

DTE Energy®

Smart Cities Symposium

April 6, 2018



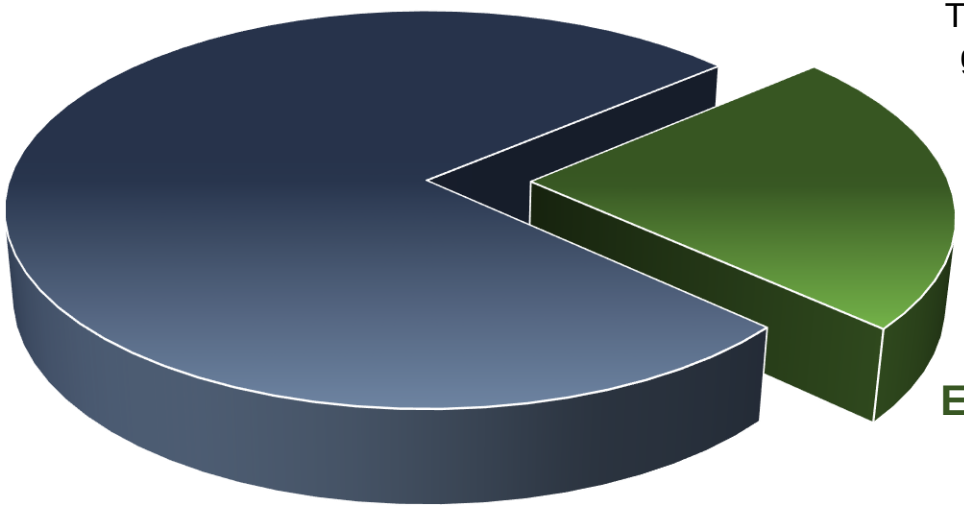

DTE Energy Overview

75% - 80% Utility

20% - 25% Non-utility

DTE Electric
Electric generation and distribution

DTE Gas
Natural gas transmission, storage and distribution

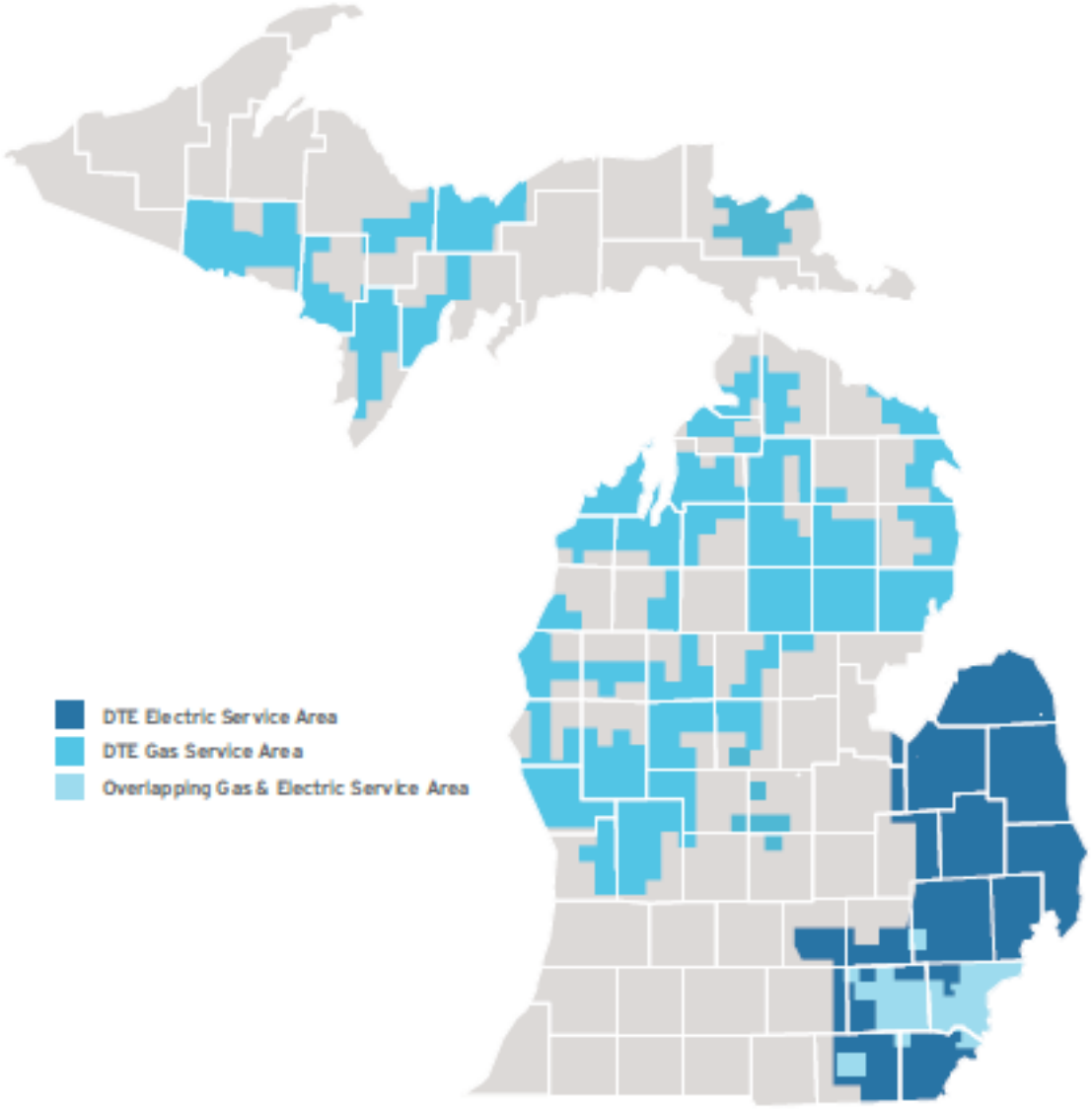


Gas Storage & Pipelines (GSP)
Transport, store and gather natural gas

Power & Industrial Projects (P&I)
Own and operate energy related assets

Energy Trading
Gas and power marketing

DTE Electric & DTE Gas Highlights



DTE Electric

- 2.2 million electric customers
- 7,600 square miles service territory
- 47,000 miles of electric distribution lines

DTE Gas

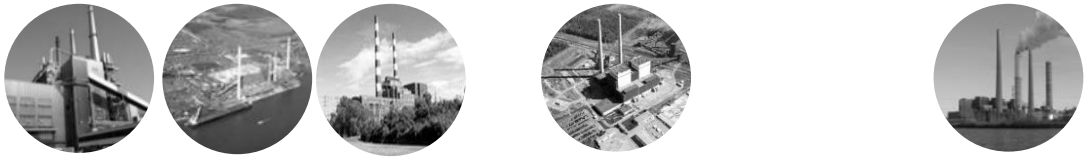
- 1.2 million customers
- 20,300 square mile service territory
- 21,000 miles of gas pipelines

Generation Portfolio Transition

CO_2 reduction plan*

- 30% by ~2022
- 45% by 2030
- 75% by 2040
- > 80% by 2050

Planned Retirements



River Rouge | St. Clair | Trenton Channel | Belle River | Monroe

Planned additions

2020 | 2030 | 2040 | 2050

A steady march toward zero-emitting and low-emitting resources

* CO_2 percentage reductions from 2005 levels

Renewable Energy Plan

- Over past 10 years, invested ~$2.5 billion in adding 1,000 megawatts of wind and solar capacity – enough clean energy to power more than 450,000 homes."
- Last week, proposed additional ~1,000 MW of wind and solar by 2022
- Double DTE's renewable energy capacity from 1,000 megawatts to 2,000 megawatts – enough clean energy to power over 800,000 homes
- More than $1.7 billion investment Michigan

Distribution Grid Long-Term Investment Plan

DTE Electric Company

Distribution Operations Five-Year (2018-2022)

Investment and Maintenance Plan

Final Report

January 31, 2018

MPSC Case No. U-18014

Distribution Grid Long-Term Investment Plan

Strategic Pillars

Tree Trimming

Infrastructure Redesign

Infrastructure Resilience and Hardening

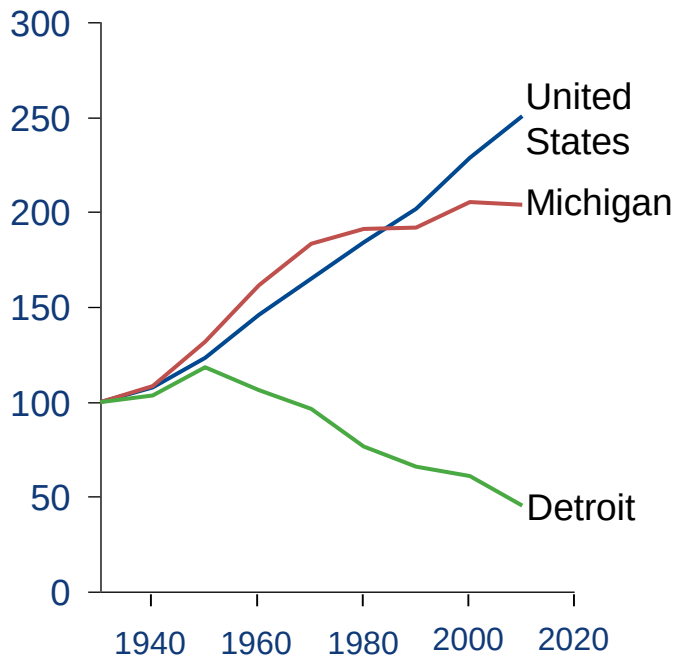
Technology and Automation

Desired Outcomes

- Mitigate Risk
- Improve Reliability
- Reduce Cost

Infrastructure Resilience & Hardening

Historical Population Change
(Indexed to 1930 Population)



Selected Asset Age Summary
(Years)

Asset	Average Age	Age Range	Typical Life Expectancy
Substation Transformers	41	0-93	40-45
Circuit Breakers	48	0-87	30-40
Switchgear	34	0-64	35-45
Poles	44	0-90+	40-50
System Cable	40	0-100+	25-40
URD Cable[2]	23	0-50+	25-35

Infrastructure Resilience & Hardening

Select Initiatives

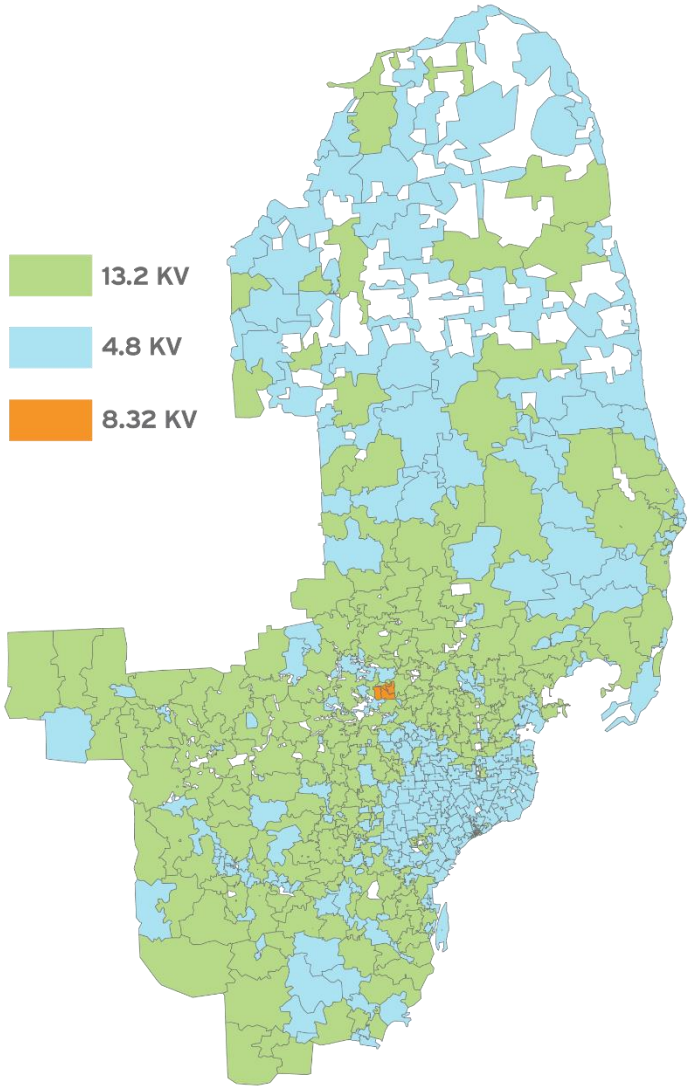
4.8 kV System Hardening

Aging Asset Replacement

Circuit Improvement

- As asset age increases, so does the likelihood of failures of critical distribution equipment – a phenomenon we are experiencing with increasing regularity
- These failures have the potential to last days, and impact a large number of customers
- Our programs have been designed to bring DTE's asset replacement cycle on-par with industry standards

Infrastructure Redesign



- The 4.8 kV system is older, less efficient, and associated with more trouble events
- Converting the 4.8kV system to a higher voltage class will reduce risk, improve reliability and reduce costs – but it will require substantial investment and will take decades to complete

Technology & Automation

Installation of Remote Monitoring and Control Devices

- Continue to install field devices, providing an enhanced view of the real time state of the system
- Upgrade equipment to allow remote monitoring and control

Modernization of the Electric System Operations Center

- Upgrade our System Operations Center to meet industry best practices and enhance the ability to respond to significant disruptions

Implementation of an Advanced Distribution Management System

- Improve real-time operating decisions based on integrated data and models
- Provide consistent information on system conditions to all Electric Distribution groups
- Facilitate the integration of distributed resources

Cities and Utilities Common Objectives

- Reduce energy costs (residential, commercial, industrial and municipalities)
- Improve infrastructure reliability and resiliency
- Reduce overall carbon emissions

Energy-Related Opportunities

Efficient Buildings

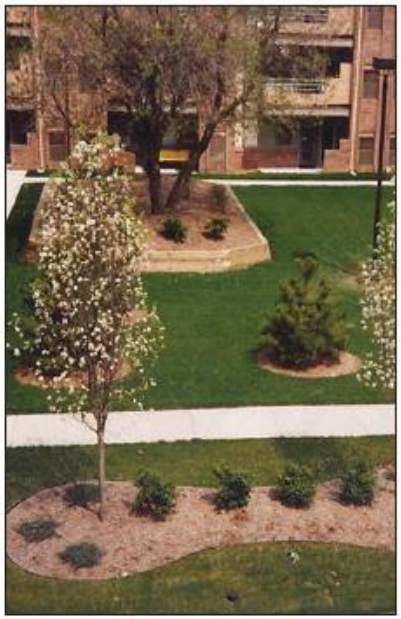
Street Lighting

Clean Energy

Data Analytics & Intelligence

Transportation

Efficient Buildings and Street Lighting



City of Warren

Projects

- Upgraded exterior lighting, installed LED exit signs and occupancy sensors for two of Warren's senior citizen housing facilities
- Upgraded lighting in the City Hall parking structure with induction lamps — and lighting controls
- Converted streetlights to LEDs
- Upgraded the city's waste water treatment plant's compressed air system

Results

- $110,000 in incentives offsetting 18% of capital costs
- Savings of more than $27,000 annually

Street Lighting

City of Detroit

- DTE worked with state and local governments to create the Public Lighting Authority (PLA) – a separate entity with the mission of improving, maintaining and modernizing Detroit's streetlight infrastructure
- DTE's leading project management organization facilitated the City's Public Lighting Authority (PLA) to install 65,000 new LED street lights
- Detroit became the largest city in the US to have 100% public LED lighting once project was completed in 2016

Clean Energy

DTE Energy

City of Detroit

- In 2017, the largest urban solar project was brought online in Detroit
- DTE and city partnered to use surplus city-owned property and will power 450 homes

Large Voluntary Green Pricing Program

- Indicated in recent renewable plan filing, large customer interest (which can include cities) for deployment of ~300 MW of wind capacity
- Wind would be operational by 2020

Transportation – EV Charging

DTE Energy

Downtown Detroit

Issue

There is currently no fast charging available anywhere in Detroit

Solution

A downtown fast charging hub and EV promotional space

Features

- Make-ready infrastructure
- Multiple fast chargers in one place
- New EV model display
- Community social space

Partners

City of Detroit

Bedrock Detroit

GM

Downtown Ann Arbor

Issue

Ann Arbor has the highest EV density in DTE territory, but limited fast charging

Solution

A downtown fast charging showcase with three fast chargers in a high-traffic area

Features

- Make-ready infrastructure
- Multiple fast chargers in one place
- Co-branded City of Ann Arbor / DTE

Partners

City of Ann Arbor Michigan

DDA

Force for Growth

Our Aspiration: To be the best-operated energy company in North America and a force for growth and prosperity in the communities where we live and serve.