A Proposal to Expand the Calibration Research Agenda

Presentation to Energy Optimization Collaborative

September 2015

DTE Energy

Consumers Energy
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ENERGY

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Agenda

1. MEMD Evolution & Calibration History
2. Collaborative Research Needs & Opportunities
3. Prioritization Process
4. Collaborative Research Opportunities
5. Next Steps

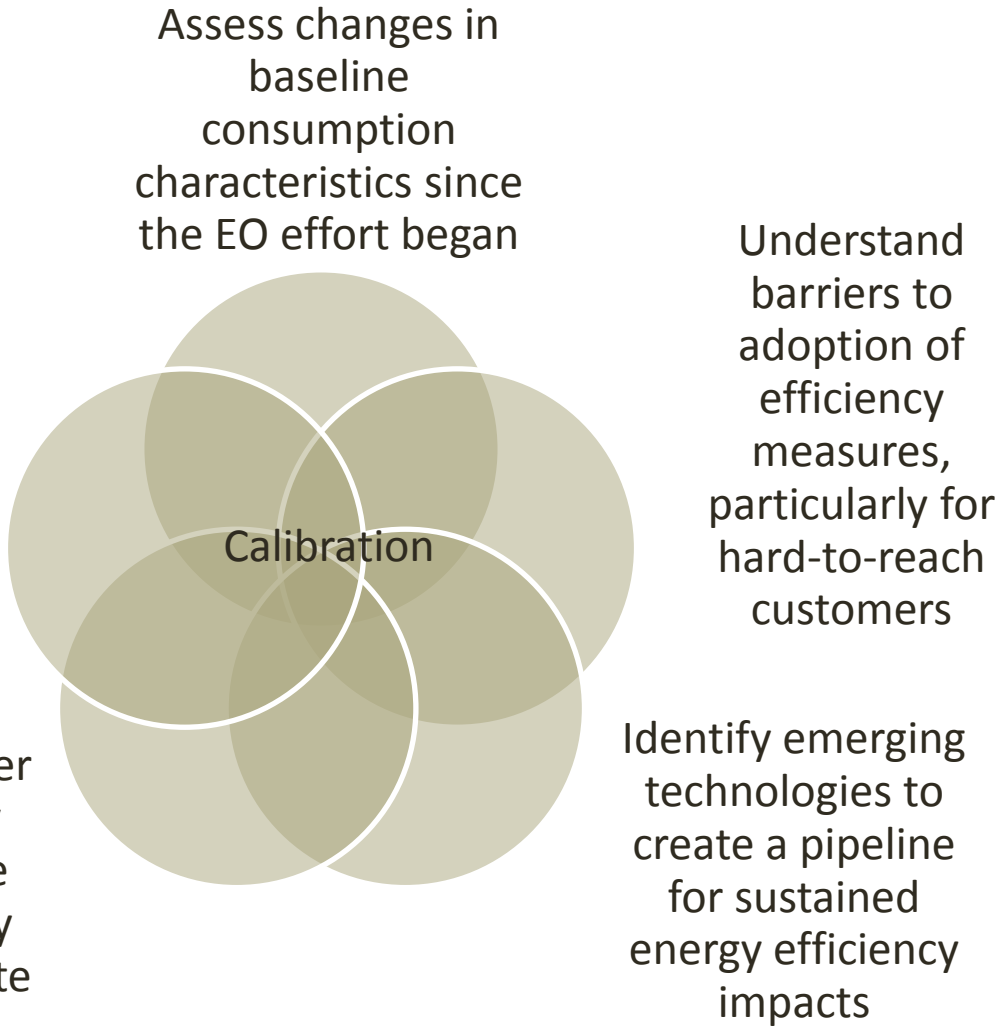
Calibration History

- Major research efforts completed:
  - Residential lighting hours of use studies
  - C&I lighting controls study
  - Recycled appliances metering study
  - Domestic water heating use metering study
  - Upstream lighting impact attribution study
  - Commercial thermostat study
  - C&I lighting hours of use study
- Recalibration studies
  - Appliance Recycling Savings Update
  - Home Energy Reports Modeling Update
- Results have been incorporated into the MEMD
- Calibration research has represented 10-15% of evaluation budgets

State of the MEMD

- Calibration has occurred for 70-80% of historical portfolio savings
- Some of the calibration studies are considered industry benchmarks and are being used in other states (e.g., water metering study)
- Most of the large savings measures have been addressed
  - Assumptions borrowed from other states have been replaced with Michigan specific characteristic data
- New measures introduced into the MEMD are subjected to a rigorous review and often utilize calibration research for key inputs to savings calculations

Expanded Collaborative Research Opportunities

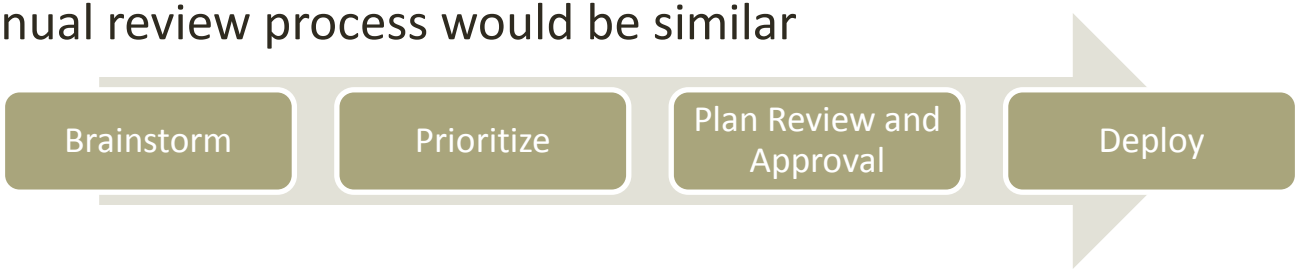


Collaborative Research Ideas

Residential LED Net-to-Gross Research	Emerging Technology Studies	Baseline Study
What is the DTE/Consumers program influence or program-attributable sales of LED program-incented bulbs?	What are potential emerging technologies in MI? What is holding adoption back? What can be done to further advance these technologies?	What is the current saturation of baseline and energy efficient measures? What is the current market share of high efficiency energy consuming equipment?
Market Transformation Research	**Program-Specific Research Studies**	**Issue-Specific Research Studies**
What has been the impact of driving the market and adoption of emerging measures, outside of direct participation in a utility rebate program?	Are there any program-specific challenges across utilities that could benefit from further research?	For example: A joint study related to 111(d)planning/compliance options, related directly to the role of EE.
Income Qualified Research	**Gas Measure Savings Study**	**Potential Analysis**
Assess the baseline for the income-qualified housing stock in order to assess the savings potential. Assess bill savings and arrearage impacts of income-qualified projects.	Identify new gas measures that can be adopted to address uncertainty in gas portfolio. What other strategies may Michigan's largest gas consumers employ?	What is the residential and commercial technical, economic and program potential for efficiency in Michigan based on current saturation of baseline and energy efficient measures?

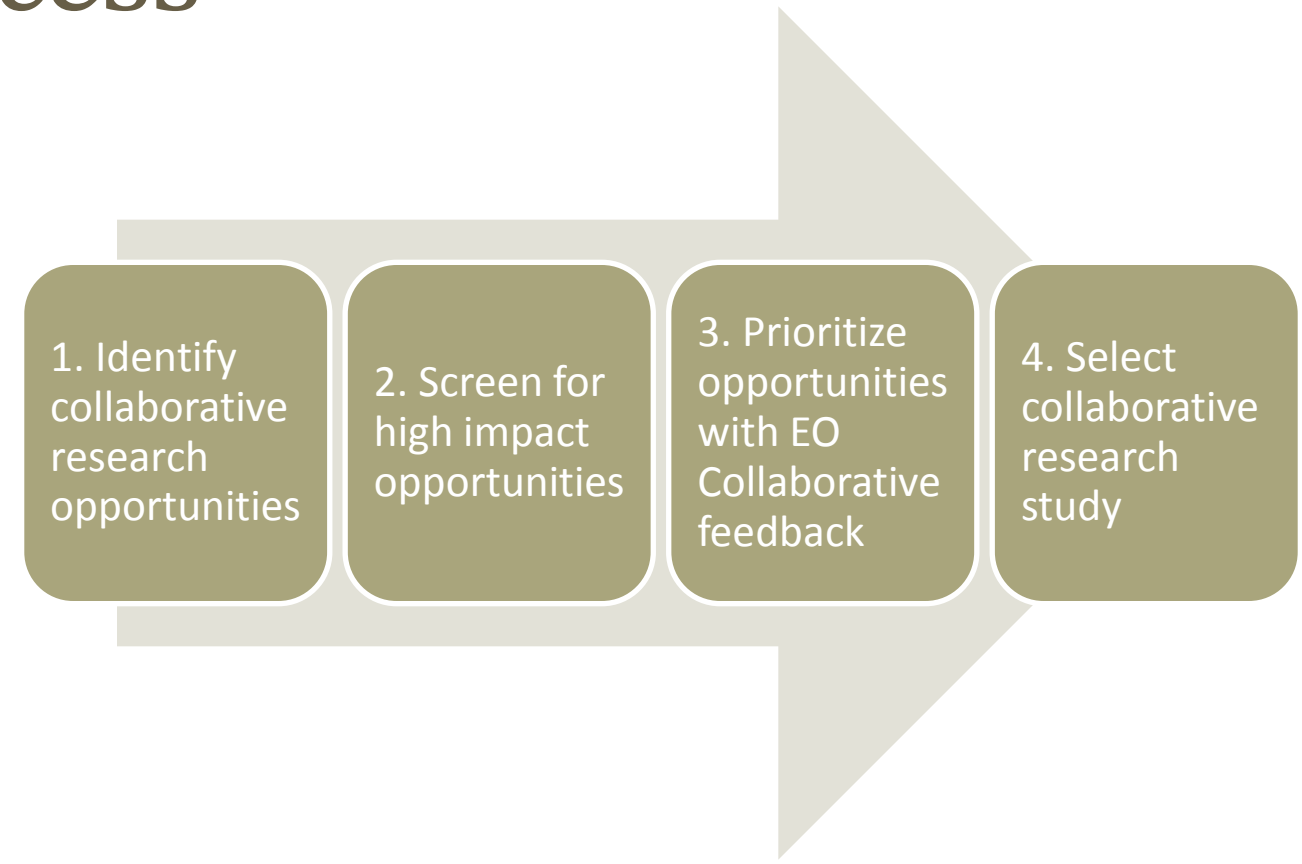
Prioritizing Collaborative Research

- Expand upon the current framework used for prioritizing calibration research
  - Magnitude of the savings opportunity
  - Degree of uncertainty
- Other criteria could include:
  - Operational excellence/continuous improvement
  - Study difficulty/cost
  - Need for a collaborative study
- Annual review process would be similar



- Like calibration, other collaborative research studies will be multi-year efforts

Collaborative Prioritization Process



Prioritization Framework

Collaborative Study Criteria	Definition	Key
Operational Excellence/Continuous Improvement	Assessment of the opportunity to improve operational excellence, including aligning with industry best practices and opportunity for industry leadership and innovation.	3-High Improvement Opportunity *[impact several programs/measures]* 2-Medium Improvement Opportunity *[impact more than one program/measures or single measure with medium contribution]* 1-Low Improvement Opportunity *[impact single program/measure]*
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***Collaborative* Study Alignment**	Assessment of whether there are efficiencies gained through a collaborative study, in comparison to meeting a utility-specific need.	3-High Alignment Opportunity *[utilities would benefit most from statewide collaborative study with statewide objectives]* 2-Medium Alignment Opportunity *[utilities could benefit from collaborative study, but utility-specific objectives may need to be considered]* 1-Low Alignment Opportunity *[utilities have high priority utility-specific objectives]*

DTE and Consumers Prioritization

Collaborative Study	Operational Excellence/ Continuous Improvement	Magnitude of Savings	Degree of Uncertainty	Difficulty/ Cost	Need for Collaborative Study	Overall Score
Market Transformation Research	2.5	2.0	2.5	1.5	3.0	2.3
Potential Analysis	2.0	2.0	2.0	3.0	2.5	2.3
MEMD Calibration	2.5	1.0	2.0	2.0	3.0	2.1
Emerging Technology Studies	2.0	1.0	3.0	2.0	2.5	2.1
Issue-Specific Research	3.0	1.0	2.5	1.0	3.0	2.1

*DTE Energy, Consumers Energy and evaluators independently prioritized and ranked study criteria, therefore the scores reflected above are averages, and do not reflect whole numbers.

Proposal

- Expand current calibration research framework to include other opportunities for collaboration to support
  - Industry leadership and innovation
  - Deployment of best practices
  - Establishment of compliance paths with federal or state policies
- Leverage current process to identify, prioritize, and deploy joint research initiatives
- Seek EO Collaborative input on research ideas and approaches

Collaborative Feedback (Discussion & Decision)

- Proposal: Provide an opportunity for EO Collaborative to review proposed collaborative studies and provide feedback on study prioritization.

EO Collaborative Meeting	Topic
October	Working group session to discuss study prioritization ranking and finalize research topic
November	Present high level research proposal on final research topic

Collaborative Homework

- Review objectives, research approach, and considerations for five potential collaborative studies.
- Complete prioritization matrix for five studies and prepare to discuss during the October EO Collaborative meeting.

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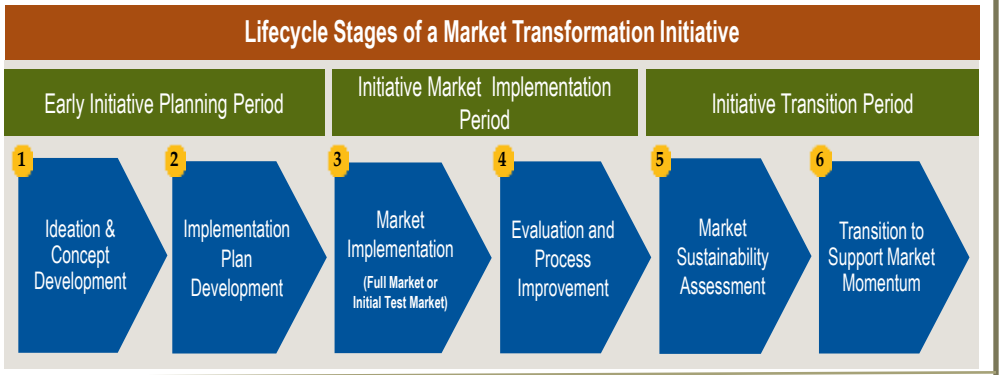
MEMD Measure Calibration

Objectives	Ensure MEMD savings values, within an acceptable level of precision, represent the actual energy savings being realized through measure installation.	

Research Approach	• Review and prioritize MEMD measures based on past evaluations and upcoming program plans
	• Calibration efforts vary by measures but can include:
	  • Collecting primary data collection via metering/on-sites (high cost)
	  • Leveraging existing evaluation data (low cost)	

Considerations: + and –	• Established protocol with MPSC and other stakeholders, provides assurance to interveners • MEMD measures account for the majority of savings currently realized through the EO programs	• A majority of measures have been calibrated during the EO program five year history -> future studies are calibrating measures at the margins • Expensive research efforts

Market Transformation

Objectives	• Develop framework for attribution for market transformation resulting from utility programs and efforts. • Develop methodology for forecasting baseline changes without utility programs and attribution for improvements above the forecasted baseline. • Identify high potential technologies and end-uses where combined Michigan utility programs are likely to transform the market.
Research Approach	1. Develop frame work 2. Identify key transformation opportunities 3. Develop methodology for attribution 
Considerations: + and –	+ All utility energy efficiency programs seek to cause long-term and lasting change in the market for energy efficiency. Market transformation requires concerted and coordinated efforts from all utilities in the state. A framework and metrics for attribution is required so that the utilities can fund and pursue market transformation. – Market transformation may be driven by many exogenous factors. Attribution may be hotly contested. DTE and Consumer's have ongoing work in this area, so there may be duplication. – Some commissions have been unwilling to accept and support market transformation attribution.

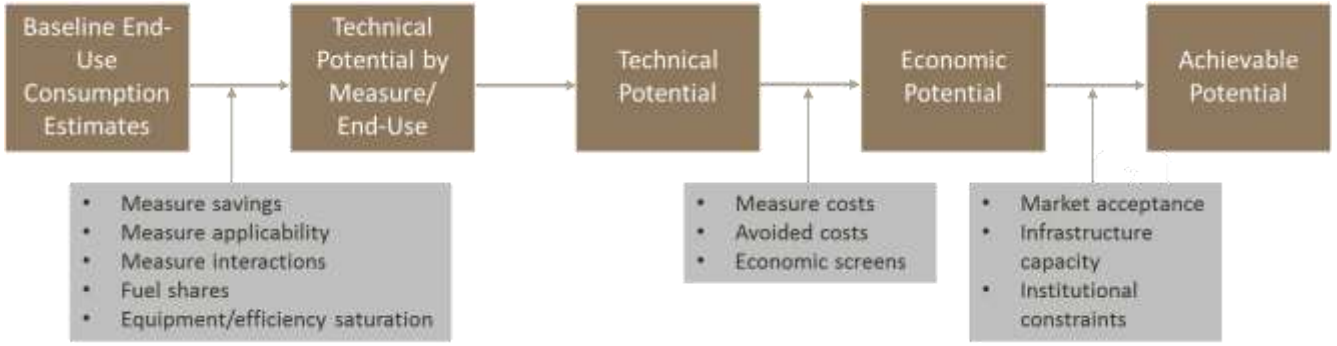
Statewide Potential Analysis

Objectives

Forecast of technical, economic, and achievable energy efficiency potential in the state based on:

- Current use of energy
- Expected economic conditions
- Available efficient technology performance and cost
- Market acceptance and adoption of efficient technologies

Research Approach



Considerations: + and –

+ Common assessment of potential will guide establishment of savings targets, further refinement of the MEMD, collaborative program opportunities. Modest investment if recent baseline research has been conducted and a robust technology database exists.

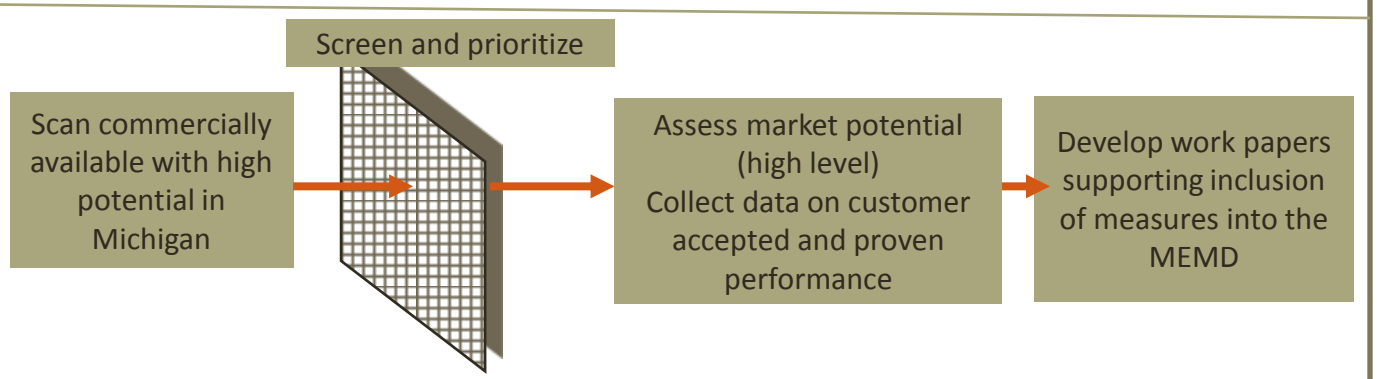
– A statewide study may not support individual utility Integrated Resource Plan development. Recent statewide baseline data is required for the study.

Emerging Technologies

Objectives

- Identify and characterize commercialized emerging energy efficiency technologies that offer significant potential in Michigan for savings in the 2017 to 2020 time frame.
- For high potential technologies, develop work papers supporting savings values for inclusion in the MEMD.

Research Approach



Considerations: + and –

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With changing baselines, it is becoming increasingly difficult to meet energy savings goals with established technologies. There are multiple emerging, commercialized technologies with high savings. Collaborative research on identifying and qualifying these measures could reduce costs and accelerate acceptance into utility programs.

–

DTE and Consumer's have ongoing work in this area, so there may be duplication. The technologies may not have sufficiently demonstrated performance to warrant inclusion in the MEMD. Many emerging technologies include controls and behavior components and may be not be suitable for a deemed or "a calculated deemed" value.

Issue Specific Research

Objectives	• Explore topics related to energy efficiency potential, program design and implementation, state or federal policies that impact implementation • Generate common understanding of current issues that impact energy efficiency program implementation.	
Research Approach	• Would vary depending on topic but would likely include literature review, stakeholder and/or technical expert interviews, scenario development, and summary reporting.	
Considerations: + and –	Collaborative research on key topics would allow provide an unbiased review of key topics. The collaborative research model would allow consolidation of resources to examine multiple perspectives of key issues.	Some of the issues impacting energy efficiency are complex and evolving; this may make it difficult to conduct discrete research on a topic that remains relevant for a significant length of time.

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