

Michigan Energy Waste Reduction and Demand Response 2021 to 2040 Potential Study – Commercial and Industrial Survey

Prepared for:

LARA
MPSC

State of Michigan Public Service Commission

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Table of Contents

Commercial and Industrial Survey Overview	1
Sample Variables	1
Sample	1
Invitation Emails.....	3
Initial Invitation Email.....	3
First Reminder Email.....	3
Second Reminder Email.....	4
Survey Body	5
Introduction	5
EWR Awareness	6
EWR Willingness to Pay.....	13
DR Program Awareness.....	14
DR Willingness to Participate	20
COVID-19 Impacts	27
Recent Energy Use Actions.....	27
Decision Factors	28
Barriers	28
Firmographics	28
Close.....	29

Commercial and Industrial Survey Overview

The primary objective of this survey is to collect information on customer awareness and willingness to pay for EWR and DR measures from MI commercial and industrial utility customers. Guidehouse will use the survey results to inform the development of market acceptance and adoption forecasts. Additional secondary research objectives, included in the table below, have been incorporated into the survey to provide datapoints the research team will use to guide calibration of the EWR and DR potential models.

Topic	Survey Questions
Introduction	INTRO1 – INTRO2
EWR Awareness	AWARE_EWR_LOW – AWARE_EWR_HIGH
EWR Willingness to Pay	EWR_WILLINGNESS_LOW – EWR_WILLINGNESS_HIGH
DR Awareness	AWARE_DR_TSTAT – AWARE_DR_BTM
DR Willingness to Participate	DR_WILLINGNESS_LARGE1 – WILLINGNESS_DR_BTM
COVID-19 Impacts	COVID_EWR – COVID_DR
Recent Energy Use Actions	ACTIONS1 – ACTIONS2
Decision Factors	DECISIONS
Barriers	BARRIERS
Firmographics	FIRM1 – FIRM4
Close	CLOSE1 – CLOSE2

Sample Variables

This table presents the sample file variables required for fielding.

Survey Variables	Description	Source
UTILITY	The customer's utility company	Utility tracking data
CUSTOMER SIZE	SMALL = annual energy use \leq 1.2 GWh (approximately \$65,000/year for gas and electric bills combined) LARGE = annual energy use $>$ 1.2 GWh (approximately \$65,000/year for gas and electric bills combined)	Survey screener question

Sample

This table outlines Guidehouse's sampling techniques.

Topic	Description	Population
Sample size	What is the target number of completes?	500 completes
Stratification	Is the sample stratified?	The sample will be designed to achieve a proportionate mix of customers from each utility and will be stratified by Upper and Lower Peninsula.

Topic	Description	Population
Incentives	Any incentives or persuasion techniques?	\$25; customers will be offered an incentive through Tango ¹ which allows customers to select an e-gift card from a participating retailer or restaurant (including Amazon.com, CVS or Dunkin' Donuts and more) or an online debit card (Visa® or MasterCard®). Customer's may also choose to donate \$25 to a charitable organization instead of receiving the gift card.

DRAFT

¹ <https://www.tangocard.com/>

Invitation Emails

Initial Invitation Email

Dear _____,

Guidehouse, on behalf of the Michigan Public Service Commission, is conducting a study to help understand energy decision-making in Michigan and invites you to complete a brief survey. Your responses will help improve energy-related programs offered by your utility provider that assist business customers in saving energy and money. Respondents who complete the survey will be offered a **\$25 e-gift or online debit card**, or can choose to donate \$25 to a charitable organization.

Please take the survey using the link below; we recommend completing the survey on a laptop or computer if possible.

[Insert survey link]

Your participation in this survey is anonymous and voluntary. Your individual answers will remain confidential and reported only in the aggregate. The survey will take about 15 minutes.

If you have any questions about this survey or how your responses to this survey will be used, please contact us at Michigan.EnergyStudy@guidehouse.com.

Sincerely,

Guidehouse

First Reminder Email

Dear _____,

Guidehouse, on behalf of the Michigan Public Service Commission, recently invited you to complete a 15-minute survey to help improve energy-related programs offered by your utility provider that assist business customers in saving energy and money, and ultimately benefit the environment.

As a token of appreciation for completing this survey, respondents who complete the survey will be offered a **\$25 e-gift or online debit card**, or can choose to donate \$25 to a charitable organization.

Please take the survey using the link below; we recommend completing the survey on a laptop or computer if possible.

[Insert survey link]

Your participation in this survey is anonymous and voluntary. Your individual answers will remain confidential and reported only in the aggregate.

If you have any questions about this survey or how your responses to this survey will be used, please contact us at Michigan.EnergyStudy@guidehouse.com.

Sincerely,

Guidehouse

Second Reminder Email

Dear _____,

Guidehouse, on behalf of the Michigan Public Service Commission, recently invited you to complete a 15-minute survey to help improve energy-related programs offered by your utility provider that assist business customers in saving energy and money, and ultimately benefit the environment. This survey will be closing on **[Date]**; don't miss out on this opportunity to contribute!

As a token of appreciation for completing this survey, respondents who complete the survey will be offered a **\$25 e-gift or online debit card**, or can choose to donate \$25 to a charitable organization.

Please take the survey using the link below; we recommend completing the survey on a laptop or computer if possible.

[Insert survey link]

Your participation in this survey is anonymous and voluntary. Your individual answers will remain confidential and reported only in the aggregate.

If you have any questions about this survey or how your responses to this survey will be used, please contact us at Michigan.EnergyStudy@guidehouse.com.

Sincerely,

Guidehouse

Survey Body

Introduction

INTRO1 In this survey we will ask you about your awareness of different energy-related technologies and utility programs, and decision-making around energy use at your business. If you are not the best person to answer these questions, please ask a colleague who makes decisions about your business's energy usage and/or capital investments to complete this survey. Note that you will need to complete the entire survey to receive your **\$25 e-gift or online debit card**, or to donate the \$25 to a charitable organization.

INTRO2 Are your combined gas and electric utility bills more than \$65,000 per year, approximately? If you are unsure, please respond with your best guess.

1. Yes
2. No

[If YES set respondent as CUSTOMER SIZE = LARGE; if NO set respondent as CUSTOMER SIZE = SMALL.]

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Lighting Baseline

The first part of the survey will ask for additional information about the lighting in your building. If you need to finish the survey at a later time or switch to a different mobile device, you can return to this point in the survey by clicking the link in the email you received. All your survey progress will have been saved.

LIGHTING1 How many **total lamps** do you have installed within the light fixture types listed below in your building (**excluding** any bulbs found in unconditioned exterior structures such as a garage), if any? Please estimate the total number of lamps, *not* the total number of fixtures; the fixture is the device that houses individual lamps. **[Matrix-style question; answer categories will vary by overall building size; example images will be provided]**

DRAFT

[Answer categories if CUSTOMER SIZE = SMALL (INTRO2 =2)]	None	1-25	26-100	101-200	201-300	301-400	401-500	501-600	601-700	>700
[Answer categories if CUSTOMER SIZE = LARGE (INTRO2 =1)]	None	1-50	51-250	251-500	501-750	751-1,000	1,001-1,250	1,251-1,500	1,501-1,750	>1,750
a. In a high bay fixture										
b. In a troffer (a modular ceiling grid fixture)										
c. In a fixture or lamp that accepts regular screw-in bulbs (A-shape or reflectors)										

d. In a downlight fixture (recessed "can light")										
e. In other interior light fixture types										

[If LIGHTING1_a DOES NOT=None]

LIGHTING2 Approximately what percentages of the **high bay fixtures** in this building fall into the following bulb type categories? **[CONSTANT SUM SLIDER (see example), MUST SUM TO 100%]**

1. Linear fluorescent (e.g., T5, T8, T12)
2. Linear LED
3. Round LED
4. Round metal halide
5. Round Induction

LED	<input type="text" value="0"/> %
CFL	<input type="text" value="0"/> %
Halogen	<input type="text" value="0"/> %
Incandescent	<input type="text" value="0"/> %
Don't know	<input type="text" value="0"/> %
Total	<input type="text" value="0"/> %

[If LIGHTING1_b DOES NOT=None]

LIGHTING3 Approximately what percentages of the **troffers** at your business fall into the following bulb type categories? **[CONSTANT SUM SLIDER (see example above), MUST SUM TO 100%]**

1. Linear fluorescent (e.g., T5, T8, T12)
2. LED

[If LIGHTING1_c DOES NOT=None]

LIGHTING4 Approximately what percentages of the **interior screw-in lamps** (standard A-shape and reflectors) at your business fall into the following lamp type categories? **[CONSTANT SUM SLIDER (see example above), MUST SUM TO 100%]**

1. LED
2. CFL
3. Halogen
4. Incandescent

[If LIGHTING1_d DOES NOT=None]

LIGHTING5 Approximately what percentages of the **downlight lamps** at your business fall into the following

lamp type categories? **[CONSTANT SUM SLIDER (see example above), MUST SUM TO 100%]**

1. LED
2. CFL
3. Halogen
4. Incandescent

[If LIGHTING1_e DOES NOT=None]

LIGHTING6 Approximately what percentages of the **other interior lighting** at your business fall into the following lamp type categories? **[CONSTANT SUM SLIDER (see example above), MUST SUM TO 100%]**

1. LED
2. CFL
3. Halogen
4. Incandescent
5. High pressure sodium
6. Metal halide

LIGHTING7 Approximately how many **exterior light fixtures** of the following types are there at your business?

[Example images will be provided]

	None	1-5	6-10	11-25	26-50	51-75	76-100	>100
Q41a. Exterior wall packs								
Q41b. Parking garage or parking lot fixtures/ wall packs								
Q41c. Exterior canopy fixtures								

[Ask if LIGHTING7 DOES NOT = None]

LIGHTING8 What percentage of the **exterior lighting** at your business falls into the following lamp type categories? Please think about flood lights, garage lighting, parking lot lighting, etc. **[CONSTANT SUM SLIDER, MUST SUM TO 100%]**

1. LED
2. High pressure sodium
3. Mercury vapor
4. Metal halide
5. Halogen
6. CFL
7. Incandescent
8. Halogen
9. Linear fluorescent (e.g., T5, T8, T12)
- 10.

Energy Efficiency Awareness

AWARE_EWR_LOW **[Low Cost Measure Reference Table. ROTATE, 1 MEASURE PER RESPONDENT]**

[low cost measure description_1]. Before today, were you familiar with **[low cost measure_2]**?

1. Yes
2. No

Low Cost Measure Reference Table			
Measure	Low Cost Measure Description_1	Low Cost Measure_2	Photo
LED Lighting	LEDs use less energy, last longer, are more durable, and offer comparable or better light quality than other types of lighting. This includes LED A line, reflector lamps, general purpose LEDs, downlights, linear LEDs etc.	LED lighting	
Indoor Occupancy Sensor	An occupancy sensor is a motion detecting device used to detect the presence of a person to automatically control lights.	indoor occupancy sensors	
Advanced Smart (Tier 2) Power Strip	Advanced smart (Tier 2) power strips have a master and switched plugs. When the master plug (Personal Computer or a TV) is on, the switched outlets are powered on. When the master plug (Personal Computer or a TV) is switched off, the switched outlets and peripherals are powered off. In addition, this power strip has a motion sensor, like those for lights, that turns the master switch off if someone leaves the room for an extended period.	advanced smart (Tier 2) power strips	
LED Pole/Arm Mounted	Exterior LED parking lot lighting fixtures can be mounted on a pole or extension arm.	pole/arm mounted LEDs	

Low Cost Measure Reference Table			
Measure	Low Cost Measure Description_1	Low Cost Measure_2	Photo
Daylight Dimming Control	Daylighting control systems dim indoor lighting in response to interior daylight levels.	daylighting controls	
Low-flow Faucet Aerator	A low-flow faucet aerator can be added to an existing faucet, saving both water and water heating costs with little to no impact on the user.	low-flow faucet aerators	
System with Smart thermostat	A Smart thermostat lets users remotely modify heating and cooling settings such as setpoints and schedule, or turn the unit on or off, from a mobile device or website. The system is defined as being the heating and cooling system, comprising heating, ventilation and air conditioning.	smart thermostats	
Demand Controlled Ventilation	Demand controlled ventilation is an HVAC control method that automatically adjusts fan speeds and fresh air intake in response to changes in occupancy.	demand controlled ventilation	
Steam Trap	Steam traps minimize steam waste to reduce energy consumption and cut costs.	steam traps	

AWARE_EWR_HIGH [High Cost Measure Reference Table. ROTATE, 1 MEASURE PER RESPONDENT]

[high cost measure description_1]. Before today, were you familiar with [high cost measure_2]?

1. Yes
2. No

High Cost Measure Table			
Measure	High Cost Measure Description_1	High Cost Measure_2	Photo
Advanced Controls and Automation	Advanced Controls and Automation include smart thermostats, building automation systems, and demand control ventilation.	advanced controls and building automation	
Heat Pump Water Heater	Heat pumps use electricity to move heat from one place to another instead of generating heat directly. Heat pump water heaters pull heat from the surrounding air and transfer it -- at a higher temperature -- into a tank to heat water.	heat pump water heaters	
Variable Frequency Drive (VFD)	Variable Frequency Drives (VFDs) control the frequency and voltage of power supplied to a motor and save electricity by allowing the motor to run at partial speed to better match the load. Typical applications include fans, pumps, and dynamic process loads.	VFDs	
ENERGY STAR Servers and Storage Devices	Computer servers and storage equipment that are ENERGY STAR certified use less electricity from reducing energy waste in the power infrastructure (e.g., power distribution unit, uninterruptible power supply) and reducing 24/7 energy needed to cool the waste heat produced by data storage.	ENERGY STAR servers and storage devices	

High Cost Measure Table			
Measure	High Cost Measure Description_1	High Cost Measure_2	Photo
Equipment Optimization	Equipment optimization is the process of reducing energy consumption through fine-tuning equipment operation (including HVAC equipment, compressed air systems, motors, pumps, and advanced equipment controls).	equipment optimization	
Efficient Equipment Upgrades	Replacing existing equipment can reduce energy use when upgrading to efficient equipment such as higher efficiency furnaces, boilers, and chillers, and installing higher efficiency motors and pumps.	efficient equipment upgrades	

Energy Efficiency Willingness to Pay

EWR_WILLINGNESS_LOW Suppose an energy efficiency project does not have any adverse impacts on the QUALITY of lighting, heating, and cooling in your business, but reduces the amount of energy consumed. An example might be an LED lighting retrofit.

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is \$5,000 if the project provided an annual energy bill savings of **[Annual Energy Bill Savings]** , and a **[Suggested payback period]** payback (that is, in about **[Suggested payback period]** the money you would save in energy costs would be greater than the extra cost for the energy efficiency technology)?

Annual Energy Bill Savings [Randomized option choice, hide lettering from respondent:]	Suggested payback period	Yes (1) [Radio button, only one response per row]	No (2) [Radio button, only one response per row]	Don't Know / Not Sure (3) [Radio button, only one response per row]
a) \$7,500 per year	less than a year			
b) \$5,000 per year	1 year			
c) \$3,750 per year	16 months			
d) \$2,500 per year	2 years			
e) \$1,250 per year	4 years			
f) \$1,000 per year	5 years			
g) \$500 per year	10 years			

[Depending on the response, eliminate answer options not possible and ask the next possible option. Example: The respondent answers No to answer option f) \$1,000 per year. The No response means options f) through g) can be removed. Ask the next possible option starting with e) and proceeding through a) until the respondent answers yes.]

EWR_WILLINGNESS_HIGH Suppose an energy efficiency project does not have any adverse impacts on the QUALITY of lighting, heating, and cooling in your business, but reduces the amount of energy consumed and MAY result in some inconvenience (for example: obtaining project estimates, selecting and overseeing a contractor for the installation). An example might be installing a Variable Frequency Drive (VFD), building automation system or a high efficiency boiler.

Would you generally pursue an energy efficiency project where the cost to you after utility rebates is \$25,000 if the project provided an annual energy bill savings of [Annual Energy Bill Savings], and a [Suggested payback period] payback (that is, in about [Suggested payback period] the money you would save in energy costs would be greater than the extra cost for the energy efficiency technology)?

Annual Energy Bill Savings [Randomized option choice, hide lettering from respondent:]	Suggested payback period	Yes (1) [Radio button, only one response per row]	No (2) [Radio button, only one response per row]	Don't Know / Not Sure (3) [Radio button, only one response per row]
a) \$37,500 per year	less than a year			
b) \$25,000 per year	1 year			
c) \$12,500 per year	2 years			
d) \$8,333 per year	3 years			
e) \$5,000 per year	5 years			
f) \$2,500 per year	10 years			

[The respondent is randomly shown an Annual Energy Bill Savings option. Depending on the response (Yes or No) the respondent is asked the next possible option. This process is continued until the respondent gets to the highest or lowest possible value or they provide an opposite response to their initial Yes or No response. Example: The respondent answers No to answer option e) \$5,000 per year. Ask the next possible option starting with d) and proceeding through a) until the respondent answers yes or they reach the highest value.]

DR Program Awareness

[IF CUSTOMER SIZE = SMALL (INTRO2=2)]

Next, we have a few questions about your awareness of Demand Response programs that electric utilities offer or could potentially offer to business customers.

Demand Response programs reward electricity customers for voluntarily agreeing to reduce energy usage during periods of high electricity demand, which helps keep electricity costs down and allows your utility to supply reliable power at a more affordable rate to all customers.

If you sign up for a Demand Response program offered by your utility, the utility would control your air conditioning and/or heating system energy use during high (peak) demand periods (referred to as “demand response events”) for a limited time (usually less than 4 hours), by automatically adjusting your thermostat during those periods. Your usage would be controlled only for a certain maximum number of days in a season (for example, 10 days maximum in the summer). You can opt-out if you are unable to reduce your energy use during these periods.

An electric utility rewards Demand Response program participants by paying a fixed and/or variable incentive each summer. Additionally, the utility may offer a one-time incentive for enrolling in the program.

Alternatively, you could also be placed on an electricity rate that gives you a discount on your current rate during off-peak times (typically nights and weekends) but is more expensive during on-peak times (weekday afternoons). You may be eligible to get a free smart thermostat from your utility, which will be controlled by the utility to reduce your electricity demand during certain critical peak events periods when electricity is much more expensive.

[IF CUSTOMER SIZE = LARGE (INTRO2=1)]

Next, we have a few questions about your awareness of Demand Response programs that electric utilities offer or could potentially offer to commercial and industrial customers.

Demand Response programs reward electricity customers for voluntarily agreeing to reduce energy usage during periods of high electricity demand, which helps keep electricity costs down and allows your utility to supply reliable power at a more affordable rate to all customers.

If you sign up for a Demand Response program offered by your utility, the utility will call events where you are asked to reduce your electricity usage. Usually there is a maximum number of days you’d be asked to reduce your energy usage in a season. Under some program designs, you can nominate a certain level of load reduction before the season begins. You select a load reduction amount that would not impact your business operations and get paid for being on standby, even if no event occurs. Additionally, you get paid for the actual energy reduction during an event. The utility may also offer you a choice to enroll in another type of Demand Response program where you are not required to nominate a fixed load reduction amount, but can instead voluntarily reduce your energy use when called and get paid for the actual energy reduced during an event.

Alternatively, you could also be placed on an electricity rate that gives a discount on your current rate during nights and on weekends (off-peak times), but is more expensive on weekday afternoons (peak times), therefore incentivizing you to shift your energy use to off-peak times.

[IF CUSTOMER SIZE = SMALL (INTRO2=2)]

AWARE_DR_TSTAT Utilities typically control space cooling/heating energy use during Demand Response events using a smart thermostat. A smart thermostat learns your patterns and offers the ability to control it from anywhere. Does your business use smart thermostats to control HVAC usage?

1. Yes
2. No
3. Don’t Know/Not Sure

[IF UTILITY = DTE AND CUSTOMER SIZE = SMALL (INTRO2=2)]

AWARE_DR_SMALL_DTE Before today, have you heard of the following demand response programs offered by your utility?

[Radio buttons, only one response per row]	Yes, my business participates in the program (1)	Yes, but my business does not participate (2)	No (3)	Don't Know / Not Sure (4)															
<p>a) Smart Savers Program that offers customers who own a smart thermostat a \$20 incentive per thermostat at the end of each summer in exchange for allowing DTE to make minor, short-term adjustments to a participant's thermostat to reduce energy use during periods of peak (high) demand for electricity. Participants can anticipate at least one adjustment, and a maximum of up to 10 adjustments, per summer. Peak demand periods for adjustments typically occur on especially hot days. Adjustments will occur on non-holiday weekdays.</p>																			
<p>b) Dynamic Peak Pricing Rate is an electricity rate which provides a discount on standard rates (typically 30% to 50% discount on standard rates) during night and on weekends (called off-peak periods), with more expensive rates on weekday afternoons (called peak periods). Participants save money by shifting use to off-peak periods. Participants are notified to reduce electricity use during critical peak events, when electricity is much more expensive. The events only occur on weekdays from 3 p.m. to 7 p.m. and are limited to a maximum of 14 occurrences (56 hours) per calendar year.</p> <p>Here is summary of the rates:</p> <table border="1" data-bbox="94 1234 808 1850"> <thead> <tr> <th>Rate</th> <th>Time</th> <th>Cost</th> </tr> </thead> <tbody> <tr> <td>Off-Peak</td> <td>Monday-Friday 11 p.m. to 7 a.m. All Day Weekends and Holidays</td> <td>4.8 cents/kWh</td> </tr> <tr> <td>Mid-Peak</td> <td>Monday-Friday 7 a.m. to 3 p.m. and 7 p.m. to 11 p.m.</td> <td>9.2 cents/kWh</td> </tr> <tr> <td>On-Peak</td> <td>Monday-Friday 3 p.m. to 7 p.m.</td> <td>16.6 cents/kWh</td> </tr> <tr> <td>Critical Peak Events</td> <td>Not more than 14 times per year on certain weekdays 3 p.m. to 7 p.m.</td> <td>95.0 cents/kWh</td> </tr> </tbody> </table>	Rate	Time	Cost	Off-Peak	Monday-Friday 11 p.m. to 7 a.m. All Day Weekends and Holidays	4.8 cents/kWh	Mid-Peak	Monday-Friday 7 a.m. to 3 p.m. and 7 p.m. to 11 p.m.	9.2 cents/kWh	On-Peak	Monday-Friday 3 p.m. to 7 p.m.	16.6 cents/kWh	Critical Peak Events	Not more than 14 times per year on certain weekdays 3 p.m. to 7 p.m.	95.0 cents/kWh				
Rate	Time	Cost																	
Off-Peak	Monday-Friday 11 p.m. to 7 a.m. All Day Weekends and Holidays	4.8 cents/kWh																	
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On-Peak	Monday-Friday 3 p.m. to 7 p.m.	16.6 cents/kWh																	
Critical Peak Events	Not more than 14 times per year on certain weekdays 3 p.m. to 7 p.m.	95.0 cents/kWh																	

[IF UTILITY = CONSUMERS AND IF CUSTOMER SIZE = LARGE (INTRO2=1)]

AWARE_DR_LARGE_CONSUMERS Before today, have you heard of these demand response programs offered by your utility?

[Radio buttons, only one response per row]	Yes, my business participates in the program (1)	Yes, but my business does not participate (2)	No (3)	Don't Know / Not Sure (4)
<p>a) C&I Demand Response program (capacity plus energy payment) that offers customers a capacity payment of \$25/kW-yr., plus an energy payment of 5 cents/kWh. You nominate a certain fixed amount of load reduction and receive the \$25/kW-yr. incentive on the nominated amount for being on call, regardless of whether events are called. In addition, you are compensated at 5 cents/kWh for every hour of each event dispatch, based on your actual reduction. Consumers Energy calls events during grid emergencies. You are required to participate once you sign up for the program.</p> <p>A 200-kW load reduction nomination could result in \$5,500 annual compensation from your utility.</p>				
<p>b) C&I Demand Response program (energy payment only) that offers customers an incentive of 30 cents/kWh for every hour of each event dispatch, based on your actual load reduction during an event. Consumers Energy calls events when electricity prices are high. Participation in events is optional.</p> <p>A 200-kW average load reduction during DR events could result in \$2,500 annual compensation from your utility.</p>				

[IF CUSTOMER SIZE = SMALL (INTRO2=2)]

AWARE_DR_SMALL_GENERAL Before today, have you heard of any of the following demand response program type(s) that utilities may offer to customers?

	Yes (1) [Radio button, only one response per row]	No (2) [Radio button, only one response per row]	Don't Know / Not Sure (3) [Radio button, only one response per row]
<p>[If UTILITY IS NOT DTE] a) Bring Your Own Thermostat programs (where customers already own the smart thermostat) offer a fixed payment per season (typically \$25 per thermostat) for enrolling in the program and allowing the utility to remotely control the thermostat on hot summer and cold winter days, when demand for electricity is highest. The utility may also offer an upfront payment for enrolling in the program.</p> <p>The utility will typically control the thermostat for a limited number of hours per season (could be limited to 14 events in summer and 10 events in winter with a maximum 4-hour duration). The utility may automatically pre-cool or pre-heat the home before an event, and notify participants in advance of events, with the option to opt-out of events at any time.</p>			
<p>[If UTILITY IS NOT DTE] b) Critical Peak Pricing is an electricity rate which provides a discount on standard rates (typically 30%-50% discount on standard rates) during nights and on weekends (called off-peak periods), with more expensive rates on weekday afternoons (called peak periods). Participants save money by shifting use to off-peak periods. Participants are notified to reduce electricity use during critical peak events, when electricity is much more expensive. The events only occur during peak periods on weekdays and are limited to a specified maximum number of occurrences and total duration per calendar year (e.g., could be 14 events in a year with maximum 56 hours of event calling). The utility may offer customers a free smart thermostat and control it to reduce energy use during critical peak events.</p> <p>You could save around 10% or more on your electricity bill by enrolling in a discounted rate of 4.8 cents/kWh in relation to your standard rate of 8.6 cents/kWh with a critical peak price 95 cents/kWh that is approximately 6 times.</p>			

[IF CUSTOMER SIZE = LARGE (INTRO2=1)]

AWARE1_DR_LARGE_GENERAL Before today, have you heard of any of the following demand response program type(s) that utilities may offer to customers?

	Yes (1) [Radio button, only one response per row]	No (2) [Radio button, only one response per row]	Don't Know / Not Sure (3) [Radio button, only one response per row]
<p>[If UTILITY IS NOT CONSUMERS]</p> <p>a) Capacity Bidding program that offers customers a fixed capacity payment (e.g., \$25/kW-year) for nominating to reduce a certain amount of load when demand response events are called. You receive this incentive on the nominated amount for being on call, regardless of whether events are called. In addition, you are compensated for every hour of each event dispatch, based on your actual load reduction during an event (e.g., 5 cents/kWh). You are required to participate once you sign up for the program. You may be called for a certain maximum number of hours (e.g., 40 hours) in total over summer with individual event duration not exceeding 4 hours.</p> <p>A 200 kW load reduction nomination could result in almost \$5,500 annual compensation from your utility.</p>			
<p>[If UTILITY IS NOT CONSUMERS]</p> <p>b) Demand Bidding program that offers customers payment for reducing energy consumption during peak periods when demand response events are called. Participants may be called to reduce demand for a maximum of 40 hours throughout the summer. Participation is optional, and participants receive an energy payment (\$/kWh) based on actual energy reduction during the event. For example, you could be paid at 30 cents/kWh for reducing energy during an event. Participation in events is optional.</p> <p>A 200 kW average load reduction during DR events could result in almost \$2,500 annual compensation from your utility.</p>			
<p>[FOR ALL UTILITIES]</p> <p>c) Critical Peak Pricing is an electricity rate which provides a discount on standard rates (typically 30%-50% discount on standard rates) during nights and weekends (called off-peak periods), with more</p>			

	Yes (1) [Radio button, only one response per row]	No (2) [Radio button, only one response per row]	Don't Know / Not Sure (3) [Radio button, only one response per row]
<p>expensive rates on weekday afternoons (called peak periods). Participants save money by shifting use to off-peak periods. Participants are notified to reduce electricity use during critical peak events, when electricity is much more expensive. The events only occur on weekdays (typically from 3 p.m. to 7 p.m.) and are usually limited to a maximum of 14 occurrences (56 hours) per calendar year.</p> <p>You could save around 10% or higher on your electricity bill by enrolling in this rate in relation to your standard rate.</p>			

[ALL UTILITIES AND ALL BUSINESS SIZES]

AWARE_DR_BTM Before today, have you heard of this type of demand response program that utilities may offer to customers?

Program category	Yes (1) [Radio button, only one response per row]	No (2) [Radio button, only one response per row]	Don't Know / Not Sure (3) [Radio button, only one response per row]
<p>Battery programs are offered to customers with on-site battery storage systems (e.g., a battery charged by an on-site solar or standalone batteries). Participants agree to let the utility control the charging and discharging of the battery during events when electricity demand is the highest, in exchange for an upfront payment and/or an ongoing participation payment from the utility.</p>			

Demand Response Willingness to Participate

[If respondent doesn't already participate in a capacity or demand bidding program (AWARE_DR_LARGE_CONSUMERS_a IS NOT = 1 and AWARE_DR_LARGE_CONSUMERS_b IS NOT = 1) and CUSTOMER SIZE = LARGE (INTRO2 = 1)]

DR_WILLINGNESS_LARGE1 Which program would your business be more likely to enroll in if offered by your utility? Please select one.

- Capacity bidding programs:** Participants receive a fixed capacity payment (e.g., \$25/kW-yr.) for nominating to reduce a certain amount of load when demand response events are called. You receive this incentive on the nominated amount for being on call, regardless of whether events are called. In addition, you are compensated for every hour of each event dispatch, based on your actual load reduction during an event (e.g., 5 cents/kWh). You are **required to participate once you sign up for the program**. You may be called for a certain maximum number of hours (e.g., 40 hours) in total over summer with individual event duration not exceeding 4 hours.
- Demand bidding programs:** Participants receive a payment for reducing energy consumption during peak periods when demand response events are called. Participants may be called to reduce demand for a maximum of 40 hours throughout the summer. Participation is optional, and participants receive an energy payment (\$/kWh) based on actual energy reduction during the event. For example, you could be paid at 30 cents/kWh for reducing energy during an event. Participation in events is **optional**.

[If respondent doesn't already participate in a capacity or demand bidding program (AWARE_DR_LARGE_CONSUMERS_a IS NOT = 1 and AWARE_DR_LARGE_CONSUMERS_b IS NOT = 1) and CUSTOMER SIZE = LARGE (INTRO2 = 1)]

DR_WILLINGNESS_LARGE2 How likely would your business be to participate in this type of **[Large CI DR Option]** program if you received a **[Incentive Detail]**?

- Not at all likely
- Slightly likely
- Somewhat likely
- Very likely
- Extremely likely
- Not sure/don't know

Large CI DR Option	Incentive Detail
[If more likely to participate in a Capacity Bidding Program (DR_WILLINGNESS_LARGE1 = 1)] a) Capacity Bidding Program	\$25/kW capacity payment for committed load reduction, plus an additional 5 cents/kWh for your actual reduction during the event A 200 kW load reduction nomination could result in \$5,500 annual compensation from your utility.
[If more likely to participate in a Demand Bidding Program (DR_WILLINGNESS_LARGE1 =2)] b) Demand Bidding Program	30 cents/kWh payment based on your actual reduction during the event A 200 kW average load reduction during DR events could result in \$2,500 annual compensation from your utility.

[If respondent is more likely to participate in capacity bidding (DR_WILLINGNESS_LARGE1 = 1 and DR_WILLINGNESS_LARGE2 IS NOT = 6)]

DR_WILLINGNESS_LARGE3

How likely would your business be to participate in this type of a **Capacity Bidding** program if you received a...

	Not at all likely (1)	Slightly likely (2)	Some-what likely (3)	Very likely (4)	Extremely likely (5)	Not sure/ don't know (6)
<p>[Lower incentive amount if DR_WILLINGNESS_LARGE_2 = 4 or 5] a) \$20/kW capacity payment for committed load reduction, plus an additional 5 cents/kWh for your actual reduction during the event? A 200 kW load reduction nomination could result in almost \$4,500 annual compensation from your utility.</p>						
<p>[Higher incentive amount if DR_WILLINGNESS_LARGE_2 <4] b) \$30/kW capacity payment for committed load reduction, plus an additional 5 cents/kWh for your actual reduction during the event? A 200 kW load reduction nomination could result in almost \$6,500 annual compensation from your utility.</p>						

[If respondent is more likely to participate in demand bidding (DR_WILLINGNESS_LARGE_2 = 2 and DR_WILLINGNESS_LARGE2 IS NOT = 6)]

DR_WILLINGNESS_LARGE4 How likely would your business be to participate in this type of a Demand Bidding program if you received a...

	Not at all likely (1)	Slightly likely (2)	Some-what likely (3)	Very likely (4)	Extremely likely (5)	Not sure/ don't know (6)
<p>[Lower incentive amount if DR_WILLINGNESS_LARGE_2 = 4 or 5] a) 25 cents/kWh payment based on your actual reduction during the event? A 200 kW average load reduction during DR events could result in almost \$2,000 annual compensation from your utility.</p>						

	Not at all likely (1)	Slightly likely (2)	Somewhat likely (3)	Very likely (4)	Extremely likely (5)	Not sure/ don't know (6)
<p>[Higher incentive amount if DR_WILLINGNESS_LARGE_2 <4]</p> <p>b) 35 cents/kWh payment based on your actual reduction during the event?</p> <p>A 200 kW average load reduction during DR events could result in almost \$3,000 annual compensation from your utility.</p>						

[If respondent doesn't already participate in a smart thermostat program (AWARE_DR_SMALL_DTE_a IS NOT = 1) and CUSTOMER SIZE = SMALL (INTRO2 = 2)]

DR_WILLINGNESS_SMALL1 If your utility offered a(n) **[Small CI Option]** program that **[Small CI Option Description]**.

How likely would your business be to participate in this type of program if you received a **[Incentive Detail]**?

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
5. Extremely likely
6. Not sure/don't know

Small CI DR Option	Small CI Option Description	Incentive Detail
<p>a) [If customer already has a smart thermostat (AWARE_DR_TSTAT = 1)] Bring Your Own Smart Thermostat</p>	<p>offers customers who already own a smart thermostat a fixed payment per season (typically \$25 per thermostat) for enrolling in the program and allowing the utility to remotely control the thermostat on hot summer and cold winter days, when demand for electricity is highest. The utility may also offer an upfront payment for enrolling in the program.</p> <p>The utility will typically control the thermostat for a limited number of hours per season (could be limited to 14 in summer and 10 in winter with a maximum 4-hour duration). The utility may automatically pre-cool or pre-heat the home before an event, and notify participants in advance of events, with the option to opt-out of events at any time.</p>	<p>one-time \$75 sign-up bonus plus \$25 per season for each enrolled thermostat</p>

Small CI DR Option	Small CI Option Description	Incentive Detail
<p>b) [If customer DOES NOT already have a smart thermostat (AWARE_DR_TSTAT = 2 or 3)] Energy Efficiency and Bring Your Own Smart Thermostat</p>	<p>offers customers who do not already have a smart thermostat an incentive payment to purchase one through an energy efficiency program. The utility then offers a smart thermostat demand response program in which customers receive a fixed payment per season (typically \$25 per thermostat) for allowing the utility to remotely control the thermostat on hot summer and cold winter days, when demand for electricity is highest.</p> <p>The utility will typically control the thermostat for a limited number of hours per season (could be limited to 14 in summer and 10 in winter with a maximum 4-hour duration). The utility may automatically pre-cool or pre-heat the home before an event, and notify participants in advance of events, with the option to opt-out of events at any time.</p>	<p>one-time discount of up to \$175 for the purchase of a smart thermostat (typical retail costs range from \$80-\$250), and \$25 per season for each enrolled thermostat (paid at the end of each season) for participating in the smart thermostat demand response program</p>

[If customer already has a smart thermostat (AWARE_DR_TSTAT = 1) and DR_WILLINGNESS_SMALL1a IS NOT = 6]

DR_WILLINGNESS_SMALL2 How likely would your business be to participate in a smart thermostat demand response program if you received...

	Not at all likely (1)	Slightly likely (2)	Some-what likely (3)	Very likely (4)	Extremely likely (5)	Not sure/ don't know (6)
<p>[Lower incentive amount if DR_WILLINGNESS_SMALL1 = 4 or 5] a) a one-time \$50 sign-up bonus, plus \$25 per season you participate, for each enrolled thermostat?</p>						
<p>[Higher incentive amount if DR_WILLINGNESS_SMALL1 <4] b) a one-time \$100 sign-up bonus, plus \$25 per season you participate, for each enrolled thermostat?</p>						

[If customer DOES NOT already have a smart thermostat (AWARE_DR_TSTAT = 2 or 3 and DR_WILLINGNESS_SMALL1b IS NOT = 6)]

DR_WILLINGNESS_SMALL3 How likely would your business be to participate in a smart thermostat demand response program if ...

	Not at all likely (1)	Slightly likely (2)	Some-what likely (3)	Very likely (4)	Extremely likely (5)	Not sure/ don't know (6)
<p>[Lower incentive amount if DR_WILLINGNESS_SMALL1 = 4 or 5] a) the utility were to offer up to a \$150 rebate on a smart thermostat (typical retail costs range from \$80-\$250) for signing up in the demand response program, plus \$25 per season you participate, for each enrolled thermostat?</p>						
<p>[Higher incentive amount if DR_WILLINGNESS_SMALL1 <4] b) the utility were to offer up to a \$200 rebate on a smart thermostat (typical retail costs range from \$80-\$250) for signing up in the demand response program, plus \$25 per season you participate, for each enrolled thermostat?</p>						

DR_WILLINGNESS_CPP1 Next, consider if your utility offered a Critical Peak Pricing Program in combination with your Time-of-Use (TOU) rate, with discounted electricity prices during night and on weekends (called off-peak periods) and higher rates on weekday afternoons (called peak periods). Participants save money by shifting energy use to off-peak periods. Participants are notified to reduce energy use during critical peak events, when electricity is much more expensive. Critical peak events are restricted and can only occur on weekdays, typically from 3 p.m. to 7 p.m. and would be limited to certain maximum occurrences and hours (e.g., 14 occurrences and 56 total hours) per calendar year.

How likely would your business be to participate in this type of program if you could save 10% or higher on your electricity bill by enrolling in this rate in relation to your standard rate?

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
5. Extremely likely
6. Not sure/don't know

[If CUSTOMER SIZE = SMALL (INTRO2 = 2) and DR_WILLINGNESS_CPP1<4]

DR_WILLINGNESS_CPP_TSTAT How likely would your business be to participate in a critical peak pricing program if you received...

	Not at all likely (1)	Slightly likely (2)	Some-what likely (3)	Very likely (4)	Extremely likely (5)	Not sure/ don't know (6)
<p>A free smart thermostat from your utility for agreeing to enroll in the critical peak pricing rate and allowing the utility to control your thermostat (e.g., increase setpoint by 4 degrees) during critical peak events. You will always have an option to override the utility adjustment and make your own adjustment if you are uncomfortable.</p> <p>You can expect to save 10% on electricity bill by enrolling in this rate in relation to your standard rate, plus receive free smart thermostats.</p>						

[If CUSTOMER SIZE = SMALL (INTRO2 = 2)]

DR_WILLINGNESS_PTR As an alternative to the Critical Peak Pricing rate, your utility could offer a **Peak Time Rebate program** in which you earn a credit or rebate for reducing energy use during the critical peak periods (up to 14 days per summer with a max. 4-hour event duration). You will be notified by text, phone, or email the day before events are called. For example, you could receive 95 cents/kWh for the energy reduced during peak periods.

By enrolling in this program, an average customer could earn around \$50 per summer by reducing approximately 20% of your energy usage during the peak demand periods. The program is risk-free and there is no penalty if you are unable to shift.

How likely would your business be to participate in this type of **Peak Time Rebate** program?

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
5. Extremely likely
6. Not sure/don't know

WILLINGNESS_DR_BTM Next, consider if your utility offers a Battery Control program that offers customers with on-site battery storage systems (e.g., on-site solar or standalone batteries) an upfront payment and/or an ongoing participation payment in exchange for allowing the utility to discharge your battery during peak demand periods. If you have demand charges in your electricity tariff, you could use your battery for demand charge reduction at other times.

How likely would you be to install a battery and enroll in this type of demand response program?

1. Not at all likely
2. Slightly likely
3. Somewhat likely
4. Very likely
5. Extremely likely
6. Not sure/don't know

COVID-19 Impacts

COVID_EWR How has the COVID-19 pandemic impacted your business' decision-making around energy efficiency upgrades? We are...

1. Much **less** likely to pursue energy efficiency upgrades
2. Slightly **less** likely to pursue energy efficiency upgrades
3. Just as likely to pursue energy efficiency upgrades (i.e., there has been **little or no impact**)
4. Slightly **more** likely to pursue energy efficiency upgrades
5. Much **more** likely to pursue energy efficiency upgrades

COVID_DR How has the COVID-19 pandemic impacted your business' decision-making around demand response programs that reward electricity customers for voluntarily agreeing to reduce energy usage during periods of high electricity demand? We are...

1. Much **less** likely to pursue demand response participation
2. Slightly **less** likely to pursue demand response participation
3. Just as likely to pursue demand response participation (i.e., there has been **little or no impact**)
4. Slightly **more** likely to pursue demand response participation
5. Much **more** likely to pursue demand response participation

Recent Energy Use Actions

ACTIONS1 Which of the following **energy-efficient** products have you installed **in the last 12 months**, if any? Please select all that you have installed. **[Randomize Response Options]**

1. LED Lighting
2. Indoor Occupancy Sensor
3. Advanced Smart (Tier 2) Power Strip
4. Pole/Arm Mounted LED
5. Daylight Dimming Control
6. Low-flow Faucet Aerator
7. Smart thermostat
8. Demand Controlled Ventilation
9. Steam Trap Advanced Controls and Automation
10. Replacing broken steam traps
11. Heat Pump Water Heater
12. Variable Frequency Drive (VFD)

13. ENERGY STAR Servers and Storage Devices
14. Equipment Optimization
15. Efficient Equipment Upgrades (e.g., boilers, chillers, etc.)
16. Other
17. None

ACTIONS2 Do you currently have an energy management system installed at your business?

1. Yes
2. No
3. Don't know/not sure

Decision Factors

DECISIONS How important are the following factors in driving the decisions you make about energy-consuming equipment at your business? Please rate each factor on a scale of 1 to 5 with 1 being "not at all important" and 5 being "very important". **[Randomize response options.]**

1. Reducing environmental impact
2. Financial considerations (e.g., payback period)
3. Limited disruption during installation
4. Price of the higher efficiency model
5. Savings on energy bill
6. Be the first to purchase the latest high-tech products and equipment
7. Reduce the need for additional power plants and support grid reliability
8. Support my community and/or state's energy initiatives
9. Concern about potential impacts on the products or services offered to my customers
10. The availability of incentives and rebates

Barriers

BARRIERS Which of the following factors are likely to **prevent** your business from pursuing additional energy management activities including installation of energy efficient equipment or participation in demand response programs? Please rank each factor on a scale of 1 to 5 with 1 being "not at all likely to prevent" and 5 being "extremely likely to prevent". **[Randomize response options.]**

1. Time and attention needed for energy management
2. The upfront cost of technologies or equipment
3. Awareness of available utility programs that offer payments for changing the way energy is managed at my business
4. Level of in-house technical expertise and data to make informed decisions about energy
5. Reluctance to allow your utility to control equipment in your business
6. Ownership or lease restrictions of the building
7. Corporate limitations or policy

Firmographics

FIRM1 Which of the following best describes your business?

1. Multifamily (Market Rate)
2. Multifamily (Low Income)
3. Industrial
4. Education
5. Grocery
6. Health
7. Lodging
8. Office
9. Restaurant
10. Retail
11. Warehouse
12. Other

FIRM2 Approximately, what percentage of your business expenses are spent on energy?

[A slide bar scale from 0 to 100% will be on the web version of the survey, and a “Don’t Know” option will be provided.]

FIRM3 What type of system(s) do you use to heat your business? Please select the **primary** system that you use.

1. Gas boiler
2. Gas furnace
3. Electric furnace
4. Air source heat pump
5. Variable refrigerant flow heat pump
6. Packaged terminal heat pump
7. Other: please describe: _____
8. Don’t know
9. Prefer not to say

FIRM4 What type of water heater do you use at your business? Please select the **primary** water heater that you use.

1. Electric tankless water heater
2. Electric water heater with storage tank
3. Gas tankless water heater
4. Gas water heater with storage tank
5. Heat pump water heater
6. Other: please describe: _____
7. Don’t know
8. Prefer not to say

Close

CLOSE1 Those are all the questions we have, thank you for your help! Would you like to receive the \$25 e-gift card or online debit card, or credit to donate to a charitable organization, at **[Email]** or at another email address? You will receive the gift card within 4 to 6 weeks of survey completion.

1. Yes, please send the gift card to **[Email]**

2. Please send the credit for the e-gift card, online debit card or charitable donation to another email address (please specify): **[OPEN ENDED, require valid email address]**
3. No thanks, I do not wish to either receive or donate the gift card

CLOSE2 This concludes the survey. The Michigan Public Service Commission thanks you for your participation in this survey. If you have any questions about the survey or how your responses will be used please reach out to us at Michigan.EnergyStudy@guidehouse.com.

DRAFT