele
Page: 62 of 69

DTE Gas's compression assets play a key role in ensuring gas deliverability to customers. DTE Gas has strong preventative maintenance programs in place to enable high equipment reliability at reduced overall lifecycle cost; however, nearly half of its compressor units were installed more than 40 years ago, and it is becoming increasingly difficult to secure replacement parts in a timely manner due to obsolescence. As a result, the Company is developing a Compression Replacement Program (CRP) to replace its older assets and ensure reliable compression horsepower for decades to come.

Compression Assets Overview and Location

DTE Gas has seven compressor stations located throughout the state consisting of 47 compressor units totaling approximately 180,000 horsepower (HP). The North Central region has 25 units (or approximately 50,000 HP) located at three stations (Kalkaska, Alpena, and Taggart stations) while 22 units (or approximately 130,000 HP) are at four stations in the Southeast region (Belle River Mills, Columbus, Milford, and Willow stations) (See Figure 56). HP distribution is driven by system load based on customer population, location, capacity of storage fields, and transportation requirements.

Compression Stations Location – Figure 56



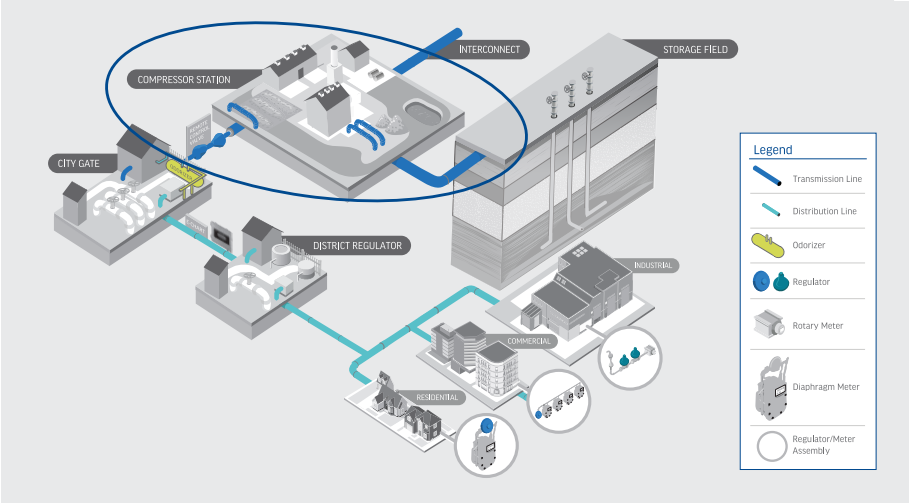
Compression Asset Management

Utilization of Compression Assets

Compressor stations play a vital role when injecting gas into or withdrawing gas from storage fields (Figure 57). Specifically, compression is used when the gas in the pipeline connected to the storage field reaches the same pressure as the storage field. Compressor stations are also used at strategic locations along a pipeline to increase the gas pressure for transport to the rest of the system to meet system and/or contractual requirements of flow and pressure. DTE Gas Control communicates pipeline flow requirements to the station operators who determine if compression is needed and, if so, which units will be started to satisfy the flow requirements. Compression utilization varies significantly based on the season.

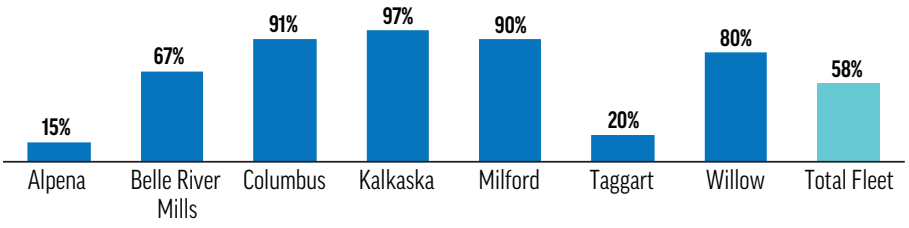
DTE Gas compressor utilization reflects seasonal injection and withdrawal operations, consistent with system flow requirements in the summer and winter months. The highest levels of compression utilization happen during the summer months when the Company injects gas into storage, followed by the winter when gas is withdrawn from storage. Based on the 2022/2023 capacity release study (a biannual report forecasting monthly operational activity required for both peak and minimum markets), the maximum utilization forecast for the entire fleet is approximately 58% for injection and 51% for withdrawal, averaging 38% for the year. However, the maximum utilization forecast by individual stations is as high as 97% in the summer and 82% in the winter months (See Figures 58 and 59). By comparison, the actual average fleet utilization over the last five years (2018-2022) was approximately 22% (See Figure 60).

Natural Gas System - Illustrative – Figure 57

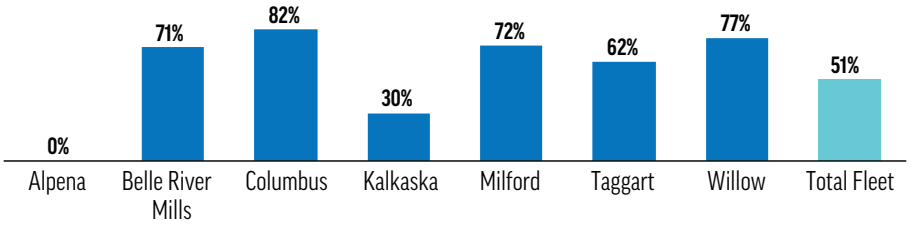


Since 2019, utilization at the Taggart Compressor Station has been trending up. From 2015 through 2018, Taggart had an 11% average utilization. From 2019 through 2022, Taggart's average utilization increased to 22% (100% increase in utilization). This increase in compression utilization at Taggart is primarily due to changes in interconnect delivery points, requiring transportation of large gas volumes over a longer distance resulting in lower delivery pressures at Taggart, which requires higher compression HP to boost pressure for injection or delivery to customers. The increased compression is also helping maintain supply to the northern system to compensate for declining Michigan gas production. A similar trend is shown for Milford, due to the transportation of NEXUS gas to the rest of the system.

Summer Injection (April 2022-October 2022) Maximum Utilization Forecast by Compressor Station – Figure 58

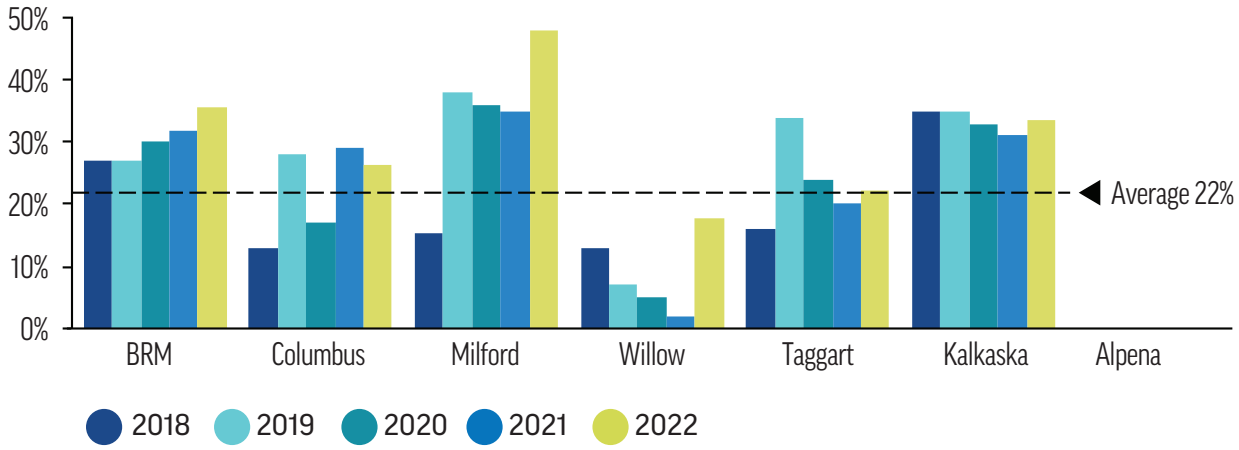


Winter Withdrawal (November 2022-March 2023) Maximum Utilization Forecast by Compressor Station – Figure 59



Peak utilization is what drives requirements at each station needed to meet customer demand including redundancy to maintain supply in the event of unit outages. The actual average annual utilization is based on the sum of power output by the units and since compressor units rarely run at max HP, the percentages in terms of number of units running are higher. For example, during the polar vortex of January 2019, all 40,000 HP (21 units) at Taggart Station were utilized.

Actual Average Annual Utilization by Compressor Station – Figure 60



Asset Management Foundational Capabilities (AMFC)

DTE Gas believes preventative maintenance is a critical component of risk management and customer affordability. By extending the life of its assets, major capital investments can be minimized, in turn reducing customer costs. AMFC is a set of five capabilities, which provide a structured approach to achieve best-in-class maintenance strategies for DTE Gas. AMFC focuses on preventative, predictive, and corrective maintenance by analyzing the system to determine the most critical assets, and by developing an effective work management process to realize high equipment reliability at reduced overall lifecycle cost.

AMFC Capabilities

1. Provide Supportive Management and Work Culture
2. Establish Asset Management Strategies
3. Conduct Maintenance Activities
4. Monitor Asset Condition and Performance
5. Perform Corrective Actions

Effective Leadership and Work Culture

DTE Gas has a strong governance board that meets regularly to review program performance and ensure adherence to targets. Training has been provided to more than 121 employees in the Company on the fundamentals of AMFC. An external entity is also utilized to conduct periodic assessments to determine program maturity and identify opportunities to enhance the effectiveness of the program.

From the most recent assessment (2021) the Company's AMFC program was rated above a level four, which is a proactive level of maturity on a scale of one to five. This level of maturity is attributed to a reduction in the unplanned outage rate.

Asset Risk Management

In addition to external assessments, DTE Gas has performed a risk assessment at all transmission and storage compressor stations. The results of this assessment have been used to enhance and prioritize preventative maintenance and execute capital upgrades on critical assets to improve asset reliability.

Optimizing Maintenance

In the past, the Company used a manual maintenance and work management process to direct maintenance and routine work. This practice was subject to loss or degradation of paper documentation and the inability to correctly trend performance. Recognizing that a robust maintenance plan along with an electronic work management system is essential for a more efficient operation and management of company assets, DTE Gas deployed IT and enhanced processes in 2017. These enhancements focused on work management and furtherance of maintenance cost transparency. This tool houses all of the preventative maintenance and code-required work and self-generates work orders at a specific timeframe required for the task. This tool also enables employees to surface corrective maintenance issues, which are escalated to supervisors who then assign the proper resource to correct the issue. DTE Gas is also developing solutions to modernize the record-keeping process and enhance the integrity of maintenance records.

Preventative maintenance tasks have been developed at normal weekly, monthly, quarterly, and annual intervals, and are completed by DTE Gas personnel. These tasks are developed based on the engine/compressor unit Original Equipment Manufacturer (OEM) recommendations, yet still accommodate for deviations in maintenance required among the different units in the DTE Gas fleet. Major overhauls are also planned based on OEM recommendations while taking into account overall engine performance and run time. The AMFC program uses continual assessment to improve the program maturity and enhance the effectiveness of the preventative maintenance of the Company's critical assets.

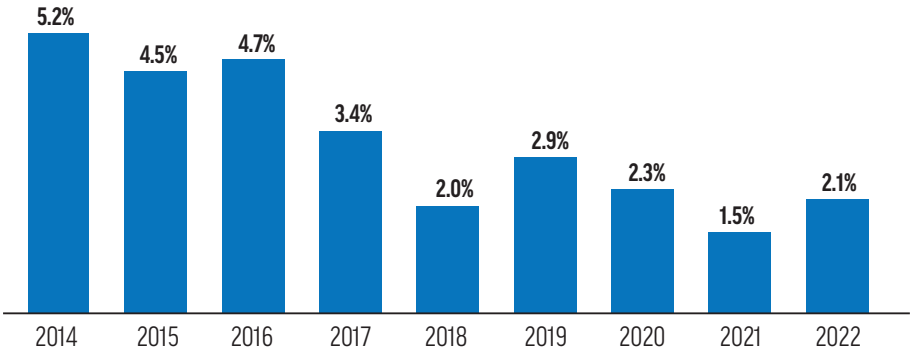
To augment preventative maintenance, DTE Gas is implementing predictive analytics to trend key asset parameters and identify abnormal trending, in turn driving proactive corrective measures. These analytics are designed to go above and beyond original equipment manufacturer specifications for monitoring equipment to help minimize asset failure and ensure reliable and efficient operation.

DTE Gas is also utilizing Management Of Risk Tree (MORT), a widely recognized Root Cause Analysis (RCA) template, which the Company has successfully utilized for recent failures on the pipelines and at compressor stations.

The deployment of the AMFC program described above to manage the maintenance of the compression fleet to ensure reliable service has yielded positive results, reducing compressor unplanned outages from 5.2% in 2014 to 2.1% in 2022. This is a 60% decrease in random outages thus improving the Company's reliability. In 2022, Taggart had a significant failure on a unit that resulted in crankshaft damage, thus causing a rise to 2.1% for 2022 (See Figure 61).

Despite the benefits of DTE Gas's asset maintenance program, many of the Company's compressor units are more than 40 years old. To mitigate reliability risk driven mostly by obsolescence of parts and sustain reliable service for the foreseeable future, DTE Gas is developing a Compression Replacement Program (CRP) to renew the compression fleet over the next two to three decades.

Annual Unplanned Compression Outages* – Figure 61



*2019-Abnormal year because the failure of compression equipment was driven by upstream separation equipment

DEPENDABLE

EFFICIENT

Compression Replacement Program (CRP)

As depicted in Figure 62, nearly half of DTE Gas's compressor units were placed into service more than 40 years ago. The average age of the DTE Gas compression fleet is 46 years and the median age is 59 years with compressor age ranging from five to 68 years. The oldest units are the 11 units at Taggart Plant 1 (68 years old) and the 10 units at Taggart Plant 2 (64 years old) (See Table 12).

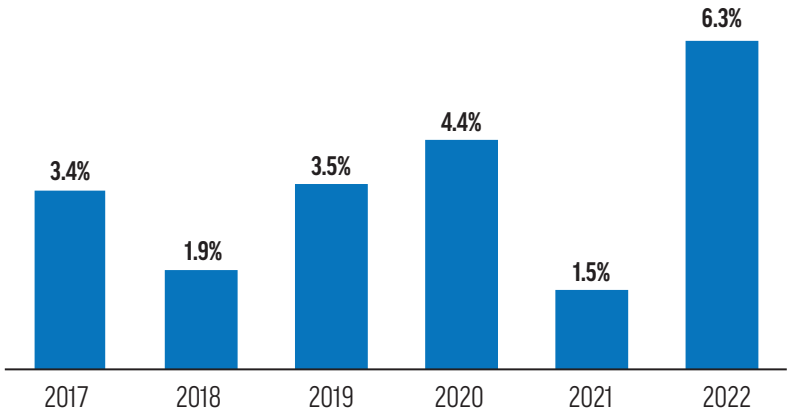
The Compression Replacement Program will replace older assets and ensure DTE Gas has reliable horsepower capacity to meet current and future customer demands. Reliable compressor units are critical to ensuring deliverability to customers and allow for full utilization of storage facilities. Reliable compressor units also ensure consistent, stable operation of the transmission system.

The CRP will target DTE Gas's aging compression assets and prioritize replacement based on age, utilization, spare parts availability, and reliability to ensure an appropriate priority is established. In addition, the program will optimize asset replacement to increase utilization without sacrificing redundancy. New compression assets will help ensure the Company's operations are reliable while also lessening the impact on the environment as new units have modern emission controls and limits to ensure sustained environmental performance. With the goal of reducing carbon emissions, the Company will also evaluate the option of electric compression where economically and operationally feasible.

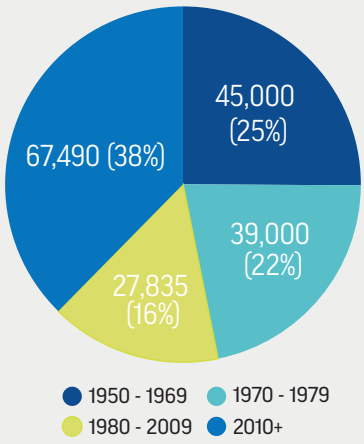
This program will start with Taggart Plant 1, which is already experiencing issues with parts obsolescence and an increase in random outages (Figure 63). This increase in random outages at Taggart can be attributed to a combination of both small, easy-to-repair failures, and large failures on the legacy units. In 2022, a significant failure impacting the crankshaft on a unit was experienced, which is a costly and extensive repair on an aged unit.

When completed, the Compression Replacement Program will have replaced 82,000 HP or approximately 46% of the total fleet HP at Taggart plants 1 and 2 (40,000 HP), Columbus Delavals (4,000 HP), BRM Z-330 (17,0000 HP), BRM GMVC (5,000 HP), and Milford plant 1 (16,000 HP). The Company plans to begin investing in the CRP in 2024, with $150M allocated in the 10-year plan. DTE Gas will continue to rely on the PSMS risk matrix to further refine the prioritization of the planned replacements.

Taggart 5-Year Random Outage Rate (ROR) – Figure 63



Compression HP by Age – Figure 62



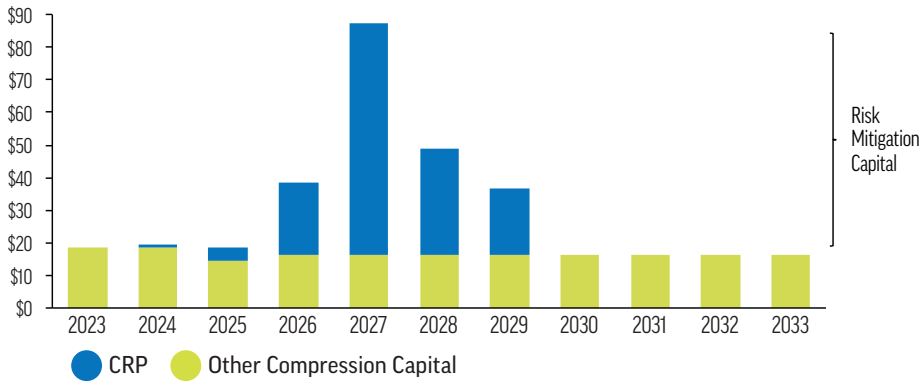
DTE Gas Compression Fleet – Table 12

Compressor Station	Compression Equipment	# of Units	Total HP	Year Installed
Taggart	Taggart Plant 1 (Ingersoll Rand)	11	20,000	1955
	Taggart Plant 2 (Ingersoll Rand)	10	20,000	1959
Belle River	BRM Plant 1 (GMVCs)	3	5,000	1964
	BRM Plant 2 (Z-330s)	2	17,000	1972
	BRM Plant 3 Unit 6 (Mars-100) Unit 7 (Centaur-50) Unit 8 (Taurus-70)	 1 1 1	 15,000 6,130 10,915	 2007 2016 2016
Columbus	Columbus (Delavals)	2	4,000	1972
Alpena	Alpena (White Superior)	1	2,000	1975
Milford	Milford Plant 1 (Delavals)	4	16,000	1979
	Milford Plant 2 & 3 (Taurus-70)	3	32,745	2018
Kalkaska	Kalkaska (GMVHs)	3	8,100	1992
Willow Run	Willow Run Plant 1 (CAT/Ariel) (Taurus-60)	 1 1	 4,735 7,700	 2009 2018
	Willow Run Plant 2 (Cat/Ariel)	3	10,000	2018
Reed City	Retired	Retired	Retired	1997
	TOTAL	**47**	**179,325**	

Compression Capital Financial Summary

Over the next 10 years, the DTE Gas compression system capital investments will remain focused on its critical routine capital programs, including equipment upgrades to continue to extend the life of its compression assets (See Figure 64). As mentioned above, the Company is planning to begin a Compression Replacement Program in 2024 ($1M capital investment for preliminary engineering).

Compression 10-year Capital Plan ($M) – Figure 64



The Compression Replacement Program will replace older assets and ensure DTE Gas has reliable horsepower capacity to meet current and future customer demands.

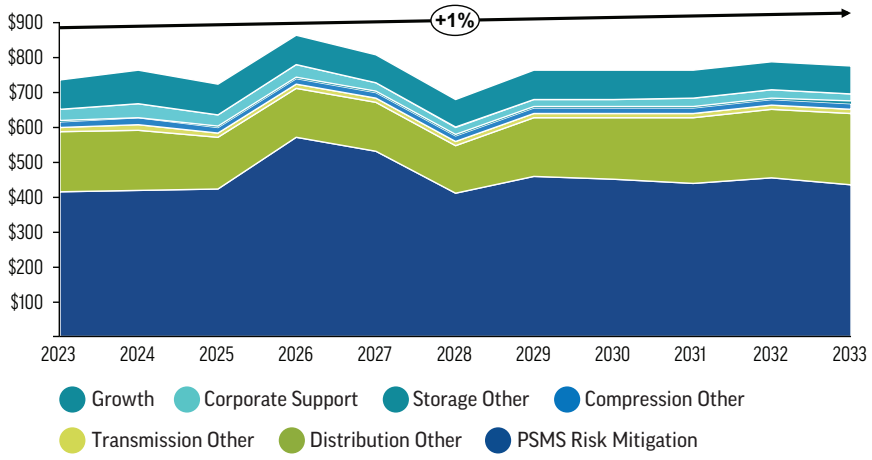
Gas Delivery Plan Financial Summary

As previously mentioned, DTE Gas is using a PSMS framework to guide this 10-year Gas Delivery Plan. Approximately 60% of DTE Gas's investments will be dedicated to the aforementioned PSMS countermeasures (See Figure 65). The remaining 40% is largely comprised of routine, system expansion, and corporate support capital; investment that is critical to the sustained operation of the system.

The Company expects total annual capital investment to remain relatively stable over the next 10 years (1% CAGR), but as projects near completion (e.g., 97% of inside meters will be moved outside by 2028), the specific areas where DTE Gas invests will vary based on risk prioritization (e.g., shift from distribution asset investments to transmission and compression asset investments). The plan is further enhanced with the implementation of a probabilistic risk model, which allows DTE Gas to better compare risks across asset classes. As it stands currently, DTE Gas's plan outlines investments totaling approximately $7.7B over the 10-year period (2024-2033).

Grounded in the Company's commitment to prioritize safe, reliable, affordable, and cleaner natural gas service, DTE Gas has developed this 10-year delivery plan. This plan communicates both the Company's near-term and long-term capital investments guided largely by countermeasures designed to mitigate the top industry risks. Going forward, DTE Gas will update this plan with every rate case to reflect changing opportunities and challenges in the system, industry, and communities.

DTE Gas 10-year Capital Plan ($M) – Figure 65



Acronyms

AGA ..... American Gas Association
AMFC ..... Asset Management Foundational Capabilities
API ..... American Petroleum Institute
ARMA ..... Association of Records Managers and Administrators
Bcf ..... Billion Cubic Feet
CAPA ..... Corrective And Preventative Action Program
CFR ..... Code of Federal Regulations
CRP ..... Compression Replacement Program
CTN ..... Colder-Than-Normal
CTNP ..... Colder-Than-Normal Protection
DA ..... Direct Assessment
Dehy ..... Dehydration Unit
DIMP ..... Distribution Integrity Management Program
DRP ..... Distribution Renewal Program
EEJ ..... Energy and Environmental Justice
EMAT ..... Electro Magnetic Acoustic Transducer
EPA ..... Environmental Protection Agency
EUT ..... End User Transportation
EWR ..... Energy Waste Reduction
GARP ..... Generally Accepted Recordkeeping Principles
GCC ..... Gas Customer Choice
GCR ..... Gas Cost Recovery
GDP ..... Gas Delivery Plan
GIS ..... Geographic Information System
GRP ..... Gas Renewal Program
HCA ..... High Consequence Areas
HDD ..... Horizontal Directional Drilling
HP ..... Horsepower
ICS ..... Incident Command Structure
IFR ..... Interim Final Rule
ILI ..... In Line Inspection
INGAA ..... Interstate Natural Gas Association of America
ISO ..... International Organization for Standardization
IT ..... Information Technology
LDAR ..... Leak Detection and Repair
LEL ..... Lower Explosive Limit
LIA ..... Low-Income Assistance Credit
LSP ..... Low-income Self-sufficiency Program
MAOP ..... Maximum Allowable Operating Pressure
MCA ..... Moderate Consequence Area
MGSS ..... Michigan Gas Safety Standards
MLV ..... Main Line Valves
MMcf/d ..... Million Cubic Feet per Day
MGH ..... Michigan Gas Holdings
MORT ..... Management Of Risk Tree
MPSC ..... Michigan Public Service Commission
NPRM ..... Notice of Proposed Rulemaking
NTSB ..... National Transportation Safety Board
O&M ..... Operations and Maintenance
OEM ..... Original Equipment Manufacturer
ORR ..... Operational Risk and Resilience
OT ..... Operational Technology
PHMSA ..... Pipeline and Hazardous Materials Safety Administration
PPB ..... Parts Per Billion
PPM ..... Parts Per Million
PRA ..... Probabilistic Risk Assessment
Psig ..... Pounds per square inch gauge
PSMS ..... Pipeline Safety Management System
QA ..... Quality Assurance
QC ..... Quality Checks
QMS ..... Quality Management System
RCA ..... Root Cause Analysis
RCV ..... Remote Control Valve
RIA ..... Residential Income Assistance Credit
RMC ..... Risk Management Committee
RNG ..... Renewable Natural Gas
RP ..... Recommended Practice
RSG ..... Responsibly Sourced Gas
SCADA ..... Supervisory Control And Data Acquisition
SCC ..... Stress Corrosion Cracking
SD ..... Security Directives
SEA ..... State Energy Assessment
SFL ..... Station Feature List
SME ..... Subject Matter Expert
SMYS ..... Specified Minimum Yield Strength
SOLR ..... Supplier Of Last Resort
TCARP ..... Traverse City Alpena Replacement Project
TIMP ..... Transmission Integrity Management Program
TPOD ..... Transmission Pipeline Operated in Distribution
TRP ..... Transmission Renewal Program
TSA ..... Transportation Security Administration
TSO ..... Transmission and Storage Operations
TVC ..... Traceable, Verifiable, and Complete
UNGSIMP ..... Underground Natural Gas Storage Integrity Management Program
VCA ..... Volume Cost Averaging
WRP ..... Well Renewal Program

Michigan Public Service Commission
DTE Gas Company
DTE Gas Site Security - Summary of Security Projects

Case No.: U-21291
Exhibit: A-12
Schedule: B5.7
Witness: K. M. Fedele
Page: 1 of 1

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