

AMEREN ILLINOIS COMPANY 2018-2021 ENERGY EFFICIENCY EVALUATION PLAN

Presentation to IL SAG

November 29, 2017



Portfolio Background and Overall Evaluation Approach



2018-2021 Ameren Illinois Energy Efficiency Initiatives

- Ameren Illinois is the only dual-fuel program administrator in Illinois
- With the exception of Street Lighting and ARP, all initiatives are dual-fuel

Residential Program

- Behavioral Modification
- Direct Distribution of Efficient Products
- *Retail Products*
- HVAC
- Appliance Recycling
- *Income Qualified*
- *Public Housing*
- Multifamily

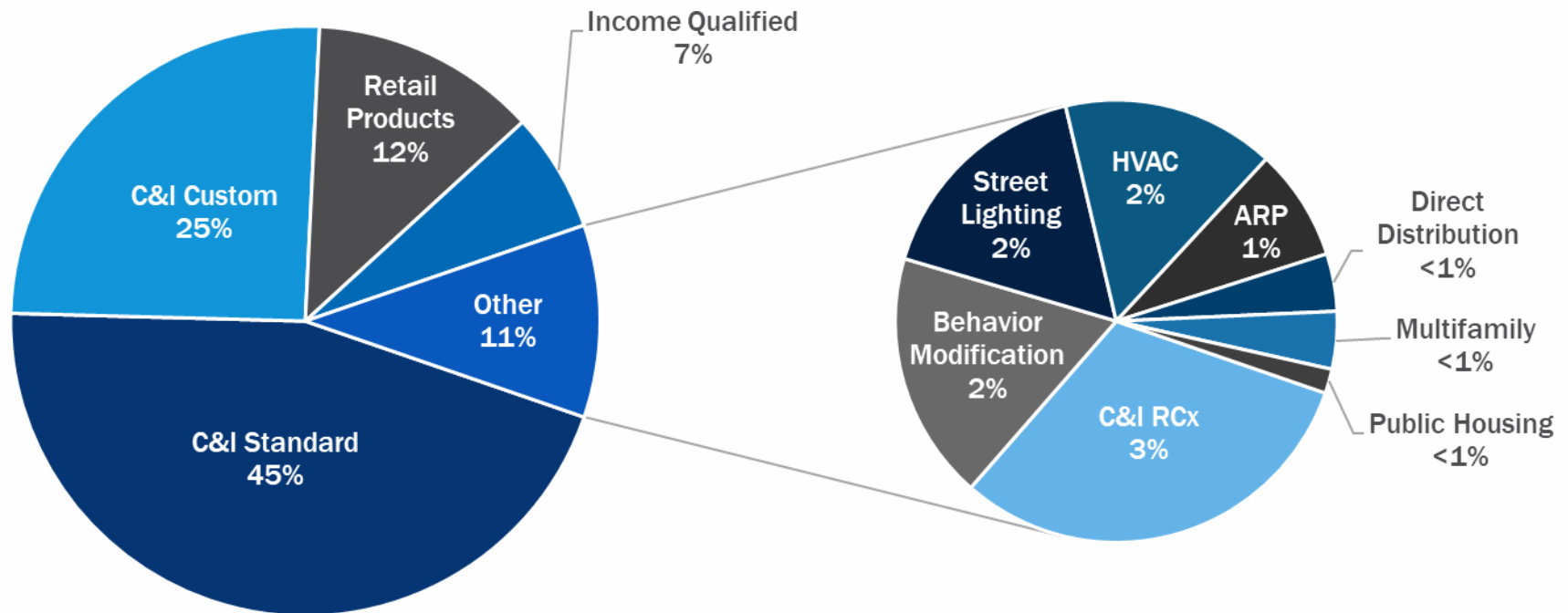
Business Program

- Standard
- Custom
- Retro-Commissioning
- *Street Lighting*



Electric Savings Summary 2018-2021

- During the plan cycle, Retail Products, Income Qualified, and C&I Standard savings ramp down while C&I Custom savings ramp up
- Other initiatives remain relatively constant over the course of the cycle



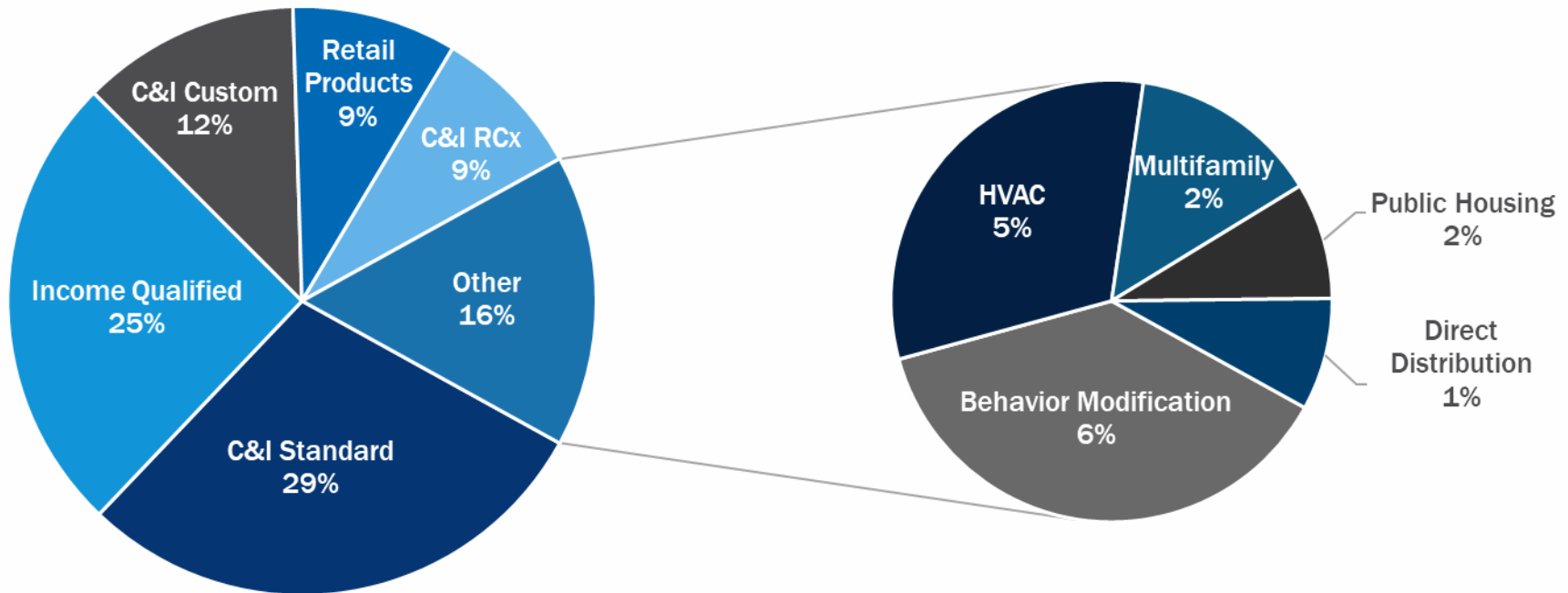
Electric High Impact Measures



- C&I Custom measures (25%)
- Business LED lighting (24%)
- Other business lighting (12%)
- Res LED specialty lamps (7%)
- Res omnidirectional LEDs (6%)
- VSD air compressors (4%)
- Retro-commissioning (3%)
- Behavior modification (2%)
- Air sealing (2%)
- Street lighting (2%)
- All other measures under 2% of savings

Gas Savings Summary 2018-2021

- During the plan cycle, C&I Standard and C&I Custom savings ramp down while Retail Products savings ramp up
- Other initiatives remain relatively constant over the course of the cycle



Gas High Impact Measures



- Steam traps (14%)
- C&I Custom measures (12%)
- Residential advanced thermostats (12%)
- Residential air sealing (9%)
- Retro-commissioning (8%)
- Residential programmable thermostats (7%)
- Behavior modification (6%)
- Duct insulation and sealing (5%)
- High efficiency furnace (4%)
- Kitchen demand ventilation controls (4%)
- Low flow showerheads (3%)
- All other measures under 3% of savings

Guiding Principles for Portfolio Evaluation

- Budgets will be split between initiative-specific and other evaluation efforts
 - Initiative savings will be a guiding factor in determining budget allocations
- Program-specific evaluation activities during the cycle include:
 - Yearly impact and high-level process evaluations
 - Net-to-gross (NTG) research for each initiative at least once
 - Detailed process evaluations as needed
- Other evaluation activities include:
 - Research to support the IL-TRM
 - Cross-cutting process research
- Statewide collaboration with other evaluators to ensure consistency in evaluation approaches and to identify opportunities for coordination

Program-Specific Evaluation Plans



Business Program

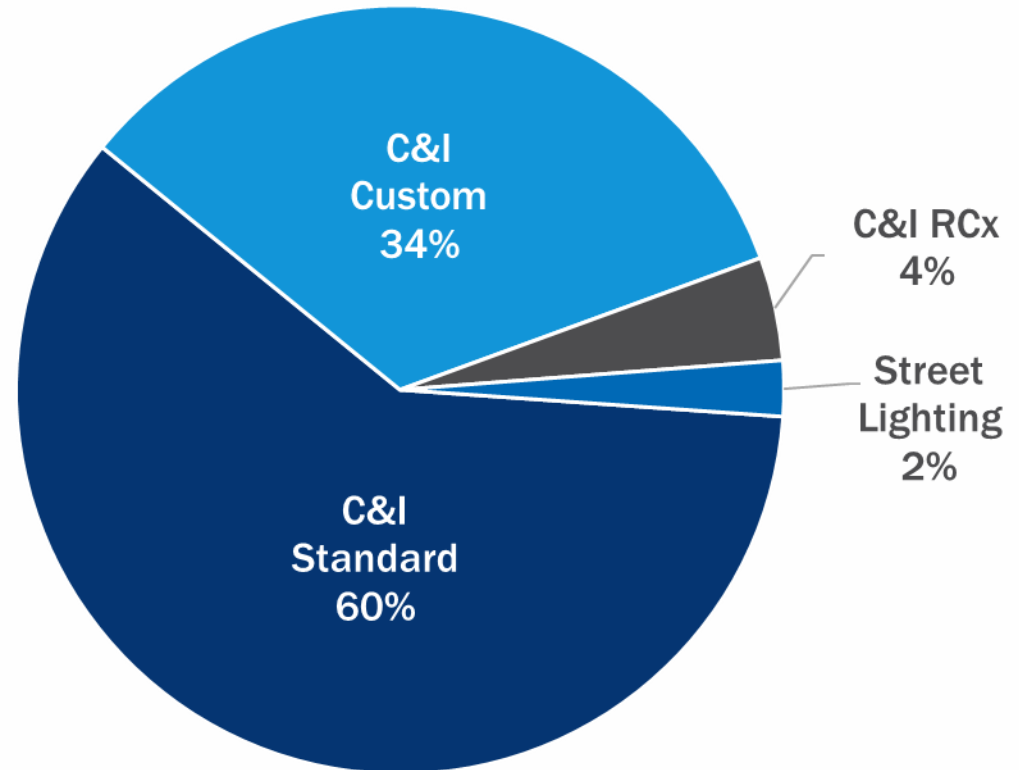
Core Evaluation Activities



Business Program

- Ameren Illinois' Business Program consists of four initiatives:
 - Standard
 - Custom
 - Retro-Commissioning
 - Street Lighting

MWh Savings Targets 2018-2021



Standard Evaluation Activities



- Prescriptive measures with IL-TRM algorithms; contains Small Business, Instant Incentives (midstream) and Online Store offerings
- Planned to make up 43% to 46% of portfolio MWh savings by year, and 19% to 35% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Core NTG Research		X		X
Aerator Pilot NTG Research	X			
Instant Incentives NTG Research		X		X
Online Store NTG Research		X		X
Participant Survey		X		X

Custom Evaluation Activities

- Custom measures without IL-TRM algorithms; contains several “incubator” offerings including SEM (Strategic Energy Management)
- Planned to make up 20% to 33% of portfolio MWh savings by year, and 10% to 12% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (Site Visits)	X	X	X	X
NTG Research	X		X	
Participant Survey	X		X	
Incubator Offering Process Research	X	X	X	X

Retro-Commissioning Evaluation Activities

- Retro-commissioning measures without IL-TRM algorithms
- Planned to make up ~3% of portfolio MWh savings, and 8% of portfolio therm savings

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (Site Visits)	X	X	X	X
NTG Research		X		X
Participant Survey		X		X
RSP Research	X		X	

Street Lighting Evaluation Activities



- Ameren Illinois and publicly-owned street lighting
- Planned to make up ~2% of portfolio MWh savings

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (Algorithm-Based)	X	X	X	X
NTG Research	X		X	
Survey of Participating Municipalities	X		X	

Business Program

Cross-Cutting Program Research

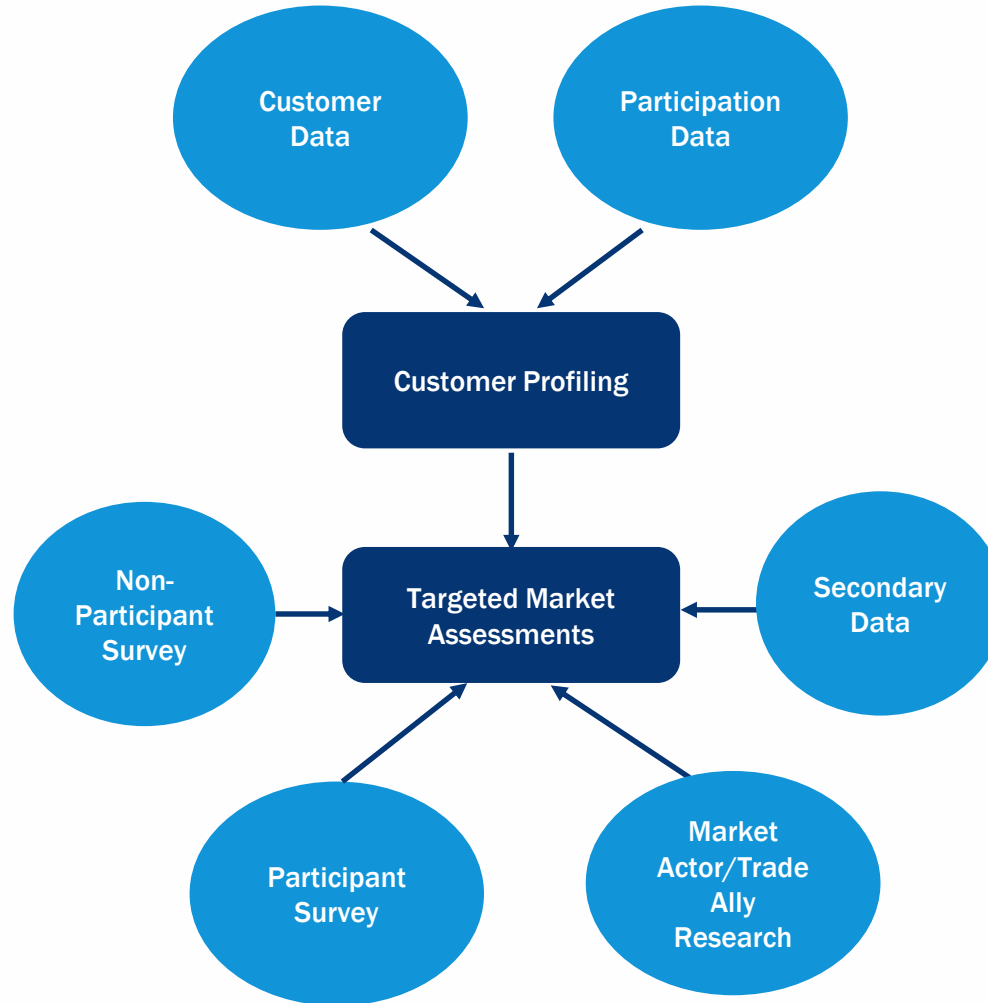


Overarching Business Program Activities

- Business Program has historically been operated in a very integrated fashion with the same implementer and resources shared across initiatives (e.g., Energy Advisors)
- The evaluation team will implement a number of evaluation activities across Business Program initiatives, detailed below by year

Activities	2018	2019	2020	2021
Historical Participation Analysis	X			
Customer Profiling		X		
Targeted Market Assessments			X	X
Non-Participant Survey (including NPSO)			X	
Energy Advisor Research	X		X	
Standard/Custom Program Ally Research	X		X	

Overarching Business Program Market Assessment Strategy



Residential Program

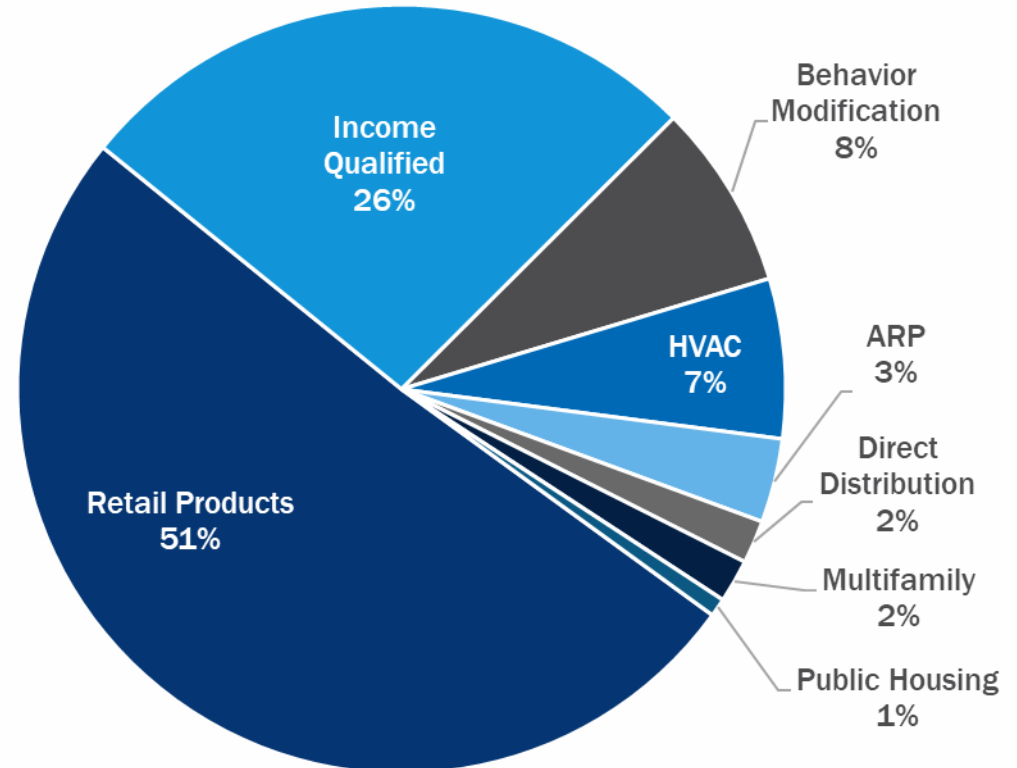
Core Evaluation Activities



Residential Program

- Ameren Illinois' Residential Program consists of eight initiatives:
 - Retail Products
 - Income Qualified
 - Public Housing
 - Behavioral Modification
 - HVAC
 - Appliance Recycling
 - Direct Distribution of Efficient Products
 - Multifamily

MWh Savings Targets 2018-2021



Source: AIC 2018-2021 Compliance Filing

Retail Products Evaluation Activities



- Rebates (instant or mail-in) to encourage customers to purchase high efficiency products in person or online
- Planned to make up 9%-15% of portfolio MWh savings & 7%-11% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Lighting Intercepts (NTG)	X		X	
Non-Lighting NTG and Process Survey	Continuous, Real Time			
Smart Thermostat Process Research	X		X	

Income Qualified Evaluation Activities

- Comprehensive home weatherization services for customers up to 300% of the federal poverty line including multifamily housing
- Planned to make up 5%-8% of portfolio MWh savings & 23%-27% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Site Verification Visits		X		X
In-Depth Community Agency Interviews	X		X	
In-Depth MF Manager Interviews	X		X	
Participant Survey	X	X		X

Public Housing Evaluation Activities

- Mirrors Income Qualified Initiative, targeting public housing
- Planned to make up <1% of portfolio MWh savings and 1% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Manager Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Site Verification Visits		X		X
Historical Participation Analysis	X	X		
Housing Authority Interviews	X		X	

Behavioral Modification Evaluation Activities



- Delivery of Home Energy Reports (HERs)
- Planned to make up ~2% of portfolio MWh savings and ~6% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Equivalency Analysis	X	X	X	X
Consumption Analysis	X	X	X	X
Participation Lift & Channeling Analysis	X	X	X	X
Persistence Study		X		X

HVAC Evaluation Activities

- Rebates for heating and cooling measures, heat pump hot water heaters, and programmable and smart thermostats
- Planned to make up 1-2% of portfolio MWh savings and 5% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Trade Ally Interviews	X		X	
NTG Research	X		X	
Participant Survey	X		X	

Appliance Recycling Evaluation Activities

- Incentivizes customers to replace inefficient refrigerators and freezers
- Planned to make up ~1% of portfolio MWh savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Retailer Interviews		X		X
NTG Research	X		X	
Participant Survey	X		X	

Multifamily Evaluation Activities

- Direct installation of low-cost energy savings measures in individual living units and common areas of multifamily buildings
- Planned to make up <1% of portfolio MWh savings and 2%-3% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Verification Site Visits		X		X
Property Manager Survey	X		X	
NTG Research	X		X	
Tenant Survey	X		X	

Direct Distribution Evaluation Activities

- Provides energy efficiency education and kits to students in grades 5-8
- Planned to make up <1% of portfolio MWh savings and 1% of portfolio therm savings by year

Activities	2018	2019	2020	2021
Program Material & Database Review	X	X	X	X
Program Staff Interviews	X	X	X	X
Gross Impact Analysis (TRM Application)	X	X	X	X
Parent Survey		X		X
NTG Research		X		X

Residential Program

Cross-Cutting Program Research



Residential Program Overarching Activities

- The evaluation team will implement a number of evaluation activities across Residential Program initiatives, detailed below by year

Activities	2018	2019	2020	2021
Historical Participation Analysis			X	
Non-Participant Survey (including NPSO)		X		X
Targeted Market Assessments (as needed)			X	X

Research to Support the IL-TRM

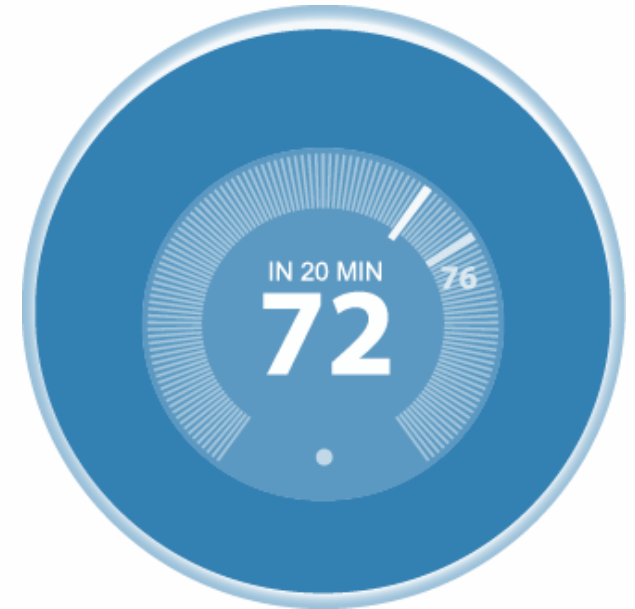


Smart Thermostat Research

SW Collaboration



- AIC is delivering smart thermostats to customers through a number of channels
 - HVAC
 - Retail Products
 - Public Housing and IQ
 - Business Program; Standard Initiative
- This measure has not been heavily incented by AIC in the past; 35,000 smart thermostats planned for 2018-2021
- Goal is to conduct research on both residential and business applications to help update the IL-TRM
 - Business study would require SW collaboration
- Timing:
 - Residential: ~2019 or later
 - Business: Depends on number of installed units



Steam Trap Research

SW Collaboration



- Steam traps have historically been one of AIC's most important gas measures, and are the largest contributor to gas savings in AIC's 2018-2021 plan (14% of therms)
- IL-TRM uses an "adjustment factor" (derived from an Enbridge study in Canada dating back to ~2005) to reduce maximum theoretical steam flow to an actual value
- We will work with the other IL evaluators to design a study to review other steam trap parameters and, if possible, update this factor; this study will involve on-site metering and will require customer cooperation



Incremental Cost Research

- The evaluation team proposes conducting incremental cost research for the following measure categories:
 - Commercial lighting
 - Variable-frequency drives
- We will explore a variety of methods to conduct this research, including interviews with market actors and web scraping
- In the case of VFDs, we have fairly comprehensive cost information included in program tracking data and believe we can develop an updated measure cost for the IL-TRM through analysis of this information



Behavioral Persistence Research

- In the 2018-2021 cycle, AIC will cease treating a large number of cohorts that have received HERs in past program years, providing an opportunity for a natural experiment
- In 2019, the evaluation team will conduct analysis examining the persistence of behavioral savings in previously treated customers who have ceased to receive HERs



Non-Energy Benefits



- Leverage planned participant research to gather information on non-energy benefits where feasible
- Use information to inform program marketing/outreach, as well as demonstrate additional value of programs
- Coordinate with other evaluation teams on methodology development
- Timing to be determined



Additional Possibilities for TRM Research

SW Collaboration



- Residential measures
 - Smart strip metering
 - ECM fan behavioral changes
 - Ductless heat pump impact study
 - HVAC early replacement research
- Baseline research
 - Business – T8 research
 - Residential – Gas boiler/furnace efficiencies
- Measure life research

Other Evaluator Activities



Other Evaluator Activities

- The evaluation team is involved in a number of non-research activities
 - Annual Evaluation Planning
 - SAG Participation
 - Technical Advisory Committee
 - NTG Working Group
 - AIC Support
 - Coordination and program design
 - Methodological collaboration with other evaluation teams
 - ICC Staff Requests and Support

Statewide Collaboration

SW Collaboration



- Opinion Dynamics collaborates on an ongoing basis with the other Illinois evaluation teams
 - Coordination has and will continue to occur on an ad-hoc basis regarding statewide and program-specific issues that might impact multiple utility programs
 - We will also coordinate through existing channels such as:
 - Illinois NTG Working Group
 - Illinois TRM Technical Advisory Committee (TAC)
- Beginning in the 2018-2021 cycle, the Illinois evaluators plan to hold a monthly evaluation coordination call to keep abreast of key issues
- Additionally, the evaluators plan to coordinate on key research topics including those identified in this presentation as presenting opportunities for statewide collaboration



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Appendix: Reporting Structure



2018-2021 Deliverable Structure

- Four major types of deliverables
 - Impact deliverables
 - Annual program impact evaluation reports
 - Annual integrated impact evaluation report
 - Process and forward-looking evaluation deliverables
 - Ad-hoc memos as needed to report on TRM research, NTG, etc.
 - Annual integrated process/forward looking evaluation report summarizing results of year's worth of work into one report for convenience

Impact Deliverables

- Contain three major categories of information
- First-Year Savings
 - Ex ante gross and net savings (electric energy, electric demand, and gas energy)
 - Ex post (verified) gross and net savings (electric energy, electric demand, and gas energy)
 - Program-level gross realization rates (electric energy, electric demand, and gas energy)
 - Program-level net-to-gross ratios (NTGRs) (electric and gas)
 - Gas savings to electric savings conversion (where relevant)
- Cumulative Persisting Annual Savings
 - Program-level weighted average measure life (WAML)
 - Measure-level effective useful life (EUL)
 - Year-by-year incremental verified net savings
- Participation and Program Touch (where relevant)
 - Project counts
 - Participant counts
 - Reported (ex ante) and verified (ex post) measure quantities