



## **ICC Staff Thermal Energy Networks Workshops**

### **Comments of Commonwealth Edison Company – January 31<sup>st</sup>, 2024**

Commonwealth Edison Company (“ComEd”) appreciates the opportunity to submit this final set of comments on issues ComEd has not previously addressed and recommendations regarding Thermal Energy Networks (“TEN”).

ComEd could support the development and success of a TEN pilot in its territory in several ways and in several different roles depending on the other partners who are engaged in the initiative. In each, however, ComEd would serve as the electricity delivery service provider to the initiative, would build out the required electric delivery infrastructure, support both design and deployment decisions for the electrical infrastructure, and assist initiative participants in minimizing electric delivery and service costs. In addition, ComEd could support a pilot in the following ways:

- A. While TENs promise to minimize the additional grid load during peaks, post-retrofit load profiles will look different and there would still be new sites and equipment that need power. ComEd could support follow-on investigations into whether these facilities should have an added level of resiliency, such as battery backup.
- B. ComEd could support the deployment of weatherization and home electrification initiatives among the customers who are participating in the thermal energy loop as allowed by law. There are significant advantages to weatherizing buildings in advance of a TEN deployment, particularly given the cost of ground-source infrastructure and the performance profile that benefits from minimizing the thermal lift (the difference between the temperature in the thermal loop and the temperature of the water that serves radiators and fan coils within buildings)
- C. ComEd also has deep experience in the development of pilot protocols, including the measurement and verification of technical and process demonstrations. To ensure that effective before and after observations are collected at participating buildings and to ensure that these observations are analyzed and reported using industry best practices, ComEd could lead some of the investigation aspects of the pilot.

Some aspects of the pilot funding, particularly within the weatherization and building electrification components (B), could be co-funded or supported in non-financial ways by existing programs and initiatives. Depending on the building type and the depth of the energy retrofit, home weatherization and electrification can cost \$40,000 - \$60,000. These are substantial costs, and ComEd is investigating several techniques to make them more manageable, including the use of batteries in kitchen appliances to reduce panel and circuit upgrades and the use of 110v hot water heaters. Across the range of these

programs, the avoided cost of gas service tends to be a key element in the cost calculation. Thus, while the conversation in the workshop implied that a TEN did not necessarily need to be installed in place of a gas service, our work has shown that these are the use cases that are most likely to provide the best payback to customers. One of the key advantages of a thermal energy network is that it mitigates the customer HVAC load in cold climate conditions. ComEd would suggest that a pilot be designed to assess the mitigation of costs in overall electrification through ground-source system designs.

During a recent workshop, it was requested that ComEd share funding levels allocated to relevant weatherization programs aimed at low-income customers. According to the Illinois Department of Commerce & Economic Opportunity's 2023 DOE State Weatherization Plan, total funding for the Illinois Home Weatherization Assistance Program (IHWAP) last year was \$18.8 million. Within the ComEd Energy Efficiency Program, incentives for Single Family Retrofits in 2024 (available only for income-eligible customers; measures include fully funded air sealing, insulation, emergency HVAC mechanicals plus health and safety) is expected to total \$20.6 million. Similarly, ComEd incentives for Multi-Family Retrofits are expected to total \$22.7 million, allocated as follows: Income Eligible \$19.1 million, Public Housing \$1.9 million, Market Rate \$2.7 million. Across the current four-year Energy Efficiency and Demand Response Plan ("Plan 6" 2022-2025), ComEd intends to allocate a total of \$40.0 million to its Whole Home Electric offering, which assists income eligible customers in fully electrifying both single- and multi-family homes, alongside typical weatherization and health and safety measures.

Another issue related to pilot development that may warrant consideration by the commission is the selection and prioritization of candidate sites. An ideal site would include a diversity of buildings, including both residential and commercial customers. New buildings or older buildings with recently upgraded HVAC systems may be less likely to participate in the pilot. Owner-occupied buildings may be more likely to participate. While an equity-investment-eligible community would be an ideal site to demonstrate the changes, additional care must be taken to ensure that financially vulnerable customers are not exposed to additional infrastructure risk through their participation. In terms of infrastructure, it may also be worthwhile to target areas where grid upgrades are particularly costly or areas where natural gas infrastructure repairs can be avoided through building electrification, such as sites that are at the end of a natural gas feeder. It could be tempting to look to TENs where customers are currently reliant on propane for building heat since the fuel has a higher cost level that would increase the economic performance of the system. However, there are few sites that have the kind of building density that would make a thermal energy network most cost-effective. If resources are available, it might be interesting to develop both urban and exurban pilots to compare use cases. Another valuable consideration in pilot design is the selection of a site that is already facing significant civil work. Where water mains and other infrastructure are being replaced, it may be possible to reduce the disruption to customers and to plan a project that makes use of low-cost thermal energy in wastewater.

The Commission may also wish to investigate how the operation and ownership of thermal energy network infrastructure affects outcomes and costs. ComEd suggests that care be taken to ensure that the entity installing and maintaining the pipes and pumps, whether a utility, a community organization, or a public water authority, must bring both the human and financial resources required to maintain these facilities, to monitor performance, and to rapidly restore during outages. Customers will depend

on this infrastructure and their adoption of it is somewhat path dependent; care must be taken to ensure that customers are well served by the new infrastructure.

In conclusion, beneficial thermal energy networks are likely to be expensive, so identifying the best opportunities for the pilot will be important. A full appreciation of future energy cost dynamics will also serve these pilots well. Building electrification will add winter load, which peaks during nighttime hours when renewables are not easily procured. Alternative generation resources that function under these scenarios (e.g. hydrogen and fuel cells or renewables and long-duration energy storage) come with a high price tag, particularly for resources that would rarely be used. Under these cost scenarios, the investment justification for a thermal energy network would differ markedly from the payback that we see with today's energy prices.