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Stakeholder Meeting 2

Energy Waste Reduction (EWR) and Demand Response (DR) Statewide Potential Studies for 2021 to 2040

For the State of Michigan

Department of Licensing and Regulatory Affairs

LARA
MPSC

February 2, 2021

Meeting Goals

1. Project and schedule update
2. Summarize project and customer survey feedback
3. Summarize statewide market characterization parameters

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Agenda

1. Introductions and Meeting Overview
2. Project Schedule Update and Next Steps
3. Initial Stakeholder Feedback
4. Customer Survey: Overview and Stakeholder Feedback Summary
5. Draft Market Characterization
6. Questions

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MPSC Project Team

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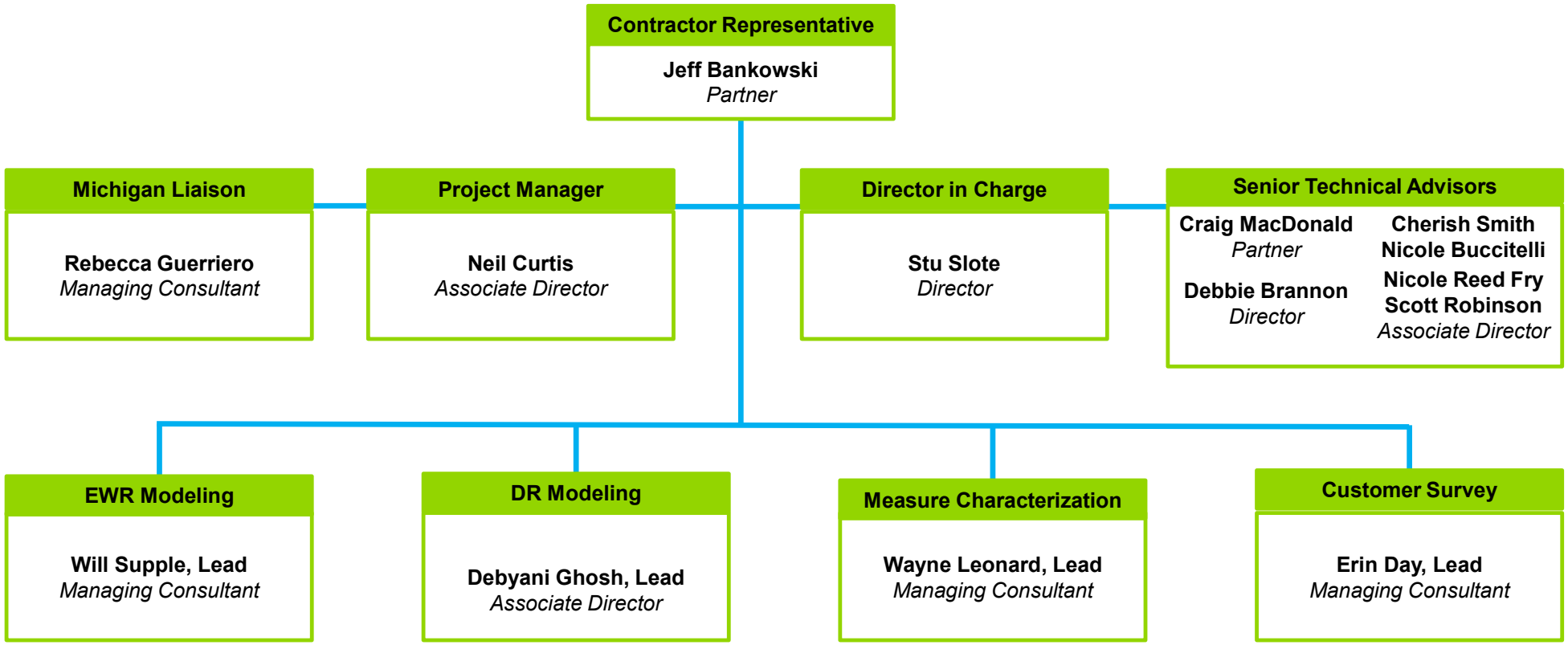

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Key Objectives
Energy Waste Reduction (EWR)

PURPOSE: Assess technical, economic and achievable potential for reducing electricity and natural gas use, and peak electric demand in Michigan through EWR measures

Quantify technical, economical and achievable potential energy efficiency savings for system planning and GHG reduction
- Differentiate Upper and Lower Peninsulas
- Sectors: Residential, Commercial, Industrial (C&I)

Propose energy savings targets through various scenarios

Propose appropriate EWR program funding levels

Provide program recommendations for residential and C&I customers to achieve EWR

Research and report on findings related to customer attitudes, beliefs and behaviors affecting their energy use

Examine effect of deployment and use of smart meters and interface with smart grid on enhancement of program opportunities

Market segment nuances:
- Income-eligible residential customers
- Agricultural customers
- Small commercial customers annual utility bill of $65,000 or less (for electric and gas combined)
- Upper / Lower Peninsula

Key Objectives
Demand Response (DR)

- If possible, identify benefits of integrating DR with EWR programs
- Program benefits for DR and EWR should be reported separately

Purpose: Assess technical, economic, and achievable potential for reducing on-peak electricity usage through DR programs for all customer classes

Calculate technical, economic, and achievable potential for demand response

Discuss barriers to achieve the identified potential and how these will affect the recommended program designs

Quantify potential peak demand savings for each DR program

Estimate cost per MW of potential demand savings

Estimate benefits from DR programs

Assess winter DR potential; in addition, assess emergency potential for each DR program

Assess how to maximize DR potential using AMI already installed in Michigan

Assess natural gas DR potential

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Utilities Providing Market Data

Utility	Fuel
Alpena Power Company	Electric Only
Consumers Energy	Dual-Fuel
DTE Energy	Dual-Fuel
Indiana & Michigan Power	Electric Only
Michigan Gas Utilities	Gas Only
Northern States Power (Xcel)	Dual-Fuel
Semco Energy Gas Company	Gas Only
Upper Michigan Energy Resources Corporation	Dual-Fuel
Upper Peninsula Power Company	Electric Only

- Electric Only: 3 utilities
- Gas Only: 2 utilities
- Dual-Fuel: 4 utilities
- Some dual-fuel utilities have overlapping service territories

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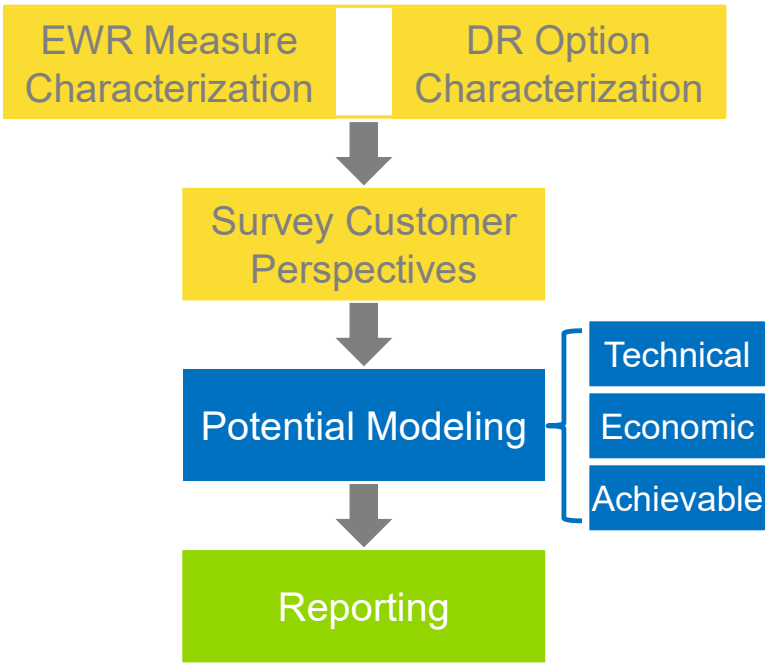
Project Schedule Update and Next Steps

Project Approach



Conduct Research

- Support characterization of EWR measures and DR options, customer decision-making and market adoption, codes and standards, emerging technologies, incremental costs, and other inputs and parameters necessary to estimate potentials
- All primary and secondary data collection and analysis

Develop and Run Models

- Adapt suite of potential models – DSMSim™, DRSim™ – to meet all requirements and provide all outputs desired by MPSC
- Models will be used for all potential scenarios
- Deliver Excel or web-enabled locked versions of model inputs and outputs

Draft and Final Reporting

- Draft report provided to MPSC for review; may result in questions and requests for further explanations
- Guidehouse will present draft findings at Technical Conference for stakeholders (July)
- Final report will include feedback from MPSC and Technical Conference

Stakeholder Engagement and Feedback

Meeting	Topic	Timeframe
Initial Stakeholder Meeting	Project overview, stakeholder feedback of EWR Measure and DR Option lists	December 2, 2020
Second Stakeholder Meeting	Project update, presentation of Market Characterization results and customer survey stakeholder feedback	February 4, 2021 Today!
Third Stakeholder Meeting ***(Technical Conference)***	Review Draft Report results	Late July 2021

Questions, comments, feedback: michigan.energystudy@guidehouse.com

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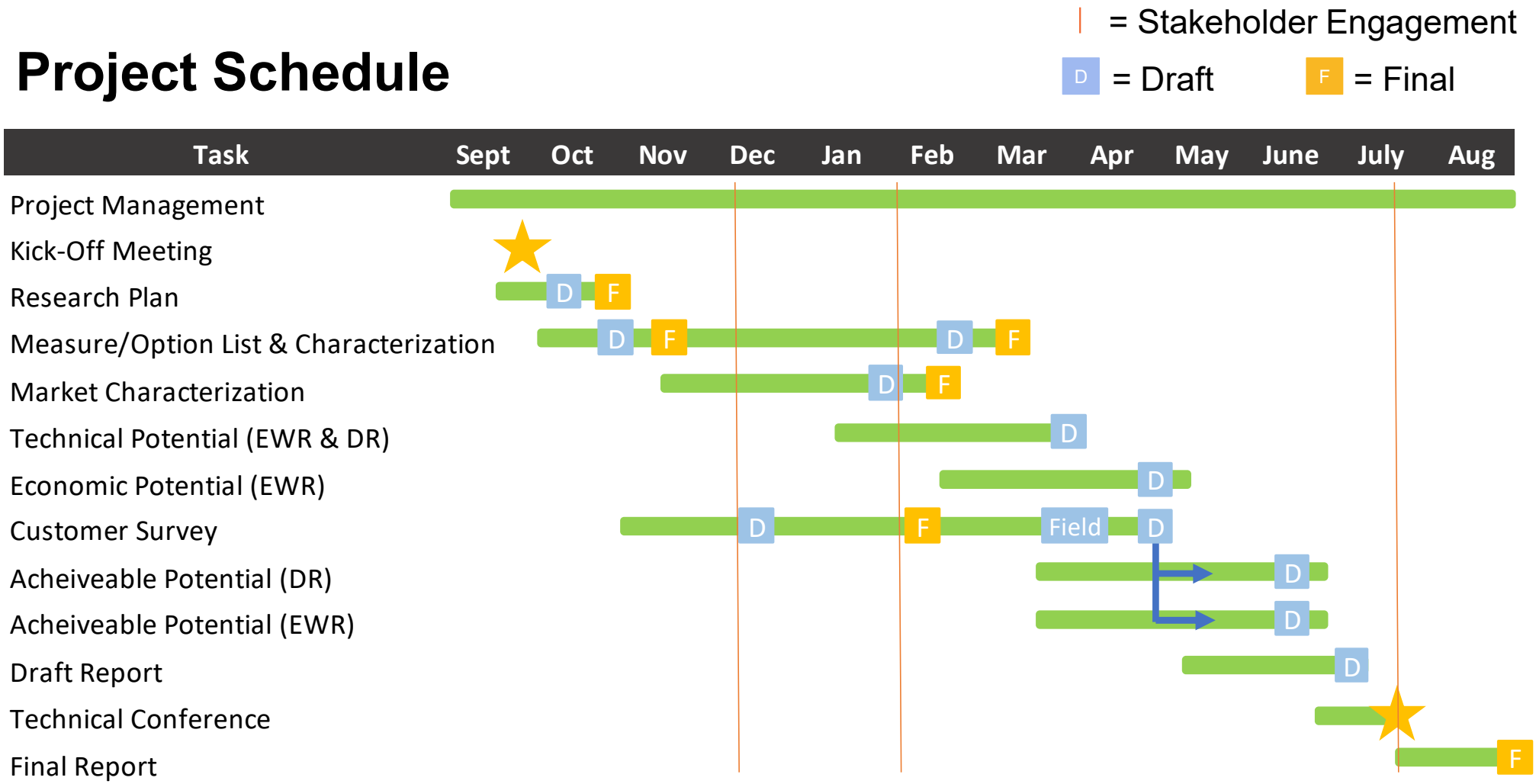
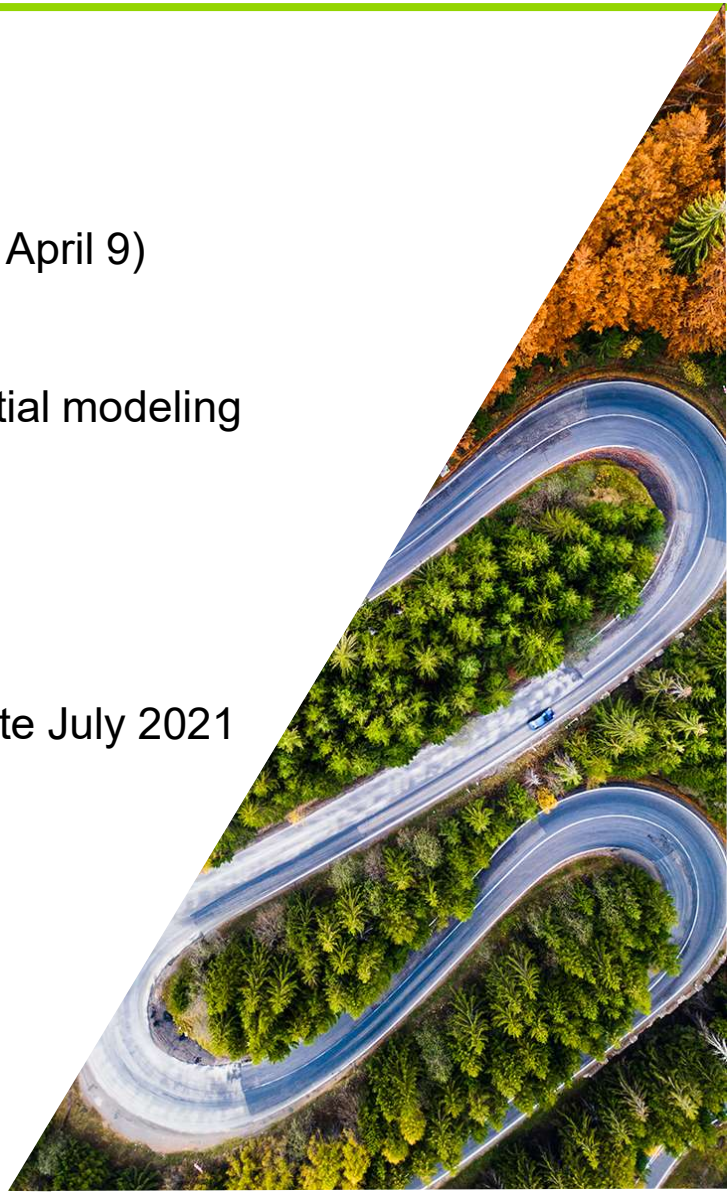
Project Schedule



Next Steps

- Program and field customer survey (fielding expected March 29 – April 9)
- Complete measure characterization, QC through Technical Potential modeling
- Technical > Economic > Achievable Potential modeling
- Stakeholder Feedback: draft results and Technical Conference: late July 2021



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Initial Stakeholder Feedback

High-Level Stakeholder Feedback Follow Up

From December 2, 2020 presentation

- **Program Planning –** study will be used to inform IRP, provide high-level statewide research, rather than detailed utility results
- **Top 100 EWR Measures** typically provide vast majority of achievable savings
  - 2017 Michigan Electricity Potential Study: 100 electric measures (including duplicated measures across end uses and equipment sizes) yield 84.1% achievable potential savings in year 20, 2036
  - 2018 National Grid Massachusetts Potential Study: 72 electric and natural gas measures yield 90%+ of achievable savings in year 3, 2021
  - In 30 years, measures providing majority of savings likely aren't aware to us now (Ex: 1991 LED lighting?)
- **Codes and Standards** are not included as a stand-alone measure. Rather, these are managed in the model (natural changes to increasing codes) and can be presented independently, to be transparent about the effects.
- **EWR and DR integration** will be considered for a sub-set of measures that provide both EWR and DR benefits

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High-Level Stakeholder Feedback Follow Up *(continued)*

From December 2, 2020 presentation

- **Awareness and Willingness to Pay Survey Approach**
  - Primary survey research is one component of customer adoption logic
  - Peer utility benchmarking and historical savings calibration also are considered when developing achievable potential estimates
- **Modeling Scenarios** will be determined with MPSC. Stakeholder feedback on desired scenarios will be considered, including:
  - **Reference Case**: incentives at 50% of incremental cost, calibrated to historical program data, intended to illustrate a continuing business-as-usual approach
  - **Aggressive Case**: incentives at 100% of incremental costs, calibrated to leading utility programs
  - **Technology Case**: emerging technology cost decrease and electric load increase (reflecting increased heating and transportation electrification towards Michigan's 2050 net zero goal)
- **Retail Open Access** customers will be included, since they can participate in EWR and DR programming

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Customer Survey Feedback

Customer Survey

Primary Research Objectives

EWR

- Assess awareness of EWR measures
- Assess willingness to pay for EWR measures

DR

- Assess awareness of DR program types offered by the customer's utility
- Assess awareness of key DR program types *not* currently offered by the customer's utility
- Willingness to participate in DR programs

Secondary Research Objectives

- Effect of COVID-19 to inform modeling
- Customer barriers and recent energy use decisions to inform modeling
- Fill in any critical gaps discovered in existing baseline study results, as doable

High-Level Stakeholder Feedback Follow Up

Draft Customer Survey Instruments, comments due 2/1

- **Survey Approach**
  - Survey questions and response options related to awareness, willingness to pay for EWR measures and willingness to participate in DR are designed to align with the inputs required for Guidehouse's model
  - The team plans to use baseline information from existing studies, and will integrate questions into the survey to cover any gaps – baseline/saturation are not a primary objective of the survey
- **Willingness to Pay / Participate**
  - The results from EWR willingness to pay questions will be used to build simple payback curves for the model
  - The DR options included in the survey are based on programs currently offered by MI utilities and information currently available on the estimated $ impact to the customer
- **COVID-19 Pandemic**
  - Guidehouse and the MPSC are still determining if and how COVID-19 will be integrated into scenario modeling
  - Survey includes questions that can be used to inform the model if needed when this final decision is made

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High-Level Stakeholder Feedback Follow Up *(continued)*

Draft Customer Survey Instruments, comments due 2/1

- **Measure details**
  - Guidehouse will consider updates to EWR measure descriptions, DR options, measure costs, incentive levels and rates based on comments from Stakeholders
  - EWR measures included in the survey are based on the study measure list, which included a separate stakeholder review process
- **Survey complexity and length**
  - Survey is designed to gather key model inputs, which requires some complexity and a variety of questions to inform both EWR and DR objectives within the scope of the study
  - Survey design is consistent with surveys we have fielded for other successful studies, and we expect the incentive offered for responding will entice customers to complete the full survey
  - Respondents will not receive every question or be asked about all measures in instrument based on skip logic

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Market Characterization

Utility Data Request

- Guidehouse completed several rounds of data requests and review from Michigan utilities
- Information received was used as the preferred source for model inputs
- Secondary sources, such as state census data and publicly-available EIA data, were used to estimate statewide input values after utility data gaps were identified

Technical Potential Inputs	Economic Potential Inputs
Electricity and Gas Sales Forecast	Electric and Gas Loadshapes
Peak Demand Forecast	Electric and Gas Avoided Costs
End Use Allocations	Electric and Gas Retail Rates
Residential Building Stock (households)	Discount Rates
Commercial Building Stock (sqft)	Line Losses
Heating Fuel Type Multiplier	Reserve Margin
Measure Density and Saturation	Inflation

Key Technical Potential Inputs – Data Summary

Sales Forecast

- Primary Data Sources – Utility data and MPSC filings to develop sector-level forecast
- Secondary Data Sources – MI census data for home type (multi vs. single family) and percentage of low-income
- Assumptions – Compound annual growth rates used to forecast sales where available

Peak Demand Forecast

- Primary Data Sources – Peak factors based on 8760 hourly data and sales forecast for DTE and UMERC
- Assumptions – Single hour peak used to develop peak factor

Residential Building Stock

- Primary Data Sources – Utility customer data
- Secondary Data Sources – FERC, EIA, MI census data
- Assumptions – Low-Income at poverty level for MI census data

Key Technical Potential Inputs – Data Summary (continued)

Commercial and Industrial Building Stock

- Primary Data Sources – Utility sales data and EIA energy use intensity data (kWh or therms per sqft)
- Assumptions – EUI consistent across C&I customer segments

Space Heating and Water Heating Fuel Type Splits

- Primary Data Sources – Utility data provided for Residential Sector
- Assumptions
  - Fuel splits for utilities providing data will be weighted and used as statewide estimate.
  - Commercial fuel splits will be characterized in measure density values

Measure Density and Saturation

- Primary Data Sources – 2011 Michigan Baseline Reports and the 2016-2017 DTE Energy Baseline Study
- Secondary Data Sources – Regional and national study potential studies benchmarking
- Assumptions – Guidehouse may adjust measure saturations based on assumed efficient adoption from the time of the applicable study, based on historical program performance and regional trends

Key Economic Potential Inputs – Data Plan

- **Economic inputs for each parameter were provided by some utilities**

- **Model inputs will be developed for each economic input using the same methodology**
  - Summarize available utility data for each parameter
  - Request DSMORE input workbook for recent evaluation if supplemental information is deemed necessary
  - Weight input data based on utility sales percentage
  - Apply weighted inputs as statewide values

DR Market Characterization

Level	Description
Level 1: Region	• Lower Peninsula, Upper Peninsula
Level 2: Sector	• Residential, Commercial and Industrial (C&I)
Level 3: Customer Class	• Residential • C&I customers (based on maximum demand values) ▪ Small C&I <=30 kW ▪ Medium C&I >30 and <=200 kW ▪ Large C&I >200 and <=1000 kW ▪ Extra Large C&I >1000 kW
Level 4: Segment / Building Type	• Residential customers ▪ Single Family Non-Low Income ▪ Single Family Low Income ▪ Multi Family Non-Low Income ▪ Multi Family Low Income • C&I customers (retain classification by size, based on max. demand values)* ▪ Small C&I <=30 kW ▪ Medium C&I >30 and <=200 kW ▪ Large C&I >200 and <=1000 kW ▪ Extra Large C&I >1000 kW
Level 5: End Use	• Residential (space cooling, space heating, water heating, appliances, total load) • C&I (HVAC, lighting, water heating, refrigeration, industrial loads, whole building/total facility) • Cross-cutting (battery, electric vehicles)

Approach

1. Primarily relied on utility-provided sales, count, and load data
2. Filled in gaps with data from secondary sources (FERC Form-1, EIA Form-861, etc.)
3. Developed count and peak demand projections (summer and winter) location, utility, and segment

*NAICS code data not available to segment C&I customers by building type

Questions

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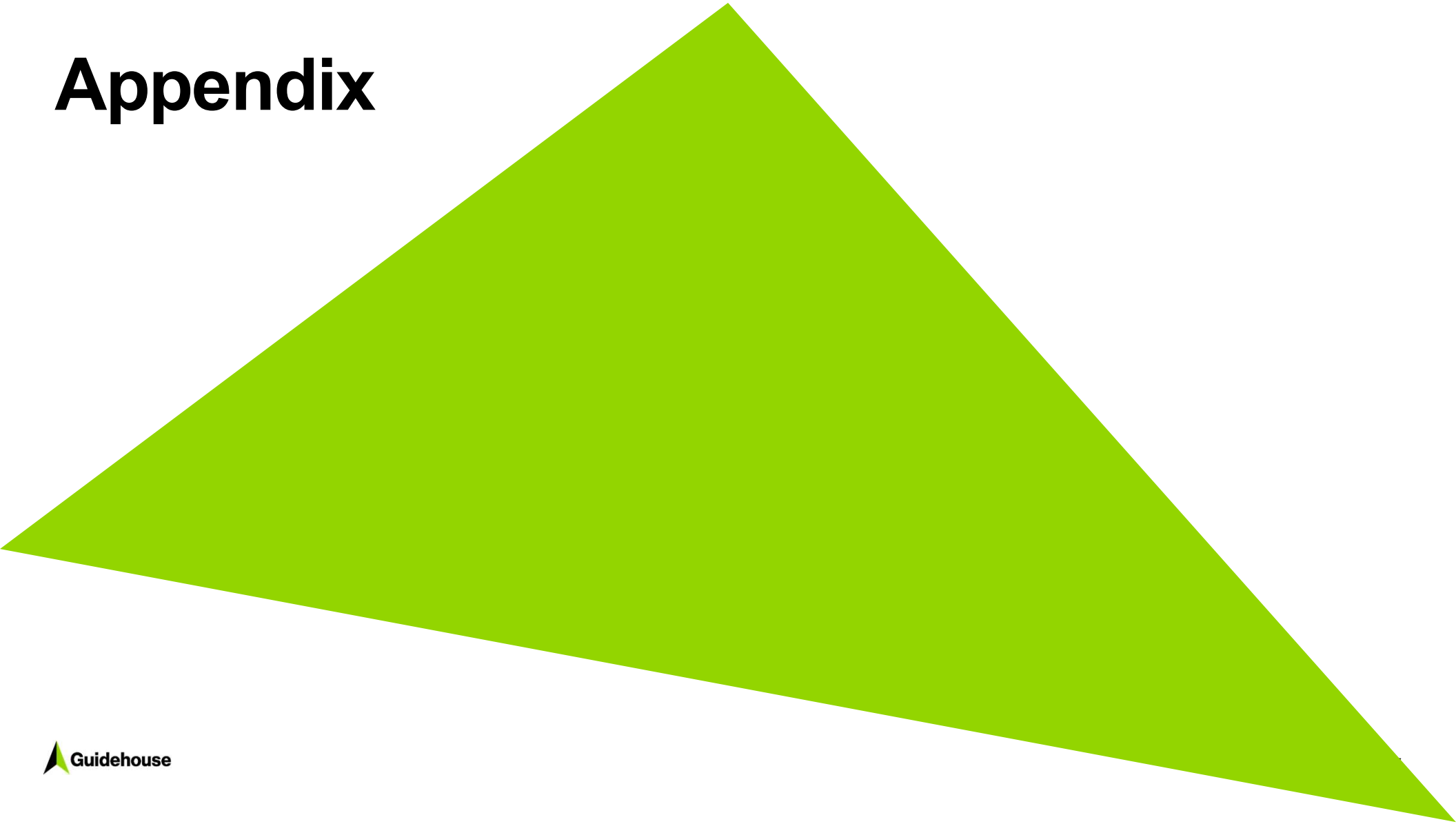
Appendix



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