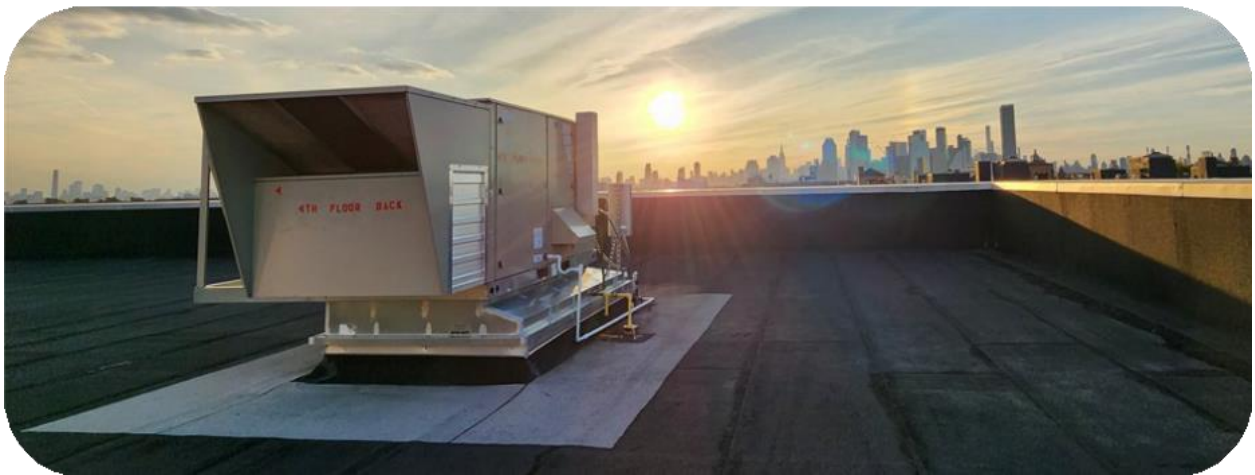


Presentation Report: Technical and Market Assessment of Commercial Heat Pump Rooftop Units



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Prepared For
Commonwealth Edison Company

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EXECUTIVE SUMMARY

Heat pump rooftop units (HPRTUs) are an emerging solution for commercial customers to unlock the benefits of heat pump technology for their heating and cooling needs. Heat pump rooftop units can provide many of the same benefits seen in residential-scale heat pump systems when partially or completely electrifying commercial heating loads while packaging the heat pump and backup heating system (gas or electric resistance) into a single enclosure. Heat pump rooftop units can displace existing RTUs on commercial rooftops, occupying the same physical footprint as the incumbent system. Although heat pump rooftop unit offerings are limited compared to their residential counterparts, many major manufacturers currently produce heat pump rooftop unit options across a broad range of system sizes matching all but the largest fossil-fuel RTUs, which are used in comparatively few installations.¹ This study provides a robust guide to the current state of the market for heat pump rooftop units to understand the role this technology can play in ComEd's territory in the future.

Methodology

To understand the current state of the market for heat pump rooftop units, the team conducted an in-depth analysis of several factors impacting equipment adoption. Key areas of exploration in this analysis included equipment specifications and availability, existing incentive programs, national trends, and feedback from multiple stakeholder types.

Conclusions and Next Steps

Our exploration of both the technical capabilities and current market conditions in ComEd's territory suggests that heat pump rooftop units are a promising technology. The equipment is available on the market and modeling shows that this technology has the potential to save customers money and help them achieve emissions reduction goals and/or benchmarking targets. The availability of both all-electric and dual-fuel options provides additional potential for broader adoption of heat pump rooftop units. While heat pump rooftop units are available currently, uptake has been low due largely to higher upfront costs and a lack of familiarity with the equipment by key stakeholders. This report has detailed several areas where more data is needed to

¹ Seventhwave and CEE. 2017. "Commercial Roof-top Units in Minnesota." Minneapolis, MN. Minnesota Department of Commerce Conservation Applied Research and Development (CARD) Final Report. cards.commerce.state.mn.us/CARDS/security/search.do?method=showPopup&documentId=%7BAC3FB94A-9598-4A9C-BF02-967BFAC28FF3%7D&documentTitle=386204&documentType=6

respond to concerns from risk-averse market actors. Stated more succinctly, the overarching findings from our work are:

- Building owners, contractors, and distributors want more information on ROI, i.e., incremental cost, field performance, and bill impacts.
- Dual-fuel heat pump rooftop units are the most market-ready technology and help mitigate risk and alleviate barriers found in the market research.

Next Steps – Case Studies, field-performance verification, and resource development

- Case Studies – Real-world examples are needed
 - Contractors have little experience with this technology in the field.
 - Building owners lack the awareness and confidence to ask for this technology.
 - Examples are needed to highlight incremental cost, bill impacts, and experience with this technology.
 - Energy modeling can be used to show potential bill impacts, emissions reductions, and ROI at these sites, while the field data is being collected.
- Field-performance verification
 - As highlighted, there is little to no field research on this technology.
 - This is needed to better understand field-performance, controls, and energy and emissions savings.
- Education – Resource development
 - Program resources are needed to build confidence, help with decision making, and answer common questions and concerns.
 - Develop training and education curriculum.
 - Develop case studies.
 - Develop a ROI Calculator.
 - Develop product selection tools.