

DTE Energy®



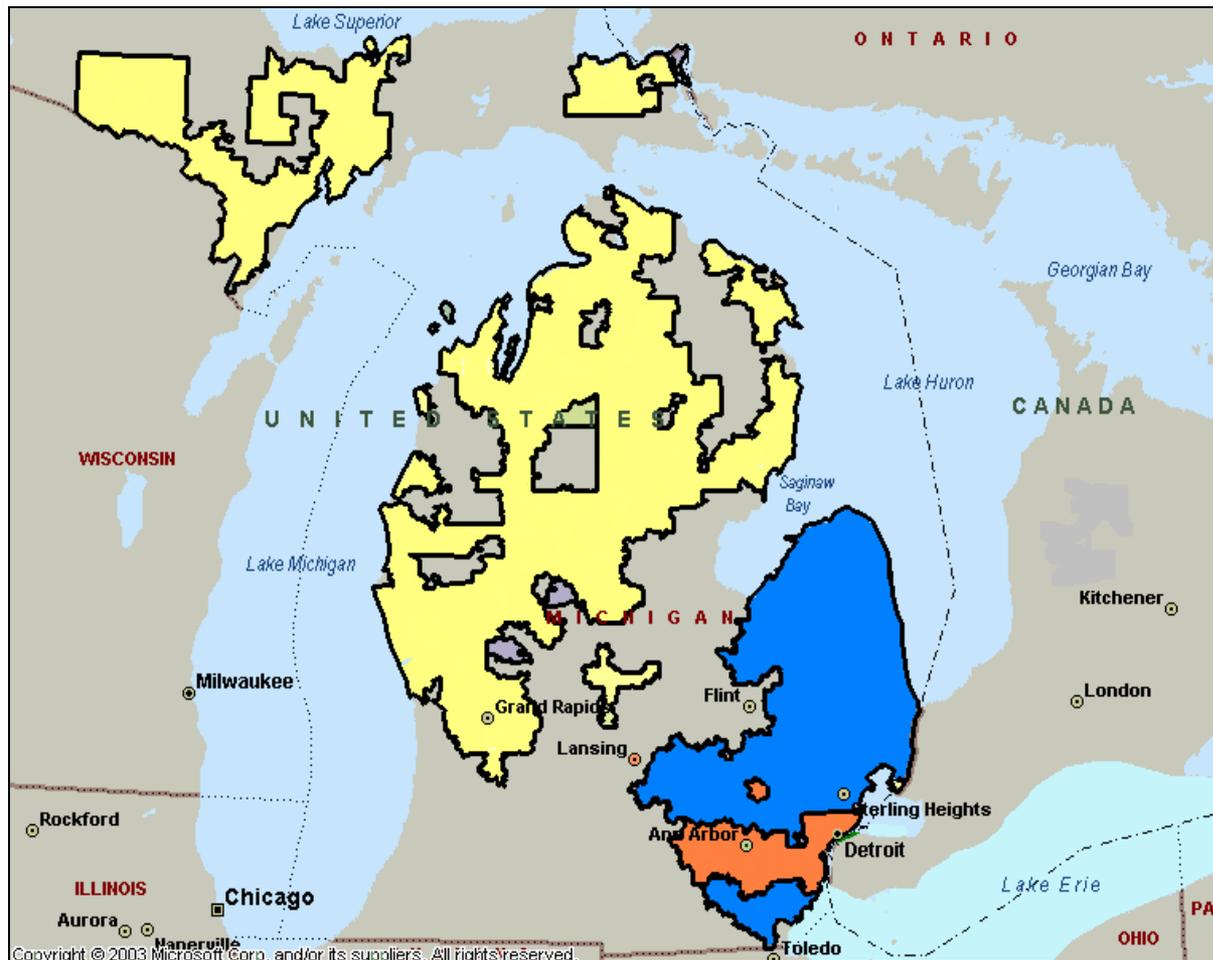
Smart Grid

James Hull/Joseph McCormick

Manager(s) Major Enterprise Project

DTE Energy

DTE Service Area and Meter Overview



<u>Meters, '000</u>	<u>Total</u>
Overlap	1,765
Electric Only	1,777
Gas Only	<u>533</u>
Total	4,075

- Overlap territory**
- Electric only territory**
- Gas only territory**

DTE Energy Smart Grid Initiatives

- DTE Energy's Smart Grid initiatives consists of three related Projects.
 - Advanced Metering Infrastructure (AMI)
 - Smart Circuit
 - Smart Home

DTE Energy®



AMI Project

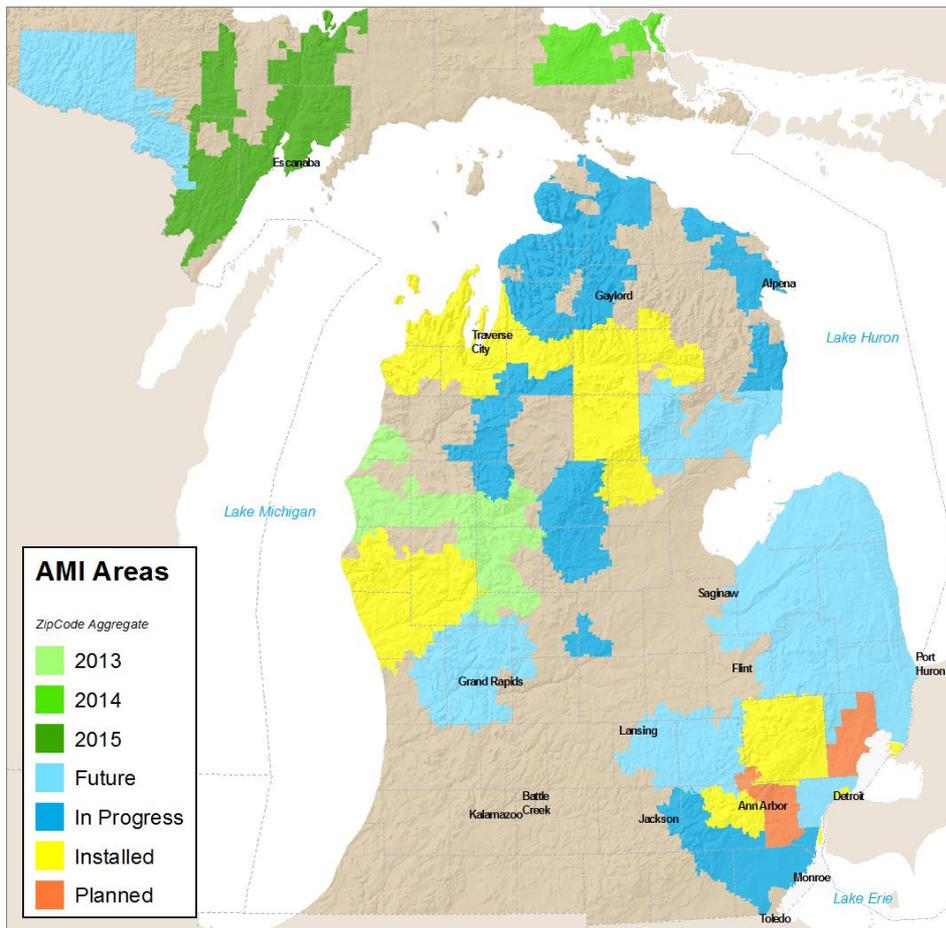
AMI Overview

The AMI project is DTE Energy's plan to upgrade or replace natural gas and electrical meters throughout our service territory. The project includes

- AMI Meter and Module installation
 - DTE Energy utilized ITRON Open Way technology
 - Replacing 2.6 million electric meters
 - Modifying 1.3 million natural gas meters with a remote-reading module
 - Full conversion will occur in phases over multiple years
- Information Technology (IT)
 - 15 integrated IT systems to provide a complete and connected picture of the distribution network
 - Security and Interoperability

Total AMI Installations

- AMI project total installations include AMI Electric, AMI Gas, and AMR Gas



u09647 Mapping Technology 8/31/2012 10:21:10 AM S:\Graphics\Design Library\Working Files\Bryan (u09647)\AMI\Areas-Planned_Installed_Future 7-2012.mxd

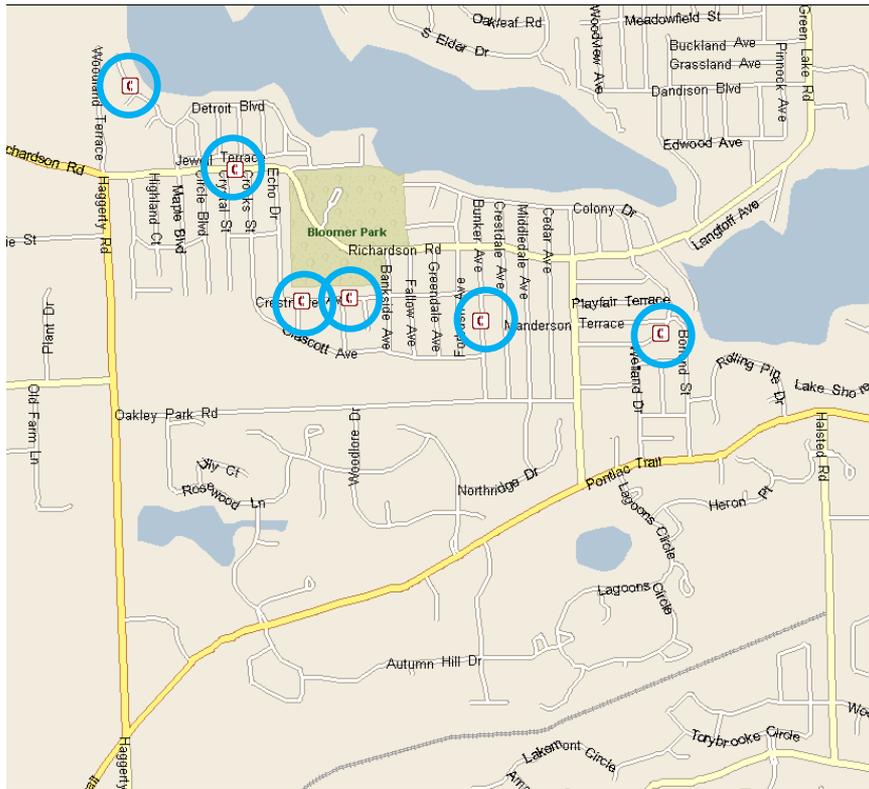
Total Installation Progress as of 8/31/2012			
	Month	Year to date	Total Project
AMI Electric	16,398	149,166	752,914
AMI GAS	6,466	26,249	45,237
Sub Total	22,864	175,415	798,151
AMR GAS	2,532	34,593	62,343
Total	25,396	210,008	860,494

AMI Accomplishments

- **Benefit Realization** (All Benefit metrics End of August 2012)
 - Disconnect / Reconnect Events – 197,143 truck rolls avoided
 - Billing Read Rate – AMI YTD 99.6% vs Manual 97.2%
 - Meter Reading Routes Automated – 1,354 routes
- **Customer Contacts**
 - 2,160 Issues filed by customers out of 860,494 total installs (721,000 electric meter installs for DOE grant period)
 - Less than 0.25%
 - Issues included privacy, installation, and opt out
 - 100% of these customers were contacted

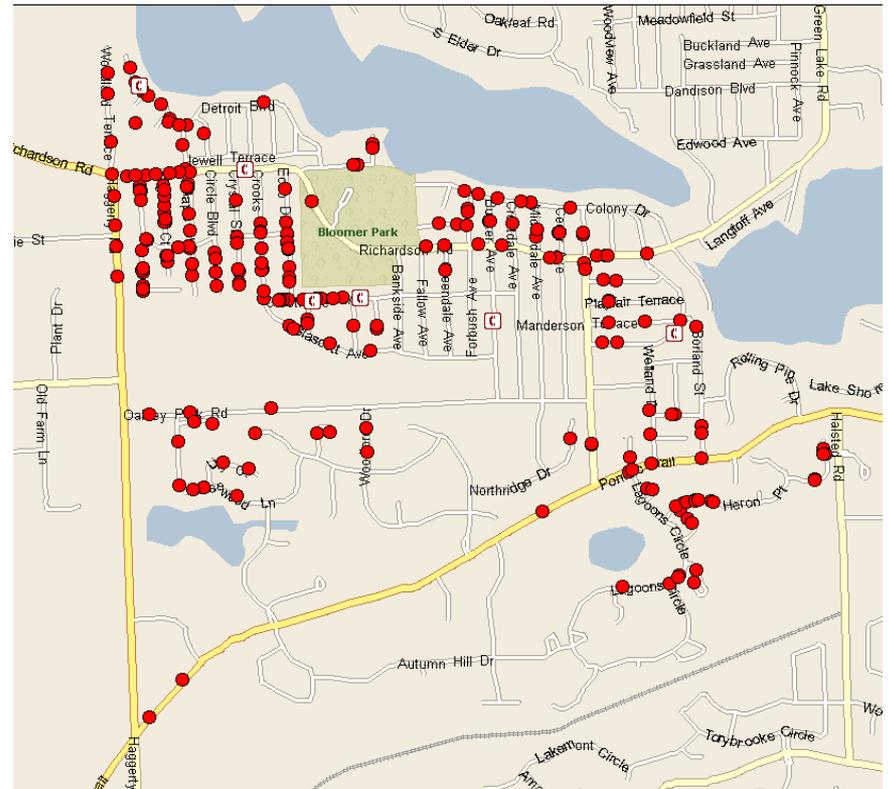
Storm control with AMI provides real-time geographic outage information

In a world without AMI, limited information is collected monitoring customer calls



○ Customer Phone call reporting power outage

AMI provides immediate outage location information



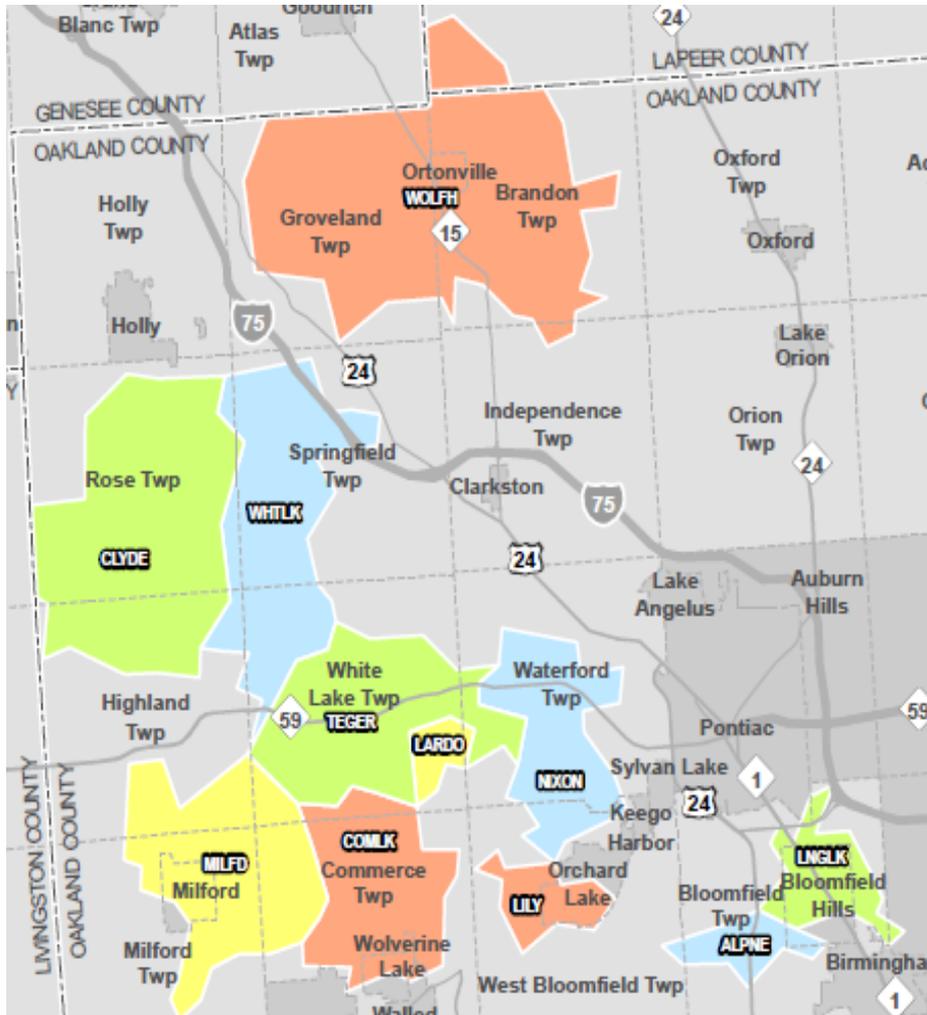
● AMI Meter generated power outage location data

DTE Energy®



Smart Circuit

Smart Circuit Overview



- **Installation of Field Devices & Extend Communications Network**
 - Allows remote monitoring and control of the distribution system
- **Centralized Distribution Management System (DMS) Implementation**
 - Creation of a distribution network model
 - Involves the cleansing of existing data elements and the gathering of new engineering data
- **Covers geographical area of 11 substations, 55 circuits**

Smart Circuit Project Streams

- **Installation of Field Devices**
 - Overhead/Underground Construction on Distribution Circuits
 - Completed installation of pole top switches, reclosers, capacitors, regulators, and automatic switching.
 - Reconductoring/Circuit Splitting to enable automatic transfer of load between circuits – Reconductoring is complete. Some load transfers remain.
 - Substation Construction – Completed
 - Installation of relays and metering in substation to enable fault locating.
 - Installation of Dissolved Gas Analysis (DGA) on the transformers at two substations.
 - Installation of battery monitoring system at substation.
- **In commissioning of Devices in EMS/SCADA/DMS**
 - SCADA checkouts and communication optimization continue and will be a continuing activity for the company

Smart Circuit Project Streams

- **Extend Communication Network**

- Network improvements to bring additional device data back to DMS and engineering analysis environments.
 - Substation
 - Overhead Devices

- **Data Analytics and Visualization**

- Provide visualization of data across business work groups and systems.
- Provide engineering data access for advanced analysis and reporting.
- Accurate and integrated data will allow us to operate system more efficiently.

Smart Circuit Project Streams

- **Centralized Distribution Management System (DMS)**
 - Installation of hardware and software enhancements to support advanced distribution applications
 - Cleansing of data to create a distribution network model
 - Smart Grid success is highly dependent on the quality of the cleansed data.
 - Processes to maintain/sustain cleansed data.
 - Testing of DMS Application Enhancements
 - Volt/Var Optimization
 - Restoration Switching Analysis
 - Fault Locating
 - Simulation Mode

DTE Energy®



Smart Home

Smart Home Overview

- **Smart Home Objectives**

- Smart Home is a platform to promote energy management, customer control, choice and flexibility by utilizing interactive in-home technology.
 - Evaluate customer reaction to, and usage of, the technologies.
 - Determine demand-response and energy efficiency benefits.
- Leverage the capabilities of AMI to offer new pricing and billing options as well as tools to promote energy efficiency.
- Dynamic Peak Pricing will be evaluated for customer acceptance and satisfaction as well as tools to reduce or shift consumption.
 - Offer Pre-Pay billing option, as a stand alone and in conjunction with dynamic pricing, to evaluate customer acceptance and satisfaction.
- Provide an educational facility for employees, customers and other stakeholders to see demonstrations of smart grid, renewable and energy efficient technologies.

Smart Home Pilot Key Services

- **DPP: Dynamic Peak Pricing**, a pilot residential time of use rate designed to encourage demand response behavior by charging customers a high commodity cost during peak periods in exchange for lower commodity costs the rest of the time.
- **Web Portal**: allows for daily usage reporting and tips on conserving energy and saving money.
- **PCT: Programmable Communicating Thermostats** adjust room temperatures automatically in response to price changes or remote signals from utilities.
- **IHD: In-Home Energy Displays** communicate near real-time price and consumption information to consumers
- **Smart Appliances**: equipped to react to changing price signals:
 - Refrigerators can delay the start of a defrost cycle
 - Electric clothes dryers can enter an 'economy' mode and reduce the heat and extend the drying cycle
 - Dishwashers and washing machines can delay the start of the clean cycle until prices have dropped below a certain level or a certain time of day

Smart Home

- **Smart Home Pilot/Consumer Behavior and Communication Plan**
 - Comprehensive plan has been implemented to provide education on smart grid technologies, the benefits of the programs and how to use information and tools to control home energy usage.
 - Smart Home Pilot Website available to pilot participants.
 - Online usage information available on DTE website as well as through energy management software for customers with GE smart devices.
 - Campaign Management Tool and Smart Home Call Center operational since January 2012.
 - Data Analytics created to allow for analysis of consumer behavior.
 - Recruitment for Pilot began January 2012 and will complete June 2012.
 - Installation of equipment and devices will be complete by July 2012.

Smart Home

Technology Demonstration Center - Completed

- Site selection and demolition - completed December 2010
- Floor Plan Design - completed March 2011
- Construction completed December 2011
- Changes completed May 2012

Questions?