



COMED CY2018 – CY2021 EVALUATION PLAN OVERVIEW

PREPARED FOR COMED AND SAG

December 4, 2017

1. Research Overview
2. Evaluation Details
3. Targeted Evaluation Research
4. Evaluation Coordination Across Utilities

- **Job #1: Verify energy savings**
- Economies of scale mean the core impact work does not scale at the same rate as the program budgets
- Leaves room in the budget for other research
 - **Update the TRM**
 - Non-Energy Benefits (NEBs)
 - CPAS means new research on effective useful life and persistence
 - Targeted research on new program concepts
 - RFP Programs (2019)
 - Cross-cutting research topics

FEJA Brings Key Changes

- Cumulative Persisting Annual Savings (CPAS)
- Final data available January 30th
- Final Report due April 30th
- Tight timeline between data available and draft
- Tight timeline for reviews
- Solutions
 - Separating impact report from process and NTG
 - Process results presented near time of research
 - Waves of impact research
 - Simplified impact report

53 CY2018 Programs

Business	Residential	Income Eligible	Pilot
Air Care Plus	Appliance Rebates	Affordable Housing New Construction	Bidgely
Business Energy Analyzer/First Fuel	Elementary Education Kits	Food Bank LED Distribution	Ecova
Business New Construction	Fridge & Freezer Recycling	Illinois Home Performance	Sensor IQ
Combined Heat & Power (CHP)	Heating & Cooling (HVAC) Rebates	Lighting Discounts - Income Eligible	Water/Energy Nexus
Custom	Home Energy Assessments (HEA - Joint w/Ncior Gas & PG/NSG)	Multi-family Retrofits	Alltemp Advanced Refrigerant
Data Centers	Home Energy Reports	Single-family Retrofits	Commercial Advanced Power Strips
Industrial Systems Optimization	Lighting Discounts	UIC ERC Low Income Kits	Commercial Geothermal
Instant Discounts	Middle School Take-Home Kits		PlotWatt Quick Serve Restaurant Optimization
Operational Savings /Facility Assessments	Multi-Family - Market Rate (Joint w/Nicor Gas & PG/NSG)		Q-Coefficient Thermal Mass
Power TakeOff	Residential New Construction		Q-Sync Motor
Public Housing Authorities	Weatherization - Market Rate		Root3 Energy Data Model
Retrocommissioning			Community Energy Management Platform
Rural Small Business EE Kits			Connected Savings Wi-Fi Thermostat Optimization [with Nicor Gas]
Small Business			HVAC SAVE
Standard			Nest Seasonal Savings
Strategic Energy Management			Smart Home Demonstration Project
Street Lighting			Total Connected Savings
Voltage Optimization			

? CY2019 Programs Add Third Party Programs

Common Evaluation Activities

- Three types of impact evaluation
 - TRM-Based
 - Custom and Model-Based
 - Regression
- Majority of Residential and Income Eligible program evaluations are TRM-based
- Majority of Business Programs evaluations are custom

Use of AMI Data

- **Billing Usage Regression Analysis**
 - Behavioral Programs: Home Energy Reports
 - Smart Thermostat impact analysis
 - Air Sealing and Insulation billing analysis (ongoing)
 - Other TRM measures will be considered, but no studies are planned at this time
- **Calibrated Simulation and Calibrated Engineering Models**
 - Residential New Construction
 - Deep Retrofit / Whole House Retrofits
 - Strategic Energy Management
 - About one in four custom project verifications use billing usage history (for process and difficult to model savings)
 - Affordable Housing NC (depends on savings volume)

Net-to-Gross Research

- **NTG research timing criteria**
 - Is the most recent research result still valid?
 - How many years since the last research?
 - Program maturity: When is the right time?
 - How large are the program impacts in the portfolio?
 - How much variation do we expect?
 - Joint or not-joint? What are the plans for other utilities?
 - Balance the evaluation effort over the four years
- **Move toward more real-time (RT) and on-line survey research**
- **Include free ridership and spillover in NTG, although research may be done separately**
- **Follow the TRM NTG protocol or notify parties of divergence**
- **No NTG research when billing regression provides net savings**

Program Level 4-Year Evaluation Plan

See Accompanying Spreadsheet

- Program by program
- Year by year
- Matrix with research tasks

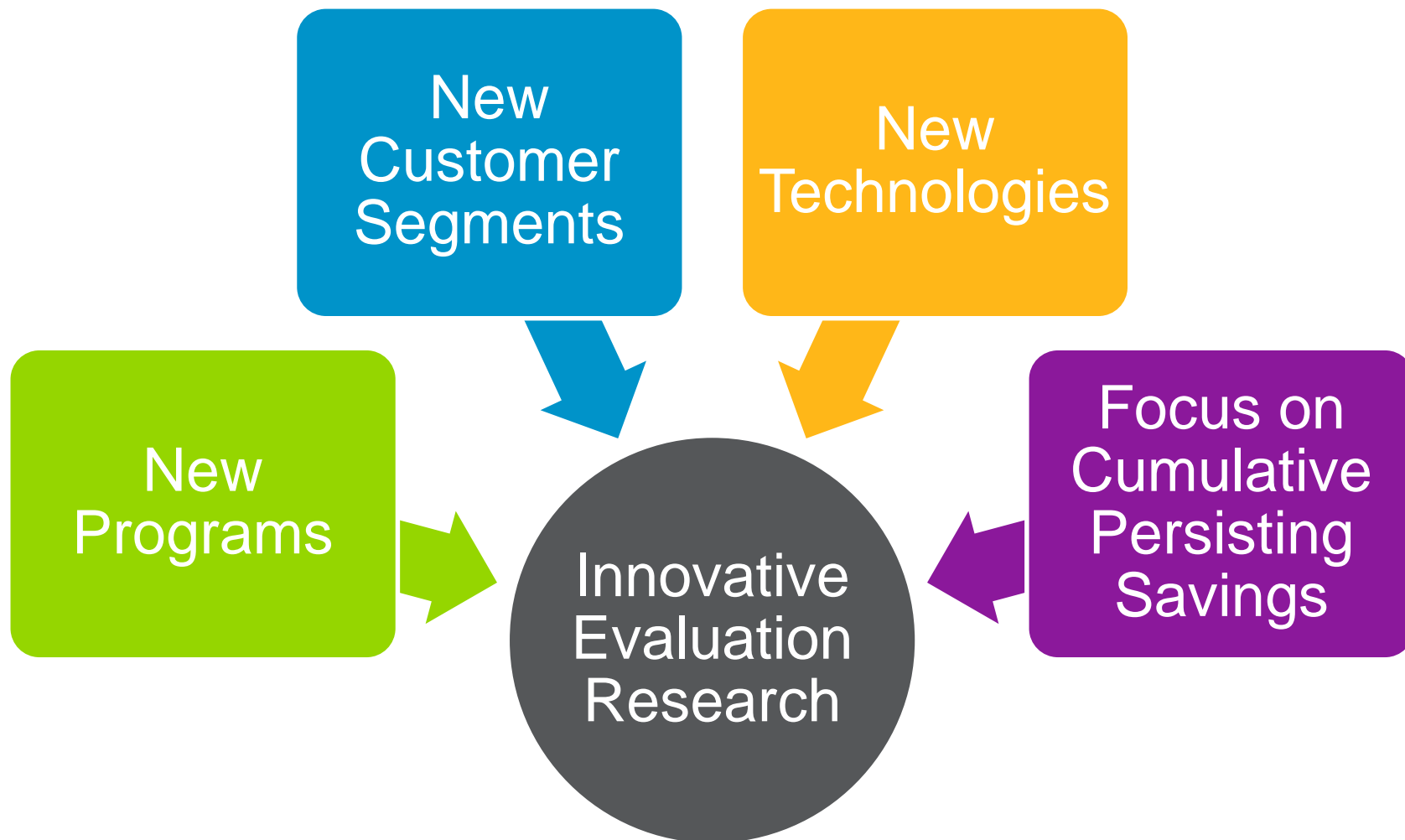
Program Level 4-Year Evaluation Plan Example – Retrocommissioning

Sector	Program	Task	2018	2019	2020	2021
Business	RCx	Tracking System Review	X	X	X	X
Business	RCx	Data Collection – Participant Surveys		X		X
Business	RCx	Data Collection – Program Manager and Implementer Interviews	X	X	X	X
Business	RCx	Data Collection – Trade Ally Interviews		X		X
Business	RCx	Impact – Project-specific Billing Analysis	X	X	X	X
Business	RCx	Impact – Engineering Review	X	X	X	X
Business	RCx	Impact – Verification & Realization Rate	X	X	X	X
Business	RCx	Net-to-Gross – Customer Self-Report Surveys		X		X
Business	RCx	Net-to-Gross – Trade Ally Interviews		X		X
Business	RCx	Process Analysis	X	X	X	X


Program Level 4-Year Evaluation Plan Example – Residential Lighting

Sector	Program	Task	2018	2019	2020	2021
Residential	Lighting Discounts	Tracking System Review	X	X	X	X
Residential	Lighting Discounts	Data Collection – In-store Intercept Participant Surveys	X	X	X	X
Residential	Lighting Discounts	Data Collection – In-store Shelf Surveys		X		X
Residential	Lighting Discounts	Data Collection – Program Manager and Implementer Interviews	X	X	X	X
Residential	Lighting Discounts	Data Collection – Trade Ally Interviews		X		X
Residential	Lighting Discounts	Impact – Measure-Level Deemed Savings Review	X	X	X	X
Residential	Lighting Discounts	Impact – Verification & Realization Rate	X	X	X	X
Residential	Lighting Discounts	Net-to-Gross – Customer Self-Report Surveys	X	X	X	X
Residential	Lighting Discounts	Process Analysis	X	X	X	X

FUTURE ENERGY JOBS ACT DRIVES NEED FOR NEW AND INNOVATIVE EVALUATION RESEARCH



TARGETED RESEARCH



Exploring Savings

- Derive more accurate, faster impact estimates
- Drive continual TRM improvement
- Conduct custom measure research

Markets & Innovation

- Utilize AMI in evaluation
- Evaluate impacts from new technologies
- Monitor and document industry trends

Process and Customer Engagement

- Discover and apply best practices for engaging customers
- Explore geographic and other participation patterns

Exploring Savings

TRM measure updates
Effective useful life and persistence
Advanced thermostats
Custom measures
New behavioral measures
Updating end-use load shapes



Markets & Innovation

Using AMI data

Non-energy benefits

Income-eligible evaluation

Evaluating R&D activities

Third-party programs

Opportunities to innovate evaluation



Process and Customer Engagement

Email or electronic surveys

Customer and/or trade ally geographic participation patterns

Increase participation in underserved areas

Customer experience – income eligible, public sector

Community energy management

Customer engagement



Research Tracker

Status	Research Task	Research Description	Project Priority	Project Difficulty
In progress	LED Street Lighting O&M Cost Savings Research (separate municipal and ComEd)	Secondary research to determine avoided operations and maintenance costs from upgrading to LED street lighting	High	Medium
In progress	Retrocommissioning Measure Persistence Study	Study to determine the persistence of savings from retrocommissioning measures		
In Progress	TRM 4.4.17: Variable Speed Drives for HVAC Pumps and Cooling Tower Fans - Measure Cost	Secondary research to update incremental cost estimates for VSDs	High	Medium
In Progress	TRM 4.4.19: Demand Controlled Ventilation - Savings Factors	Secondary research to update savings factors for demand-controlled ventilation	High	Medium
In progress	TRM 5.6.1-5.6.4: Shell Measures - Savings Verification	Engineering and billing analysis to update de-rating factors for air sealing and insulation		
In progress	TRM 6.1.1: Adjustments to Behavior Savings to Account for Persistence	Billing analysis to estimate decay rates for behavior measure savings		
In progress	TRM 6.1.1: Weather Normalization for Behavior Measures	Billing analysis to determine whether weather normalization is required for evaluating behavior measure savings		
Planning under way	TRM 5.2.2: Advanced Power Strip Tier 2 - ISR/Persistence	Metering study to determine the in-service rate and persistence of savings from Tier 2 Advanced Power Strips		

COORDINATION ACROSS UTILITIES

- **Navigant coordinates with the other utilities and evaluators, today, on an ongoing basis - this includes Ameren, Nicor and PGL & NSG**

- **Coordination beyond specific programs occurs as follows:**
 - SAG meetings on specific topics and issue management
 - Via e-mail on Illinois-wide key issues or issues that are program specific and may impact multiple utility programs
 - Illinois NTG Framework – updating the framework is an ongoing discussion
 - Illinois TRM Technical Advisory Committee
 - Coordination call (schedule monthly)

- **Gas/Electric Joint Program Evaluations**
 - Some evaluations will be done jointly (BNC, RCx, etc.)
 - Joint programs can be evaluated separately in some cases

- **Support Coordination on Research Studies**
 - Advanced Thermostats in Businesses
 - Non-Energy Benefits Research

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