Request (1): How did you arrive at assumptions related to expected useful lives?

Response: GDS used the 2016 Michigan Energy Measures Database (MEMD) to determine useful lives for the large majority of the energy efficiency measures considered in the electric energy efficiency potential study. Other sources for measure expected useful lives were taken from Technical Reference Manuals (i.e. the energy measure databases and manuals in other states), ENERGY STAR calculators, or engineering reports from other states or regions, including the Illinois, Vermont and Mid-Atlantic Technical Reference Manuals (TRMs) and technical case studies from California. The sources for all measures' effective lives can be found in sector appendices of the potential study report.

Request (2): Please briefly list and describe all factors and assumptions involved in the change in potential from "economic" to "achievable" potential. (e.g., What assumptions were made around participation rates? etc.)

Response: Achievable potential is an estimate of energy savings that can feasibly be achieved given market barriers and equipment replacement cycles. This study estimated achievable potential for two scenarios. The Achievable UCT Scenario determined the achievable potential of all measures that passed the UCT economic screening assuming incentives equal to 50% of the measure cost. A narrative description of the methodology used in this study to estimate market penetration of energy efficiency measures is provided in Section 5.7.1 of the final report. The description of the market penetration forecasting methodology for the residential sector starts on page 39 of the final report. The description of the market penetration forecasting methodology for the non-residential sector starts on page 41 of the final report.

Unlike the economic potential, the achievable potential considers the estimated market adoption of energy efficiency measures based on the incentive level and the natural replacement cycle of equipment. The second scenario, Constrained UCT, assumes a spending cap equal to 2% of two years' prior annual utility revenues, thereby limiting utilities from reaching the ultimate potential estimated in the Achievable UCT scenario.

Also, as GDS mentioned in their recent presentation at the MPSC, there is another relevant level of potential which is "program potential." That level of potential is an assessment of what level of energy efficiency potential can be achieved given other types of constraints such as local market and customer barriers and others that affect program design and implementation. For example, as discussed in the answer to request #4 below, Consumers Energy encounters building code issues in about 30% of our income qualified customers' homes that prevent the safe installation of certain measures and therefore reduces achievable potential.

Request (3): Please provide data on average and marginal line losses. If no data on marginal line losses exist at the service-territory level, is it possible to compare to any existing data in other service territories?

Response: The most current Consumers Energy data that was available at the time of this GDS study identified average line losses as follows:

Electric Line Losses					Demand Line Losses		
	Winter On Peak	Winter Off Peak	Summer On Peak	Summer Off Peak	Winter Gen.	Summer Gen.	T&D Capacity
Residential	1.094	1.090	1.096	1.091	1.107	1.121	1.121
C&I	1.094	1.090	1.096	1.091	1.107	1.121	1.121

That data was provided to GDS to incorporate in the potential study and is listed in Appendix D – Global Assumptions. As stated in the body of the GDS report, "GDS has used average line losses to adjust kWh and kW savings at the customer meter to the generation level of the electric grid. Consumers Energy recognizes that in theory it would be appropriate to use marginal line losses instead of average line losses for this adjustment of savings, but because that CE specific data was not available, the average line loss data was used." Consumers Energy is certainly open to considering data in other service territories on marginal line losses, but would want to ensure that the characteristics of those systems and territories are as similar as possible to make them relevant comparisons.

Request (4): The low-income adoption rate is expected to be 80% in the initial year, due to 100% incentives. How does this compare to actual experience for Consumers Energy?

Response: GDS's adoption rate estimate is higher than we have experienced for this specific population. While higher incentives generally have a positive impact on participation, our income qualified customers more frequently occupy older housing where we encounter higher incidents of hazardous conditions and safety concerns that prohibit the installation of certain measures types. Once we identify interested participants (which are a subset of the total income qualified population), the initial adoption rate for the following measure types (HVAC Equipment, HVAC Shell, & Water Heating) usually trends closer to 70% due to conditions that prevent us making those improvements such as asbestos requiring removal, needed roof repairs, needed gas/electrical system upgrades, or other building code deficiencies.

Request (5): Provide a list of the low-income measures examined in the study and the relevant underlying assumptions. Provide this for measures accepted as well as any measures screened out as not sufficiently cost-effective.

Response: An additional file submitted with these responses, titled, "Consumers Energy Low Income Measure Detail – EE Potential Study 2017.04.14" provides a list of the low-income measures examined in the study and the relevant underlying assumptions. Column U provides the UCT ratio, and column V indicates whether the measure is included or excluded from the achievable potential estimates.

Request (6): Clarify the following: For purposes of this analysis, administrative costs were assumed to be equivalent to $0.0581 per first-year kWh saved, which is based on a review EIA data of typical program administrator costs of several utility energy efficiency programs in and around Michigan. How does this compare to CE costs in the most recent year? Historically?

Response: Consumers Energy typically defines energy efficiency administrative costs as utility staff labor expense plus the costs associated with our tracking system. We consider vendor cost of delivering the programs as operational expense. It appears that GDS may categorize these costs differently. For 2015, which was the last year with which we have finalized, certified results, our administrative expenses were $0.021 per first-year kWh saved. It should be noted that this was a year in which our negotiated performance incentive mechanism was directed to focus on life-time savings rather than first-year savings which understandably affects first-year acquisition costs. In 2014, our administrative expenses were $0.014 per first year kWh saved, $0.0096 for 2013 and $0.010 for 2012.

Administrative costs and acquisition costs vary based on a number of factors including how they are defined, diversity of programs and measures offered and the objectives of different jurisdictions. For example, some utilities' portfolios are much more heavily weighted towards their retail lighting programs which have historically provided very cost effective savings, but provide less choice in energy efficiency programs to customers and maybe less sustainable long-term given changing federal lighting standards. Consumers Energy provides our Michigan customers with a diverse portfolio of high-quality programs which has been consistently highly cost-effective as measured by our portfolio's overall strong cost-benefit scores on the MPSC-required Utility Cost Test (UCT) and favorably received by our customers as indicated by our high customer satisfaction scores.

Request (7): Define "programmable thermostats." Do these include smart and interconnected learning thermostats?

Response: Yes, GDS did include smart and interconnected learning thermostats. These are labeled as Tier 3 Analytics Capable Thermostats in the Michigan Statewide Energy Savings Database (MEMD). The MEMD includes three tiers of programmable thermostats. Tier 1 Programmable Thermostats provide customer set point scheduling located on the device. Tier 2 Communicating Thermostats offer Tier 1 functionality with additional customer remote access to set point scheduling using a smart device, such as computer, phone, or tablet. Tier 3 Analytics Capable Thermostat includes Tier 2 functionality with additional capabilities of analytics, demand response, customer specific data and recommendations, HVAC diagnostics, geofencing (GPS), and comparative information.

Request (8): What assumptions did Consumers make about growth in the industrial sector?

Response: The industrial retail sales forecast reflects the expected long-term growth outlook based on projected economic conditions, such as manufacturing employment and industrial production, at the time the forecast was prepared. These Michigan-specific economic indicators are provided by IHS Markit, a leading research and publishing company that provides industry-specific data and analyses. Based on this approach and data, the Company projected a 1.25% compounded annual

growth rate for industrial load at the time inputs were required for the energy efficiency potential study.

Request (9): The number of industrial measures included in the study varies between Consumers and DTE. Is this due to different facility types within each territory or differences in the program portfolio structures?

Response: When GDS Associates provided the study's draft Industrial Sector measure list to Consumers Energy (which was the same as what had been included in the DTE study), Consumers Energy asked GDS to specifically evaluate some additional measures that were not included in the DTE study. This may have been due to either different facility types or differences in program portfolio structures between the two territories. The additional measures added by Consumer Energy were mostly agricultural, with a small handful of industrial technologies. The complete list of measures added to the Consumers Energy measure database are the following:

- Poultry LED Lighting
- Long Day Lighting Dairy
- Lab Fume Hood Ventilation Reduction
- Process Fan Ventilation Reduction
- Hybrid Injection Molding Machine
- Other Industrial -Low-Energy Livestock Waterer
- Other Industrial -Dairy Refrigerator Tune-Up
- Greenhouse Environmental Controls
- Scroll Compressor with Heat Exchanger for Dairy Refrigeration
- Variable Speed Drive with Heat Exchanger, Milk
- Milk Pre-Cooler Heat Exchanger
- Variable Speed Drives for Dairy Vacuum Pumps
- VFD for Process Fans - Agriculture
- VFD for Process Pumps - Agriculture
- VFD for Process Pumps - Irrigation
- Grain Storage Temperature and Moisture Management Controller
- Low Pressure Sprinkler Nozzles
- Fan Thermostat Controller
- Variable Speed Drive with Heat Exchanger, Milk New