



DTE Energy®

Creating a Smarter Energy Grid for Our Customers

Investing in Michigan's Future

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Preparing the Grid to Support Michigan's Future



Trevor Lauer



Heather Rivard

Michigan's future looks brighter every day. Recovering from a long and hard recession, the proof is in the numbers. Manufacturing job growth is the highest in the country. The latest census shows more people are moving in – than out – of the state for the first time since 2001. The unemployment rate has fallen to levels not seen for more than a decade and personal income growth outpaced much of the country last year. At DTE Energy, we are proud to power this much-anticipated revival with safe, reliable and affordable power.

It's not as easy as flipping a switch. To meet the needs of today's modern homes and high-tech businesses, Michigan's aging infrastructure requires significant investment. We must update a system that includes more than 47,000 miles of power lines, nearly 4,000 circuits and almost 700 substations. It also requires responding to today's shifting population, and investing where you call home – whether that be in a new suburban neighborhood, a quiet country road or a revitalized city center. This work will make our infrastructure more reliable, giving you peace of mind.

The good news is these upgrades are already underway. From tree trimming in your neighborhood to large-scale capital investments, where work has been completed, our customers have seen an average of 70 percent improvement in reliability. These investments are also lowering our operating costs. We're always looking for efficient ways to work, and this report explains what we're doing to upgrade and strengthen our infrastructure – a long-term investment that will improve the quality of power our customers receive, positively impact Michigan's economy and prepare communities for the future with high quality, reliable energy.

Best wishes,

A handwritten signature in dark ink, appearing to read 'T. Lauer'.

Trevor Lauer

President and COO, DTE Electric

A handwritten signature in dark ink, appearing to read 'Heather Rivard'.

Heather Rivard

Senior Vice President, Distribution Operations

2.2 million
electric customers

700
substations

4,000
circuits

1 million
utility poles

3 million
smart meters

Investing in Our Infrastructure to Meet Changing Customer Demands

The State of Our Electric Infrastructure

Our nation's infrastructure was built to be best-in-the-world five decades ago. But the American Society of Civil Engineering says the country has a lot of work to do to upgrade roads, bridges, dams and the energy grid. Here in Michigan, significant electric infrastructure investment last occurred between 1940 and 1970 when rapid population growth, thanks to the booming auto industry, brought hundreds of thousands of workers to the state.

Since that time, the state has faced a combination of declining population and a struggling economy. At DTE Energy, we have worked to maintain our existing equipment in a cost-effective manner for decades but in many areas, it is time to invest in new, modern infrastructure. Our five-year plan is part of an ongoing commitment to building an energy grid that meets the needs of the 21st century economy.

DTE Energy is committed to building a more reliable and more resilient power grid to give our customers peace of mind

Age and Weather

In addition to an aging system, harsh weather – including ice storms and powerful winds – has impacted the reliability of our power grid and the convenience of our customers. While we can't control the weather, we are taking significant steps to limit its impact. From trimming trees before they fall on a power line to adding sensors to detect issues the moment they occur, DTE Energy is improving the resiliency and reliability of the energy powering Michigan homes and businesses.



“Infrastructure systems in Michigan should enhance residents’ quality of life, enable economic growth and create a strong foundation for vibrant communities.”

– 21st Century Infrastructure Commission

The Economy of Tomorrow

Business customers who once depended on us to simply keep the lights on now require significant amounts of reliable energy to power computer workstations, data centers, state-of-the-art manufacturing technologies and Internet-based applications. Without the power to energize this equipment, Michigan’s new economy simply does not run. Michigan’s businesses require higher power quality and better reliability than ever before.

The world in which local businesses operate is changing rapidly, too. Technological evolution – the rate at which our technology improves and changes – is exponentially faster than when our current infrastructure was created. This impacts our business customers and their needs, but also how our industry meets these changing requirements.

Today’s Discerning Customer

Customer satisfaction is a primary focus of our enterprise. Our goal is to continuously improve our products, programs and processes to best serve our customers. Understanding our customers and how they use and rely upon the energy we provide is central to this goal and our operations. Three key considerations about today’s customers influence our infrastructure decisions:

Energy Consumption: An increasingly connected and hectic life demands reliable energy to power home electronics, computers and more. With more aspects of a family’s daily routine requiring a connected or powered device, outages are more inconvenient than ever before.

Increased Engagement: Today’s customers demand information at their fingertips. They expect more control of, and transparency into, their energy bills and usage to increase their savings.

Population Shifts: Michigan residents are creating new neighborhoods and population centers and calling older areas home again. Population shifts and economic growth in Detroit, Pontiac, Ann Arbor, the I-96 corridor and other areas require significant investment to ensure reliable power to these growing communities.



DTE Energy

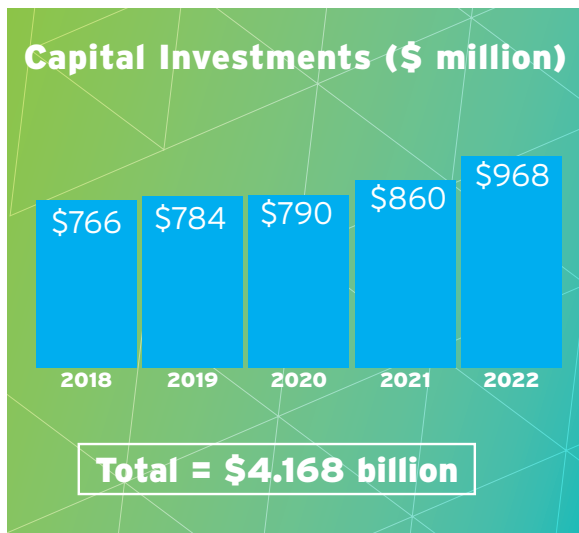
**BUILDING
TOMORROW'S
ENERGY GRID**

www.dteenergy.com

At DTE Energy, we are embracing the changes in our customers, communities and economy to build a 21st century energy grid. What does this mean to our customers? We are updating and maintaining our infrastructure, improving operational efficiency, and meeting customers' growing power needs.

\$ \$6-9 billion

of economic benefits to our customers



Our Investment and the Economy

DTE Energy will invest nearly \$4.2 billion in electric infrastructure upgrades over the next five years. These investments are a win-win for our customers and communities. They will improve and strengthen the power grid that delivers safe, reliable and affordable energy to homes and businesses to better prepare Michigan for the future, and will bring jobs through both DTE hires and partnerships with local contractors and businesses. Additionally, improved quality of energy delivery and fewer outages are estimated to provide more than \$6 billion - \$9 billion of economic benefits to our customers.

This signifies a noteworthy investment in our communities and will strengthen the economy in both the short- and long-term.

Commitment to Affordability

Our goal is to provide safe, reliable and affordable energy and ensure superior customer satisfaction. DTE has devoted much consideration, planning and research to determine the most cost-effective manner to make these necessary improvements. All projects were evaluated against criteria for safety, reliability improvement and cost management.

DTE also is committed to minimizing the financial impact of these investments on our customers. Not only will improvements create efficiencies in the resulting infrastructure, but new, smart technologies will be incorporated into the grid, reducing operating expenditures.

Distribution Investment and Maintenance Framework

This investment encompasses many technical projects that can be defined and simplified by four key pillars:

Tree Trimming

- » Tree trimming across 31,000 miles of overhead power lines



Technology and Automation

- » Integrated, high-tech distribution management systems
- » Smart Meters
- » Distributed Energy Resources integration



Infrastructure Redesign

- » Increase system capacity
- » Convert and consolidate older systems



Infrastructure Resilience and Hardening

- » System hardening
- » Circuit improvements
- » Equipment replacements and upgrades

**Tree trimming efforts
improve reliability** of
the energy grid for our
customers

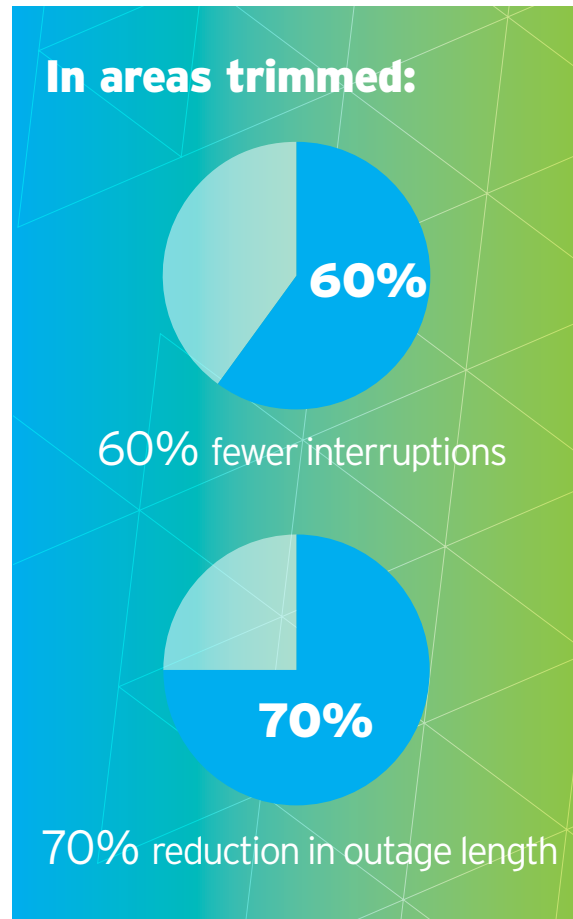


Tree Trimming

Trimming trees sounds simplistic, but it can make an extraordinary impact on reliability. Trees and tree-related events are responsible for more than two-thirds of the time customers are without power.

DTE Energy collaborates closely with customers every step of the way on tree trimming, and new specifications for how we trim have already proven successful. Significant improvement has been shown in areas where new tree trimming guidelines were implemented. Customers in these areas experienced 60 percent fewer interruptions. Outages that did occur were reduced in length by approximately 70 percent.

Tree trimming efforts are ongoing along our 31,000 miles of overhead power lines to minimize tree interference and downed wire events that disrupt power to your home and business.



Two-thirds of the time customers are without power is due to trees and tree-related events

31,000 
miles of overhead power lines

Infrastructure **Resilience and Hardening**

Circuit Improvement Programs

System resiliency involves installing equipment called sectionalizing and switching devices that limit the number of customers impacted by an outage. The equipment isolates the fault on the system and most customers can be restored quickly while the damage is repaired. In addition, DTE Energy is performing work throughout the system to strengthen and rebuild circuits to minimize frequent outages and improve reliability.

About one-third of DTE's electric grid is **underground cable**. Our proactive cable replacement program will upgrade this part of the grid and provide increased reliability and resiliency. More than 350 miles of underground cable will be replaced in the next five years.

Switchgear houses a combination of electrical parts and allows DTE to perform substation and circuit maintenance work. Replacing switchgear involves extensive substation renovations both below and above ground.

A proactive program inspects and tests DTE's more than 1 million **utility poles** to identify and address weakened poles and pole top hardware. Pole replacements provide higher strength and storm resiliency. More than 60,000 poles will be reinforced or replaced over the next five years.

Circuit breakers are electrical switches designed to isolate faults that occur at various points of the grid. Nearly 400 circuit breakers are targeted for replacement in the next five years.

Electrical System Hardening Program

A key element of updating the infrastructure is a hardening program to improve the safety, reliability and storm resiliency of the current system. This work includes:

- » **Replacing targeted poles and crossarms**
- » **Rebuilding targeted sections of overhead wire**
- » **Trimming trees to enhanced specifications**



Replacing aging infrastructure will increase the energy grid's resiliency to handle adverse weather, surges in customer usage and other challenges

Infrastructure **Redesign**

Projects have been prioritized based on many factors for the highest potential direct customer benefit

Increase System Capacity

DTE Energy is planning for the upgrade and expansion of the electrical system to accommodate population shifts and the changing needs of customers at home and at work by building new substations and upgrading existing substations. This will allow the company to meet the needs of current and future load growth.

Conversion and Consolidation of Older Systems

To operate a modern energy grid, DTE will begin to convert substations to newer design and technology standards. But this is not a quick upgrade project. Transitioning to a more modern distribution system will require significant investment and decades of planned projects.



A modern energy grid with best-in-class design and technology standards will power the continued revival of Southeast Michigan

Technology and Automation

Smart Meters

DTE Energy has installed about 3 million smart meters, which can be read remotely and provide a wide range of benefits to our customers, including:

- » **Up-to-date and accurate information to help customers track and control their energy usage, saving them money**
- » **Reduced length of power outages**
- » **Remote connect and disconnect service**

DTE is innovating new ways to use smart meter outage data, and is among the first energy companies in the country to use it to more accurately reflect our customers' reliability experience.

Advanced Distribution Management System

The Advanced Distribution Management System connects and aggregates several operational functions to provide real-time situational awareness. This means DTE will have a real-time view into the energy grid's status and performance. While the advantages of this integration are numerous, for our customers it means a reduction in the length and number of outages. DTE will receive automatic outage notifications, which means crews can be assigned quicker and get to your neighborhood faster. The system also provides the ability to isolate faults, minimizing the number of customers impacted by an outage.

Distributed Energy Resources

Commonly referred to as DER, Distributed Energy Resources is an emerging trend in the energy field. DTE's infrastructure upgrades will greatly improve the capability of our power grid to better integrate future DER resources such as rooftop solar. At the same time, DTE continues to work with customers to increase the accessibility of our grid.

A smart and integrated grid will improve reliability and system performance through real-time situational awareness and a controllable distribution grid. While the shining star of technology and innovation is the Advanced Distribution Management System, additional improvements include:



**Real time energy
grid view**



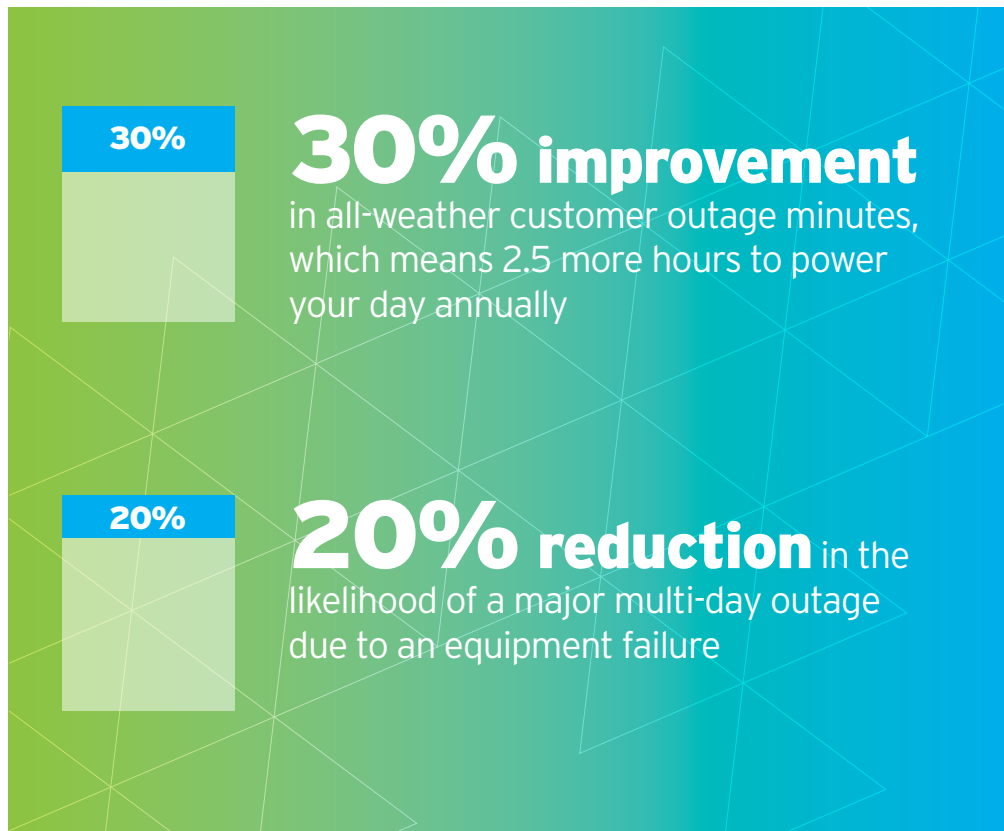
Smart Meters



**Distributed energy
resources integration**

Investments Improve **Reliability**

Our customers have weathered the storm of a long recession and are rebounding in so many ways. Over the next five years, DTE Energy will significantly improve reliability for these customers. We are proud to play our part in the revival of Michigan's economy by providing safe, reliable and affordable power to those who are paving the way to a bright future ahead.



Our infrastructure investment and maintenance plan will significantly improve reliability

In Your Community: Project Snapshots

This work will take place across Southeast Michigan and benefit nearly every electric customer on the energy grid

Detroit // Gordie Howe International Bridge

DTE facilities and infrastructure will be relocated to accommodate the development of the new bridge connecting Detroit with Windsor, Canada.

Ann Arbor // University of Michigan

To improve reliability for customers throughout the Ann Arbor area, DTE will construct two new substations, including five miles of 120 kV power lines and a reconfiguration of surrounding infrastructure, around the University of Michigan campus in Ann Arbor.

Macomb County // Malta Substation Rebuild

To meet the energy demands of the growing population in Macomb County, most existing aging equipment at the Malta substation will be replaced and new equipment will be added. This will allow the facility to reliably serve customers for many years to come.

Pontiac // Vault Projects

Twenty-one locations in Pontiac that have electrical equipment located in underground cement vaults will be replaced or decommissioned. This is part of a larger effort to update the energy grid in Pontiac to power the city's revitalization.

Thumb Reliability Work // Lapeer Substations

Replacement of older infrastructure on the circuits and in the substations will provide the residents of Lapeer and surrounding areas with increased reliability and will better accommodate economic growth, including the Lapeer Industrial Park development, in the coming years.



DTE Energy

For more information visit: dteenergy.com/reliability