

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
<input checked="" type="checkbox"/>	New Measure or New Program Idea
<input checked="" type="checkbox"/>	Proposed Program Approach
<input checked="" type="checkbox"/>	Innovative Idea

Check	Illinois Utility Impacted by Energy Efficiency Idea
<input checked="" type="checkbox"/>	Ameren Illinois
<input checked="" type="checkbox"/>	ComEd
<input type="checkbox"/>	Nicor Gas
<input type="checkbox"/>	Peoples Gas & North Shore Gas
<input type="checkbox"/>	All Illinois Utilities

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

IL SAG Call for EE Ideas-April 27, 2020

Program Name: ERC - PTAC/PTHP Pilot Conversion to Service Program Project

1. Description of Idea

The purpose of this project is:

1. Upgrade old inefficient package terminal air conditioners (PTACs) units in residential Condo buildings that serve as the primary source of heating and cooling with cold climate package terminal heat pumps (PTHPs)
2. Promote quality installation of the new systems by training contractors
3. Promote residential and condo building managers' education and awareness on the PTHP systems and operation through targeted marketing and outreach plans
4. Conduct applicable research for further development
5. Convert a pilot project to a full-service delivery program

Project Rationale

The project's main focus is to provide services to replace inefficient PTACs in residential condo units that serve as the primary heating and cooling systems with energy efficient package terminal heat pumps (PTHPs). Programmable/Smart thermostats will be paired with the equipment since many of the residents do not have thermostats to control their heating and cooling needs. For these occupants, this program will increase heating and cooling options, awareness of efficiency and comfort levels thereby increasing participation and energy savings opportunities. According to the 2017 American Community Survey: statewide, 333,286 units are in buildings with 50+ units over 20 years old. About 122,346 (37%) of these units are occupied by seniors and total electric costs are estimated at \$284,903,496. The project will work with identifying contractors to train for quality installation of these PTHPs.

The project is also partnering with program staff from the DOE Technology Challenge Program and the Pacific Northwest National Laboratory Cold Research Program.

Increased Cost Savings & kWh Saved

We are proposing this project as a pilot and if successful creating a PTAC/PTHP service conversion program into 2025. The pilot has strong potential to reduce significant kWh and save customers money considering the volume of outdated PTAC units in the targeted region. Please see table in section 7 for estimated cost and kWh savings.

Establishment of Pilot Program

Historically, ASHP technology has only been feasible in mild climates where outdoor air rarely reaches freezing temperatures. Utilizing ASHPs has many advantages over other sources of heating equipment. Fuel choice flexibility, efficiency, capital cost, installation cost, and decreased maintenance are all potential benefits of using an ASHP for heating. Recent technological advances have pushed ASHP capabilities to subzero temperatures without reliance on inefficient electric resistance backup heat. As cold climate ASHP technology is a relatively new opportunity to be used for primary heating, we are proposing beginning this project as a pilot. The aim is to investigate and implement the best path forward towards establishing this emerging technology in a brand-new environment. We will do this by testing, documenting, and realizing the benefits of ASHP installations and implement and improve upon subsequent larger projects. We feel that targeted marketing in specific City of Chicago neighborhoods with existing condo buildings, outreach to condo association boards and building management, and educational presentations to condo residents on the efficiency and operation of this measure is vital to getting this program off and running. The program will also seek to improve the overall availability and quality of residential HVAC services by increasing the knowledge

and training of independent contractors as air source heat pump installation vendors. Additional collaborative research would be engaged with the DOE Technology Challenge Program and the Pacific Northwest National Laboratory Cold Research Program.

Customer Satisfaction

Customer satisfaction will be enhanced by increasing indoor comfort and air quality by providing a quiet dehumidification operating system reducing the chances of mold and mildew growth and bringing in fresh outside air when desired. Anti-microbial air filters that can be easily accessed and cleaned along with an instant heat pump mode that will quickly heat a room to the desired temperature for increased comfort in the cold months will also be included. Programmable or smart thermostats will be installed to allow for desired room temperatures and to ensure desired conditions are maintained. Finally, a reduction in monthly electric bills will certainly please the customer.

Help to achieve statutory goals

This program will help the utilities meet statutory goals by saving significant cost-effective kWh. The model established in this program will be easily replicable and can scale towards additional market sectors such as low-rise residential and hotels. Calculations are based on the latest IL TRM version.

Help to increase program penetration

The pilot will begin by targeting neighborhoods with large high-rise condo buildings in the City of Chicago zip code of 60610. Once this program is tested and successfully in selected project sites, the program will have a greater opportunity to be expanded throughout the City of Chicago, ComEd, and Ameren service territory. This program also has the potential to impact both residential and commercial buildings (such as hotels). Case studies and examples of significant energy and cost savings along with increased indoor comfort will be prepared to illustrate the success of the program and technologies installed.

2. Implementation

Condominium associations have generally not been included in programs to promote sustainability in building upgrades. The program will develop targeted marketing plans to promote the installation of PTHPs and thermostats. The plan will include mailing brochures, email notices, and outreach promotional events with key stakeholders including but not limited to condo association boards, condo building managers and management companies, and condo residents. Technical staff will be available at all presentations to serve as a resource for more focused discussions and responding to participants' questions. Hand-outs to offer tips, case studies, and other resources developed from the latest research will also be offered. ERC will utilize engineering students from UIC to assist in the implementation of the program. The students, under supervision, will help administer the program by visiting condominium buildings to perform a detailed assessment to generate specific recommendations with estimates of costs, performance, and participate in condo board presentations, and engage in residential educational sessions. The students will gain valuable hands-on engineering experience that will help further their careers and make them highly attractive to future employers.

3. Background

An ERC colleague resides in a high-rise condominium building with residential electric heating and cooling. The unit is 1,200 square feet and there are four dated PTAC units with no thermostat to control the interior temperatures. Many of the residents reported very high utility bills; sometimes \$500 a month or more during

the heating season. This colleague realized that there are many of these buildings and no one is working to help resolve these specific extremely inefficient energy issues. In addition, researching housing data sources and reports the following housing trends and data was noted.

By 2050, 70% of the world's population is projected to live in urban areas. In the United States, 80% of the population already do so. Analyzing future housing trends in the United States, a recent **Harvard University Report: Seniors Face Affordable Housing Crunch**, outlines the growing challenges facing baby boomers reaching retirement age. Many of them are ill-equipped to meet the high costs of housing. In Chicago, 37% of households are 65 years or older and about 220,000 households are cost-burdened, compared with 30.8% nationwide. ¹ For household units that are 80 years and older, 43.9% versus 36.7% nationwide are considered over-burdened. Cost-burdened households pay more than 30% of their income on housing, including moderate to moderately high-income seniors residing in Chicago condominium buildings, particularly in buildings 20 years and older. For many of these households, cost burdens are a result of fixed retirement incomes, remaining mortgage payments, high homeowner association fees (HOA) and real estate taxes, along with health care expenses.

High energy costs are a big factor in housing affordability and indoor comfort. It is projected that buildings use about 43.5% of energy in the US (not including industrial use) and about 30% of the energy and costs are wasted in energy-inefficient buildings. According to the 2017 American Community Survey, there are 154,137 units in buildings 20 years or older with 50-plus units and estimated annual energy costs of \$800 in Chicago. Collectively, the electric costs are over \$93 million, and gas costs are over \$22 million annually. Comprehensive energy efficiency upgrades take anywhere from 5 to 20 years to pay back. Condominium boards and management entities are delaying and/or overlooking major capital repairs and necessary upgrades. Currently, no entities are systematically working with Condominium boards and their unique issues. Unfortunately, condominium associations are not eligible properties under the Chicago Property Assessed Clean Energy (PACE) Program. "The Chicago PACE Program makes it possible for owners and developers of commercial properties to obtain low-cost long-term financing for energy efficiency, sustainability, and renewable energy infrastructure deployment in new or existing buildings." www.chicagopace.org/about

4. Idea Impact

As mentioned previously, fuel choice flexibility, efficiency, capital cost, installation cost, and decreased maintenance are all potential benefits of using an ASHP for heating. Recent technological advances have pushed ASHP capabilities to subzero temperatures without reliance on inefficient electric resistance backup heat. This program will be an opportunity to establish heat pumps as a viable and efficient option in Illinois.

Looking beyond the operation of a PTAC service replacement program to also include a persistence tune-up savings program that could be offered to capture additional savings through the development of a participant's tune-up equipment program and/or annual service contracts with Condo Associations. As technologies changes, continue to train contractors in best practices for quality and sizing installation, tune-ups and repairs.

¹ Gallun, Alby> "Seniors Face Affordable-Housing Crunch". Crain # 39: Chicago Business, 28 Oct. 2019: <https://www.chicagobusiness.com/commercial-real-estate/seniors-face-affordable-housing-crunch>.

Project staff working with key stakeholders, residents, condominium boards and managers will contribute towards the necessary steps to preserve older buildings and introduce new sustainable practices for building operation.

5. Duration

This idea is intended to be offered as a pilot the first year, testing the replacement on a limited number of ASHPs. This time will be used to not only gather research on these early adopters but identify and coordinate additional energy saving ASHP replacement opportunities for the subsequent 3 program years.

Our research shows this specific market is large and in need of necessary upgrades. The Chicago Benchmarking Database is a vital tool that can point towards additional high users with similar inefficient heating systems. Market expansion statewide could begin in year 2024. This would allow time for M&V and customer satisfaction surveys on equipment installed during the pilot phase. In addition, case studies on successfully implemented projects and established savings will be developed and made available to improve upon.

6. Estimated Budget

	2022	2023	2024	2025
Admin / Direct Costs	\$130,000	\$160,000	\$160,000	\$160,000
Equipment / Installations	\$13,720	\$171,500	\$343,000	\$514,500
Total	\$143,720	\$331,500	\$503,000	\$674,500

7. Estimated Participation

	2022	2023	2024	2025
ASHP Replacements	8 units	100 units	200 units	300 units
Energy Savings (kWh)	21,566	269,572	539,144	808,716
\$/kWh Saved	\$6.66	\$1.23	\$0.93	\$0.83