

COMED EVALUATION RESEARCH: IL TRM MEASURE UPDATES

This evaluation research plan summarizes Navigant's approach for conducting evaluation research to update measures in the Illinois Technical Reference Manual (IL 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. We expect these activities to occur on a rolling basis each year during the four-year period.

1. BACKGROUND

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

2. STUDY OBJECTIVES

The objectives of IL TRM evaluation research are:

- 1) Develop a framework for ongoing evaluation research contributions to IL 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 IL TRM administrator to provide valuable inputs while avoiding duplication of efforts.
 - c. Share results with ComEd, gas utilities, the Ameren evaluator, implementers, and other relevant stakeholders.
 - d. Establish timing for annual prioritization updates 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 IL TRM measures and priority recommendations from TAC to develop evaluation research based on energy savings, historical realization rate, 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 IL TRM measure work papers.
- 5) Determine appropriate threshold for determining when to conduct primary evaluation research. Upon selection, develop appropriate methods to conduct such research.

3. PROPOSED TASKS AND ACTIVITIES

The scope of work outlines activities for this research into four discrete tasks, as summarized in Table 1 below. A schedule of activities is included after this table. As stated above, we expect to conduct these activities each year on an ongoing basis, resulting in an updated list of measures for evaluation research each year.

¹Policy Document for the Illinois Statewide Technical Reference Manual for Energy Efficiency, http://ilsagfiles.org/SAG_files/Technical_Reference_Manual/Policy%20Document%20for%20IL%20TRM%2010-25-12.pdf

Table 1. Summary of Tasks, Activities and Deliverables

Tasks	Activities	Deliverables
Task 1: Statewide Coordination	<ul style="list-style-type: none"> • Participation in Illinois SAG and TAC meetings • Participate in statewide coordination among utilities, evaluators and stakeholders 	<ul style="list-style-type: none"> • Summary action items from monthly meeting with the Ameren Illinois evaluation team • Summary action items from monthly meeting with IL gas utilities evaluation team • TAC meeting to discuss planned secondary and primary research
Task 2: Prioritization	<ul style="list-style-type: none"> • Define framework for determining high impact measures for secondary and primary research 	<ul style="list-style-type: none"> • Annual List of secondary and primary research priorities (2018 list included as last section of this research SOW)
Task 3: Secondary Research	<ul style="list-style-type: none"> • Conduct literature review • Conduct engineering review, including review of past measure participation 	<ul style="list-style-type: none"> • Secondary Research Memo • TRM Work Paper
Task 4: Primary Research	<ul style="list-style-type: none"> • Conduct primary research effort through metering, data collection, modeling, or other engineering method 	<ul style="list-style-type: none"> • Primary Research Evaluation Plan • Primary Research Memo • TRM Work Paper

3.1 Task 1: Statewide Coordination

Navigant coordinates evaluation research with relevant stakeholders to prioritize and conduct a coordinated research effort, including the following:

- **Ameren Illinois evaluation team.** Navigant holds monthly calls with the Ameren Illinois evaluation team and coordinates on statewide evaluation research. Navigant will prepare a summary of action items from each monthly call for distribution.
- **Illinois Gas Utilities.** Navigant 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 (e.g., air sealing and insulation). Navigant will prepare a summary of action items from each monthly call for distribution.
- **Continued IL SAG and TAC participation.** Navigant will continue to participate in IL 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. Additionally, Navigant will notify the TAC of the primary research planned during the TRM update process and will report out on research efforts during annual prioritization calls.

3.2 Task 2: Measure Prioritization

Navigant has developed a prioritization framework for TRM evaluation research tasks. Figure 1 below provides a schematic of the prioritization framework. The purpose of this framework is to aid the IL TRM Administrator and TAC in identifying current TRM measures that have the highest potential for updating current TRM algorithms or savings estimates. This task or a subset of this task will be updated each year, as needed, based on new information about technologies, measures or programs.

The framework prioritizes the following for primary research efforts:

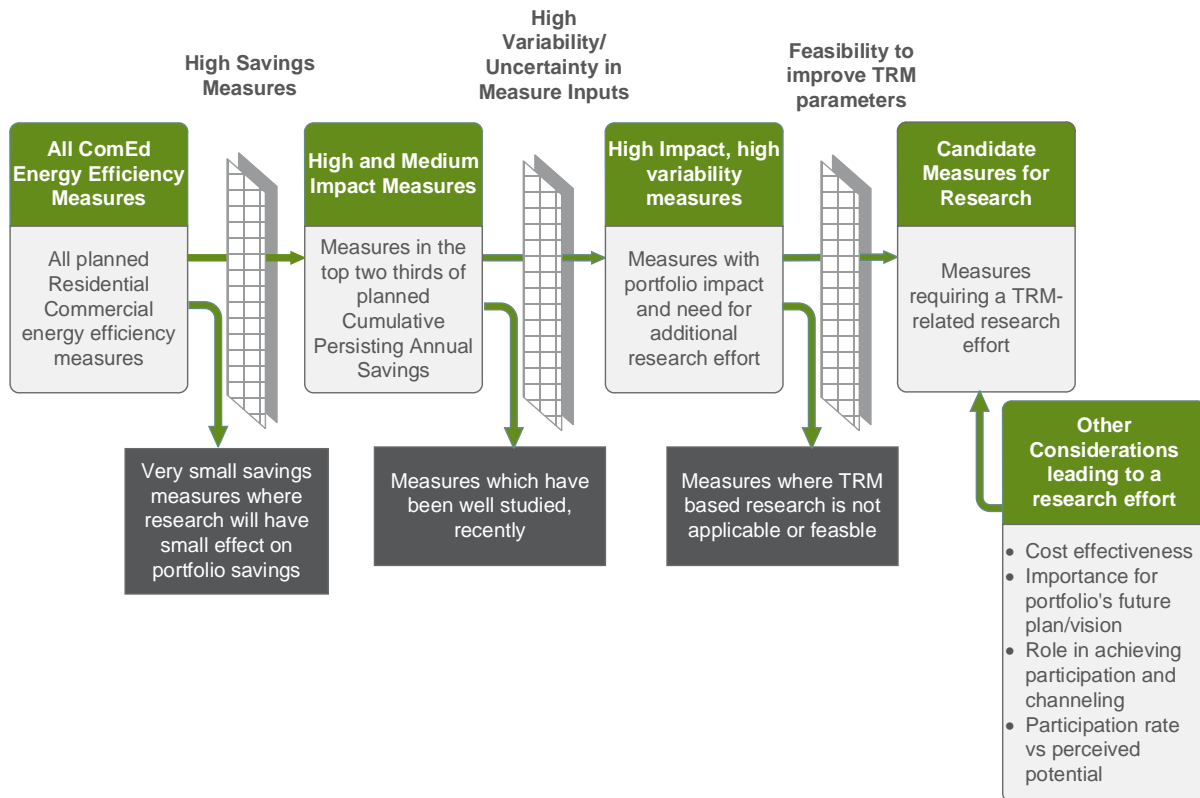
- **Energy Savings.** We will first prioritize measures with significant planned Cumulative Persisting Annual Savings (CPAS) and/or historic participation.
- **High variability/uncertainty in measure inputs.** We will focus on measures which have not been well-studied recently. We will also consider evaluated realization rates over time, program changes, or measure mix changes.
- **Feasibility to improve TRM parameters.** We will consider how the research will feed into TRM updates. 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 count for significant interactive effects.^{2,3} Our focus will be to build the IL TRM to industry best practice.

Navigant will refine this criteria for prioritization year over year with enhanced cross-cutting evaluation research and input from stakeholders.

² Seth Nowak, Maggie Molina, and Martin Kushler, ACEEE, Report U1712: *Recent Developments in Energy Efficiency Evaluation, Measurement, and Verification*, October 2017

³ SEE Action Guide for States: Guidance on Establishing and Maintaining Technical Reference Manuals for Energy Efficiency Measures, June 2017

Figure 1. TRM Evaluation Research Prioritization Schematic



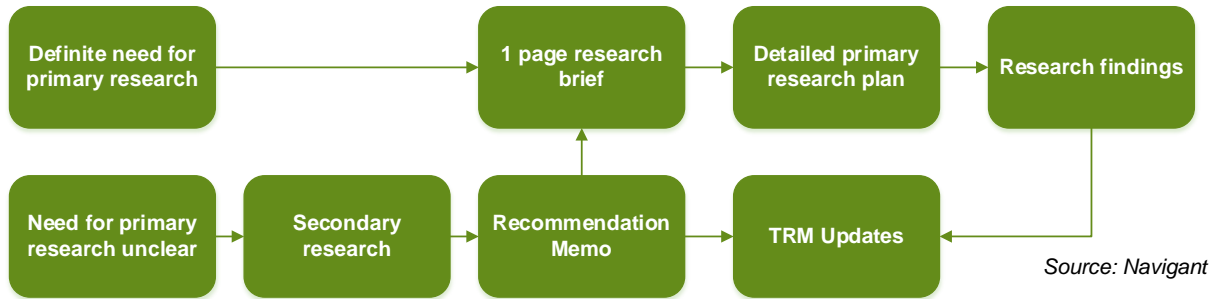
Source: Navigant

3.3 Task 3: Secondary Evaluation Research

For measures identified as evaluation research priorities through the above prioritization process or by ComEd or other Illinois stakeholders, we will conduct an initial secondary research effort. This secondary research effort will (1) inform near-term updates to the TRM (2) assess need for a primary research effort. As a part of the secondary research effort we will review applicable state TRMs, conference papers (e.g., IEPEC, ACEEE), consult internal and external industry experts, and review available cost or technology data from stakeholders.


Generally, secondary evaluation research will precede and inform primary research efforts to gather appropriate information. However, in some cases, the secondary research task may be by-passed. (e.g., secondary research was performed recently, or ComEd is piloting a program). In these cases, Navigant will move ahead with scoping the research effort, without delivering a secondary research recommendation memo, as shown in Figure 2.

Figure 2. Evaluation Research Process Flow



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

Table 2. 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"> • Background <ul style="list-style-type: none"> ○ Measure prioritization, i.e., why Navigant conducted secondary research on this measure ○ Description of measure technology and role in ComEd portfolio • Methodology <ul style="list-style-type: none"> ○ Sources reviewed (research papers, TRMs, conference papers, industry experts) ○ Type of engineering/econometric review performed • Findings <ul style="list-style-type: none"> ○ Findings from literature review ○ Findings from engineering/econometric review • Recommendations <ul style="list-style-type: none"> ○ Changes recommended to the TRM in the short term ○ Recommendations for additional primary or other type of research
TRM Work Paper	<p>The TRM work paper will include the same format Navigant has provided in the past for TRM measure-level updates. Navigant will follow the TAC submittal procedure and deadlines to share this information with statewide stakeholders and to submit work papers to the Technical Advisory Committee (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;">  <p>Illinois_Statewide_TRM_Workpaper_Rev</p> </div>

Source: Navigant

3.4 Task 4: Primary Evaluation Research

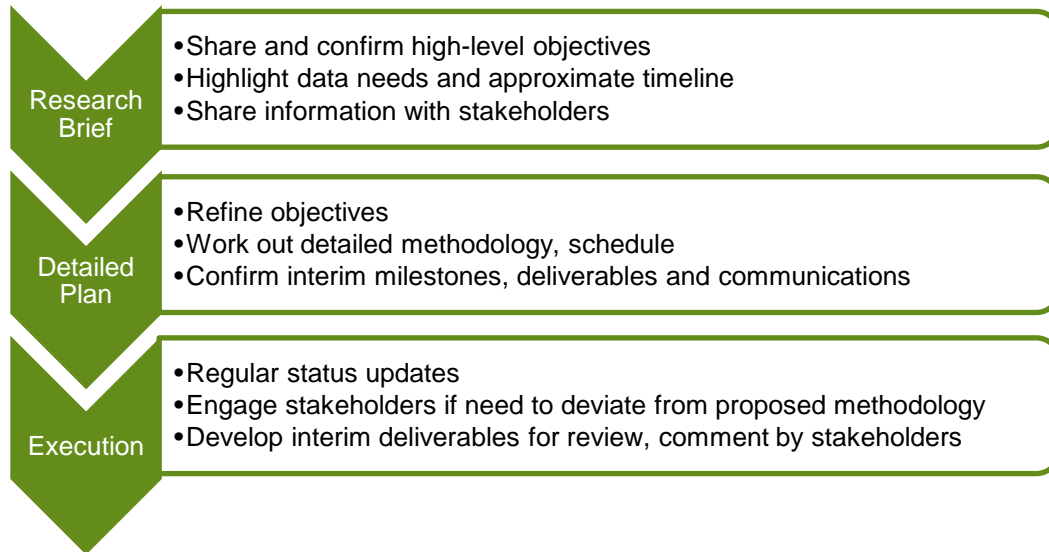
Navigant will conduct primary evaluation research for measures identified as high priority via the pathways described above. Primary research could include any ComEd territory specific data collection or analysis effort including:

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

Once a need for primary evaluation research is identified, Navigant will prepare a short evaluation research brief as a preliminary step in scoping primary research efforts. The purpose of a research brief is to share information with stakeholders to confirm high-level objectives, data needs, and preliminary timeline. Depending on the scope of the proposed primary evaluation research, Navigant may draft additional detailed evaluation research plans after preliminary planning. Figure 3 below shows how

Navigant will work with ComEd, and relevant stakeholders as appropriate, to plan and deliver primary evaluation research.

Figure 3. Primary Evaluation Research Initiative and Execution Process

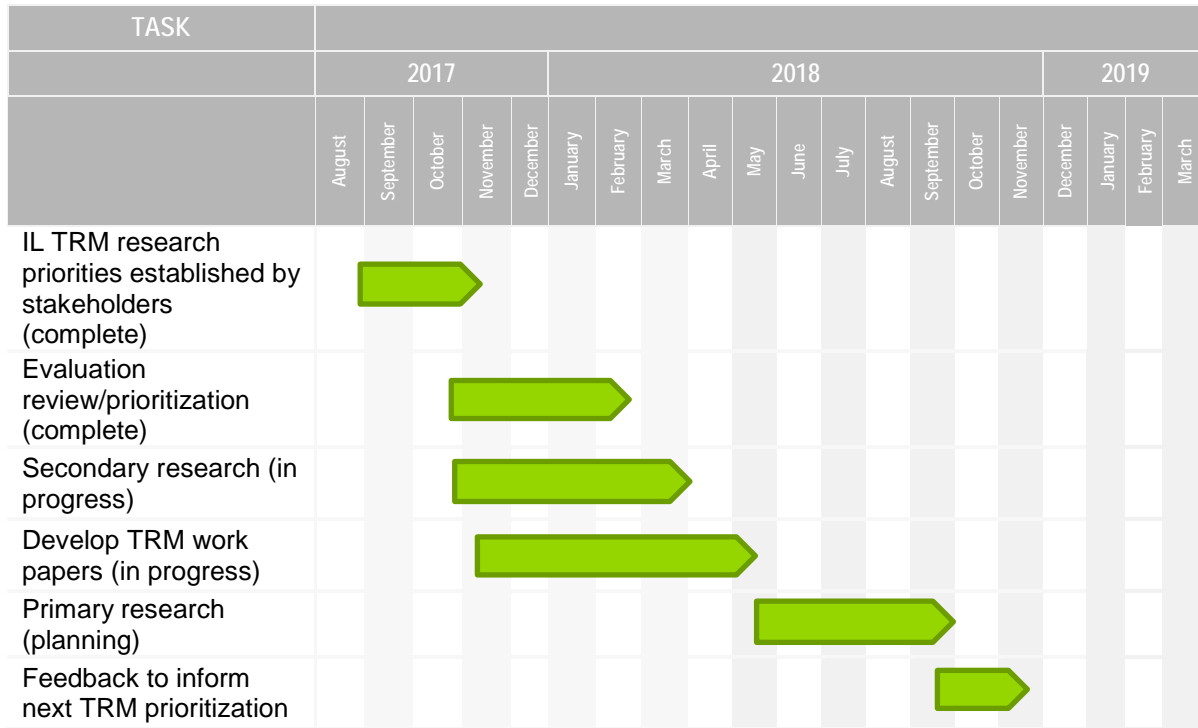


Source: Navigant

3.5 Schedule for Activities

The figure below includes a general schedule for IL-TRM evaluation research that we expect to implement on a rolling basis, using the timeframe 2017-2019 as an example.

Figure 2. TRM Evaluation Research Schedule by Task



3.6 Annual TRM Research Prioritization

Annually, Navigant will update the proposed TRM measure updates based on input from the IL TRM administrator, TAC and stakeholders. Working with the TAC, all stakeholders will have an opportunity to review the list and provide feedback before annual plans are finalized. Evaluation research will be coordinated among the statewide evaluators and other stakeholders. Additionally, we will be able to accommodate new evaluation research priorities if identified at other times.

Navigant has already identified several high priority primary evaluation research efforts, summarized in Table 2 below. Please note that evaluation research into Measure Effective Useful Life and Measure Persistence will be provided in a separate evaluation plan.

Table 3. High Priority Evaluation Research Items for 2018

High Priority Evaluation Research Item	Status
AC Tune-Up	Secondary literature review conducted for v6 TRM update; (in progress)
Variable Speed Drives	Secondary literature review conducted for v7 TRM update; (in progress)
LED Street Lighting	Secondary literature review conducted for v7 TRM update; (in progress)
Commercial Smart Thermostats	planning
Econometric AMI Analysis of Home Energy Reports and Advanced Thermostat Load Shapes	planning
Residential End Use Metering Load Shape Study	planning
Commercial Lighting Metering Load Shape and HOU Study	planning
Commercial Building Simulation Load Shape Study	planning

Source: Navigant

Additional evaluation research, not considered “high priority” will be conducted as outlined in Table 4 below. Navigant may revisit the prioritization for measures as new information is available or as requested by stakeholders.

Table 4. 2018 Planned TRM Research

2018 Research Item	Research Currently Planned	Notes
Ground Source Heat Pumps - Incremental costs, metering, FLH assumptions	Yes, primary/secondary to be confirmed	Planned as 0.09% of portfolio, thus classified as low priority; however, possible research effort could include secondary or primary (may work with geothermal pilot research)
Residential smart thermostat research – primary measurement (metering); research balance points for smart thermostat regressions; research on cross-effects for smart thermostats and HER; designing a small RCT pilot for advanced thermostats	Yes – Primary	TBD following current residential smart thermostat research
TRM 4.5.3: High Performance and Reduced Wattage T8 Fixtures - Baseline	Yes - Secondary	To be completed once baseline study data is available.
TRM 5.1.8 Refrigerator and Freezer Recycling - Regression Equation	Yes – Secondary	TAC noted, unless very high volume, suggest considering this again after 5 years (which would be in 2019); secondary research planned for 2018
Faucet Aerators - Drain Factor for kitchen and bathroom installations	Not currently	Not currently planned due to low expected savings
Low-flow faucet aerators - Usage by Building Type	Not currently	Not currently planned due to low expected savings

Source: Navigant