Illinois Energy Efficiency Stakeholder Advisory Group

2020 SAG Portfolio Planning Process
Proposed Energy Efficiency Ideas Template

Due Date: By 5:00 pm (CST) on Monday, April 27, 2020

Purpose: The SAG Portfolio Planning Process is an opportunity for SAG participants to understand current energy efficiency (EE) portfolios and provide feedback to Illinois utilities (Ameren Illinois, ComEd, Nicor Gas, Peoples Gas & North Shore Gas) as they develop their 2022-2025 EE Plans. The objective of the SAG Portfolio Planning Process is to reach consensus on EE Portfolio Plans prior to utilities filing plans for approval with the Illinois Commerce Commission on or before March 1, 2021.

SAG participants are invited to submit:

1. Feedback on current portfolios, focused on suggested changes for the 2022-2025 EE Plans;
2. Stakeholder ideas/approaches for utility consideration, such as program approaches or new measures that have been successfully implemented in other jurisdictions; and
3. Innovative ideas that could be researched during the next EE Plan cycle by utilities, evaluators, SAG, or another advisory group (IL-TRM Technical Advisory Committee; Income Qualified EE Advisory Committee).

How to Submit an Energy Efficiency Idea:

- SAG participants are encouraged to make a good faith effort to fill out as much information as possible in this template by the due date. Templates submitted after the April 27th deadline may not be considered due to time constraints.
- If you need help filling out the Energy Efficiency Idea Template or researching required information, contact the SAG Facilitator for assistance: Celia Johnson (Celia@CeliaJohnsonConsulting.com).
- Ideas will be reviewed by a small group Review Committee, organized by the SAG Facilitator. The SAG Facilitator may follow-up and request additional information after ideas are submitted.
- SAG participants that submit an idea may be invited to present their idea at the May 12-13 SAG meetings. Utilities will respond to feedback and ideas during the June 16-17 SAG Meetings.
- Please email your idea, with any supplemental materials, to the SAG Facilitator via the email above. Questions may be directed to the SAG Facilitator by email (Celia@CeliaJohnsonConsulting.com) or by phone: *(312) 659-6758*.

Submitter Contact Information

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Energy Efficiency Idea Questions

Please check the boxes below to identify 1) the type of idea; 2) which Illinois utility or utilities will be impacted by the idea; and 3) which EE sector the idea impacts.

Check	Type of Energy Efficiency Idea
☒	New Measure or New Program Idea
☐	Proposed Program Approach
☐	Innovative Idea

Check	Illinois Utility Impacted by Energy Efficiency Idea
☐	Ameren Illinois
☐	ComEd
☐	Nicor Gas
☐	Peoples Gas & North Shore Gas
☒	All Illinois Utilities

Check	Energy Efficiency Sector Targeted by Energy Efficiency Idea
☐	Residential Customers – Single Family (non-income qualified/income eligible)
☒	Residential Customers – Multifamily (non-income qualified/income eligible)
☐	Residential Customers – Single Family Income Qualified/Income Eligible
☒	Residential Customers – Multifamily Income Qualified/Income Eligible
☐	Small Business Customers (commercial & industrial sector)
☐	Medium/Large Business Customers (commercial & industrial sector)
☒	Other (research & development, emerging technologies, market transformation)

Additional Questions

1. **Description of Idea:** Describe the proposed idea, including the purpose of the suggested idea and rationale. Describe whether this is an idea that could be implemented in an existing EE program, or whether the idea involves establishing a new measure or program. Please indicate whether additional research may be required before implementation.

   Questions to consider: What issue will this proposed change resolve? Will the proposed change increase participation and result in increased energy savings? Will this reduce costs? Will this increase customer satisfaction? Will this help achieve statutory goals? Will this help increase program penetration?

   Elevate Energy and their partner, New Ecology (based in Boston, MA) are interested in deploying technology developed by New Ecology that provides remote monitoring and optimization services for central hydronic heating and domestic hot water systems. The technology behind the service has been continuously improved over the past six years and has been installed in over 150 buildings in the last three. We believe that widescale deployment of boiler monitoring and optimization has the potential to rapidly and significantly save owners money through gas savings and avoided maintenance, and will help Illinois reduce greenhouse gas pollution.

   Even as climate policy is driving us towards increased electrification of buildings, pursuit of gas savings is vitally important during this time of transition. There are few measures that result in significant natural gas savings other than equipment replacement, which is expensive. Even this strategy does not ensure energy savings persistence.

   To ensure a utility program's investment in new equipment, or to bring gas savings to buildings that don't qualify for equipment replacement, system data must be collected continuously. This enables settings to be, and remain, optimized and provides operational insight/support in real time. This capability does not currently exist in the vast majority of existing buildings. Therefore, we propose a new program measure, monitoring based commissioning of central hydronic heating and hot water systems.

   We are focusing on these systems because they are ubiquitous in our states and regions, and our project work has led us to understand there are widespread performance issues. Every central heating and hot water system is unique - they are custom designed, plumbed, and installed by teams with a range of technical capability – but they are being treated with a common set of outdated rules of thumb. In addition, most small and medium-sized buildings do not have a system that dynamically controls system operation, and if they do, it may not be well understood. System faults, if available, must be read manually from inside the boiler room. Very often faults are 'reset' or addressed in a manner that does not solve the underlying condition which caused it.

   To empower owners to operate buildings better, they need actionable intelligence supplied by *system* data collected continuously. Data from individual pieces of equipment or devices misses the mark. To address this, our approach is centered around bringing data from the entire system, and its components, into a central platform for comprehensive analysis and problem-solving. We provide owners timely answers and recommendations, not just data.

The Remote Monitoring and Optimization (ReMO) approach takes advantage of existing on-board equipment communications and adds temperature or binary sensors to capture additional critical data points. We connect to BAS communication ports using protocols, such as MODBUS and BACnet, to read sensory data that is fed back to equipment controllers. These connections allow remote monitoring of alarm and status codes to provide real time alerts with interpretations of conditions causing faults.

Data points are recorded on a local controller at each site that is connected to a central cloud- hosted database. This is the backend visualization and data analysis platform. Along with the existing rules engine for providing alerts, we are developing machine learning algorithms to automate much of the data analysis and provide optimized settings parameters for all of the monitored equipment.

The offering for buildings owners includes a site assessment to assess building configuration, installation of ReMO equipment, optimization of the system, and remote monitoring and analysis to ensure the system continues to operate efficiently. Currently, the systems are installed for as little as $7,500 which includes three years of monitoring.

ReMO can be deployed with energy efficiency programs. The technology has already shown an average energy savings of 9%. Deployment in a smaller subset of buildings in Chicago have shown similar results. We have received positive feedback from building owners with ReMO systems because of the improvement in their ability to manage and resulting savings from reduced energy consumption and avoided service calls.

2. **Implementation:** How will this idea be delivered to the target market? Describe marketing strategies used to reach the target market and minimize market confusion.

   Elevate Energy will deploy the technology in buildings located in the specific utility service territory. As an administrator for the income eligible programs in Northern Illinois for over a decade, Elevate knows and understands the needs of these building owners. Elevate Energy has a 20-year track record of working with owner of multifamily housing in the Chicago market. We plan to use a network marketing approach, guided by the Elevate team, to market to groups of owners that have participated in utility sponsored energy efficiency programs. We will also work with financing entities who monitor the operating expenses of subsidized housing, and with our extended network of owners of multifamily affordable housing. Elevate and New Ecology have already placed the technology in 11 buildings located in Chicago and are seeing positive results. Additionally, Elevate and New Ecology are working with the Exelon Foundation that has provided a grant for marketing and outreach to test deployment in Chicago, Philadelphia and Wilmington.

   The market for monitoring is small, but complicated and for multifamily buildings has not developed rapidly because the energy saved in each building is relatively modest and the costs to do so with commercially available products can be significant. Yet, because there are many thousands of buildings, the overall potential is large. As mission-based organizations with vast experience in improving the performance of multifamily buildings and a strong technical team, New Ecology and Elevate Energy are uniquely positioned to address this underserved market.

3. **Background:** Describe where the idea originated from, including whether this idea has been successfully implemented in other jurisdictions. Provide specific background information that will help utilities and SAG participants understand the proposed idea.

<u>Questions to consider</u>: In what jurisdiction has this idea been successfully implemented? Do you have information on eligible customers, participation achieved, and/or savings achieved? Do you have access to reports describing the successful idea / program approach?

As stated previously, the technology behind the service has been continuously improved over the past six years. It grew out of New Ecology's desire to understand why some equipment replacement projects were not delivering savings as expected. In a single building, New Ecology installed sensors and collected data to help identify and rectify the issue, increasing the savings from 6% to 26%. This was the beginning of more investigations in more buildings, and both the hardware and software components began to evolve. In August of 2016, the Massachusetts Clean Energy Center provided grant funding for a 100-building pilot, followed shortly by National Grid funding a 10-building pilot in Rhode Island.

It has been installed in over 150 buildings in Massachusetts, Rhode Island, Connecticut, Maryland and Illinois over the last three years.

Following is a list of ReMO programs that have been utility-funded or program funded and implemented.

Utility/Funder (State)	**Program Name**	**Description**	**Budget**	**Units**
NYSERDA	RTEM – Real Time Energy Management	On-going program- certified vendor	Budget based on number of installs as certified vendor	Program is recently launched- one building underway
Mass DOER	InnovateEE Grant	Two 3-year projects, current: subsidies for multifamily and non-profit owned buildings	$2.8 M, including 50% match	165 multifamily and 110 non-profit buildings
City of Takoma Park	None - contract	Audits and remote monitoring in four multifamily properties	$70,000	4 buildings
Massachusetts Clean Energy Center (MA)	None- grant	Remote monitoring for three years; proof of concept; grant extension for needed site repairs	$600,000 matched with $250,000 Second grant for $200,000	103 buildings
National Grid RI	None	Remote monitoring	$70,000	10 buildings
Chicago, IL	None- self funded pilot	Audits and remote monitoring hydronic and steam systems in 11 buildings	$150,000	11 buildings

4. **Idea Impact:** Provide additional information on the customer segment that will be targeted with the program idea, including how and why this idea will have a positive impact on customers participating in Illinois EE programs.

   Questions to consider: What level of impact will this idea have on current EE programs? How much additional market share do you estimate this change will impact?

   The City of Chicago's Climate Action Plan acknowledges that 75% of all greenhouse gases are generated in the world's urban areas, and therefore its role, as the 3rd most populous city in the United States, in reversing existing trends. Buildings are the primary target for reductions as they account for roughly 70% of emissions; energy efficiency in existing buildings is sited as the key strategy. The City has targeted a 20% reduction in energy use of residential buildings.

   In the Chicago metropolitan area, there are approximately 15,172 multifamily buildings larger than 25 units. We project to install systems in 150, or 1%, of these buildings in one year. We project an annual savings of 307,466 therms of natural gas per year after the buildings are optimized. This equates to 1797 tons of avoided carbon emissions per year.

5. **Duration:** Is this idea intended to be offered for the duration of the 4-year EE Plan or as a pilot measure or program?

   We propose that this idea is offered for all four years of the EE Plan.

6. **Estimated Budget:** Provide the total estimated budget for each program year (2022 – 2025).

   The budget is based on an assumed average install and service of $12,000 per building Incentive levels are based on the NYSERDA RTEM program which provides 30% rebate on the install cost and 30% for service for 3 years then 20% for service for following years, if applicable, up to 5 years. We are proposing a flat 30% rebate on the install and service for a four-year service period. Therefore, the average incentive rebate would be $3,600 per building.

7. **Estimated Participation:** Provide participation totals for each program year (i.e. number of measures installed, number of customer participants, etc.)

   We are proposing to install 150 systems during years 1 and 2 ramping up to 200 buildings per year in years 3 and 4.

	Building	Incentives per Building ($)	Overhead	Total Budget
Year 1	150	$3,600	0.2	$ 648,000
Year 2	150	$3,600	0.2	$ 648,000
Year 3	200	$3,600	0.2	$ 864,000
Year 4	200	$3,600	0.2	$ 864,000

Sources

If any sources will be useful to Illinois utilities in reviewing ideas, please either provide links within this template or send attachment(s) to the SAG Facilitator with the Energy Efficiency Idea submittal.

NYSERDA RTEM Program

https://www.nyserda.ny.gov/All-Programs/Programs/Real-Time-Energy-Management/Resources

Mass Save ESPO

https://www.masssave.com/learn/business/espo

ReMO Overview

https://www.newecology.org/what-is-remote-monitoring-optimization-remo/