Version 1.0

MICHIGAN ENERGY MEASURE DATABASE (MEMD) OVERVIEW & MAINTENANCE PROCESS MANUAL

Michigan Energy Waste Reduction (EWR) Collaborative

Publication Date: March 2, 2018

TABLE OF CONTENTS

1. Michigan Energy Measures Database (MEMD) Introduction

The MEMD is a collection of spreadsheets and supporting documentation that presents approved electric, natural gas energy, and electric peak demand savings values for Energy Waste Reduction (EWR) measures in the state of Michigan.

This manual is intended to accompany the MEMD and provide an overview of the MEMD purpose, structure and supporting documentation, key concepts, the maintenance and update process, and communication protocols used to manage and maintain the MEMD.

The MEMD is published by a third-party firm[1] (or MEMD Developer) which is sponsored by the Michigan Utilities. Natural gas and electric providers in Michigan support the generation of the MEMD, and participate in the MEMD Technical Subcommittee which manages the creation and maintenance process of the MEMD throughout its lifecycle.[2]

Updated MEMD documents are published on an annual basis. Interested parties and individuals can sponsor the addition of new measures or updates to existing MEMD measures annually. These requests are reviewed by the MEMD Technical Subcommittee and are included in the updated MEMD, if approved. All existing MEMD measures are reviewed on a regular basis, typically once every three years.

1.1 Purpose

The MEMD is sponsored by natural gas and electric providers in Michigan and overseen by the Michigan Public Service Commission (MPSC) and the MEMD Technical Subcommittee. The measures and values within the MEMD are incorporated into the development of provider-specific Energy Waste Reduction (EWR) plans. The primary users of the MEMD are program planners, regulatory reviewers, utility and regulatory forecasters, and consultants supporting utility and regulatory research and evaluation efforts. Values published in the MEMD are gross savings that represent statewide averages across various user groups, and do not reflect specific project applications or net savings adjusted for program attribution.

The purpose of the MEMD is to:

- Provide a common and consistent source of information for energy waste reduction measures
- Facilitate demand and energy savings calculations for stakeholders
- Support standardization across Michigan, expedite evaluation, measurement and verification (EM&V), and increase transparency in reporting, calibration, and reconciliation
- Provide accurate information on energy waste reduction measures and technologies that could be used by Integrated Resource Planning (IRP) and EWR program planning teams
- Document assumptions and Michigan-specific parameters (weather, load profiles, etc.) for measure savings calculations

---

1 The MEMD Developer at the time of publishing version 1.0 of the MEMD Overview & Maintenance Process Manual was Morgan Marketing Partners.

2 Section 71 of PA 342 of 2016, which amended 2008 Public Act 295 describes the required components of Energy Waste Reduction Plans, which are created by natural gas and electric providers in Michigan and which leverage the MEMD.

1.2 Structure

The MEMD is comprised of two databases, a Weather Sensitive Database and a Non-Weather Sensitive Database, as well as several types of supporting documents.

- Weather Sensitive Database
- Non-Weather Sensitive Database
- Workpaper Template
- Approved Workpapers

Definitions for these and other related terms can be found in Table 2. MEMD Terminology.

2. Key Concepts

The following key concepts are referenced in this document and in other MEMD documents, and are defined here for clarity and consistency of interpretation. These concepts are outlined in four categories: (1) MEMD Stakeholders, (2) MEMD Terminology, (3) EWR Measure Types, and (4) MEMD Measure Update Classifications.

2.1 MEMD Stakeholders

Multiple stakeholders are involved in the MEMD maintenance and update process. Key stakeholders are described below (Table 1), with an overview of their responsibilities as they relate to the MEMD. Additional details on Stakeholder responsibilities are outlined in the Maintenance & Update Process section.

Table 1. MEMD Stakeholders

MEMD STAKEHOLDER	DEFINITION
Michigan Public Service Commission (MPSC)	The mission of the Michigan Public Service Commission is to protect the public by ensuring safe, reliable, and accessible energy and telecommunications services at reasonable rates for Michigan's residents, and provide regulatory oversight in a prudent and efficient manner while implementing legislative and constitutional requirements. The MPSC is composed of three members appointed by the Governor of Michigan with the advice and consent of the state Senate. Commissioners are appointed to serve staggered six-year terms. No more than two Commissioners may represent the same political party. One commissioner is designated as chairman by the Governor. The staff of the MPSC support the management and maintenance of the MEMD.
Michigan Public Service Commission (MPSC) Staff	Staff hired by Commissioners to carry out the mission of the MPSC. Commission Staff serve as the chair of the EWR Collaborative and MEMD Technical Subcommittee, and oversee the decision-making process of the groups.
Natural Gas and Electric Service Providers *(Also known as "Utilities")*	Providers are entities which deliver energy to customers. This group can also include third-parties which perform planning and implementation for EWR programs on behalf of the utilities. Providers support the maintenance and updates of the MEMD as members of the EWR Collaborative and MEMD Technical Subcommittee.
Third-Party Evaluators	Independent third-party contractors that perform evaluation, measurement and verification (EM&V) services for Provider EWR programs. Evaluators also support the maintenance and updates of the MEMD as members of the MEMD Technical Subcommittee.

MEMD STAKEHOLDER	DEFINITION
Energy Waste Reduction (EWR) Collaborative *(Formerly "Energy Optimization (EO) Collaborative")*	In October 2008, the Governor signed 2008 PA 295 into law, requiring providers of electric or natural gas service to establish the Energy Optimization (EO) (now EWR) Programs.[3] In compliance with PA 295, the Commission issued U-15800 to implement the Act, to give guidelines for EO plans. Plans were required from retail rate-regulated electric utilities, retail rate-regulated rural electric cooperatives, member-regulated electric cooperatives, municipally-owned electric utilities and retail rate-regulated natural gas utilities. Included in Orders approving Consumers Energy (U-15805) and Detroit Edison (U-15806) EO plans were provisions for the establishment of a collaborative to: *"include all electric and gas providers subject to the Commission's jurisdiction under Act 295. In addition, energy efficiency experts, equipment installers, and other interested stakeholders should be encouraged to participate in the collaborative."* The goals of the Collaborative include the following: • Make recommendations for improving EO (now EWR) programs for all providers. • Provide program evaluation support and develop any needed re-design and improvements to energy efficiency programs. • Update and refine the MEMD. • Promote economic development and job creation in Michigan by providing a forum to connect Michigan manufacturers, suppliers and vendors with utility EO (now EWR) programs. The EWR Collaborative meets on the third Tuesday of every month from 9am - 12pm EST.
Michigan Energy Measure Database (MEMD) Technical Subcommittee	A selection of EWR Collaborative members focused on the review and approval of New and Modified measures for inclusion in the MEMD. This group supports the general oversight and maintenance of the MEMD. Like the EWR Collaborative, Technical Subcommittee members are comprised of Commission Staff, Utilities, Implementation Contractors, Third-Party Evaluators, energy efficiency experts, and other interested stakeholders. MEMD Technical Subcommittee members are established on a volunteer basis, must be technically qualified, and approved by Commission Staff.
Michigan Energy Measure Database (MEMD) Technical Subcommittee Chair	A single member of Commission Staff serves as the MEMD Technical Subcommittee Chair who oversees the decision-making process of the group and MEMD update process.
MEMD Developer	A third-party firm contracted by the utilities to assist with review and approval of MEMD Workpapers, update of the database with New and Modified Measures, and development of Workpapers. The MEMD Developer is responsible for the overall maintenance of the MEMD, including annual measure characteristic updates. [4]

[3] On December 12, 2016, Governor Rick Snyder signed into law Public Act 342 of 2016 (Act 342), the "Clean and Renewable Energy and Energy Waste Reduction Act", which amended Act 295 in several ways, most significantly "Energy Optimization" is changed to "energy waste reduction" (EWR) throughout. Act 342 had an effective date of April 20, 2017.

[4] The MEMD Developer at the time of publishing version 1.0 of the MEMD Overview & Maintenance Process Manual was Morgan Marketing Partners.

MEMD STAKEHOLDER	DEFINITION
Measure Sponsor	Individual or entity who submits a New Measure or Modified Measure for inclusion in the MEMD. Measure sponsors may include utility staff, implementation contractors, third-party evaluators, measure manufacturer/vendors or others. Measure sponsors are strongly encouraged to work with a utility to sponsor a measure.
Energy Efficiency Contractors, Builders, Intervenors and other Interested Stakeholders	Other interested stakeholders from the public can be measure sponsors, EWR Collaborative or Technical Subcommittee members, or participants in the MEMD update process.

2.2 MEMD Terminology

Key terms used in the MEMD and supporting documentation are defined in Table 2.

Table 2. MEMD Terminology

TERM	DEFINITION
Measure *(Also known as "Energy Waste Reduction Measure")*	Specific, defined equipment and/or actions that are intended to reduce electric demand, electric energy consumption, and/or natural gas energy consumption.
Deemed Savings	Specific and fixed per-unit energy savings or demand reduction values which have been accepted in the MEMD by stakeholders. These values are accepted because: measure definitions and technology applications are consistent over time, locale, program, and/or customer type; and sound engineering practices and /or research support the savings calculation.
Weather Sensitive Measures	Measures for which savings are affected directly by weather and which need to be quantified based on a simulation of that weather.
Non-Weather Sensitive Measures	Measures for which savings are not impacted directly by weather.
Weather Sensitive Database	Presents energy and demand savings values and other measure characteristics (i.e., baseline condition, hours of use, measure life, etc.) for EWR measures where savings values vary based on weather. Savings in the Weather Sensitive Database are calculated using building simulation models with multiple inputs: weather zone, vintage, system type, and building type.
Non-Weather Sensitive Database	Presents energy and demand savings values and other measure characteristics (i.e., baseline condition, hours of use, measure life, etc.) for EWR measures not directly impacted by weather.
Workpaper Template	This document presents key details for an EWR measure, including but not limited to: measure description, savings summary, methodology, assumptions, and measure life. Measure Sponsors submitting a New or Modified measure for inclusion in the MEMD must complete this template. This template ensures essential measure information is captured and consistently presented to the MEMD Technical Subcommittee for review and will be distributed to the EWR Collbarative by the MEMD Technical Subcommittee Chair.

TERM	DEFINITION
Draft Workpapers	These documents are completed Workpaper Templates, developed by Measure Sponsors, and are to be reviewed for potential inclusion in the MEMD.
Approved Workpapers	Once Draft Workpapers are submitted, they are revised as necessary by the MEMD Developer and reclassified as Approved Workpapers. Approved Workpapers are available upon request from the MEMD Technical Subcommittee Chair.
Draft Measure Summary Matrix	Summary of Draft Workpaper submissions for potential inclusion in the MEMD. Once all measure submissions are received by the MEMD Technical Subcommittee Chair, MEMD Technical Subcommittee Chair combines all the key measure characteristics in a matrix which is then distributed to the MEMD Technical Subcommittee for reference during the MEMD update process.
Calibration	Michigan-specific research which analyzes the per-unit savings impacts from current MEMD measures. This research is typically performed by third-party evaluation teams, and leverages data from current installed measures in Michigan. Measures are typically selected for calibration as part of a statewide prioritization effort when credible evidence challenges the current MEMD measure parameters, and when this evidence does not suggest definitive new values for the parameters. Additional detail on the measure calibration process can be found in Appendix A. Existing Measure Review and Calibration Process.

2.3 EWR Measure Types

EWR programs are comprised of four key measure types: (1) prescriptive, (2) hybrid, (3) custom measures, and (4) behavioral. Each of these measure types are defined in Table 3.

Table 3. EWR Measure Types

MEASURE TYPE	DEFINITION
Prescriptive Measure	Measure type which features unitized savings (e.g., savings per lamp) that are stable over time and can be reasonably estimated across multiple sites in Michigan. Prescriptive measures are typically included in the MEMD.
Hybrid Measure	Measure type which features a standard algorithm for calculating energy and demand savings, but which uses variable (custom) site-specific inputs for that algorithm (e.g., motor size, hours of use). These measures are most commonly used for measures in individual provider (utility) programs and are typically not included in the MEMD.
Custom Measure	Measure type featuring site-specific savings values which vary by project. These measures are most commonly used for complex, multi-faceted measures or projects (e.g., industrial processes, whole home, whole building) in individual provider (utility) programs and are typically not included in the MEMD.

MEASURE TYPE	DEFINITION
Behavioral Measure	Measures (including tools or programs) characterized by various kinds of outreach, education, and customer engagement designed to achieve energy savings by helping customers understand their energy use and motivating them to adopt energy efficient behavior changes (e.g., turning off lights or turning back thermostats). These measures have been included in the MEMD in the past but will be transitioning out of the MEMD in 2018 and into a separate Michigan Behavioral Resource Manual.

2.4 MEMD Measure Update Classifications

Measures submitted to the MEMD Technical Subcommittee for potential inclusion in the MEMD may be classified as (1) New Measures, or (2) Modified Measures. These measure classifications are defined in Table 4. Additional detail on measure requirements, review processes and timelines can be found in the Maintenance & Update Process section.

Table 4. MEMD Measure Update Classification

TERM	DEFINITION
New Measure	Measure which: • Is proposed for review and addition to the database, and • Does not share the same principal technology or demand/energy savings mechanism as an existing measure in the MEMD. New Measures may be based on engineering algorithms, secondary research applicable to Michigan, or pilots conducted by Michigan natural gas and electric providers.
Modified Measure	Measure which: • Is proposed for review and/or addition to the database, and • Shares the same principal technology or demand/energy savings mechanism as an existing measure in the MEMD. Measures may be modified for the following reasons: • Revision of an existing measure based upon Michigan-specific (*calibration*) research.[5] • Revision of an existing measure based upon new research from secondary sources, changes to energy and buildings codes/standards, correcting an error from a previous MEMD version, or removal of a measure from the database.[6,7] • New application of an existing measure based upon adding a new participant population, adding a new building type, or adding a new baseline condition.

[5] Additional detail on the Measure Calibration Process can be found in Appendix A. Existing Measure Review and Calibration Process.

[6] The MEMD Developer annually identifies any measure characteristic changes that may result in revisions to existing MEMD measures. Typical reasons for measure updates include: Federal and/or local code or standard changes, legal requirements changes, incremental cost changes, new testing and/or research to improve inputs or modeling, clarifications of terms or corrections from most recent MEMD version.

[7] Additional detail on the existing measure review process can be found in Appendix A. Existing Measure Review and Calibration Process.

3. Maintenance & Update Process

This section describes the following components of the MEMD maintenance and update process: 1) New and Modified Measure Submission, and 2) MEMD Review Process.

The MEMD is published annually in October, reflecting that year's updates, additions, and removals. All documents are maintained by the third-party MEMD development firm. Table 5 and Figure 1 present the details and flow chart for this process, respectively.

3.1 New and Modified Measure Submission

Measure sponsors must adhere to a set of requirements and the MEMD update process schedule to enable review and adoption of proposed measures.

3.1.1 Measure Requirements

Measure Sponsors are required to fully complete a Workpaper Template and Measure Summary Matrix and submit a Draft Workpaper for all proposed measures. The Workpaper Template outlines all information needed for the MEMD Technical Subcommittee to review the merits of each proposed measure for potential inclusion in the MEMD. These details include but are not limited to:

a) Measure Description
b) Measure Savings Summary
c) Baseline and Proposed Condition Descriptions
d) Calculation Methodology and Assumptions
e) Relevant reference sources and attached documentation

The MEMD Technical Subcommittee will use the following criteria to assess the proposed measures for approval and inclusion in the MEMD:

- **Complete Draft Workpaper.** The submitted Draft Workpaper must include all required information, and a sufficient level of detail and support.
- **Reasonable Savings Estimates.** A reasonable savings estimate is one that relies on the best practical and reliable data collection and estimation methods. Savings estimates must be supported by sound evaluation results and/or engineering estimates. For measures that rely on primary research to develop key parameter assumptions, savings can be considered reasonable if the errors associated with sampling meet or exceed 10% precision at a 90% confidence level. For measures that rely on engineering analysis or simulation modeling, savings can be considered reasonable if the analysis and/or modeling approach follows industry best practices and passes the review of the MEMD Technical Subcommittee.
- **Representative Baseline.** A satisfactory measure baseline should reflect typical choices by eligible customers of existing equipment, current codes and standards, and market conditions. When replacing equipment at end of life or for new construction, baseline conditions should reflect new standard efficiency equipment and current market conditions.
- **Michigan Specific Parameters.** Savings estimates may be based on primary or secondary data, or engineering estimates. Savings estimates must rely on parameters specific to the Michigan region and its climate zones, and be applicable to measures implemented in Michigan.

- **Measure Interactions Considered.** The savings from one measure may in part be determined by another measure that has already been implemented by the customer. Potential measure interactions should be considered in measure savings estimates.
- **Reasonable Data Timeframe.** When applicable, savings values should rely on a reasonable and sufficient timeframe for data collection to produce repeatable and consistent results (e.g., savings values established based on billing analysis typically require at least 12 months of post-installation customer data).
- **Final Data Utilized.** Savings estimates must be based on final, *not preliminary*, customer data.

The MEMD Technical Subcommittee collectively will make the final determination of whether a Draft Workpaper meets the above criteria and is recommended for inclusion in the MEMD. Additional detail on Modified Measures which originate from the Calibration process can be found in Appendix A. Existing Measure Review and Calibration Process.

3.1.2 Measure Submission Process and Timeline

The MEMD Measure Submission Process and Timeline is outlined in Table 5.

Table 5. MEMD Measure Submission Process and Timeline[8]

STEP	RESPONSIBLE PARTY	TASK	DESCRIPTION	NEW MEASURE DUE DATE	MODIFIED MEASURE DUE DATE
MS-1	Measure Sponsor	Submit Draft Workpapers	Measure Sponsors submit Draft Workpapers and Measure Summary List to the MEMD Technical Subcommittee Chair . The MEMD Developer identifies any characteristic changes that may result in revisions to existing MEMD measure characteristics. The MEMD Developer sends a Measure Summary Matrix to the MEMD Technical Subcommittee Chair.	April 1	May 1
MS-2	MEMD Technical Subcommittee Chair	Distribute Draft Workpapers	The MEMD Technical Subcommittee Chair compiles a Draft Measure Summary Matrix; confirms all appropriate supporting documentation is aggregated ; and sends out the Draft Measure Summary List and Draft Workpapers to MEMD Technical Subcommittee for preliminary review.	Within 5 business days following the April 1 deadline	Within 5 business days following the May 1 deadline
MS-3	MEMD Technical Subcommittee	Review Draft Workpapers	The MEMD Technical Subcommittee meets to discuss findings and hear reviewer comments. The committee then develops a consensus as to which measures pass the MEMD Technical Subcommittee review and are recommended for inclusion into the MEMD. Approved measures are returned to the MEMD Technical Subcommittee Chair. Rejected measures are returned to the Measure Sponsor with comments or requested revisions (if applicable).	May 1	June 1

[8] If a deadline falls on a weekend or holiday, the deadline moves to the prior business day.

STEP	RESPONSIBLE PARTY	TASK	DESCRIPTION	NEW MEASURE DUE DATE	MODIFIED MEASURE DUE DATE
MS-4	MEMD Technical Subcommittee Chair	Submit Approved Measure Workpapers	MEMD Technical Subcommittee forwards approved Draft Workpapers to the MEMD Developer for detailed review and validation, and modeling and distribute to the EWR Collaborative distribution list.	May 1	June 1
MS-5	MEMD Developer	Apply New Measure Workpapers	MEMD Developer reviews Draft Workpapers, validates information, accepts or rejects submittals, calculates savings, or models appropriate savings and publishes Approved Workpapers. The MEMD Developer then sends the Draft MEMD, Approved Workpapers and Measure Summary Matrix to the MEMD Technical Subcommittee Chair. Rejected measures are returned to the MEMD Technical Subcommittee for further review.	August 1	August 1

3.2 MEMD Review Process

The MEMD developer will incorporate New and Modified measure submissions and develop a Draft MEMD for review by the EWR Collaborative. Once the review process is complete, Commission Staff will publish the Final MEMD on the MPSC website[9]. The MEMD Technical Subcommittee will then compile a list of existing measures which merit further review over the next three years (see Step MR-9 in Table 6 for details).

3.2.1 Review Process and Timeline

The MEMD Draft and Final Review Process and Timeline is outlined in Table 6.

Table 6. MEMD Draft and Final Review Process and Timeline

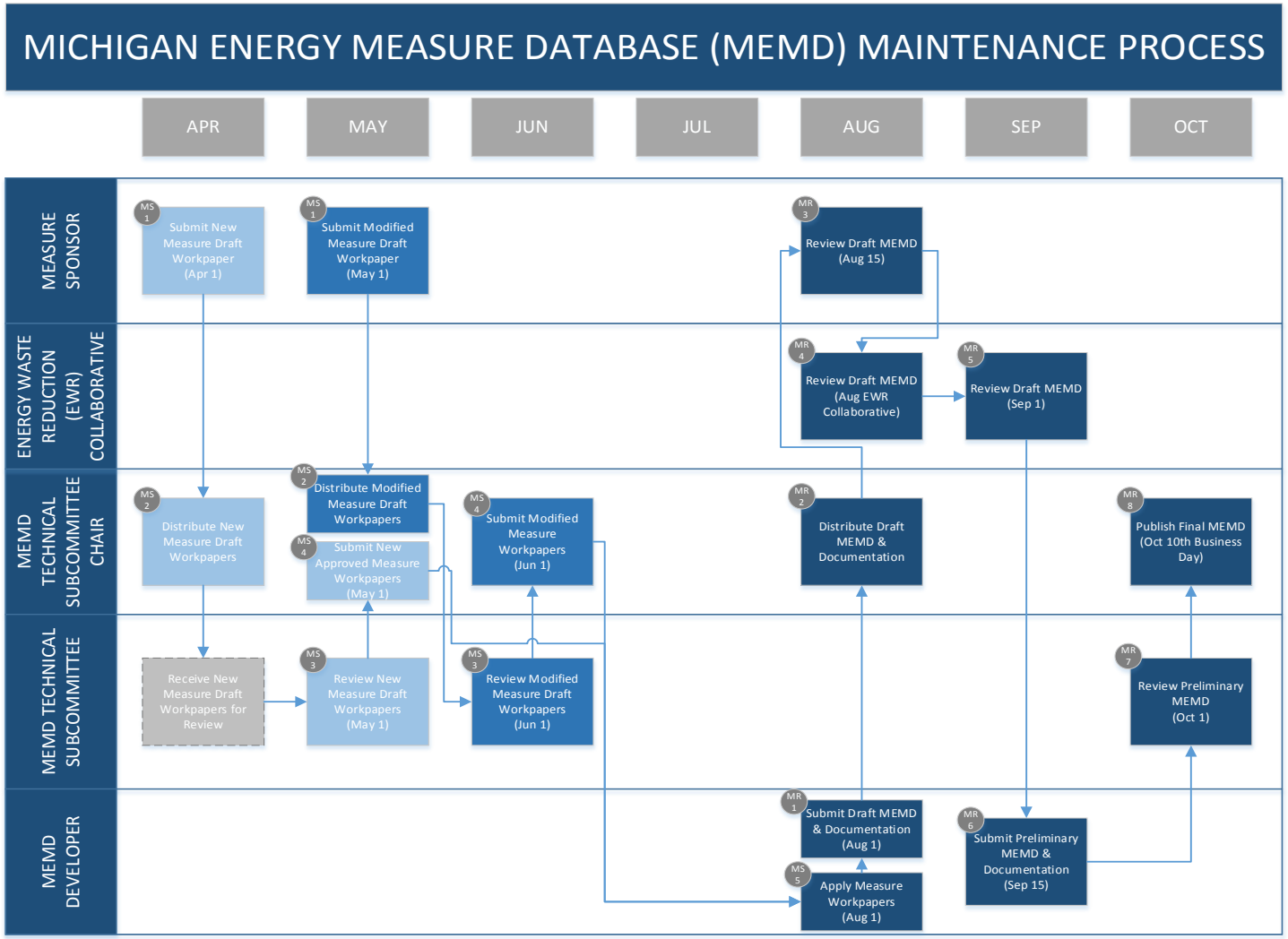
STEP	RESPONSIBLE PARTY	TASK	DESCRIPTION	DUE DATE
MR-1	MEMD Developer	Submit Draft MEMD & Documentation	MEMD Developer reviews Draft Workpapers, validates information, accepts or rejects submittals, calculates or models savings, and publishes Approved Workpapers. The MEMD Developer then sends the Draft MEMD, Approved Workpapers and Measure Summary Matrix to the MEMD Technical Subcommittee Chair. Rejected measures are returned to the MEMD Technical Subcommittee for further review.	August 1
MR-2	MEMD Technical Subcommittee Chair	Distribute Draft MEMD & Documentation	The MEMD Technical Subcommittee Chair forwards these documents to the MEMD Technical Subcommittee, the EWR Collaborative, and Measure Sponsors.	Within 5 business days following the August 1 deadline

[9] Final MEMD documents will be posted on the MPSC website at the following URL: http://www.michigan.gov/mpsc/0,4639,7-159-52495_55129---,00.html.

STEP	RESPONSIBLE PARTY	TASK	DESCRIPTION	DUE DATE
MR-3	Measure Sponsor	Review Draft MEMD	Measure sponsors review the Draft MEMD and Approved Workpapers for accuracy related to their submittal to assure workpaper calculations and data were interpreted and applied correctly. Third-party evaluators review measure updates sponsored by MEMD Developer. Reviewers (Measure Sponsors and Evaluators) are asked to send a confirmation email or an email detailing objections to the MEMD Technical Subcommittee Chair and the MEMD Developer. If objections persist, the MEMD Developer will contact the MEMD Technical Subcommittee Chair and provide a timeline on when the Approved Workpaper will be available for a second review.	August 15
MR-4	EWR Collaborative	Review Draft MEMD	The Draft MEMD is received by all stakeholders (EWR Collaborative, MEMD Technical Subcommittee, Measure Sponsors) in advance of an EWR Collaborative meeting. Stakeholders participate in the meeting and provide comment or request clarification (if appropriate) from the MEMD Developer.	August EWR Collaborative Meeting
MR-5	EWR Collaborative	Review Draft MEMD	The EWR Collaborative completes a review of the Draft MEMD, and members propose any desired changes by sending comments via email to the MEMD Developer and copying the MEMD Technical Subcommittee Chair.	September 1
MR-6	MEMD Developer	Submit Preliminary MEMD & Documentation	MEMD Developer incorporates revisions into the Draft MEMD based on received comments, clarifications, and recommended changes and then submits a Preliminary MEMD and its supporting documentation to the MEMD Technical Subcommittee Chair.	September 15
MR-7	MEMD Technical Subcommittee	Review Preliminary MEMD	The MEMD Technical Subcommittee Chair forwards the Preliminary MEMD to the EWR Collaborative distribution list. The EWR Collaborative performs a final review of the MEMD and its supporting documentation and sends any final comments via email to the MEMD developer for action and copies the MEMD Technical Subcommittee Chair. If no substantive comments persist, and the Collaborative approves of the Preliminary MEMD, then it becomes the Final MEMD.	October 1
MR-8	MEMD Developer and MEMD Technical Subcommittee Chair	Publish Final MEMD	The MEMD Technical Subcommittee Chair publishes the Final MEMD and the supporting documentation on the Michigan Public Service Commission website, and alerts stakeholders (EWR Collaborative, MEMD Technical Subcommittee, Measure Sponsors) via email.	On the 10th business day of October

STEP	RESPONSIBLE PARTY	TASK	DESCRIPTION	DUE DATE
MR-9	MEMD Technical Subcommittee	Create Measure Review Matrix	The MEMD Technical Subcommittee will review the Final MEMD and its supporting documentation and develop a Measure Review Matrix. This list will have a three-year outlook and identify measures for further investigation in each of the following three years. Measure reviews will be prioritized based upon a) expected contribution to stakeholder portfolio savings estimates; b) savings calculation uncertainty; and c) expected data availability and timing (from updated codes, ongoing studies, etc.). This matrix will be used to coordinate planning for Calibration research and MEMD Developer measure updates.	December MEMD Technical Subcommittee Meeting

Figure 1. MEMD Maintenance Process[10]



[10] As outlined in Step MR-9 in Table 6, the MEMD Technical Subcommittee will review the Final MEMD and its supporting documentation and develop a Measure Review Matrix. This list will have a three-year outlook and identify measures for further investigation, either Calibration Research or Existing Measure Review.

4. Appendix A. Existing Measure Review and Calibration Process

The Existing Measure Review and Calibration Process is used by Natural Gas and Electric Service Providers, third-party evaluators, and the MEMD Developer to support updates and improvements to MEMD savings estimates. This process produces research and workpaper revisions which become the basis for Modified Measure submissions to the MEMD.

The MEMD specifies per-unit gross energy (kWh, MCF) and demand (kW) savings estimates for each measure in the database. The per-unit impacts of MEMD measures are deemed until there is sufficient evidence to suggest a revision to the MEMD is warranted. This evidence can include:

1. Code and/or standards which change existing measure baselines;
2. A body of credible evidence that supports a different known value; or
3. A body of credible evidence that challenges the existing MEMD value but does not suggest a definitive new value applicable to Michigan.

The first two scenarios above are covered by the existing measure review process. The third scenario above triggers a review to assess the need for a more rigorous study (i.e., MEMD calibration research).

Existing Measure Review refers to the process through which the MEMD Developer or third-party evaluators review existing MEMD measures to determine if savings values, calculations, baselines, and key assumptions remain accurate or need updating based upon new developments. This review relies upon research from secondary sources.

Measure Calibration refers to the process through which the third-party evaluators conduct Michigan-specific research which analyzes the per-unit savings impacts for current MEMD measures. As discussed below, existing measure reviews and measure calibration research support the overall *MEMD Update* process but are distinctly separate activities.

Existing measure reviews and calibration research will be clustered by end-use or category to keep all like measures in the same document or set of documents and reduce processing labor. Existing measure Reviews and calibration research will be prioritized based upon:

1. Expected contribution to stakeholder portfolio savings estimates (i.e., a large share of current or future planned savings);
2. Savings calculation uncertainty;
3. Expected data availability and timing (from updated codes, ongoing studies, etc.); and
4. Length of time since the last modification, review, or calibration activity for a given measure.

It is important to note the expected contribution to portfolio savings is a mandatory requirement to select a measure for MEMD calibration; a measure must be a significant contributor to electric or natural gas portfolio savings to warrant additional research. Savings calculation uncertainty is a critical but not mandatory criterion for calibration; if a given measure with a high level of savings calculation

uncertainty accounts for a relatively small portion of stakeholder portfolio savings, it will not be prioritized for review or research.

Table 7 details the process for measure calibration, including the annual timeline for synchronizing with the MEMD update process.

Table 7. Existing Measure Review and Measure Calibration Process and Timeline

STEP	RESPONSIBLE PARTY	DESCRIPTION	DUE DATE
RC-1	Third-Party Evaluators	Third-party evaluators identify prospective review and calibration measures, using the Measure Review Matrix as a resource. Evaluators discuss and coordinate proposed review and calibration measures with stakeholder utilities.	June - July
RC-2	Third-Party Evaluators	Third-party evaluators present proposed measures for existing measure review and calibration to the MEMD Technical Subcommittee and EWR Collaborative for feedback and approval.	July EWR Collaborative
RC-3	Third-Party Evaluators	Third-party evaluators develop measure-specific calibration research plans and present to the EWR Collaborative. Measure review research generally does not require a formal research plan.	August EWR Collaborative
RC-4	EWR Collaborative	EWR Collaborative members provide feedback on research plans to third-party evaluators.	Within five business days following the meeting
RC-5	Third-Party Evaluators	Third-party evaluators incorporate EWR Collaborative feedback and begin execution of existing measure review and measure calibration research.	September
RC-6	Third-Party Evaluators	Third-party evaluators provide high-level updates on calibration studies (as requested by EWR Collaborative). Note some studies may need additional time to be completed, and therefore, this timeframe should be used as a guide with actual research time to be indicated and approved in research plan.	September - April
RC-7	Third-Party Evaluators	Third-party evaluators present measure calibration study results.	April EWR Collaborative meeting
RC-8	Third-Party Evaluators	Third-party evaluators follow the steps outlined for Modified Measures, and submit workpapers for measure review and calibration research findings which update current MEMD measure parameters.	May 1