



ELEVATE

Equity through climate action

Income-Eligible Whole Home Electrification Pilot Report

Prepared by Elevate for ComEd Customer Innovation

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Executive Summary

In this pilot, ComEd Customer Innovation partnered with Elevate to develop a community-focused model to retrofit a large number of income-eligible homes in the Chicago area. This included both single family homes and multi-family buildings. For this pilot, single family buildings are defined as individual dwellings or 2–4-unit buildings and multi-family buildings are defined as 5 or more-unit buildings. Prior to this pilot, Elevate had started implementing single family and multi-family electrification retrofits across the Midwest, with 200 units of multi-family retrofits in progress in Illinois, Michigan and Wisconsin.

Through this pilot project, which started in June of 2022, the team aimed to build momentum around electrification in the income eligible residential sector and gather the information necessary to replicate energy saving on a community scale, in collaboration with utilities, program administrators, and other market leader stakeholders. At the start of the pilot, Elevate had just 10 single family homes in the pipeline for electrification retrofits. By mid-2023, Elevate had retrofitted over 300 income-eligible units, with over 100 units in construction and 150 units in the pipeline across the Midwest. This pilot aimed to share lessons learned and best practices with the broader network of implementers to advance progress in local decarbonization efforts including but not limited to:

- (1) Cold climate heat pump performance.
- (2) Best practices for electrification retrofits, scoping equipment, and project implementation.
- (3) Best practices for addressing energy burden in implementation and achieving energy bill savings for customers.
- (4) Best practices in communicating with customers before, during, and after retrofits.
- (5) Solar in electrification retrofits.
- (6) Understand the impacts on indoor air quality (IAQ).
- (7) Understand how IAQ could be monitored during electrification retrofits.

At the conclusion of this pilot in December 2023, Elevate and ComEd successfully retrofitted a combined total of 122 units, comprising 66 single-family units and 56 multi-family units (three buildings). Drawing from Elevate’s insights gained throughout this research, the following section presents key findings, considerations, and recommendations.

Key Findings and Considerations

- Electrification in Chicago area homes, under the right circumstances, can result in reduced energy burden (the percentage of household income that is used towards energy costs) when implementing a deep retrofit that removes natural gas accounts (not including solar).
- Cold climate air source heat pumps (ASHP) perform as they are designed to in the Midwest (climate zone 5) and are a major driver of energy savings and reduced energy costs which in turn reduces energy burden.
- Heat pumps provide an additional benefit of adding energy efficient cooling in homes that are not originally equipped with air conditioning.
- Deep energy savings (over 50% savings) can be achieved in the Chicago housing stock with off-the-shelf measures and technology.
- Solar is recommended to improve cost benefits of electrification but not required to ensure cost savings for all income-eligible customers.
- Full electrification upgrade packages also provide additional benefits in terms of improved air quality, reduced air pollution emissions, and improved thermal resilience.

Recommendations

Future Program Design:

- The “one-stop-shop” approach is successful in ensuring higher levels of participation rates and satisfaction amongst program participants.
- Elevate recommends an integrated, comprehensive program design for electrifying income eligible communities with older, more energy-intensive housing stock. This includes addressing the building envelope, electrical infrastructure upgrades, and other health and safety measures.
- Consider partnerships with community-based organizations and contractors to facilitate meaningful customer engagement, better conversion rates, scalability, and overall program satisfaction.
- Establish internal process and external customer guidance to ensure prompt switchover of tenant space heating rates on their electric bills as soon as heat pump equipment is installed to maximize bill savings. Provide customer guidance for closing gas accounts as soon as all gas appliances have been capped or removed to save on service delivery charges. Additionally, provide guidance for any customers receiving LIHEAP benefits to apply for LIHEAP with electric heating as opposed to gas heating so that customers do not lose energy bill assistance on their heating or cooling costs.
- Customer education and continued support regarding new equipment operation and maintenance must be provided, especially to customers who are unfamiliar with the new equipment. Additionally, it is beneficial to review equipment energy efficiency best practices (i.e., scheduling setbacks, vacation mode, etc.) as with electrified equipment there is a risk of unexpected increases in energy usage.
- It is crucial to establish well-defined program goals and clearly articulate the relevant data points that will be tracked throughout the initiative. This will provide a solid foundation for effective program management, facilitate accurate performance measurement, and enhance the overall success and impact of the program.
- Elevate recommends direct coordination and weekly meetings with contractors to respond to any timing delays and adjust project schedules accordingly.
- Future scaled offerings should closely coordinate with related, non-electrification offerings to cost share on these expenses such as mitigation of asbestos, mold, cloth wiring, and questionable electrical setups. Alternatively, these identified homes could be directed to the most suitable program or funding source. Future offerings should coordinate with upcoming incentive programs from the Inflation Reduction Act (IRA).

Buildings to Prioritize

- Homes should be weatherized first for optimal performance and sizing of cold climate heat pump technology as well as to prioritize energy efficiency before adding more electrical space heating load.
- Prioritize homes that lack central air conditioning to address the health risks associated with extreme heat. However, it is important to note that these homes often experience more significant increases in utility bills and may not necessarily be the most cost-effective projects.
- Homes with existing boilers for heating typically have higher retrofit costs for both single-family and multi-family.

Bill Impact and Saving Analysis

- Calculating customer bill impacts with actual utility data helps for a more accurate estimate of what financial changes customers will experience after full electrification. Where possible, electrification program design should include a way to verify actual usage against models and assumptions.
- Monitoring utility data over time has given insight on heat pump equipment performance and should be incorporated in measurement and verification of program design where possible.

Key Barriers

The following barriers impacted the timeline and scheduling of construction. In this pilot, Elevate's partnership with manufacturers, and Elevate's Contractor Accelerator teams have allowed us to keep an open line of communication to improve access to materials, equipment orders, distribution chains, and contractor networks.

- Contractor capacity relating to availability, scheduling, and financial constraints associated with electrification measures.
- Permitting timelines: the review processes and inspection timelines in some jurisdictions caused extensive delays.
- Materials needed for electrical service panel upgrades, including meter enclosures, 100-amp CECHA (Commonwealth Edison Chicago Housing Authority), and larger modular meter banks.
- International shipping delays which caused challenges with getting heat pumps and heat pump accessories.
- Collaboration with ComEd New Business for multi-family sites: ComEd New Business processes coupled with an extended review period led to delays in projects, resulting in challenging experiences for both the customer and construction team. We suggest that ComEd New Business streamline its processes specifically for electrification projects to mitigate potential challenges and ensure a smooth experience for future initiatives.