

## ComEd Technical Reference Manual CY2021 Evaluation Plan

### Introduction

The purpose of the Illinois Technical Reference Manual (TRM) is to provide a transparent and consistent basis for calculating energy and demand savings in Illinois.<sup>1</sup> The overall goal of this evaluation research is to improve the TRM input parameter assumptions. All evaluators in Illinois, including Guidehouse, are part of the Illinois Stakeholder Advisory Group (SAG) and Technical Advisory Committee (TAC) and are charged with providing materials to continually update and improve the TRM to provide the most accurate input parameter assumptions and impact evaluation methodology.

This evaluation research plan summarizes Guidehouse's approach for conducting evaluation research to update measures in the TRM. The purpose of this plan is to provide a summary of the prioritization framework and to outline the methodology for secondary and primary research efforts.

### Evaluation Research Topics

The objectives of TRM evaluation research are:

1. Utilize framework for ongoing evaluation research contributions to TRM updates, including scope and schedule for such activities.
2. Promote statewide coordinated evaluation research efforts through the TAC.
  - a. Outline status update and communication processes to keep interested stakeholders apprised of this work and provide stakeholders meaningful opportunities to comment.
  - b. Work with the TAC and TRM administrator to provide valuable input while avoiding duplication of efforts.
  - c. Share results with ComEd, the Illinois gas utilities, Ameren Illinois and their evaluator, and other TAC members (e.g., Citizen Utility Board [CUB], Environmental Law and Policy Center [ELPC]).
  - d. Participate in annual prioritization for TRM evaluation research in conjunction with the TAC, including attending and providing feedback during research prioritization and TRM measure prioritization meetings.
3. Review current TRM measures and priority recommendations from the TAC to develop evaluation research based on energy savings, historical realization rates, variability and uncertainty in measure impacts, feasibility to update, relative contributions of measures and planned future use, among others.
4. Conduct secondary research to develop comparable industry benchmarks for selected measures and propose standardized deliverables for secondary research including inputs to TRM measure work papers.
5. Determine appropriate thresholds for determining when to conduct primary evaluation research. Upon selection, develop appropriate methods to conduct such research.

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<sup>1</sup> Policy Document for the Illinois Statewide Technical Reference Manual for Energy Efficiency, [https://ilsag.s3.amazonaws.com/IL-TRM\\_Policy\\_Document-Version-3.0\\_Final\\_9-19-19.pdf](https://ilsag.s3.amazonaws.com/IL-TRM_Policy_Document-Version-3.0_Final_9-19-19.pdf)

## Evaluation Approach

This evaluation plan segments activities for TRM research into four discrete activities, as summarized in Table 1 below. We expect to conduct these activities on an ongoing basis, resulting in an updated list of measures for evaluation research each year.

**Table 1. Summary of Activities, Tasks, and Deliverables**

Activity	Tasks	Deliverables
Statewide Coordination	<ul style="list-style-type: none"> <li>Participate in Illinois SAG and TAC meetings</li> <li>Participate in statewide coordination among utilities, evaluators, and stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>TAC meeting to discuss planned secondary and primary research</li> <li>Evaluation plans and activities reflect statewide coordination</li> </ul>
TRM Research Prioritization	<ul style="list-style-type: none"> <li>Utilize framework for determining high impact measures for secondary and primary research</li> <li>Determine gaps in current TRM research plan</li> </ul>	<ul style="list-style-type: none"> <li>Annual list of secondary and primary research priorities</li> </ul>
Secondary Research	<ul style="list-style-type: none"> <li>Conduct literature review</li> <li>Conduct engineering review, including review of past measure participation</li> </ul>	<ul style="list-style-type: none"> <li>Secondary research memo</li> <li>TRM workpaper</li> </ul>
Primary Research	<ul style="list-style-type: none"> <li>Conduct primary research effort through metering, data collection, modeling, or other engineering method</li> </ul>	<ul style="list-style-type: none"> <li>Primary research evaluation plan (as needed)</li> <li>Primary research memo</li> <li>TRM workpaper</li> </ul>

### Statewide Coordination

Guidehouse prioritizes and coordinates evaluation research with relevant stakeholders, including the following:

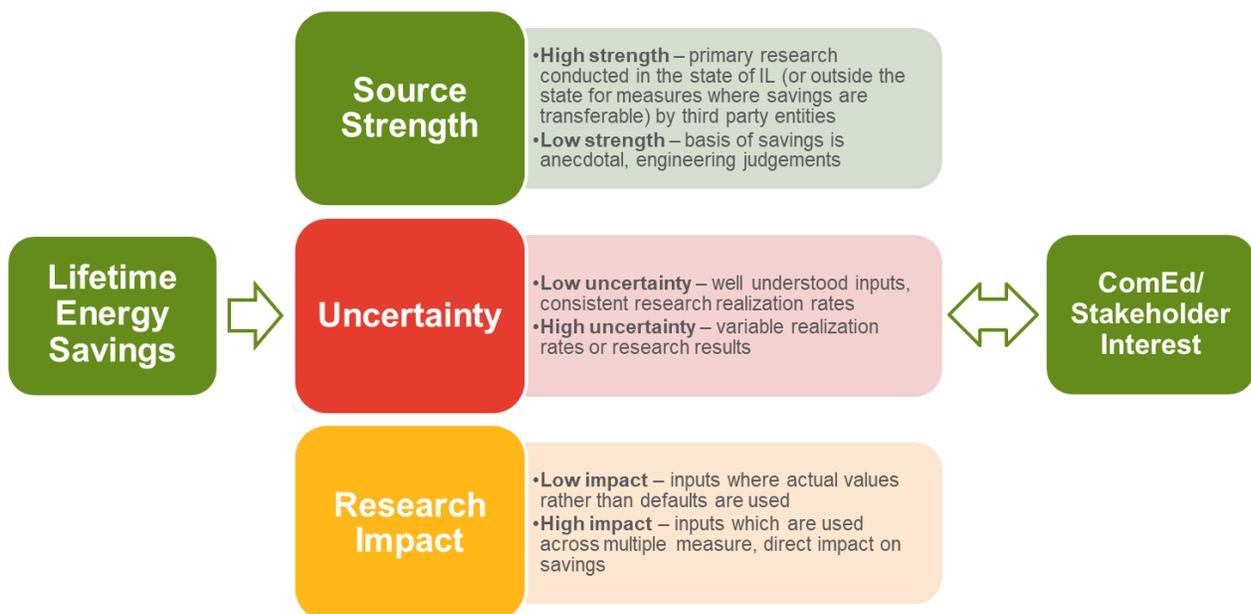
- Ameren Illinois evaluation team.** Guidehouse holds monthly calls with the Ameren Illinois evaluation team and coordinates on statewide evaluation research.
- Illinois Gas Utilities.** Guidehouse also evaluates Nicor Gas', Peoples Gas' and North Shore Gas' energy efficiency programs and will coordinate with our internal team on research items of interest to the gas utilities.
- Continued Illinois SAG and TAC participation.** Guidehouse will continue to participate in Illinois SAG and TAC meetings to engage stakeholders at key stages of evaluation research plan development to ensure that objectives and methodology align with statewide and regional goals and other ongoing research (such as similar studies in other regions when relevant). Additionally, Guidehouse will notify the TAC of the primary research planned during the TRM update process and will report out on research efforts during TAC calls.

### Measure Prioritization

Guidehouse has developed a prioritization framework for TRM evaluation research tasks. The purpose of this framework is to aid the TRM Administrator and TAC in identifying current TRM measures that have the highest potential for updating current TRM algorithms or savings estimates. Figure 1 below provides a schematic of the prioritization framework. Guidehouse will update this framework as needed, based on new information about technologies, measures, or programs. The framework considers the following:

- **Energy Savings.** Prioritize measures with significant planned Cumulative Persisting Annual Savings (CPAS) or high anticipated savings.
- **Measure Research Criteria.** Rank each measure based on three criteria. Guidehouse uses a one to five ranking for the three below criteria, where a five represents a high need for research and a one represents a low need for research.
  - **Source strength** – Focus on measures which have not been well-studied recently. We will prioritize updates to measures with references noted by industry as “weak”, e.g., values based on another state, values based on engineering simulations instead of primary data collection, or values which do not account for significant interactive effects.
  - **Uncertainty of measure savings** – Consider evaluated research realization rates over time, program changes, or measure mix changes.
  - **Research impact** – Consider how likely the results from the research will develop into significant TRM updates.
- **Stakeholder and utility interest.** Consider interest from ComEd or other stakeholders in developing measure research priorities.

**Figure 1. TRM Evaluation Research Prioritization Schematic**



Source: Guidehouse

The framework will assist Guidehouse in (1) identifying gaps in our current TRM research plans and (2) determining the appropriate level of rigor for each research effort. The following tables present results from the CY2019 high impact measures list by energy savings and whether there is a current or planned research initiative.

**Table 2. Commercial & Industrial Measure Prioritization**

End Use Type	Verified Gross First Year Savings (kWh)	Percent Impact on First Year Savings	Verified Gross Lifetime Savings (kWh)	Percent Impact on Lifetime Savings	Research?	Target TRM Version Update
Lighting	763,842,893	62%	8,997,278,146	60%	TRM updates are planned for wattage, lumen, and cost values	V10
Voltage Optimization	184,041,503	15%	2,760,622,546	18%		
Other (Custom, RCx, etc.)	136,347,404	11%	1,472,015,313	10%	Review Custom Program data for instances of Hydraulic Oils and Gear Lubricants measures	V10
Compressor system	37,607,241	3%	257,507,152	2%	EUL research proposal for 2021	V11+
Other (HVAC)	28,655,367	2%	489,580,369	3%	Research into HVAC fan energy factor for C&I applications for Small Commercial Thermostats measure	V10
EC Motor for Cooler or Freezer	15,647,358	1%	220,324,709	1%		
Other (Refrigeration)	11,711,870	1%	110,219,554	1%		
Other (Industrial Systems)	9,170,530	1%	131,201,156	1%	Review Industrial Systems Program data for instances of Vortex Tube Thermostat measure Review Industrial Systems Program data for instances of Hydraulic Oils and Gear Lubricants measures	V10
Occupancy Sensor & Other Controls	6,769,427	1%	51,494,348	0%	Possible research into Networked Lighting Controls	V11
EMS	6,713,766	1%	100,706,494	1%		

End Use Type	Verified Gross First Year Savings (kWh)	Percent Impact on First Year Savings	Verified Gross Lifetime Savings (kWh)	Percent Impact on Lifetime Savings	Research?	Target TRM Version Update
Other					Research outside the areas listed above includes: - Review Data Centers Program data for instances of Energy Efficient Rectifiers measure - Propose new measures for Computer Room AC/HP and EC Plug Fans based on Data Centers Program - Review ISR, end uses, and hours of operation for Smart Sockets measure in the Small Business Kits Program	- Data Centers V10 - Smart Sockets V10-V11
<b>Total*</b>	<b>1,241,205,626</b>	<b>100%</b>	<b>15,118,489,019</b>	<b>100%</b>		

\* Indicates that these are total values for the sector, not for the tabulated values.

Source: Guidehouse Analysis

**Table 3. Residential Measure Prioritization**

End Use Type	Verified Gross First Year Savings (kWh)	Percent Impact on First Year Savings	Verified Gross Lifetime Savings (kWh)	Percent Impact on Lifetime Savings	Research?	Target TRM Version Update
LED Lamps and Fixtures	330,619,382	76%	3,395,721,741	77%	TRM updates are planned for wattage and lumen values	V10
Freezer & Refrigerators - Recycled	40,347,877	9%	262,261,201	6%		
Advanced Thermostat	24,179,231	6%	265,971,538	6%		
ECM Furnace Blower & Motor	7,840,846	2%	117,612,686	3%		
Air Purifier	5,998,518	1%	53,986,662	1%		
Advanced Power Strips Tier 1	4,669,766	1%	32,688,363	1%		
Dehumidifier	4,254,792	1%	51,057,509	1%		
Room & Central Air Conditioner	3,286,122	1%	58,302,100	1%		
Low Flow Showerhead	3,034,930	1%	30,349,304	1%		
Clothes Washer	2,814,403	1%	39,401,648	1%		
<b>Total*</b>	<b>435,945,257</b>	<b>100%</b>	<b>4,416,911,301</b>	<b>100%</b>		

\* Indicates that these are total values for the sector, not for the tabulated values.  
Source: Guidehouse Analysis

**Table 4. Income Eligible Measure Prioritization**

End Use Type	Verified Gross First Year Savings (kWh)	Percent Impact on First Year Savings	Verified Gross Lifetime Savings (kWh)	Percent Impact on Lifetime Savings	Research?	Target TRM Version Update
LED Lamps and Fixtures	157,809,790	89%	1,520,149,959	85%	TRM updates are planned for wattage and lumen values	V10
Advanced Power Strips Tier 1	10,972,642	6%	76,808,493	2%		
Low Flow Showerhead	1,551,648	1%	15,516,479	1%		
Kitchen & Bathroom Faucet Aerator	1,277,719	1%	12,777,187	1%		
Air Sealing	898,069	1%	17,961,379	2%		
Attic/Wall/Basement /Floor/Foundation Insulation	888,928	1%	17,778,566	0%		
Room & Central Air Conditioner	613,598	0%	10,786,935	1%		
Other (Shell)	594,907	0%	12,066,147	1%		
Other (HVAC)	588,059	0%	10,938,747	1%		
Refrigerator & Freezer	571,038	0%	9,547,584	0%		
<b>Total*</b>	<b>177,533,607</b>	<b>100%</b>	<b>1,728,040,923</b>	<b>100%</b>		

\* Indicates that these are total values for the sector, not for the tabulated values.

Source: Guidehouse Analysis

### Secondary Evaluation Research

Secondary evaluation research efforts will (1) inform near-term updates to the TRM and (2) assess need for a primary research effort. Secondary evaluation research efforts may include reviewing applicable state TRMs, conference papers (e.g., IEPEC, ACEEE), consulting internal and external industry experts, reviewing previous measure-level evaluation findings, and reviewing available cost or technology data from stakeholders.

There are two deliverables typically associated with the secondary evaluation research effort; a research findings memo and TRM measure workpaper, outlined in the table below.

**Table 5. Secondary Evaluation Research Deliverables**

Deliverable	Description
Secondary Research Memo	<p>The secondary research memo will typically include the following sections:</p> <ul style="list-style-type: none"> <li>• Background               <ul style="list-style-type: none"> <li>○ Measure prioritization, i.e., why Guidehouse conducted secondary research on this measure</li> <li>○ Description of measure technology and role in ComEd portfolio</li> </ul> </li> <li>• Methodology               <ul style="list-style-type: none"> <li>○ Sources reviewed (research papers, TRMs, conference papers, industry experts)</li> <li>○ Type of engineering/econometric review performed</li> </ul> </li> <li>• Findings               <ul style="list-style-type: none"> <li>○ Findings from literature review</li> <li>○ Findings from engineering or econometric review</li> </ul> </li> <li>• Recommendations               <ul style="list-style-type: none"> <li>○ Changes recommended to the TRM in the short term</li> <li>○ Recommendations for additional primary or other type of research</li> </ul> </li> </ul>
TRM Workpaper	<p>A TRM workpaper will include TAC submittal procedure and deadlines to share this information with statewide stakeholders and to submit workpapers to the TAC by May 15 of each year to be incorporated into future versions of the TRM. An example is embedded here:</p> <div style="text-align: center;">             Illinois_Statewide_TRM_Workpaper_Rev         </div>

Source: Guidehouse

### Primary Evaluation Research

Once a need for primary evaluation research is identified, Guidehouse will work with ComEd, and relevant stakeholders as appropriate, to plan and deliver primary evaluation research. Primary evaluation research could include any ComEd territory-specific data collection or analysis effort, including:

- On-site metering
- Billing analysis
- Modeling
- Surveys/Interviews/Observations
- Collection of cost data

## Evaluation Schedule

The table below includes a general schedule for TRM evaluation research.

**Table 6. Schedule – Key Deadlines**

Activity or Deliverable	Responsible Party	Date
2021 TRM research priorities established by stakeholders (complete)	Evaluation/ComEd/Stakeholders	October 31, 2020
Evaluation review/prioritization (complete)	Evaluation	October 31, 2020
Secondary research	Evaluation	January 1 - May 15, 2021
Submit TRM workpapers	Evaluation	May 15, 2021
Feedback to inform next TRM prioritization	Evaluation	August 31, 2021
2022 TRM research priorities established by stakeholders	Evaluation/ComEd/Stakeholders	October 31, 2021