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May 15, 2017

Ms. Kavita Kale
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, MI 48917

RE: In the matter, on the Commission's own motion, to review the response of
CONSUMERS ENERGY COMPANY and DTE ELECTRIC COMPANY to
recent storm damage in their service territories
Case No: U-18346

Dear Ms. Kale:

Attached for electronic filing in the above matter is DTE Electric Company's March 8, 2017 Windstorm Report submitted pursuant to the March 28, 2017 Michigan Public Service Commission's Order.

Very truly yours,

Andrea Hayden

AH/lah
Encl.

STATE OF MICHIGAN
BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter, on the Commission's own motion,)
to review the response of **CONSUMERS ENERGY**)
COMPANY and **DTE ELECTRIC COMPANY** to)
recent storm damage in their service territories.)

Case No. U-18346



DTE ELECTRIC COMPANY'S MARCH 8, 2017 WINDSTORM REPORT

On March 28, 2017, the Michigan Public Service Commission (“Commission” or “MPSC”) issued an Order instructing DTE Electric Company (“DTE Electric” or the “Company”)¹ to file a report that provided a summary of the March 8, 2017 windstorm and various other issues, including the following: (1) how the windstorm affected the utilities’ distribution systems; (2) how the utilities prepared for and responded to the storm; (3) whether any changes could be implemented to reduce the potential for future power outages of the same magnitude; (4) whether the utilities were properly prepared to receive and respond to customer calls to report outages and if the utilities’ customer communications were adequate; (5) whether the utilities sufficiently addressed all public safety concerns associated with downed power lines in a timely manner; (6) the accessibility of outage maps and how that could be improved; and (7) the performance of smart meters and other online communications. The Commission also requested that DTE Electric assess how investments in distribution infrastructure, distribution equipment repair and construction, expansion of automation, early warning technology, and vegetation management affected the time and number of outages from the windstorm. Finally, the Commission was interested in why, in DTE Electric’s opinion, it was disproportionately impacted by the storm. DTE Electric’s response to the Commission’s request is below.

¹ DTE Electric was responsible for the storm restoration activities, with assistance from various enterprise resources including employees of DTE Energy Company and DTE Gas Company. Reference to DTE Electric throughout this report may also include these resources.

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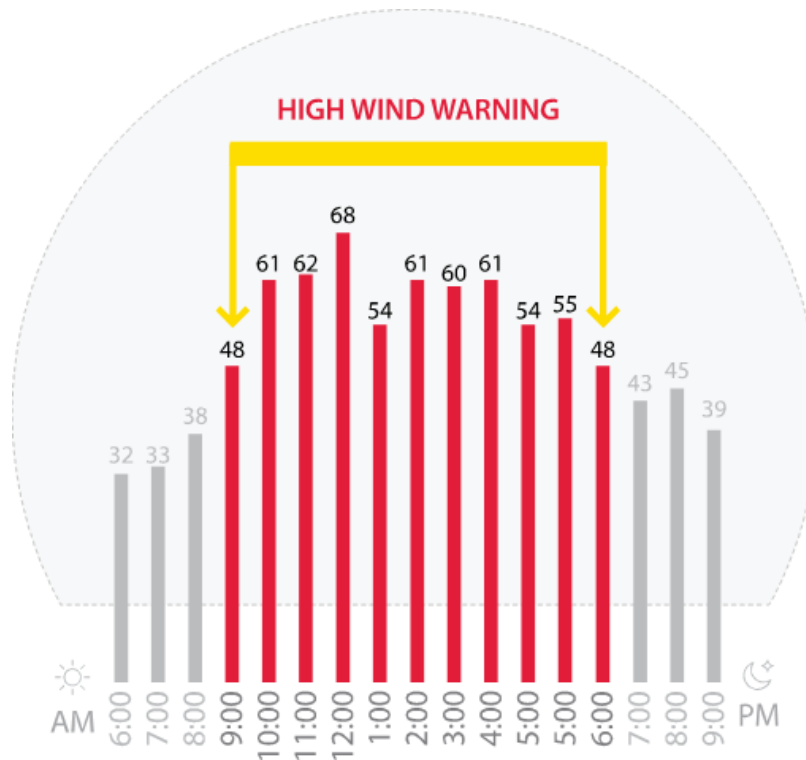
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Overview

On March 8, 2017, sustained tropical storm-force winds² battered southern Michigan, resulting in extensive tree damage, leading to the largest weather event in DTE Electric's history.

Figure 1 - Wind Gusts by hour (NOAA)



The National Weather Service predicted on Tuesday, March 7 that wind gusts could reach 50 mph. The actual wind speeds surpassed all predictions. From 9 a.m. to 6 p.m., the region endured six recorded hours of wind gusts greater than 60 mph, with gusts as high as 68 mph (Figure 1). At dusk, the wind speeds began to subside; by 7 p.m., wind gusts reduced to less than 50 mph and continued to diminish over the nighttime hours.

² Tropical Storm force wind = 39-73 mph per National Oceanic and Atmospheric Administration (NOAA)

The sustained high winds impacted the electrical system by breaking utility poles and toppling trees onto DTE Electric's power lines, causing extensive damage. Sustained winds greater than 30 mph continued to impact the area through Saturday, March 11. These winds, along with the addition of snow, slowed restoration progress. Nearly 800,000 customers were impacted by the weather events.

When it was determined that 420,000 customers had lost power, the Company's Corporate Crisis Response Plan (CCRP) was triggered, establishing a FEMA modeled Incident Command Structure (ICS) at a corporate level, channeling all needed and qualified DTE Electric resources into the restoration effort. One key component of the ICS involves key executive leaders from around the Company meeting twice daily to review the overall strategy including resources, restoration progress and areas of concern. CCRP also is designed to ensure all stakeholders receive clear, concise, timely and accurate information about the event and response plans.

DTE Electric immediately deployed thousands of employees as well as foreign contractors, utility workers and tree trimmers from the Great Lakes Mutual Assistance (GLMA) program to complete a safe, efficient and timely restoration. In all, approximately 2,500 DTE Electric employees and 2,000 non-DTE Electric employees protected the public from potential hazards and completed restoration efforts. The nine-day restoration was challenging due in large part to the number of single customer outages (5,500) more than quadruple the number in most catastrophic storms. These repairs were the most difficult as many required specialized skills and multiple crews to complete.

To assist those directly involved in restoration efforts, hundreds of additional employees from across the Company – from Public Affairs to Gas Operations – mobilized as well. They

worked with nonprofits and local communities to open warming centers, check on vulnerable customers, provide logistical support to the field, help answer customer calls, and many more functions – all with one goal in mind: protect the public and restore power as quickly and safely as possible.

DTE Electric recognizes this event was a hardship for the Company’s customers, and understands the impact that being without power had on their daily lives. While the weather experienced was extreme, we are responsible for the electric system that services our customers and we have identified opportunities to improve the Company’s restoration process and overall system.

DTE Overhead Line Crews replacing broken pole in the aftermath of the March 8 Windstorm



The following table displays DTE Electric’s key areas of success and areas for improvement as it pertains to this extraordinary weather event. These items are discussed in detail throughout the report.

| |
|--|
| Areas of Success <ul style="list-style-type: none">• No safety incidents internally or externally in the face of 11,000 reported downed wires• Timely activation of Corporate Crisis Response Plan to stand up FEMA modeled Incident Command Structure (ICS)• Exceeded our goal to restore 90 percent of customers by Sunday, March 12• Able to restore 99 percent of the approximately 1,100 schools impacted by Sunday, March 12, allowing the majority of schools to reopen on Monday, March 13• Quick and efficient integration of foreign crews into the restoration effort• Use of social media, radio and TV to communicate to customers• Integration of Advanced Metering Infrastructure (AMI)³ and Outage Management System (OMS) to validate outage data and check the power status of self-identified seniors and medical customers• Support of community warming centers and United Way 211 |
| Areas for Improvement <ul style="list-style-type: none">• Accelerate Enhanced Tree Trimming Program (ETTP)• Continue the System Resiliency (SR) hardening program• Continue to refine restoration processes to allocate resources as efficiently as possible• Improve restoration estimates for our customers• Improve strategy to more quickly restore single and nested customer outages (i.e., reduce “tail” of storm)• Increase integration of AMI, Supervisory Control and Data Acquisition (SCADA) and OMS through use of an Advanced Distribution Management System (ADMS) to allow for more efficient restoration• Further implement the use of Incident Command Structure (ICS) model for storm management including pushing operating authority closer to the point of activity |

³ AMI may also be referred to as smart meter

Preparing for the weather⁴

The windstorm of March 8 included several highly unusual weather dynamics that, when combined, ultimately resulted in extensive damage to the DTE Electric System. First, very dry desert-like air (dew point in the single digits) caused high-speed upper atmospheric winds to be driven to the surface. Second, a very tight high-to-low pressure gradient centered over southeast lower Michigan, which sustained the weather dynamic for a much longer period of time than predicted. DTE Electric's service territory also experienced a warmer than average winter with wet conditions leading up to the windstorm. This led to very soft, unstable ground, causing conditions conducive to trees being easily uprooted, including many healthy trees outside of our normal system easements.

The Company prepares for serious weather events throughout the year with cross-functional tabletop exercises, strategy sessions and training. Of the scenarios that are practiced, one that is worked through is a storm with 500,000 customers affected. This practice, which includes employees from across the enterprise, including Distribution Operations, Customer Service, Corporate Communications, Environmental Management and Resources and other business units, allows the Company to practice its Business Continuity Plans (BCP) in the event of a catastrophic event such as the one that occurred on March 8.

On March 3, DTE Electric's meteorologist and the National Weather Service predicted 40-50 mph winds in the five-to- seven-day forecast. Based on these forecasts, DTE Electric followed its pre-specified storm plan. The Systems Operations Center (SOC) and Central Dispatch worked to complete critical open maintenance jobs on the electric system, which

⁴Addresses MPSC question 2

readied the system for predicted outages of 50,000-100,000 customers. This preparation ensured that the health of the electric system would be at its peak for the pending weather.

More than 72 hours before the incoming weather hit DTE Electric's electric service area, Central Dispatch, SOC, Service Operations and other key stakeholders organized and conducted several strategy planning sessions for the expected outages and to coordinate and arrange resources as necessary. Through these early strategic sessions, DTE Electric decided to secure overhead line contractors and local foreign crews (overhead line workers that work for third party companies within DTE Electric's service territory). Additional pull out yards (areas that house non-DTE Electric overhead linemen trucks and supplies near the point of expected activity) were also secured. The Company's storm plan for a predicted outage volume of 50,000-100,000 customers (outage counts typically associated with winds of 50-55mph) does not call for the utilization of Great Lakes Mutual Assistance (GLMA) resources; thus no request for GLMA resources was initially made.

However, as the weather moved into our service territory, the actual wind gusts were much higher than predicted by both DTE Electric's own meteorologist and the National Weather Service. The winds quickly gusted up to 68 mph. For 14 hours, southern Michigan experienced sustained tropical force wind gusts⁵.

As it became clear that the damage would surpass the worst-case scenario previously estimated, DTE Electric moved with a great sense of urgency to respond. The Company's number one priority was to ensure the safety of the public, and even as the weather continued to cause problems on the electrical system DTE Electric mobilized crews to begin securing and de-energizing downed wires.

⁵Tropical Storms force wind = 39-73 mph per NOAA

When considering the weather experienced in comparison to population density (Figure 2) and the area of the driest air/highest winds (Figure 3), many of the strongest sustained wind gusts hit the most densely populated areas of DTE Electric's service territory (Area A) compared to the rest of the state. As illustrated in both Figure 2 and Figure 3, the two distinct areas with the highest sustained surface level winds track across the most densely populated portions of DTE Electric's service territory over the course of 14 hours. Relative to other electric systems in the region, this weather pattern resulted in a disproportionate number of DTE Electric customers impacted by the windstorm.

**Figure 2 - Areas of highest population density (2010
US Census Data)**

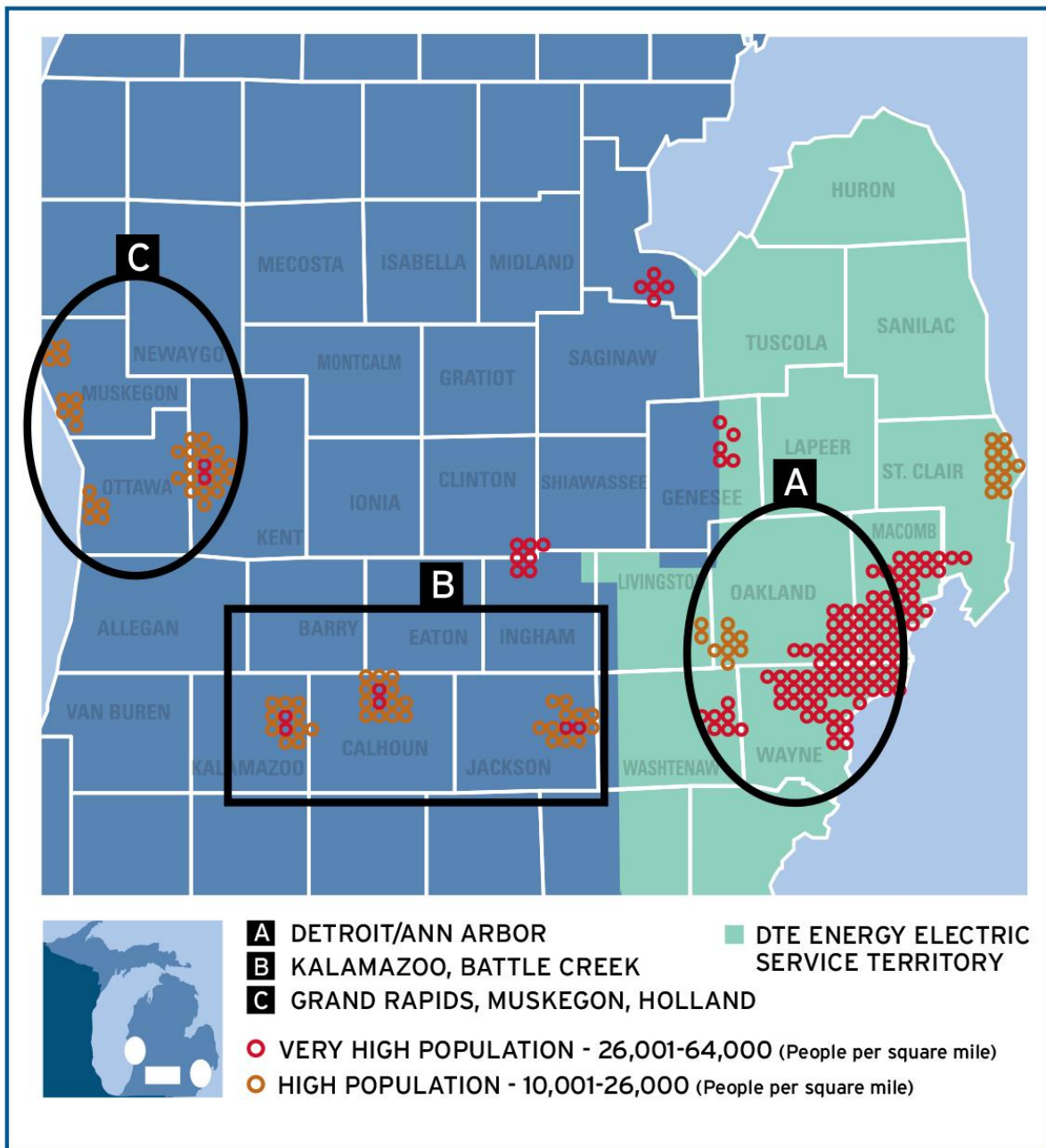
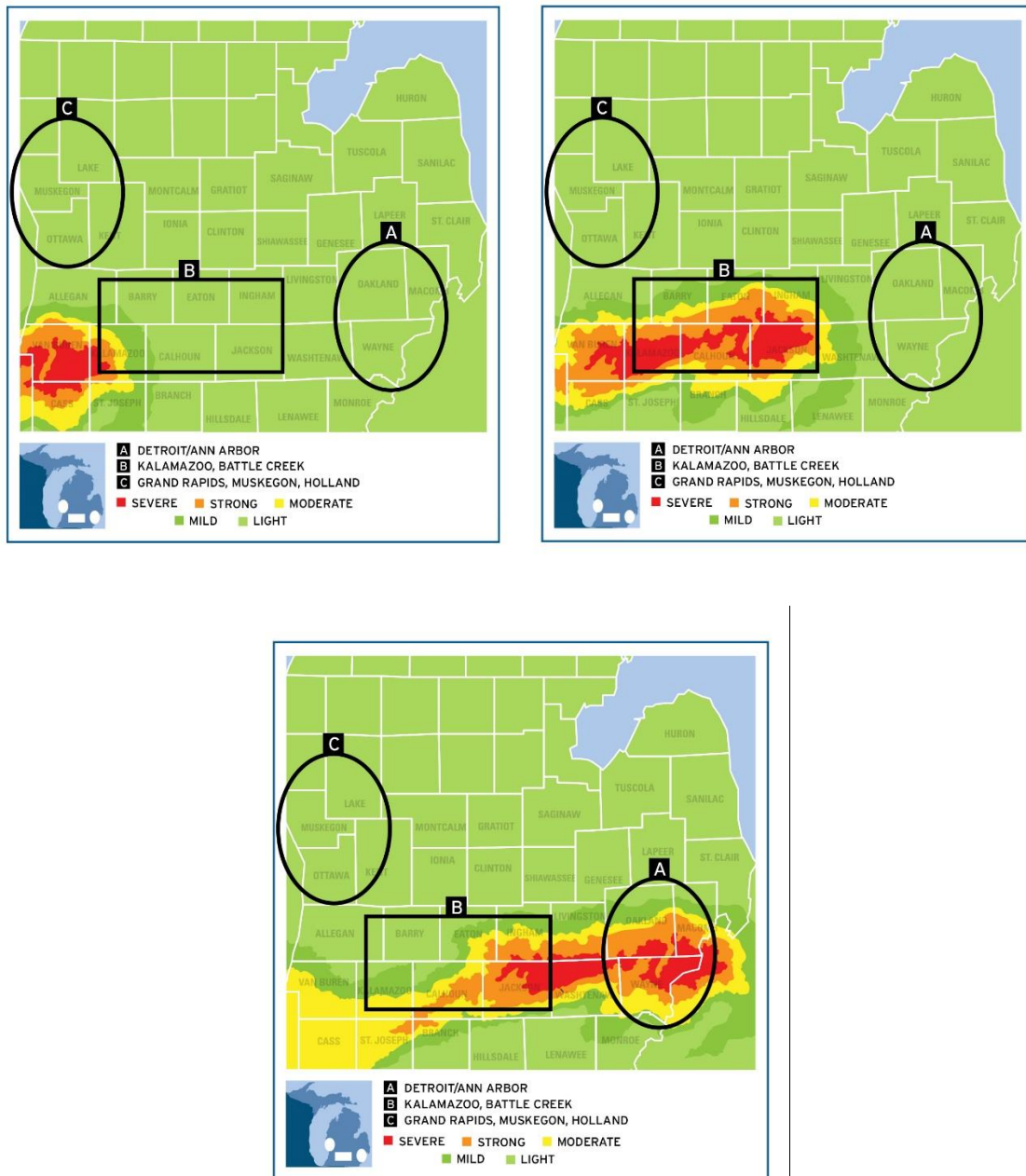


Figure 3 – Path of driest air (shown in red) on Wednesday, March 8 as it moves through southern Lower Michigan⁶.



⁶ Image taken from Geostationary Orbiting Environmental Satellite-16 water vapor satellite imagery. Note that dry air facilitates movement of high winds aloft to the surface of the earth.

Impact⁷

In all, after auditing Outage Management System (OMS) data, 749,511 customers were affected by the sustained winds in the largest weather-related outage event in Company history. DTE Electric reported the number of customers impacted as approximately 800,000. When experiencing large storms it is normal to have discrepancies between real time volume of events in OMS and audited actuals. This OMS auditing process accounts for duplicate jobs, low voltage calls, momentary outages (less than 5 minutes) and right-sizing outages based on actual field crew reported results.

This massive wind event coupled with the moist ground conditions caused numerous healthy trees both in and out of the rights-of-way to come down on DTE Electric's distribution and sub-transmission wires at a rate and magnitude not seen before. The required repairs included replacing 1,285 utility poles and 1.1 million feet of wire. Nearly 11,000 total reports of wire downs came through the Company's call center and mobile app. Due to the massive volume of customer interactions including views on the website and internal data connections, the Company's IT systems were pushed beyond their operational capacity. This ultimately led to a slowdown in the functionality of some internal and external systems.

Stakeholder Communications⁸

Our outreach and communication strategy consisted of a four-pronged approach:

1. Timely and accurate communication to our customers
2. Constant communication with government/emergency agencies

⁷ Addresses MPSC question 1

⁸ Addresses MPSC questions 4, 6 and 7

3. Thorough, transparent and continuous media relations and social media communications
4. Steady cadence of updates to the Michigan Public Service Commission

This approach is standard in any storm that the Company experiences. In the case of this windstorm, all activities were performed consistently and with a higher degree of intensity.

In the aftermath of the catastrophic storm of March 8, DTE Electric responded to 150,000 customer interactions, with an overwhelming peak rate of 30,000 per hour from all channels (call center, Interactive Voice Response (IVR), web, mobile). These customer interactions constitute reports of outages, downed wires, low voltages, etc., which created or became a part of 27,000 total events in our OMS.

To prepare for the expected call volume, the Company's Customer Service team maximized staffing in its call centers and opened the IVR to full capacity. However, the massive volume of data caused some slowdown in the processing time of calls and events. The Information Technology (IT) group for the DTE Energy enterprise worked through the night to successfully remedy this slowdown. Within the first 24 hours, the IT and Corporate Communications team adjusted the Company's website to turn off non-essential functions, limiting website traffic to only emergency and outage related communications. This enabled the IT systems to better handle the significant increase in web traffic and allowed DTE Electric customers to successfully view the outage map. To improve the outage map accessibility going forward, the Company will build off its rapid experiment of altering the website's functionality in a catastrophic storm, focusing only on emergencies and outage reporting.

During the course of the storm, DTE Electric activated numerous communication channels to provide customers updates on safety, restoration progress and support options if needed. Highlights are shown below:

- Distributed 28 media updates from March 8 to March 15 to provide our customers with information regarding downed wires, weather facts, ways to contact the Company and links to additional information
- Provided a liaison at the State Emergency Operating Center (SEOC) to support with timely updates on the restoration effort
- DTE Electric executives participated in numerous media interviews and held 11 press conferences, including several in the field
- Sent targeted and specific messages to customers to deliver estimates and updates based on the status of their outage
- Staffed the communication war room to regularly update restoration progress, provide safety tips and mitigate customer issues
- Performed extensive outreach to city officials, lawmakers and school district officials
- Worked with the American Red Cross and local municipalities to establish 70 warming centers across the DTE Electric territory
- Partnered with United Way to ensure customers that called their 211 center received timely information on warming centers, medical assistance, etc.
- Coordinated with Detroit faith-based community on direct outreach to customers, particularly those with medical needs
- Updated the Company's mobile app and web banners to reflect the most current restoration information

- Channeled customers to an external website (empoweringmichigan.com) as the source for general information regarding the storm. This ensured timely information was available to customers, and diverted non-essential traffic from the Company's website
- Launched extensive storm crisis ad campaign across radio, digital, print and TV to communicate messages on safety, restoration, warming centers and the community

Recognizing the cold weather that moved into the area on March 10, DTE Electric also took action to assist its most vulnerable customers. DTE Electric used AMI technology to determine whether self-identified critical medical care customers and those on our senior rate had power. Once we acknowledged this sub-group of customers, DTE Electric then queried their AMI meters to check power status. If their AMI meter responded with no power, DTE Electric employees performed a "well visit" check and provided information about nearby warming centers. Hundreds of these were performed during the course of the storm. During this process, the Company's regional relations group worked closely with numerous community and faith-based groups and municipal organizations, to set up warming centers. DTE Electric also provided the community groups with needed funding and supplies to ensure the safety and comfort of those who required assistance.

Gov. Rick Snyder activated the State's Emergency Operations Center (SEOC) on March 8 to closely monitor and share information about the wide-ranging damage and power outages from the windstorm.

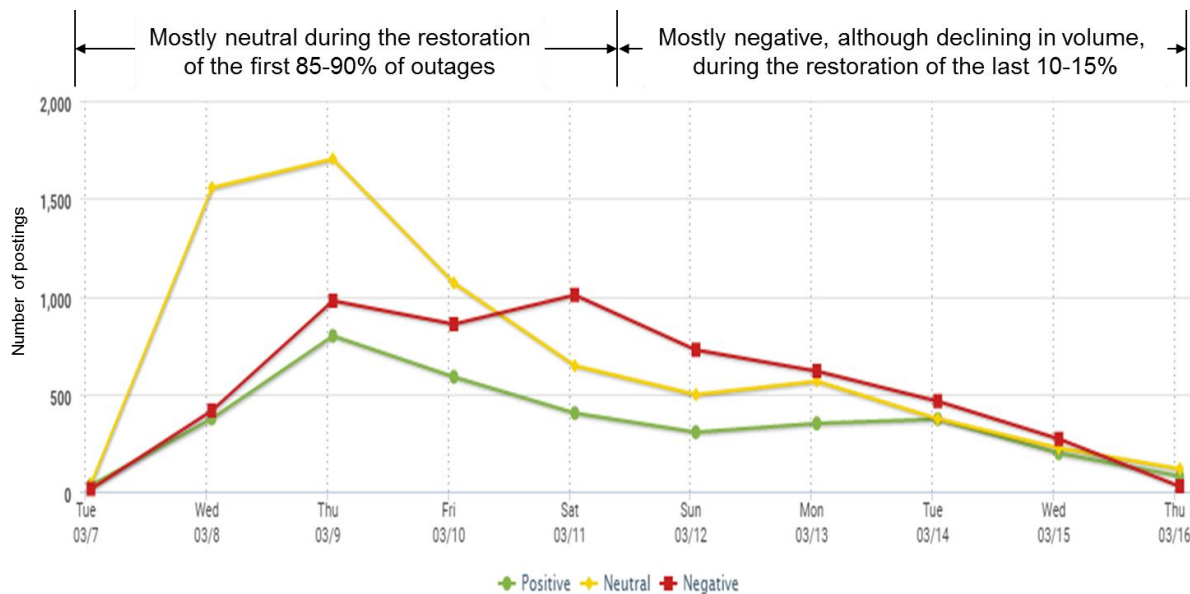
The SEOC is the emergency operations center for the state of Michigan. Located in Lansing, the SEOC is overseen by the Michigan State Police, Emergency Management and Homeland Security Division and coordinates response and recovery efforts by state agencies, local government and other entities as required. The SEOC is staffed by members of state

agencies involved in decision-making and information coordination during disasters or emergencies in the state of Michigan. During the March 8 storm event, DTE Electric was asked to provide utility personnel in the SEOC to interface with the SEOC staff directly and to facilitate information flow between the Company and state agencies.

DTE Electric staff from State Governmental Affairs assisted the SEOC and enabled real-time communication with Corporate and Governmental Affairs staff working in the Company's Emergency Operations Center in Detroit. This facilitated critical and timely information transfer to address issues affecting health and public safety. DTE Electric employees were in position to brief the Lansing SEOC staff and update the statewide agency staff twice daily regarding DTE Electric's outage locations, outage magnitude and restoration progress. DTE Electric staff worked within the SEOC through completion of the restoration efforts in DTE Electric's service territory.

Overall, customer sentiment toward DTE Electric remained neutral to positive through Sunday, when approximately 90 percent of customers were restored; however, the tone shifted as customers who remained without power for six or more days expressed frustration. Most of these included single customer outages, which required significant work to restore. Figure 4 illustrates the social media sentiment over the course of the restoration effort. More than 40 employees from the Company's corporate communications and customer service departments monitored social media to provide restoration updates and safety tips, to mitigate customer issues, as well as to provide additional outage reports and address any other emergent conditions. The Company's Corporate Communications team rapidly assembled a communication war room where sentiment and interactions were closely tracked and responded to, ensuring consistent and accurate messages were communicated.

**Figure 4 – Customer sentiment via social media
(number of mentions on Facebook and Twitter)**



Safety⁹

Protecting the public is DTE Electric’s number one priority. Because of the volume of 11,000 reported wire downs from the March 8 windstorm, the task of protecting the public from potential hazards would be a multi-day effort spanning numerous parts of the organization. Three hundred and thirty-seven (337) employees were dispatched to start assessing and securing downed wires. In addition, the majority of DTE’s Electric Field Operations, Underground Splicers, and Substation Electricians (approximately 200 employees) were also dispatched to secure downed lines. In total, more than 500 trained and qualified responders were dispatched to the 11,000 reported downed wires. Due to the extent of the damage from the storm, overhead linemen were shifted from customer restoration work to cutting and removing down wires that posed the greatest potential hazard. All 11,000 reported wire down cases were field investigated,

⁹ Addresses MPSC question 5

leading to a total of 4,938 confirmed wire downs. The balance of the reported downed wires were from duplicate reports, non-DTE Electric wires and incorrect reports. All confirmed electric wire downs were made safe by either cutting and removing, or taping and barricading.

In an additional measure to protect the public, DTE Electric's System Operations Center (SOC) opened up 118 distribution substation breakers, creating an intentional interruption anywhere a potential wire down was detected on the 4.8kV system. This additional safety measure accounted for nearly 100,000 customers in the outage total. While we recognized this would add time to the storm restoration effort, due to increasing the number of customers out, this added measure helped us to ensure the safety of the public. This was a key factor in there being zero safety incidents for DTE Electric customers, contractors and employees. Safety messages were played hourly on multiple radio stations across our service territory, and messages were shared repeatedly on our social media accounts, website, and through traditional media outlets to further strengthen our safety efforts.

Resources¹⁰

Personnel within SOC, in partnership with overhead linemen, performed the bulk of restoration during the first 48 hours by operating remote switches via the SCADA system. The focus was on restoring the greatest number of customers per circuit. First, overhead line crews patrolled the circuits and identified areas that could be cleared and quickly restored via remote operation. Second, overhead line crews identified and performed rapid repairs to allow more restoration via remote operation.

¹⁰ Addresses MPSC question 2

Next, crew resources were required to begin the tough task of restoring the remaining customers without power. These included:

- 420 DTE Electric linemen and apprentices
- 270 regular daily contractor linemen
- 640 regular daily tree trim resources
- Additionally, from the GLMA, 1,070 contract linemen and 500 tree trimmers from 25 different contract companies and mutual assistance utilities, from seven states, were working on restoring DTE Electric customers within 24 hours
- 134 electricians from IBEW Local 58, to assist in addressing the high level of single outages.

All told, nearly 3,000 total resources in the field performed work to restore power. Much of this restoration work was performed in less than ideal conditions including snow and temperatures below freezing. Appendix I provides details on the foreign crews utilized during storm restoration efforts.

Restoration Plan¹¹

DTE Electric's restoration process followed a structured, prioritized approach. Because of the severity of the storm and the number of additional resources required to complete restoration, our senior leadership team was deeply involved in the strategy, along with highly skilled and trained employees with specific knowledge relative to critical aspects of the Company's distribution system. This intense approach allowed DTE Electric to implement several real time process improvements to best serve the customers. Some of these included

¹¹ Addresses MPSC question 2

rethinking overhead linemen pull-out yard locations and the single customer outage restoration strategy, described above.

The main categories of the restoration strategy followed our normal storm prioritization:

1. Securing all down power lines and preventing public safety incidents, our top priority.
2. Restoring critical customers (hospitals, schools, water treatment plants, police/fire departments, etc.). We successfully restored critical customers - including 99 percent of schools that were out - by Sunday, March 12.
3. Restoring the circuits with the highest number of customer outages. This third element was integrated into the second wherever possible. This strategy resulted in restoration of more than 90 percent of impacted customers by Sunday, March 12.
4. Executing the service restoration strategy early to restore the 5,500 single customer outages. For context, during a typical catastrophic storm, DTE Electric typically responds to approximately 1,200 single customer outages. More than quadrupling that number exponentially added time and required resources for the restoration effort for this extraordinary windstorm. With the help of the contracted electricians from IBEW Local 58, DTE Electric began this on the second day of the event. While this occurred in parallel with the restoration of multi-customer outages, the sheer volume of singles was a multi-day task, extending the “tail” of the restoration effort. The customers associated with these small outages felt the biggest impact from this storm as they were typically the last to be restored. We recognize this hardship and are prioritizing process improvements in this area. Key to our plan for this storm was the transition of resources from wire down investigations over to service restoration in support of our single customer outage restoration strategy. The longer length of time required for this portion of the restoration

plan comes from each individual customer outage, requiring a site visit and associated restoration effort. During the March 8 storm, we often experienced single customer outages requiring replacement of broken poles in customer back yards, a time-consuming and labor-intensive job. It can require similar time and resources to restore single customer outages as compared to larger multiple customer outages.

Tree Trimming and System Resiliency Performance¹²

The most unique aspect of this storm from a tree trim perspective was the frequency with which healthy coniferous trees were uprooted due to the high winds, toppling onto the Company's overhead distribution lines, causing outages. Several key contributing factors made these trees especially vulnerable to sustained high winds during the storm: (1) the shallow root systems characteristic of conifers, (2) the soft and wet soil conditions at the time, and (3) during the winter, conifers with dense needles experience significantly more drag at a given wind speed than their deciduous counterparts (trees without leaves).

The Company gathered several key pieces of information around tree cause outages via details submitted by DTE Electric linemen on a mobile app developed internally. This data provides the following insights on this windstorm:

- Conifers (pine, spruce, and cedar trees) accounted for significantly more outages than any deciduous species
- 90 percent of conifers that caused outages were healthy
- 95 percent of conifers that caused outages did so by uprooting and toppling over (as opposed to broken branches associated with overhang, undergrowth, or the lines being engulfed)

¹² Addresses MPSC question one

- Approximately half of the tree-related outages were caused by trees from outside the right-of-way
- DTE Electric estimates that between 15 percent and 30 percent of the tree outages could have been prevented if the entire system were trimmed to the Enhanced Tree Trim Program (ETTP) specifications

Two examples of healthy conifers laying on DTE Electric's distribution lines



The Commission's Order asked DTE Electric to assess how the Enhanced Tree Trim Program and System Resiliency contributed to the system's performance during the storm. DTE Electric's examination of reliability data indicates the following:

- Circuits that have had ETTP performed experience a 79% reduction in customer outages minutes relative to their five-year average prior to program execution, as illustrated in Figure 5
- System Resiliency improvements, such as adding sectionalizing devices (reclosers and switches) to increase circuit automation and operability, perform 70 percent better on a SAIDI¹³ basis compared to circuits yet to receive this upgrade, as illustrated in Figure 6
- Audited OMS and AMI data show that there was a clear difference in the way that circuits trimmed to the Company's ETTP specification performed relative to other circuits. Circuits on which ETTP has not been performed in at least three years (i.e., those that are off cycle) performed worse than circuits that received tree trimming
- However, in this particular storm, ETTP and SR did not have as much of an impact due to the severity of the event and the sheer number of trees outside of the right of way that fell onto DTE Electric's system

Both ETTP and SR are relatively new, as both have been implemented for less than three years. It is important that DTE Electric continues these industry best practice strategies across the electric system to reach best-in-class reliability performance for our customers.

¹³ Average outage duration for each customer served

Figure 5 – Comparison of customer outage minutes before and after ETTP on same circuits

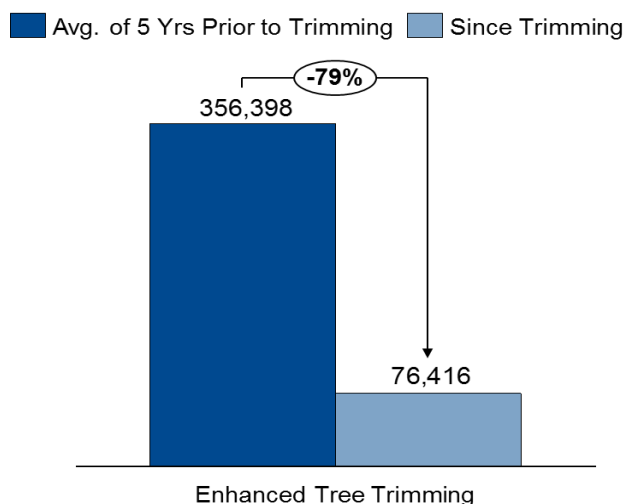
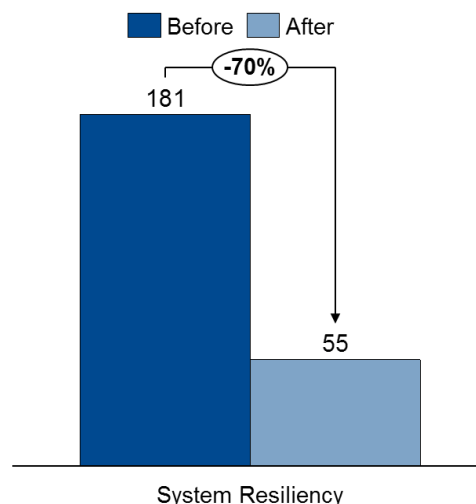


Figure 6 – Comparison of circuit level SAIDI before and after System Resiliency



Performance Summary¹⁴

Due to DTE Electric’s intense restoration efforts, based on audited OMS data, more than 90 percent of customers were restored by the end of the day on Sunday, March 12, in line with the Company’s initial schedule. Continued winds greater than 30 mph were experienced through Saturday March, 11. This, coupled with the addition of snow, slowed restoration progress.

To determine restoration progress and how many customers remained without power, the 2.7 million electric AMI meters on DTE Electric’s system were heavily utilized in this storm. All these AMI meters were automatically queried by the system four times per day, providing frequent customer power status updates. These AMI data points were used to analyze, update and refine Outage Management System data to automatically update the OMS-fed outage maps, prioritize restoration activities and align resources. The overwhelming number of outages slowed the performance of the OMS. The increased integration with AMI allowed the OMS to

¹⁴ Addresses MPSC question 7

improve its accuracy under extreme conditions and aided restoration to continue as planned. This reduced the restoration time by an estimated 1-2 days.

DTE Electric focused on the safety of employees and of our customers, resulting in no recordable injuries by those supporting the storm and no safety incidents involving the public. Schools were a restoration priority, and by Sunday, March 12 nearly 1,000 school accounts were restored – leaving fewer than a dozen schools out of power going into Monday, March 13. As is our practice during any storm restoration, some temporary repairs are made in an effort to restore customers quickly. Once all customers were restored from the windstorm, DTE Electric turned its attention to making permanent repairs to the electrical system. Follow-up work from the storm is expected to be complete in early June. DTE Electric is moving with a sense of urgency to complete this work before the summer storm season begins in earnest, as shutdowns will be difficult with the high heat expected.

Distribution Infrastructure¹⁵

DTE Electric's distribution investment strategy is imperative to both harden the system against future weather events and to ensure safe, reliable and affordable power for our customers. This strategy includes:

- **Tree trimming and reclaiming DTE Electric's rights-of-way.** Historically, one-half of all outages and two thirds of the time customers spend without power are driven by trees and this storm was no different. Fully executing DTE Electric's Enhanced Tree Trim Program, and adhering to a regular maintenance cycle is the central priority in our distribution strategy. Studies have indicated that trees are one

¹⁵ Addresses MPSC question three

of the top contributors to both outages and trouble/storm spend on the Company's distribution system. Based on existing system design, condition and benchmarking, DTE Electric's past tree trimming practices were inadequate to address hazardous trees and provide a full cycle of clearance.

- **System resiliency and system hardening.** This program installs additional sectionalizing devices (reclosers and switches) to increase circuit automation and operability. It will localize outage events and minimize the number of customers affected during an outage. This technology also enables the crews to restore customers sooner by switching/sectionalizing the circuits and moving customers electrically to an adjacent circuit before making repairs. The program also includes reconductoring and rebuilding/hardening part of the circuits to eliminate the root cause of the trouble events.
- **Technology enhancements.** This area is focused on investing in technology to provide greater system visibility and increased control and operating capability. Key programs in this focus area include installation of circuit monitoring (pole top line sensors), System Operations Center modernization and an integrated control system referred to in the industry as an Advanced Distribution Management System (ADMS). The ADMS project, coupled with the Company's efforts to increase real-time visibility into the operation of the electrical system through the deployment of monitoring devices and further integration of AMI will benefit customers by reducing the time they spend without power and improving operating efficiencies. Enhancements also include continued installation of Supervisory Control and Data Acquisition (SCADA) monitoring devices at substations and SCADA controlled

switches on the circuits and continued upgrade of the AMI network system to improve data transfer speed and reliability.

- **4.8kV/8.3kV Conversion and Consolidation:** This program is improving reliability by removing aged equipment and upgrading the electrical system in cities and communities that have been southeast Michigan's population centers since the early 20th century. The 4.8kV/8.3kV (voltage class) system is older, less efficient and associated with more trouble events. While the 4.8kV system serves approximately 42 percent of the customers, it is where 55 percent of the trouble events and 62 percent of wire downs occur.

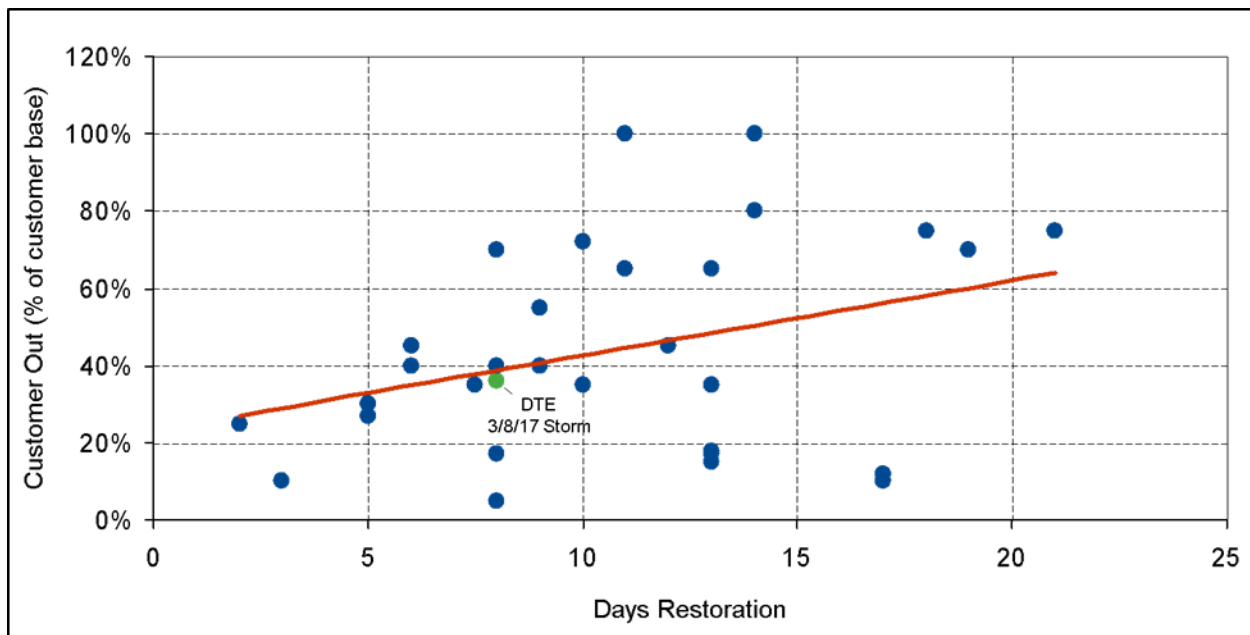
Conclusion

The March 8 windstorm was a historic, extraordinary storm. It was the worst storm DTE Electric has ever experienced with 749,511 customers losing power throughout the course of the weather events. DTE Electric's second-largest storm was 26 years earlier, in July 1991, when 684,000 customers lost power. An ongoing commitment to continuously improve our processes, along with newer technologies, upgrades to the electrical system and enhanced tree trimming ensured that in this storm, power was restored to our customers at an unprecedented pace. Even so, we know the outages caused frustration and hardship for many customers, and we are focused on implementing the improvement opportunities identified from the windstorm.

We are truly proud and grateful of the work and dedication of our employees on behalf of DTE Electric's customers. They safely worked 16 or more hours a day for the duration of the restoration; some employees were away from their families for many days while their own homes also were without power from the storm. A number of linemen volunteered to work 24 hours straight toward the tail of the storm in order to restore the remaining few thousand

customers, a testament to the Company's values – to see our work through the eyes of those we serve. This dedication led to the Company performing in line with its peers when comparing like-size storms and duration (Figure 7).

Figure 7 – Comparison of % of customers out and days till restoration (Davies Consulting)



Our work did not stop when the last customer's lights came back on. We have been following up with permanent repairs to restore our electrical system back to normal operations as quickly and safely as possible so it doesn't further impact reliability for customers – and our goal is to complete these repairs by early June, in advance of the summer season.

Additionally, while we cannot control extreme weather, we are hardening our infrastructure to help reduce the likelihood of what happened on March 8 from occurring again. But like a lot of infrastructure across Michigan, DTE Electric's electrical system was built a long time ago. We have worked to extend the serviceable life of existing equipment to keep our bills affordable, but in many areas it is time to invest in new, modern infrastructure. While DTE Electric has started an aggressive investment plan, it will take time to complete our grid

modernization. We are committed to delivering the reliability and peace of mind that our customers expect - and to building an electric grid that meets the needs of the 21st century economy.

Respectfully submitted,

DTE ELECTRIC COMPANY

By: _____
Trevor F. Lauer
President and Chief Operating Officer

DTE ELECTRIC COMPANY
Legal Department

By: _____
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DATED: May 15, 2017

Appendix I – Foreign crew sources and quantities

| Foreign Overhead Line Restoration Crews | | | |
|---|--|------------|-------------|
| Company | Home Location | #Crews | # of FTEs* |
| 12085 Wormer, Redford | | | |
| MJ Electrc - Service Electric | Tennessee | 33 | 171 |
| BESCo | Indiana | 15 | 59 |
| AEP | Indiana | 8 | 26 |
| Totals | | 56 | 256 |
| 26261 Evergreen, Northwest corner of Evergreen and Civic Center Dr. | | | |
| Sargent Electric | Indiana | 12 | 52 |
| LE Myer | Indiana | 3 | 13 |
| PMI | Illinois | 7 | 27 |
| Asplundh | Illinois | 3 | 12 |
| Thompson Electric | Ohio | 3 | 13 |
| Arc | Indiana | 3 | 11 |
| Michels Power-DUKE | Indiana | 4 | 17 |
| Consumers Energy | 7 C crew - Saginaw 2 C crew - Clare 1 C crew - Kalamazoo 1 C crew - Owosso 1 C crew - Monroe | 12 | 35 |
| Totals | | 47 | 180 |
| 47884 D Street, Belleville | | | |
| PAR | Illinois+ | 12 | 51 |
| Arc | Cincinnati, OH | 40 | 141 |
| I B Abel | Pennsylvania | 7 | 29 |
| JF Electric | Illinois | 7 | 22 |
| Asplundh | Southbend, IN | 12 | 53 |
| Duquesne | Pennsylvania | 10 | 26 |
| Totals | | 88 | 322 |
| 56500 Grand River Ave., Lyon Twp | | | |
| Midwest Power | Cincinnati, OH | 14 | 68 |
| NG Gilbert | Kentucky | 6 | 23 |
| Meade - GLMA | Indiana | 4 | 17 |
| 3 Phase | Illinois | 14 | 53 |
| Indiana Power & Light (IPL) | Indiana | 4 | 15 |
| Pieper Line | Wisconsin | 8 | 18 |
| Totals | | 50 | 194 |
| 584 Main St., Lapeer Twp | | | |
| United Electric | Kentucky | 5 | 23 |
| Thumb Electric | Michigan | 2 | 8 |
| Totals | Lapeer | 7 | 31 |
| 3223 Ravenswood Ave., Marysville | | | |
| ITC_ULC - GLMA | Local/Foreign | 4 | 17 |
| Totals | Marysville | 4 | 17 |
| 4100 Doerr, Cass City | | | |
| Henkels & McCoy | IL and IN | 2 | 10 |
| Totals | North Area Bad Axe | 2 | 10 |
| 6301 23 Mile Rd., Shelby Twp. | | | |
| Nipsco - GLMA | Indiana | 10 | 26 |
| Intren | Wisconsin | 4 | 8 |
| Danella Construction | Plymouth Meeting, PA | 7 | 29 |
| Totals | Shelby | 21 | 63 |
| | Grand Total | 275 | 1073 |

Appendix II: Communication Examples

APPENDIX IIA

An example of 1 of 28 media updates that was regularly sent to a variety of news outlets throughout the storm:

DTE Energy Storm Update

Friday, March 10, 2017 - 10 a.m. update

Strong Progress / Prepare for Cold Temps

As out-of-state crews join forces with DTE Energy line workers, progress continues as about 400,000 customers have had their power restored. Current projections are that another 200,000 will be restored today with the expectation that 90 percent of customers will be restored by Sunday evening.

The safety of employees and residents are of particular concern; as frigid nighttime temperatures are anticipated over the weekend. DTE Energy is working with local municipalities, human resource agencies, city governments, United Way and the American Red Cross to set up Warming Centers for families and customers to stay warm and safe in Macomb, Monroe, Oakland, Washtenaw and Wayne counties.

We ask residents to check on elderly and vulnerable seniors, those with disabilities or medical needs, and anyone else who may need assistance.

For those with medical needs:

- Call United Way's 2-1-1 crisis hotline, which will help you find local resources, 24 hours a day, 7 days a week
- Call 9-1-1 if it is urgent or life-threatening

More information about dealing with the impending cold weather can be found at:

<http://empoweringmichigan.com/unprecedented-storm-dte-history-stay-safe-stay-warm/#.WMGu3LNz4bM.facebook>

In total, more than 800,000 DTE Energy customers were impacted by the windstorm and approximately 400,000 remain without power as of 10 a.m. Friday. This was the most significant weather event DTE Energy has experienced in its more than 100-year history. DTE recognizes this event is difficult for customers and asks for your ongoing patience.

The outages are widespread across the region, with the hardest hit areas in Wayne, Oakland, Macomb and Washtenaw counties.

The high winds caused extensive tree damage, resulting in more than 9,000 reported downed power lines. Due to the unusually warm weather this winter, as well as significant rainfall, the

ground is very soft and saturated. That, combined with the high winds, caused trees to uproot, falling onto DTE's poles and power lines.

DTE Energy crews include more than 1,800 linemen and 700 contractors and workers from other states. They are focused on restoration efforts around the clock. DTE also has 700 tree trimmers working.

Safety is always a priority. Customers should stay at least 20 feet away from all power lines and anything they may contact, and consider them live. They are extremely dangerous. Treat every downed power line as if it is energized. Customers should also heed the warning of yellow caution tape, which indicates there is a downed power line in the area. DO NOT CROSS YELLOW CAUTION TAPE.

Customers have three ways to contact DTE during an outage. Customers can report an outage, check on the status of an outage and view an outage map from their smart phones using the DTE Energy Mobile App, which is available free of charge from the Apple Store or Google Play. DTE encourages customers to use the website at dteenergy.com as well. Customers can also call DTE at 800-477-4747 to report power outages or downed lines.

Storm Tips:

- Carbon monoxide (CO) is a colorless, odorless gas that is produced whenever fuel is burned. CO can build up quickly in an enclosed space. Prolonged exposure can cause headache, weakness, nausea and dizziness. To avoid the potential of CO exposure, do not operate fuel-burning devices like generators without ventilation. Anyone experiencing symptoms of CO exposure should move quickly to an area with fresh air and seek medical attention.
- **Never drive across a downed power line.** If a power line falls on your vehicle, remain inside until help arrives.
- **Always operate generators outdoors** to avoid dangerous buildup of toxic fumes.
- **Turn off or unplug all appliances** to prevent an electrical overload when power is restored. Leave one light switch on to indicate when power is restored.
- **Don't open refrigerators or freezers more than absolutely necessary.** A closed refrigerator will stay cold for 12 hours. Kept closed, a well-filled freezer will preserve food for two days.
- If a customer is elderly or has a medical condition that would be adversely impacted by a power outage, they should try to make **alternative accommodations** with family or friends.

The next media update will be at 4 p.m. on Friday, March 10, 2017.

APPENDIX IIB

A total of 11 press conferences were held at various locations from March 8 -14 to update public.



Trevor Lauer, president and COO, DTE Electric, updates media and public at DTE's Detroit Headquarter Complex



Gerry Anderson, chairman and CEO, DTE Energy, holds press conference on work location.

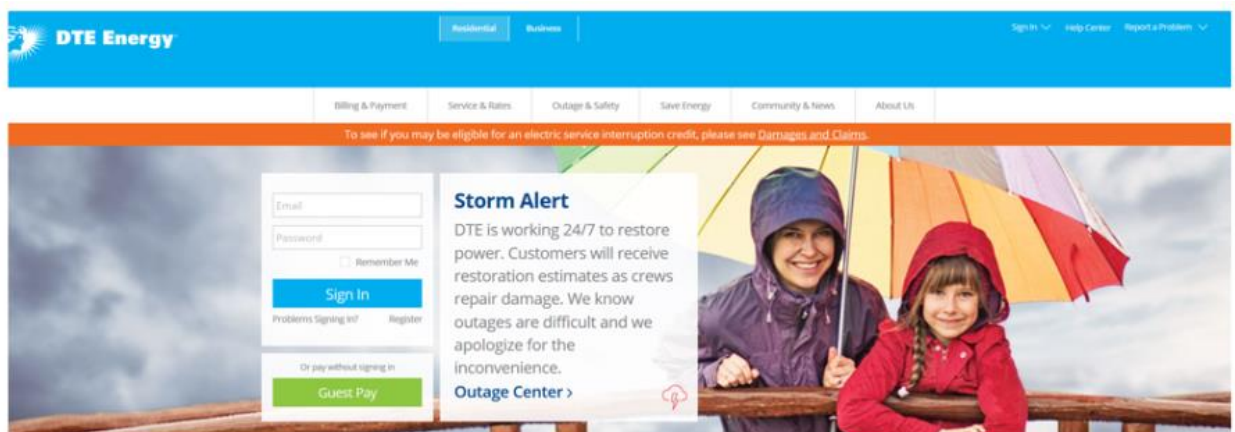


Heather Rivard, senior vice president, Distribution Operations, DTE Energy, updates media at Redford Service Center



Gerry Norcia, President and COO, DTE Energy, holds press conference at DTE's Detroit Headquarters complex.

APPENDIX IIC



APPENDIX IID

One example of several blog posts on DTE Energy's external website, empoweringmichigan.com. Blogs provided customers with answers to their commonly asked questions.

Your storm questions, answered

March 12, 2017 / by DTE Social Media Team

Tags: [2017 Storm](#), [storm](#)

I haven't seen a truck in my area.

There are 1,700 DTE and out-of-state crews working around the clock. Just because you don't see us, doesn't mean we're not working to restore your power. The repair location for your area may not be near your home.

Why did my power go out a day or two *after* the wind storm?

It could be a couple of different issues. One, even though we've installed a number of smart technologies on the energy grid to limit the size and impact of an outage, there are times when we have to take down the entire circuit in order to fix it, which can take several hours or longer if the issue is complex. We experienced 30-40 mph winds on Friday night, which caused an additional 12,000 customers to lose power. Plus, many tree limbs left dangling over power lines Wednesday night came down over the weekend.

Why did DTE miss their estimate?

We understand the frustration you're feeling as you try to go about your day-to-day activities without power. As we continue to receive information from the field, we're updating our systems and are pushing out estimates to our customers so you can make plans. We've estimated restoration times to the best of our ability, but these estimates are just estimates. Restoration times may change based on unexpected issues and damage that our crews encounter in the field.



[DTE fixed my neighborhood, but skipped my house?](#)



APPENDIX IIE

Variety of posts gave proactive updates to customers.


Facebook

**DTE Energy**
Published by Tony Caruso [?] · March 11 · 

As of 11 a.m. Saturday, more than 569,000 of the 800,000 customers impacted have had their power restored. DTE expects to have roughly 90 percent of customers restored by Sunday evening.

We recognize this event is difficult for customers, and restoration teams are still working around the clock to restore power to all customers. As work is complete in one area, crews will move to the next and call customers with restoration estimates, and repair damage in their area.

As DTE Energy line crews and crews from out of state are restoring electricity to those who lost power, DTE Gas employees continue to focus in on the hardest-hit areas in Detroit and continues to check on senior customers and those with known medical issues who have lost power as a result of the historic outage.



17,899 people reached

Boost Post

**DTE Energy**
Published by Annie O'Dell [?] · March 13 · 

Status update from Heather Rivard on the continued restoration efforts.




18,089 people reached

Boost Post

5.2K Views


 Like  Comment  Share 


DTE Energy

Published by Hootsuite [?] · March 13 ·

As of 5:30 a.m. Monday, 45,000 customers are still without power. As DTE continues to receive information from the field, estimates are being provided to customers. With two-to-four inches of snow predicted today, we are still on track to restore power for all of our customers by 11:30 p.m. today.

DTE Energy has restored power to 755,000 customers – more than 90 percent of the 800,000 customers impacted by Wednesday's wind storm. We have continued our outreach efforts to our most vulnerable customers in cooperation with our non-profit and faith-based community partners. We encourage individuals to check on friends and neighbors who may still be without power.



Your storm questions, answered - Empowering Michig...


I haven't seen a truck in my area. There are 1,700 DTE and out-of-state crews wor...

EMPOWERINGMICHIGAN.COM

11,383 people reached

Boost Post

Twitter


DTE Energy @DTE_Energy · Mar 10

The latest on our restoration efforts: more than 300,000 customers restored after 9,000+ power lines brought down by gale force winds.

Our crews are out in force restoring power to our customers and protecting power lines. Over the last 30 hours, DTE has restored power to more than 300,000 customers who lost power during the gale force winds that pounded the Southeast Michigan area on Wednesday. More than 800,000 DTE Energy customers were impacted by the storm. As of 5 a.m. Friday, this was the most power outages DTE Energy has experienced in its more than 100-year history.

Customers should stay at least 20 feet away from downed power lines, and consider them live. Customers should not touch downed power lines or anything that indicates there is a downed power line in the area.

Generators outdoors to avoid dangerous buildup of gas. Turn off all appliances to prevent an electrical overload. Turn off light switch on to indicate when power is restored. Turn off generators or freezers more than absolutely necessary. Keep closed, a well-filled refrigerator for 12 hours. Kept closed, a well-filled refrigerator for 12 hours.

Due to the unusually warm weather this winter, as well as significant rain, the ground is very soft and saturated. That, combined with the high winds, caused trees to fall on DTE's poles and power lines.

It is our first priority, so we remain focused on securing wires down through the night as new reports continue to come in.

Our crews include more than 1,800 linemen and 700 contractors and workers. They are focused on restoration efforts around the clock. DTE also has a medical team on site to assist anyone who is injured or has a medical condition that would require medical attention. They should try to make alternative arrangements if they are unable to get to work.

15
 13
 15



DTE Energy @DTE_Energy · Mar 9

If you see a downed power line, STAY 20+ FEET AWAY from it, and anything it may contact; consider the line to be energized and dangerous.

3

30

13



DTE Energy @DTE_Energy · Mar 9

Our crews will continue to work around the clock to restore power; out-of-state crews are arriving this morning to assist.

17

29

68



DTE Energy @DTE_Energy · Mar 9

Report your outage and sign up for outage updates through our DTE mobile app or automated system at 800-477-4747.

3

7

6



DTE Energy @DTE_Energy · Mar 9

Crews are working to restore your power. As temperatures drop, here's list of warming centers:



Warming Center locations during March wind storm restoration - Em...

We want you to stay warm, comfortable and safe as temperatures drop and we continue to restore power. We encourage everyone to take advantage ...
empoweringmichigan.com

5

21

15