

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 22-M-0429 - Proceeding on Motion of the Commission to
Implement the Requirements of the Utility
Thermal Energy Network and Jobs Act.

ORDER PROVIDING GUIDANCE ON DEVELOPMENT OF UTILITY THERMAL
ENERGY NETWORK PILOT PROJECTS

Issued and Effective: September 14, 2023

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STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

At a session of the Public Service
Commission held in the City of
Albany on September 14, 2023

COMMISSIONERS PRESENT:

Rory M. Christian, Chair
Diane X. Burman
James S. Alesi
Tracey A. Edwards
John B. Howard
David J. Valesky
John B. Maggiore

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BY THE COMMISSION:

INTRODUCTION

The State of New York established nation-leading greenhouse gas (GHG) emission reduction targets with the passage of the Climate Leadership and Community Protection Act (CLCPA) in 2019.¹ To achieve the emission reductions required by law, it is necessary to reduce the combustion of fossil fuels in New York's building stock, which is the largest contributor to GHG

¹ The CLCPA mandates a 40 percent reduction in statewide GHG emissions from 1990 levels by 2030, 85 percent reduction in statewide GHG emissions from 1990 levels by 2050, and net zero emissions statewide by 2050. See ECL §75-0107.

emissions in New York.² For over one hundred years, homes and businesses in the state have often used on-site combustion of fossil fuels, including natural gas, to provide essentials such as space heating, hot water, and cooking.³ However, complying with CLCPA emissions reduction targets requires a transition away from buildings' present reliance on fossil fuels and the systems that deliver them and toward electrification. Many home and business owners across New York are pursuing electrification on an individual basis, but the state also requires a more equitable solution to building electrification that takes advantage of economies of scale. Regulated utilities are well equipped to help develop such solutions.

Recognizing the need for a utility-scale building electrification solution, the New York State Legislature passed the Utility Thermal Energy Network and Jobs Act (the Act), and Governor Hochul signed it into law on July 5, 2022.⁴ The primary purpose of the Act is to remove the legal barriers to utility development of "thermal energy networks."⁵ The Act added §66-t to the Public Service Law (PSL), which requires the Public Service Commission (Commission) to commence a proceeding to consider "the appropriate ownership, market and rate structures

² See NYS DEC 2021 Statewide Greenhouse Gas Emissions Report, found at: <https://www.dec.ny.gov/energy/99223.html#Process>. The building sector accounts for 32 percent of statewide GHG emissions.

³ Other sources of building emissions include fuel oil, kerosene, and propane, the sale of which is not regulated by the Commission.

⁴ See Laws of 2022, Chapter 375 (enacted July 5, 2022).

⁵ PSL §2(29) defines "thermal energy networks" as "all real estate, fixtures and personal property operated, owned, used or to be used for or in connection with or to facilitate a utility-scale distribution infrastructure project that supplies thermal energy."

for thermal energy networks and whether the provision of thermal energy by gas and/or electric utilities is in the public interest.”⁶ Additionally, the Act requires “each of the seven largest gas, electric, or combination gas and electric corporations”⁷ to submit to the Commission for review and approval at least one and as many as five thermal energy network pilot project proposals, “with at least one pilot project in each utility territory proposed in a disadvantaged community” as defined by the CLCPA.⁸ On September 15, 2022, the Commission issued the Order on Developing Thermal Energy Networks Pursuant to the Utility Thermal Energy Network and Jobs Act (Initiating Order), directing Staff to convene a Technical Conference to gather information about thermal energy networks, and to identify further steps toward fulfilling the Act’s directives.⁹ Building upon the phased approach outlined in the Initiating Order, this Order provides necessary guidance for further development of the Utility Thermal Energy Network (UTEN) pilot

⁶ PSL §66-t(1).

⁷ The Initiating Order identified the “seven largest” utilities by applying the “annual intrastate gross operating revenue of the corporation” as used in PSL §25-a and §66(29)(a). Accordingly, as used herein, “Utilities or Utility” refers to and pilot project requirements apply to: Consolidated Edison Company of New York, Inc. (Con Edison), Orange and Rockland Utilities, Inc. (O&R), New York State Electric & Gas Corporation (NYSEG), Rochester Gas and Electric Corporation (RG&E), National Grid USA (National Grid, which includes Niagara Mohawk Power Corporation d/b/a National Grid (NMPC), The Brooklyn Union Gas Company d/b/a National Grid NY (KEDNY); and KeySpan Gas East Corporation d/b/a National Grid (KEDLI)), Central Hudson Gas & Electric Corporation (Central Hudson), and National Fuel Gas Distribution Company (NFG). Initiating Order, pp. 6-7.

⁸ PSL §66-t(2).

⁹ Case 22-M-0429, Initiating Order (issued September 15, 2022), p. 5.

projects, including on threshold issues applicable to all proposals.

BACKGROUND

PSL §66-t(1) tasks the Commission with adopting regulations addressing the construction of thermal energy networks, and to thereby foster a business model for gas utilities that does not depend on serving customers with natural gas, while also providing jobs to utility workers who are at risk of losing their employment as their utilities transition away from traditional gas service.

The Initiating Order directed each of the Seven Utilities to make, by October 5, 2022, a compliance filing that includes a summary of the proposed pilot project(s), and to submit their initial pilot project proposals by January 9, 2023, for approval. This phased timeline exemplifies the Commission's "stepped implementation approach," allowing for subsequent filings by the Utilities to provide additional necessary details about their pilot project proposals.

As directed by the Initiating Order, Staff held a Technical Conference on December 1, 2022, to assist the Commission in developing rules addressing the use of thermal energy networks. The Technical Conference agenda included 1) an overview of thermal energy networks, presented by the New York State Energy Research and Development Authority (NYSERDA); 2) a summary of the Utilities' October pilot projects compliance filings; 3) open discussion focused on the barriers and potential solutions to implement UTEN pilot projects; and 4) discussion of any other UTEN-related topics of interest. The event was held simultaneously in-person and online, with approximately 180 attendees. This format fostered robust engagement and dialogue between the regulated Utilities,

external stakeholders and consultants, and Department Staff. The novelty of Utility Thermal Energy Networks raised several implementation questions from geothermal companies, borehole drillers and advocacy organizations. Common threads of inquiry included: the scope of project costs and eligible cost recovery, energy efficiency building upgrades, what incentives or supplemental programs are available for funding, standardization of geothermal drilling, permit costs associated with drilling wells beyond 500 feet deep, cost recovery from gas customers versus electric customers, use of and engagement with unionized labor, project scalability, and possible 'phase two' pilots using project learnings.

SUMMARY OF PROPOSALS

The Utilities filed fourteen UTEN pilot projects on January 9, 2023, for consideration by the Commission. The proposals' state of readiness varies widely. Several Utilities indicate that they have request for information (RFI) processes ongoing and plan to make, or have already made, supplemental filings.¹⁰ In aggregate, the Utilities proposed estimated total costs of the fourteen pilot project proposals, as filed on January 9, 2023, is between \$362.32 million and \$435.32 million.

Per the Initiating Order, each proposal must include (a) a single line drawing identifying the geothermal energy source(s), (b) engineering plans related to the project's design, (c) a description of and number of projected potential energy users, (d) a development schedule detailing major milestones for the pre-construction, construction, and operational phases of the project, (e) information to support

¹⁰ For example, Con Edison and O&R filed Pilot Project Supplements on May 19, 2023, and Central Hudson filed a Pilot Project Supplement on June 30, 2023.

any claims by the utility regarding needs related to safety and reliability, (f) the estimated capital and operations expenses associated with the capital and ongoing costs of the network, and (g) proposed metrics by which to measure cost-effectiveness. In its review, as set forth in the Initiating Order, the Commission will consider if the pilot will aid in the development of regulations, furthers the climate justice and/or GHG reductions in compliance with CLCPA, advances equitable and affordable electrification, and creates benefits to customers and society at large. Below is a summary of the UTEN pilot project proposals.

Central Hudson

Central Hudson proposed one pilot project, located in the Eastman Park neighborhood in the City of Poughkeepsie. The project utilizes varied building stock, including a planned new Community Youth Center and Low-Income Housing, intended to test varying levels of energy efficiency upgrades on UTEN functionality. Central Hudson filed a "Supplemental Plan Update" on July 30, 2023, providing detailed cost estimates and additional pilot project information. Central Hudson estimates the costs at approximately \$12.3 million and expects to complete the final engineering design, procurement, and project construction within 6-12 months following Commission approval. Central Hudson proposes a three-year project operation phase, which could begin as early as July 2025 or as late as December 2026, depending on the timing of Commission approval and other project milestones.

Con Edison

In its January filing, Con Edison offered three types of pilot projects with no sites yet selected. The proposed pilots and their costs are: High-Rise Commercial and Industrial Buildings (\$40-\$60 million), Large Residential Buildings in

Dense Urban Area (\$35-45 million), and Smaller Buildings in Less Dense Areas (\$25-35 million). Con Edison stated that it intended these projects to maximize learning opportunities by engaging with varying types of building stock across different jurisdictions, customers of different types with discrete needs, and urban and suburban communities with unique engineering requirements. Con Edison completed its RFI process and filed supplemental project details on May 19, 2023. The updated filing provides significant additional details about the proposed projects. Additionally, Con Edison filed another supplement on August 16, 2023, providing an update on the Chelsea Project and its overall UTEN portfolio.

Con Edison's proposed Chelsea Project plans to recycle waste heat from a data center to provide heating, cooling, and domestic hot water to four nearby New York City Housing Authority (NYCHA) low-income multifamily buildings, referred to as Fulton Houses, located in a Disadvantaged Community. The project would deliver waste heat to a clean heat pump facility (Energy Center) at the NYCHA property, where a water-source heat pump would generate heat into a primary ambient loop to serve all four buildings with highly efficient all-electric heat pump-supplied domestic hot water. A secondary ambient loop would provide both heating and cooling to the residents. Buildings will also receive energy efficiency upgrades as necessary. However, the NYCHA Fulton House residents recently agreed to a full rebuild of all buildings at this location. In light of this development, Con Edison plans to still utilize the Energy Center and connect the new NYCHA buildings to the UTEN. In its August 16, 2023 filing, Con Edison provided an update on the project based on the forthcoming rebuild, reducing estimated project costs by \$5.5 million to \$62.4 million, with an additional cost reduction of \$2 million in contingency costs and

sales tax expenses, for a total portfolio cost reduction of \$7.5 million. Con Edison states that the cost reductions result from the reduction of the number of buildings configured with variable refrigerant flow systems from three buildings to two, reflecting the NYCHA rebuild. Con Edison says that, despite the projected demolition of the two buildings receiving variable refrigerant flow systems, the project will provide adequate learnings and NYCHA has committed to connecting the new construction to the on-site UTEN. An estimated 75 percent of project costs are for infrastructure located outside of the NYCHA buildings, including the Energy Center, and can be leveraged for the NYCHA rebuild, maximizing the UTEN infrastructure's useful life.

Con Edison states it designed its proposed Mount Vernon Project to serve up to seventy-six buildings in a Disadvantaged Community, in an area identified to have leak prone natural gas piping. This suburban UTEN would have two separate ambient loops connecting homes, apartment buildings, businesses, and government and community buildings to the system via heat exchangers. Building work would include electrical upgrades as needed and air sealing and insulation to improve occupant comfort. Con Edison states that this project has built in future scalability, and a projected total cost of \$51.4 million.

Con Edison's proposed Rockefeller Center project consists of three large commercial buildings in midtown Manhattan converting from steam heating to UTEN-connected heat pumps. This UTEN is designed to utilize clean recycled waste heat from a variety of sources (including multiple building system steam condensate) in the Rockefeller Center network of buildings, which span three full city blocks. This project offers year-round heating and cooling for commercial buildings,

and accordingly the commercial customers will share in the cost of the pilot project with their own capital contributions. Con Edison estimates the project cost at \$58.4 million, with \$17 million to be provided by the corporate customers.

Additionally, Con Edison requests an additional one million dollars in funding for feasibility studies to explore potential additional pilot projects, the Endurant Sewer Heat Recovery Project in Downtown Mount Vernon, and the SUNY Purchase Campus Project in Purchase, NY.

KEDNY

KEDNY proposed one pilot project, in partnership with NYCHA, for buildings located at 17, 47, and 77 Vandalia Avenue in Brooklyn. The project consists of two 10-story apartment buildings and a low-rise community center, together totaling 335,000 square feet. KEDNY seeks to interconnect with nearby commercial buildings to balance the load profile, which may include two buildings in a nearby strip mall on 11110 Flatlands Avenue and 430 Louisiana Avenue. KEDNY projects the costs to be over \$67.7 million to offer both heating and cooling, or \$38.7 million for heating only. Note that these estimates include contingency costs of \$12.9 million and \$7.2 million, respectively. KEDNY states that, following commission approval, KEDNY will recruit all customers within 6 months; complete Preliminary Design, obtain permits and Issue Construction Request for Proposals within 12 months; and engage construction contractor(s), final design and commence construction within 18 months.

KEDLI/LIPA

KEDLI submitted a UTEN pilot project proposal jointly with Long Island Power Authority (LIPA). KEDLI and LIPA submitted limited project specifics. Without identifying the exact location, KEDLI and LIPA described the site as a cluster

of buildings comprising 200,000 square feet on a university campus located in a Disadvantaged Community. KEDLI and LIPA proposed that the project may keep existing equipment on site as backup heating and cooling, and that the area is "potentially gas constrained." They estimated costs at \$33.5 million, including \$6.2 million as contingency costs. KEDLI and LIPA proposed a timeline for the project identical to the KEDNY project described above. On July 24, 2023, KEDLI and LIPA made a filing with the Commission to withdraw this project. Citing "significant uncertainties regarding the viability of the project," KEDLI and LIPA have decided to pursue an alternative thermal energy pilot. They expect the new proposal to also have a college campus located within a Disadvantaged Community as the anchor customer. KEDLI and LIPA explain that they intend this new proposal to extend the thermal energy network into the surrounding neighborhood to provide greater community benefit. KEDLI and LIPA are in the process of developing a new project filing, which they plan to submit no later than December 1, 2023.

NMPC

NMPC submitted two pilot projects, one in the City of Troy and one in the City of Syracuse. Both projects were previously evaluated in scoping studies under NYSERDA PON 4614.¹¹ The City of Troy project consists of nine mixed use commercial and multifamily buildings in downtown Troy, all located in a Disadvantaged Community. To provide an adequate thermal load,

¹¹ Program Opportunity Notice (PON) 4614, a competitive solicitation launched by NYSERDA in 2021, provided funding for feasibility studies, detailed designs, and construction of community heat pump systems in New York State. Additional information can be found on the Community Heat Pump Systems website: <https://www.nyserda.ny.gov/All-Programs/Community-Heat-Pump-Systems/Community-Heat-Pumps-Pilot-Program>.

NMPC plans to drill a geothermal bore field in Troy's Riverfront Park, with all thermal generation equipment and associated piping to be installed, owned, operated, and maintained by Troy Local Development Corporation. NMPC will install, own, operate and maintain the distribution piping in the city streets, the district loop pumps, and the emergency backup generation. NMPC estimates the thermal load at approximately 550 tons, serving 317,000 square feet. NMPC estimates costs at \$12.27 million including \$2.22 million as contingency costs.

NMPC's City of Syracuse proposal is in the Inner Harbor area of Syracuse and utilizes the existing Metro Wastewater Treatment Plant outfall to Onondaga Lake as a thermal resource. If approved, it will serve up to fourteen newly constructed buildings consisting of multifamily housing, office space, retail space, restaurants, and an aquarium. As of the January 9, 2023 filing, NMPC states that the thermal load is 2,000 tons serving 1.2 million square feet. NMPC estimates that the connection to the Metro Wastewater Treatment facility could support at least two to four times the capacity currently envisioned in the pilot project. NMPC estimates the costs at \$66.75 million, including \$13 million as contingency costs. NMPC estimates these projects' timelines as identical to the KEDNY project described above.

NYSEG

NYSEG proposed two pilot projects. The project in Norwich consists of nine non-residential and twenty-three residential buildings on a city block located within a Disadvantaged Community. The building stock profile features a large grocery store, smaller commercial businesses, and a residential neighborhood. For load balancing, the grocery store has a cooling-dominant load that would provide heat to the

network. NYSEG projects costs to be \$13.5 million. NYSEG also projects \$183,400 in annual operating expenses.

NYSEG proposed its second pilot project in Ithaca. This proposal potentially includes fourteen non-residential and thirty-two residential buildings, with thermal resources from shallow closed loop boreholes, wastewater heat recovery, and a surface water heat exchanger in the Cayuga Lake Inlet. It is unique amongst the proposed pilot projects for its use of an open-loop groundwater system. NYSEG projects the costs to be \$15.4 million. NYSEG also projects \$183,400 in annual operating expenses.

For both projects, NYSEG estimated the following timeline: 6 months after Commission approval - Design Development Phase; 5 - 9 months after approval -- Construction Document Phase; 9 - 12 months after approval -- Bidding Phase; 12 - 23 months after approval - Construction Phase. NYSEG expects the pilot projects to last for five years.

RG&E

RG&E proposed one pilot project in the South Wedge neighborhood of Rochester, located in a Disadvantaged Community. It potentially includes five non-residential and seventeen residential buildings. RG&E states it will balance the thermal load through the large heating and cooling load associated with the Spectrum Communication Center and its location along the Genesee River, which allows for usage of a surface water thermal source. RG&E would also locate geothermal boreholes underneath parking lots. RG&E projects the costs to be \$13.2 million. RG&E also projects \$183,400 in annual operating expenses. RG&E proposes the timeline for this project to be identical to the timelines for the two NYSEG projects discussed above.

O&R

In its January filing, O&R proposed two pilot projects, which it referred to as "Geothermal Neighborhood Project" and "Pilot 2." O&R had not selected sites for either project at the time of the January filing, but proposed broad project goals of 1) developing a UTEN with residential and commercial customers in a newly constructed development located in a Disadvantaged Community, and 2) exploring the extent to which installing a new UTEN and retrofitting buildings can convince customers to fully electrify, especially if those customers are located at end of a gas spur or are served by aging distribution gas pipe. "Conceptual costs" led O&R to propose a maximum budget of \$50 million for both pilot projects. O&R recently completed its RFI process and filed supplemental project details on May 19, 2023.

In its supplemental filing, O&R clarified that it never selected a site for the "Geothermal Neighborhood Project" and has determined to close out that proposed project. As of the supplemental filing, O&R proposed a single pilot project in a Disadvantaged Community in downtown Haverstraw, Rockland County, where there is a diverse makeup of buildings and energy uses, including residential, shops, restaurants, businesses, parks, and recreational facilities. O&R envisions two separate UTEN loops within this pilot project, one by the Hudson River (East Loop) and one by the Village Hall (West Loop). According to the filing, O&R has already solicited potential customers for each loop, including an elementary school with solar, the Village Hall, a community center, and a planned real estate development adjacent to the Hudson River. Developing both loops will provide the opportunity to investigate retrofitting existing buildings for conversion to a geothermal source, as well as supplying UTEN solutions as a gas alternative for new

construction. To reduce the required number of boreholes, the East Loop location provides an opportunity to utilize the Hudson River as a thermal source, while the West Loop design incorporates sewage heat recovery as a thermal source. O&R designed both loops with future expansion in mind, to connect and expand the loops across the community. O&R is also seeking approval to conduct a feasibility study for a potential additional pilot project in the City of Port Jervis, Orange County. O&R estimates the cost for the Village of Haverstraw UTEN pilot project and for the Port Jervis feasibility study is approximately \$45.5 million, with a projected start-up date of first quarter 2025.

NFG

NFG proposed one pilot project, consisting of twelve residences and one commercial facility in an urban neighborhood, located in a Disadvantaged Community in the City of Buffalo. NFG stated that the project would be a "hybrid" thermal energy network comprised of new geothermal wells, a heat pump chiller, as well as new and existing natural gas boilers and existing cooling towers. Hot water and chilled water loops will tie-in to the existing Heating, Ventilation, and Air-Conditioning (HVAC) distribution system at the commercial facility and will serve new space heating equipment in the residences.

NFG proposed the use of a new supplemental natural gas boiler system to provide approximately 15 percent of the commercial campus' total annual load. NFG stated that the hybrid network "provides redundancy to ensure reliability and resiliency." NFG estimated costs to be \$14 million to \$18 million. However, NFG recently completed its feasibility study, and determined that the project is not viable. NFG withdrew the pilot project on May 26, 2023, and has already begun an RFI process to identify a new UTEN pilot project. NFG states it

will submit a new UTEN pilot project proposal to the Commission no later than December 1, 2023.

NOTICE OF PROPOSED RULE MAKING

Pursuant to the State Administrative Procedure Act (SAPA) §202(1), a Notice of Proposed Rulemaking with respect to the Thermal Energy Network Pilot Proposals provided by the state's seven largest utilities on January 9, 2023, was published in the State Register on February 1, 2023 [SAPA No. 22-M-0429SP1]. The time for submission of comments pursuant to this notice expired on April 3, 2023.

Written comments were received from the City of New York (NYC), Natural Resources Defense Council, Multiple Intervenors (MI), Tompkins County Climate and Sustainable Energy Advisory Board, Sane Energy Project, Building Decarbonization Coalition, Home Energy Efficiency Team, and the Building Decarbonization Coalition.¹² The Commission also received more than 500 form letter comments. Con Edison and O&R submitted reply comments on April 24, 2023. KEDNY submitted reply comments on April 28, 2023, and NYC submitted reply comments on May 1, 2023. Additionally, Con Edison and O&R filed project supplements on May 19, 2023, and Central Hudson on June 30, 2023. The Secretary to the Commission issued a notice on June 8, 2023, requesting comments regarding the Con Edison supplement by July 10. The Secretary to the Commission issued a notice on July 6, 2023, requesting comments regarding the

¹² The Building Decarbonization Coalition filing includes joint comments from the Alliance for a Green Economy, Building Decarbonization Coalition, Home Energy Efficiency Team, New York League of Conservation Voters, Sierra Club Atlantic Chapter, The Alliance for a Greater New York, and WE ACT for Environmental Justice and will henceforth be referred to as the Joint Environmental Commenters.

Central Hudson supplement by August 4. Appendix C to this Order provides a summary of all comments received. In addition, comments are addressed in relevant sections below.

LEGAL AUTHORITY

PSL §66-t(1) requires the Commission to initiate a proceeding to support the development of thermal energy networks for the purpose of meeting the GHG emissions and climate justice goals of the CLCPA. Questions that the Commission shall consider include the appropriate ownership, market, and rate structures for thermal energy networks and whether the provision of thermal energy services by gas and/or electric utilities is in the public interest.¹³

PSL §66-t(2) requires "each of the seven largest gas, electric, or combination gas and electric corporations" to submit at least one and as many as five proposed thermal energy projects to the Commission for approval.¹⁴ The pilot projects are intended to be "diverse and designed to inform the commission's decisions in the proceeding on the various ownership, market, and rate structures for thermal energy networks."¹⁵ PSL §66-t(2) requires that the Commission determine whether it is "in the public interest to approve or modify such pilot thermal energy network projects."

DISCUSSION

The Act seeks to demonstrate the viability of thermal energy networks as an equitable approach to decarbonization of New York's buildings at the community and utility scale,

¹³ PSL §66-t.

¹⁴ PSL §66-t(2).

¹⁵ PSL §66-t(2).

consistent with the goals of the CLCPA. The Legislature found that utilities' access to capital, their experience with networked infrastructure in public rights of way, and the requirement that they serve all customers, positions them well to develop and scale thermal energy networks that are accessible to all customers and to coordinate the development of thermal energy networks with any downsizing of the utility gas system.

It is the responsibility of the Commission to determine whether the Utilities' proposed pilot projects are in the public interest. In considering whether each pilot project is in the public interest, PSL §66-t(2) instructs the Commission to consider whether the pilot project will: (a) develop information useful for the Commission's promulgation of regulations governing UTENs; (b) further the climate justice and/or emissions reduction mandates of the CLCPA; (c) advance financial and technical approaches to equitable and affordable building electrification; and (d) create benefits to customers and society at large, including but not limited to public health benefits in areas with disproportionate environmental or public health burdens, job retention/creation, reliability, and increased affordability of renewable thermal energy.

The Commission must also balance the expected learnings from these pilot projects with the costs imposed upon ratepayers to undertake the pilot projects. MI recommends the Commission evaluate the costs of the proposed pilot projects carefully and moderate the costs to a modest level. PSL §66-t(2) states that the portfolio of pilot projects need to be diverse enough to adequately "inform the Commission's decisions in this proceeding on the various ownership, market, and rate structures for thermal energy networks." Further, the Act also requires that each utility shall "coordinate with other utility

participants, NYSERDA, and consultants with expertise on successful pilot projects.”

Given the intention of the pilot projects to provide useful information to promote the development of thermal energy networks throughout New York State, the Commission shall consider whether the pilot projects will test diverse UTEN technical system designs and configurations, business models, pricing structures, or other aspects of operating the UTEN. Additionally, the Commission shall consider the unique learnings each project may provide, in determining which projects should proceed to full implementation. This will allow the Commission to balance the financial impacts to ratepayers for these early pilot projects with the expected learnings that will result from them. Moreover, the Commission notes that, as described in the Initiating Order, the Utilities may propose pilot projects in the future for consideration by the Commission, after learning from the experience of the initial round of projects.¹⁶

Procedural Approach

Development and implementation of UTEN pilot projects is a complex undertaking that requires utilities to design and engineer systems and develop pricing and rate structures that have not been a part of their core business to date. Garnering participation in the pilot projects will also require novel approaches to customer engagement. The pilot project proposals submitted by the Utilities on January 9, May 19, June 30, and August 16, 2023, contain varying levels of detail and reflect differing degrees of project maturity, but represent a reasonable first step in describing the pilot projects the utilities seek to undertake. As evidenced by the two project withdrawals as well as the supplemental filings providing

¹⁶ Initiating Order, p. 9.

further details or modifications, the development of these pilot projects is an ongoing and fluid undertaking. The Joint Environmental Commenters noted that many of the pilot project proposals lacked sufficient detail for the Commission to assess their merit and recommended the Commission delay approval until the Utilities provide more information. The Commission agrees that the Utilities must supplement the record before it can authorize construction of any particular pilot project.

The process adopted here to review and steer project development must recognize the dynamic nature of this endeavor. It must also provide structure and transparency as well as clarity to the Utilities regarding the requirements they must meet to advance their projects. And it must minimize risk while advancing projects that are in the public interest as quickly as possible. Accordingly, we adopt a process that entails stepwise advancement through five distinct stages:

- Stage 1: Pilot Project Scope, Feasibility, and Stakeholder Engagement
- Stage 2: Pilot Project Engineering Design and Customer Protection Plan
- Stage 3: Customer Enrollment and Pilot Project Construction
- Stage 4: Pilot Project Operation and Management
- Stage 5: Pilot Project Review, Recommendations, and Conclusion

Under this "stage-gating" approach, a Utility's pilot project will proceed from one stage to the next only after Staff or the Commission, as appropriate, is satisfied that the Utility has complied with the requirements for each stage, as described below.

Stage 1: Project Scope, Feasibility, and Stakeholder Engagement. All active pilot project proposals received to date are currently in Stage 1. The proposals require further development before they can advance to Stage 2. Accordingly,

the Utilities shall supplement their proposals by filing a Final UTEN Pilot Project Proposal by December 15, 2023. That filing must include the following information: the specific objectives of the pilot project, including the novel or unique technical or business model approaches it will explore and anticipated findings; preliminary cost estimates and timeline associated with the Stages presented here, and other key milestones identified by the Utility; potential barriers and risks associated with the proposed pilot project and steps the Utility will take to address them; and a description of benefits to residents of the Disadvantaged Community, if applicable.

The Final UTEN Pilot Project Proposal must also adequately address the other guidance provided in this Order. Further, this filing must also include a Preliminary Customer Protection Plan, including a description of required customer engagement activities and customer agreement template that recognizes customer protections, also discussed below. Relatedly, if any of the Utilities decide to withdraw a pilot project prior to completing the pilot phase, the Utility shall, in consultation with Staff, file a Pilot Project withdrawal letter with the Secretary to the Commission. This filing shall describe the reasons for withdrawing the pilot project and document any key findings or recommendations from the pilot project.

Approval to Advance to Stage 2: Upon receipt of each Utility's Final UTEN Pilot Project Proposals, Staff shall conduct a compliance review to determine if the filing meets the requirements set forth in this Order. Approval to enter Stage 2 is expected to be rendered for each distinct pilot project. If Staff confirms that a Final UTEN Pilot Project Proposal complies with all requirements, the Director of Energy System Planning and Performance (or successor) shall issue a letter confirming

compliance and advancing the pilot project to Stage 2. The approval letter may also include Staff feedback that the Utility should consider in the next stage of development. If Staff identifies one or more aspects of a Utility's Final UTEN Pilot Project Proposal that is non-compliant or presents feasibility concerns, the Director of Energy System Planning and Performance (or successor) shall issue a letter identifying the deficiencies and/or concerns and setting forth a timeline for the Utility to respond with the necessary information. Upon receipt of the additional information, Staff will undertake the compliance review process discussed above. The Final UTEN Pilot Project Proposal, and all subsequent filings and Director letters shall be filed with the Secretary to the Commission.

Stage 2: Pilot Project Engineering Design, and Customer Protection Plan. This stage entails the development of a final project engineering design, including acquisition of all necessary permits and the development of all documents required to begin construction of the pilot project. Stage 2 also includes development of a project-specific Final Customer Protection Plan. Stage 2 will also entail the further development of operational requirements, the cost recovery approach, performance metrics, and other data collection and reporting structures.

Of note, the Utility shall not incur costs greater than 10 percent of the proposed pilot project budget from project inception through finalizing project engineering design and Customer Protection Plan (Stage 2), as identified in Appendix A¹⁷. For those utilities that have withdrawn their initial proposals, the Commission uses the budgets for the

¹⁷ The proposed pilot project budget refers to the total project budget detailed in the pilot project proposals and supplemental filings received as of the date of this Order.

withdrawn proposals as a guide to set the cost limitation through Phase 2.

Approval to Advance to Stage 3: Within nine months of Staff issuance of a Utility's individual pilot project-specific compliance letter advancing a project to Stage 2, the Utility shall file a Final UTEN Pilot Project Engineering Design and Customer Protection Plan. The final pilot project design shall contain decision-quality information for the Commission to assess the merits of the pilot project. As such, prior to authorization for the further expenditure of ratepayer funds to proceed with pilot project construction, the Utility shall present construction specifications for the system, including at a minimum: the piping design of the system beyond the single-line drawings required under the initial pilot project proposals; piping type and grade of material and trenching backfill; maximum operating pressure; maps of proposed system including depths, thermal sources, valves, and metering; composition of fluid; equipment and appurtenances to be used for both the distribution system and customer side; anticipated thermal and pressure design loads and parameters. Also, the Utility shall identify the training and qualification programs and activities that will be required to ensure the integrity of the system. Additionally, the Final UTEN Pilot Project Engineering Design and Customer Protection Plan filing shall include the Utility's proposed operating procedures, emergency plan, and damage prevention program for the project.

The Final UTEN Pilot Project Engineering Design and Customer Protection Plan filings will be issued for public comment and the subsequent Commission Order(s) determining whether the specific pilot projects can advance to Stage 3 will also address cost recovery, refined performance metrics, and direct tariff filings, further data collection and reporting, or

other elements deemed necessary to ensure proper monitoring and oversight of the pilots.

Stage 3: Customer Enrollment and Pilot Project

Construction. The two sub-stages of Stage 3 are to be completed in sequence.

Stage 3a: Customer Enrollment. Formal enrollment of customers into the pilot project requires the execution of a Customer Agreement.¹⁸ For each pilot project, the Utility must enroll a prescribed minimum number of customers, to be detailed in the forthcoming order(s) determining whether to authorize the pilot projects to advance to Stage 3.¹⁹ Once the Utility has done so, it shall file a letter with the Secretary of the Commission documenting that it has met this milestone.

Stage 3b: Pilot Project Construction. Construction may not begin until the Utility files a letter with the Secretary documenting its enrollment of sufficient customers. The Commission will determine specific reporting requirements in the forthcoming order(s) determining whether to authorize the pilot projects to advance to Stage 3. At present, the Commission anticipates that we will require the Utilities to provide monthly status updates documenting progress towards meeting construction milestones during this phase. We expect the status updates will identify, at a minimum, unanticipated

¹⁸ The Customer Agreement is the agreement entered into between the utility and the customer with respect to services provided to the property.

¹⁹ Given the unique nature of each of the pilot project proposals, it is not possible nor appropriate, at this time, to identify a minimum threshold for enrollment that would apply universally to all projects. The Commission will take this into consideration in its review of the Final UTEN Pilot Project Engineering Design and Customer Protection Plan filings and invites the Utilities to propose a level that would be appropriate to minimize risks that would jeopardize the operation of the UTEN in their filings.

events, reasons for any delays, and changes to the number of customers enrolled.

Stage 4: Pilot Project Operation and Management.

Stage 4 represents the full operation of the pilot project and the start of performance monitoring. The Commission anticipates the pilot phase of the projects will be a minimum of five years to capture sufficient seasonal data for conducting analysis such as, thermal loop performance, building energy benchmarking, load shape analysis, energy consumption, occupancy predictions, and HVAC control impacts, to understand building operations and impacts on energy use, energy costs, and GHG emissions. The Commission anticipates requiring ongoing reporting throughout the pilot period of the projects. The Commission will detail the contents and frequency of such reporting in the forthcoming order(s) determining whether to authorize the pilot projects to advance to Stage 3. The Commission anticipates requiring performance metric reporting quarterly, further discussed below. The operation and management phase will ensure the pilot project is performing as designed while remaining adaptable to incorporate any necessary changes.

Stage 5: Pilot Project Review, Recommendations, and Close Out. In this stage, the Utility shall review the project, document key findings, and propose recommendations for the Commission to consider regarding future UTEN pilots, full-scale UTEN deployment, or the promulgation of regulations necessary to support UTEN operations. This information shall be detailed in a Pilot Project Review and Recommendations Report, which shall be developed in consultation with Staff. Relatedly, the Commission may consider requiring a separate, third-party evaluation of the pilot project(s).

Additionally, the Commission requires that the Utility file a Pilot Project Close Out Report for each applicable pilot

project, detailing the Utility's proposed steps for closing out the pilot project. At conclusion of the pilot phase, the project will be considered complete for informational purposes outlined in the Act. While project specific report requirements and filing timing will be detailed in subsequent order(s), the Commission expects the Pilot Project Close Out Report will include but not be limited to details on continuing to serve customers through the UTEN as a normal course of business or transitioning customers to alternatives in accordance with provisions outlined in the Customer Agreement, and all associated tariff filings.

If, at any point in time, a pilot project is not progressing through the Stages in accordance with the stage-gating criteria described in this and future orders, or if design, construction, or operational deficiencies become apparent, the Commission retains the authority to require project modifications or rescind approval and cease the pilot project.

As described above, all active pilot project proposals received to date are currently in Stage 1 and are required to file a Final UTEN Pilot Project Proposal by December 15, 2023. The Commission notes NFG and KEDLI/LIPA have withdrawn their original pilot project proposals. However, NFG and KEDLI/LIPA have indicated their intention to provide revised proposals by December 1, 2023. Rather than provide multiple filings, NFG, KEDLI, and LIPA shall take account of the requirements of this Order and file Final UTEN Pilot Project Proposals for their respective projects as described herein. For each guidance area set forth below, the Commission requires specific next steps to reach resolution.

Key Terms and Definitions

While thermal energy networks have operated throughout the United States and the world for many years,²⁰ the UTENs envisioned by the Act require characteristics present in a small number of existing thermal energy networks. Those characteristics align with the CLCPA's GHG emissions reduction and climate justice goals. Commenters note that as New York embarks on developing this industry it is critical for all involved to use common terminology and definitions for various design and operational features.²¹ Staff is therefore directed to convene a technical conference, by public notice, within 30 days of the effective date of this Order to identify key concepts and develop mutually agreed upon terms and definitions that are consistent with terms and definitions found in codes or standards applicable or under development for thermal energy networks. Staff shall participate in the development of agreed-upon UTEN Terms and Definitions and shall file them publicly in this proceeding. Staff, the Utilities, NYSERDA, and other interested stakeholders will be expected to adopt this

²⁰ The Con Edison Steam System is an example of a high-temperature centralized production district heating network. Other examples, such as, a campus style property with multiple buildings whose heating and cooling needs are met by a central plant fossil-fuel based system is an example of a thermal energy network with operating loop temperatures typically below 212°F. Thermal energy networks are integral to building stock heating and cooling in jurisdictions across the world, such as Denmark and Canada, where widespread adoption has proven successful. Technological advancements and sustainable network design has led to low-temperature thermal energy networks that aim to be fossil free.

²¹ Comments filed by The Joint Environmental Commenters include proposed definitions for the following terms: Primary Thermal Resource, Secondary Thermal Resource, Supplemental Thermal Resource, Emergency or Backup Resource, and Zero Emission Thermal Resource. The Commission does not expressly endorse the proposed definitions, at this time.

terminology in all future filings in this proceeding and others involving thermal energy networks. If no mutual agreement is reached amongst technical conference participants, Staff shall resolve disagreements regarding the applicable terms and definitions for this proceeding. Additionally, if any new terminology is identified or developed through the operation and learnings of the pilot projects, or from external industry-wide advancements, that may be useful in the conduct of this proceeding, Staff shall update the terms and definitions as appropriate.

Disadvantaged Communities

The Act requires each utility to propose at least one pilot project located in a Disadvantaged Community within that utility's service territory. If a utility proposes four or more pilot projects, the Act requires that at least two be proposed in a Disadvantaged Community. The Commission understands this requirement is purposeful to align the Act with the climate justice and emissions reductions mandates of the CLCPA. As such, in the Commission's review of the pilot project proposals, one factor that must be considered is whether the pilot project is reasonably expected to produce benefits to members of the Disadvantaged Community in which it is located. An examination of the KEDLI/LIPA proposal, which has subsequently been withdrawn, is instructive with regard to this requirement. While the proposal stated it was located within a geographic area defined as a Disadvantaged Community, it was entirely focused on a university campus and the filing provided no further detail as to how, or if, residents of the Disadvantaged Community in which it was located would benefit from the pilot project. To the extent this level of information was not detailed in the Utilities' filings to date, they shall provide additional information in their Final UTEN Pilot Project

Proposal for any pilot projects proposed within a Disadvantaged Community explaining how that community and its residents are expected to benefit from the pilot project.

Clarification on UTEN Design Options

Thermal energy networks that use an ambient temperature loop design can take advantage of the ground's relatively constant temperature and minimize thermal losses in the distribution network. This design allows for integrating various thermal sources into the distribution network. These might include groundwater and surface water, geothermal exchange wells, wastewater heat recovery, and waste heat recovery from refrigeration systems, among others. The fluid in a low temperature distribution network circulates thermal energy to and from multiple thermal sources and sinks connected to a district distribution energy network and to heat pumps in connected buildings to serve space heating and cooling, domestic water heating, and refrigeration loads.

The Commission observes that the Act does not require utilities' UTEN pilot projects to use ambient loop systems. Even so, to date, most of the Utilities' pilot project proposals use an ambient temperature loop design. While the Act's legislative findings section does reference "ambient temperature," the Act's amendments to the Public Service Law do not limit thermal energy networks to ambient loop systems. The Act defined "thermal energy," codified in PSL §2(28), to mean "piped non-combustible fluids used for transferring heat into and out of buildings for the purpose of eliminating any resultant on-site GHG emissions from all types of heating and cooling processes, including, but not limited to, comfort heating and cooling, domestic hot water, and refrigeration."

Nothing in this provision, nor in PSL §2(29) defining "thermal energy networks," limits a utility's UTEN design

options to an ambient temperature system. Therefore, the Commission clarifies here that the Utilities may offer designs that use varying fluid temperature levels, beyond or including "ambient," as appropriate. While ambient systems may be the best option in certain circumstances, each Utility's proposed pilot projects should consider the most efficient, reliable, and affordable solutions in the design and operation of their proposed UTENs.

Technical, Economic and Operational Aspects

UTENs represent complex technical systems that have a collective and decentralized nature for distributing thermal energy production across multiple buildings. UTENs use some variations of thermal resources such as, ground source heat pumps, geothermal infrastructure, or waste heat energy that can be employed in conjunction with renewable energy resources in providing efficient heating and cooling alternatives. As noted, the pilot project proposals included varying levels of specificity with regard to the technical elements of the proposed UTEN, however overall, the proposals currently are generally high level and lack specificity. The Commission provides additional guidance below for the Utilities to consider and incorporate as they further develop their pilot projects. The guidance relates to technical, economic, and operational elements of the UTEN, energy efficiency of connected buildings, and the need for comparative analysis.

Pilot projects must focus on achieving cost effectiveness, system resiliency, and reliability objectives, as well as aligning with the CLCPA's GHG emissions reduction requirements. UTEN pilot projects should be designed and operated to maximize system mechanical and thermal efficiencies. This can include but not be limited to capturing waste heat from refrigeration, air conditioning, or process loads as part of the

system design. The design objectives of an optimized UTEN are to improve system efficiency, thereby reducing operating and maintenance costs as well as associated emissions and, ultimately, customer costs.

1. UTEN Optimization and Balancing

Network optimization is an important aspect of thermal energy network design that is achieved by aligning thermal energy production and consumption with the demand on the system. Balancing thermal energy systems requires consideration of the thermal energy inputs, outputs, and utilization or generation on the system. The supply and demand of thermal energy from diverse building loads of connected customers and thermal energy sources must be considered to facilitate a balanced system overall. Resources such as waste heat recovery, geothermal exchange wells, surface water heat exchangers, cooling towers, wastewater heat recovery, renewable thermal sources, and thermal storage can all be used to balance the system and can serve to share thermal energy. The Joint Environmental Commenters note that NMPC's Syracuse project appears to be in line with the goals of the Act. The Joint Environmental Commenters also note they are encouraged with NMPC considering the wastewater treatment plant outfall as a thermal energy resource citing such an approach provides a diversity of thermal energy resources compared to relying solely on geothermal boreholes. The Joint Environmental Commenters also applaud NMPC for considering third-party thermal energy procurement from a municipality, as described in NMPC's Troy and Syracuse pilot projects, as they submit the low upfront capital cost obtained by using heat from third-party sources is a positive attribute of the projects. The Joint Environmental Commenters also note there is value in allowing competition for those functions and the learnings from this type of arrangement could be very promising.

Renewable thermal energy production, and thermal energy sources if applicable, must be aligned with the demand on the system. The peak supply and/or demand conditions of the network may not be coincident with the peak design conditions of any one site connected to the network. As the proposed pilot projects are relatively small in scale, it will be critical to accurately assess the thermal balancing of the networks and management of their thermal resources. Network optimization should evolve as the Utilities implement the UTEN pilots and they increase in size and demand. By tracking performance metrics, real-time data collection, and other network data, the Utilities can implement solutions to further optimize their UTENS for highest network performance and best design at the lowest possible cost to the connected consumer.

2. Safety, Reliability, and Resiliency

Utility customers have an expectation of safe, adequate, and reliable electric and natural gas service to meet their homes and buildings' energy needs. While UTENS represent a new form of delivery of service to customers, the expectation for safe, adequate, and reliable service remains foundational. The safety and reliability rules and regulations governing the electric and natural gas industry have been developed over many years. Knowledge and experience related to the provision of other types of utility service in New York is instructive to consider as we turn our attention to establishing the appropriate standards for UTENS related to safety, reliability, and resiliency. The Commission expects to utilize the pilot projects to further understanding in these areas. Given UTENS are only just being piloted, there may be a natural tendency for the pilot projects to build in higher levels of redundancy and protections than would be practical or necessary after gaining experience and transitioning to implementing UTENS at full

scale. However, the Commission notes these levels of protection come at costs to ratepayers and should be based on experience from other utility scale energy systems, professionally informed engineering analysis and modeling, and represent reasonable costs for the risk(s) they intend to mitigate. The intention is that customers should experience the same level of service, or better, than they currently experience with the energy systems being replaced by UTENs. Accordingly, the Utilities shall describe the measures and methodologies they propose to undertake to achieve the desired levels of safety, reliability, and resiliency, and justification for their proposed approach in their Final UTEN Pilot Project Proposals.

3. Thermal Energy Resources

The Act directs the Commission to ensure that the thermal energy exchanged through the UTEN aligns with the climate justice and GHG emissions reductions requirements of the CLCPA, such that it does not increase GHG emissions or co-pollutants. Natural Resources Defense Council (NRDC) opposes the inclusion of fossil fuel-fired equipment in the UTEN designs, stating that UTEN pilot projects should not utilize fossil-fired equipment to meet peak loads or system balancing needs. Further, NRDC supports "locating pilot projects where they will avoid or defer gas system investment because it will test UTEN's ability to replace gas and the avoided investment will reduce ratepayer impacts." The Joint Environmental Commentors "recommend rejecting or modifying projects which incorporate non-Zero Emissions Thermal Resource (non-ZETR) heating or cooling as primary, secondary, or supplemental thermal resources" but recognize that "during the demonstration phase, non-ZETRs should only be allowed for emergency or backup purposes to ensure reliability."

Reliance on fossil fuels as the thermal energy resource for UTENs is not in alignment with the emission reduction mandates of the CLCPA, and UTENs should not rely on these types of resources for baseload operations. Thus, the Commission notes pilot projects that do not use fossil fuels for peak, backup or emergency use would reduce any emissions associated with the combustion of fossil fuel at these project locations and directs the Utilities to prioritize locations that would support this approach. At the same time, the Commission recognizes that the costs of the proposals are closely linked to the characteristics of the site(s) selected for a project, including the role of different thermal sources in the project's operation. Given the nascent nature of UTENs and the need for the pilot project to produce comparative learnings across various configurations and the need to build confidence in the ability for UTENs to meet customers' needs at just and reasonable costs, the Commission may consider the use of fossil fuels to ensure reliability and to mitigate excessive costs related to thermal energy supplied for meeting peak needs.

If a Utility proposes the use of fossil fuel for reliability and resiliency purposes, it must clearly articulate the level of redundancy being proposed and associated costs. Additionally, the Utility proposal must not include provision of new natural gas service or installation of new fossil fuel equipment at customers' premises. This aspect of system design creates a potential cost concern because of the potential multiplication of Utility infrastructure to maintain continued service at customer premises. Further, pilot project proposals that retain legacy systems at the customer premises must clearly indicate how the project will control their unintended use, to mitigate risk of skewing the performance data of the UTEN, as

well as how the Utility will address any health and safety concerns.

If a Utility proposes the use of fossil fuel resources to manage project cost, complexity, and/or to provide a degree of reliability and resiliency in mitigating peak loads, the utility must limit the annual carbon emissions from the use of fossil fuels. Utilities also shall document how future UTEN expansion can reduce, decommission, or eliminate reliance on fossil fuel use as the development of UTENS continues to mature.

If a utility chooses to propose a pilot project that includes connected fossil fuel resources, the utility shall further provide a robust justification for the need within the utility's Final UTEN Pilot Project Proposal. The justification shall include, at a minimum: the basis for determining the sizing or capacity of the resource; operating characteristics which would dictate why and when the resource would be deployed; a quantifiable analysis comparing the incremental cost differences between a system with zero emission energy resources and a system that utilizes fossil fuel to meet peak loads, or for emergency or backup purposes.

4. Point of Demarcation

The Utilities Final UTEN Pilot Project Proposals must clearly state the point of demarcation between utility-owned thermal energy network infrastructure and property owned and operated by either the connected customer or the third-party owned thermal energy source. The demarcation line is where the utility's equipment on the UTEN connects with the "on-site" equipment, such as a connected customer's heat pump, heat exchanger, or thermal distribution system. Responsibilities associated with operation and maintenance of the utility-owned, third-party owned, or customer-owned assets must be clearly identified in the Customer Agreement.

5. On-site Energy Efficiency Upgrades

Energy efficiency upgrades to UTEN-connected buildings can be expected to improve the cost-effectiveness of both the building and the UTEN. A considerable loss of energy and commensurate impact on a customer's annual energy costs is typically traceable to waste from drafts, air leaks around openings, and inefficient heating, cooling, and domestic hot water equipment. The most common building envelope improvements include sealing air leaks, adding insulation, sealing of heating, and cooling distribution systems, and installing energy-efficient windows. These improvements allow heating and cooling systems to work more efficiently, improve comfort by keeping indoor temperatures and humidity levels more consistent, reduce energy use and resulting emissions, and lower energy costs. These improvements also tend to make electrification more cost-effective. With respect to UTEN-connected buildings, building envelope improvements would reduce operating costs by decreasing the load that the UTEN must satisfy.

Con Edison and O&R are proposing lasting energy efficiency upgrades for their projects, such as weatherization measures, which will reduce overall building energy consumption and improve customer comfort. Central Hudson's "Building Efficiency Testing" for its proposed pilot at the Tubman Terrace buildings will allow the utility, stakeholders, Staff, and the Commission to better understand how various levels of energy efficiency upgrades relate to project cost and energy savings using real time data on multiple buildings of similar size. National Grid states it will work with connected customers to "...support the customer's participation in any and all available energy efficiency programs..." across National Grid's service territories and all three pilots.

NYSEG and RG&E recommend that customers who participate in their UTEN pilot projects also participate in one of the free home energy audit programs available in New York. NYSEG and RG&E acknowledge that "energy conservation measures such as building envelope improvements ... maximize the overall efficiency and cost effectiveness" of the pilot projects. The Companies state they "will look to sequence the recommended energy efficiency work after the HVAC and any electrical upgrades are installed to avoid any conflicts with the newly installed systems." The Commission does not agree with this approach and strongly encourages building envelope improvements be applied before or in conjunction with the specification and installation of heat pump equipment. Doing so can allow the building envelope improvements to minimize the capacity of the heat pump equipment being installed thereby reducing energy consumption, demand, and costs.

Home Energy Efficiency Team (HEET) encourages prioritization of building envelope improvements and weatherization. Additionally, the Joint Environmental Commenters assert that utilities should be allowed to include customer-side building retrofit costs in the pilot project cost. MI argues that pilot project participants should contribute a fair amount toward the project costs.

Given the likely benefits of efficient buildings to the operation of the UTEN, the Commission will consider the inclusion of energy efficiency upgrades in connected buildings as a potential allowable cost for the pilot projects. The Commission appreciates MI's concerns about participant contributions, but notes that energy efficiency upgrades may be an important way to entice customer participation in the pilot projects. Additionally, the impact of energy efficiency upgrades may be a category of information that is worth

understanding for all stakeholders but especially for Staff and the Commission as this proceeding continues to address regulations for future UTENs. The Commission notes ratepayers already support a full suite of energy efficiency programs through utilities and NYSERDA. Additionally, the Commission notes federal funding available through the Inflation Reduction Act or the Infrastructure Investment and Jobs act may include resources that, at a minimum, could be utilized to support energy efficiency in connected buildings.²² Thus, it is the Commission's expectation that the Utilities will leverage all available programs to the extent practicable. If a Utility proposes to pursue energy efficiency upgrades as part of a proposed pilot project, the Utility's Final UTEN Pilot Project Proposal shall reflect all costs associated with such upgrades that it projects would be supported by ratepayer funds through other programs. This will enable a full accounting of costs incurred by pilot projects, even if a portion of those costs will be borne by the Utilities' or NYSERDA's energy efficiency programs.

The Commission believes it would be instructive for one or more of the pilot projects to test the impacts of energy efficiency improvements on the cost and operational characteristics of the UTEN, as proposed by Central Hudson. Any pilot project that incorporates connected building energy efficiency into the pilot design must include an analysis projecting the costs and benefits of doing so within the Final UTEN Pilot Project Proposal. This may include, but not be limited to, control groups, etc. to distill useful information for analysis. Further, for pilot projects that do not

²² Beyond efficiency work in connected buildings, the Utilities should explore any, and all, opportunities to leverage federal funding to support the UTEN pilot projects.

incorporate connected building energy efficiency into the pilot design, the Utility shall provide information to the UTEN participants about the benefits of undertaking energy efficiency and any available programs the customer may be eligible for.

In order to ensure alignment with other ratepayer funded programs and analytical consistency across UTEN pilots that may include energy efficiency, Utilities should reference the load-reduction packages currently used in the NYSERDA Comfort Home Program for single-family home treatments.²³ For energy efficiency upgrades in commercial buildings, Utilities should reference the median Energy Star® score or greater as defined by the ENERGY STAR® Portfolio Manager®, an Industry Standard for Benchmarking Commercial Buildings. Additionally, residential and commercial retrofits for domestic hot water upgrades should align with the newly amended New York State appliance and equipment efficiency standards outlined in Title 21 New York Codes, Rules, and Regulations Part 509.

6. Comparative Analysis

NRDC suggests the pilots should be designed to gather information on whether connection to the UTEN is cost-effective for customers relative to converting to individual air source heat pumps (ASHP). NRDC further identifies customer cost information to consider, including the projected increase in electric rates from meeting ASHP peak demand relative to UTEN-connected heat pumps and any potential decrease in upfront costs of electrification via UTEN connection, whether through reduced

²³ The envelope improvement packages, which include air sealing measures, insulation measures, and window replacement measures installed through the Comfort Home program reduce the heating and cooling loads of the home and enable the selection of heat pump equipment with smaller heating and cooling capacities than what would otherwise be required without the envelope improvements.

needs for deep energy efficiency retrofits, the ability to utilize existing ducts or baseboard heating systems, and other cost reductions.

One of the primary intents of the Act is to facilitate a more equitable form of electrification. As such, the Commission agrees it is necessary to compare the cost to electrify through a UTENS versus other forms of building electrification, including ASHPs and ground source heat pumps. Such an analysis is not necessarily straight-forward given the uncertainty surrounding future energy and technology costs, which will be affected by many factors, including the pace of electrification in the State as one example. Further, the Commission recognizes that the costs associated with the pilot projects may be greater than those of mature UTENS deployed on a larger scale. As with the utility-scale gas and electric systems, the costs of a UTEN can decrease significantly as additional customers join the system. Nonetheless, it is important for the pilot project proposals to include information demonstrating the pilot has the potential to advance equitable electrification.

Utilities shall provide a comparative economic life-cycle analysis in the Final UTEN Pilot Project Proposal of a UTEN versus individual building electrification alternatives. The analysis shall incorporate the best information available at the time of the filing and identify costs, energy usage, and any other assumptions used in the analysis. The comparative economic life-cycle analysis shall capture both capital and operational expenditures over the lifetime of the customer or utility assets as well as the associated benefits. Information should be presented in such a way to provide the costs and benefits to the Utility, and therefore ratepayers, as well as the cost to the electrified customer. For transparency, the

Utilities shall also include in the Final UTEN Pilot Project Proposal a similar comparative economic life-cycle analysis of the costs and benefits associated with the continuation of natural gas service to UTEN pilot project customers.

The Commission expects that pilot projects that continue to Stage 4, will track metrics to further the understanding of the costs associated with UTEN electrification versus other forms of electrification to satisfy the connected buildings' heating and cooling needs.

Customer Protection Plans

At the core of a successful UTEN pilot project is customer adoption and satisfaction. The Utilities must be able to clearly articulate the benefits of the UTEN to customers and explain customer protections for UTEN pilot project participants.

As such, the Utilities must communicate customer protections to potential participants at the earliest practical time. While the pilot project proposals to date have articulated broad goals and objectives regarding their respective customer protection plans, the Utilities provided little detail on how each Utility plans to educate and engage with participants to discuss the pilot project details and articulate their rights and responsibilities.

The Final UTEN Pilot Project Proposal shall include a Preliminary Customer Protection Plan, that includes the following components: (1) the basic conceptional structure of the Final Customer Protection Plan, (2) customer engagement activities, and (3) a customer agreement template that documents the customers' rights and responsibilities, as described below, that are associated with the pilot project.

As a general matter, the Commission recognizes that the Utilities will need to continue to develop their Customer

Protection Plans in conjunction with the Utilities' development of their pilot projects before a pilot project advances to Stage 3 and that some level of stakeholder or customer engagement has likely already been operationalized. Customers need to be aware and educated on the details of the pilot project prior to agreeing to participate and should be kept informed as the pilot project progresses toward and through construction and into operation.

As such, Utilities must maintain frequent communication with customers to provide project schedule updates. At a minimum, the customer engagement component of the Preliminary Customer Protection Plan shall include the following: a description of the UTEN pilot project, proposed customer engagement budget; recruitment plan, including methods to recruit participants; customer outreach and education plan including, but not limited to, communication methods, messaging (pre- and post-project operational start date), detailed list of the outreach materials to be dispensed to customers including, the languages in which they will be made available and schedule for the planned outreach; and the planned approach for ensuring customer understanding and acknowledgement of all elements of the Customer Protection Plan.

The customer agreement template component of the Customer Protection Plan shall detail the customer's rights and responsibilities and is essential to the recruitment of customers and ultimate success of the pilot projects. The customer agreement template shall include, at a minimum: 1) Home Energy Fair Practices Act protections, including, but not limited to, language regarding service terminations and the complaint process; 2) customers' participation/withdrawal options; 3) pricing options to minimize the risk of higher energy bills; 4) metering, billing process, fees, and payment

options; 5) installation and maintenance responsibilities; customer exit options during the UTEN pilot project operation and at the conclusion of the pilot phase; and 6) customer consent and customer privacy.

Each utility shall file its Preliminary Customer Protection Plan as part of its Final UTEN Pilot Project Proposal. Additionally, each utility shall file a Final Customer Protection Plan, that is pilot project-specific, as part of the Final UTEN Pilot Project Engineering Design and Customer Protection Plan filing. As discussed above, this filing will be subject to a public comment period after which the Commission will consider whether to authorize the project to advance to Stage 3.

Future Cost Recovery and Tracking of Costs

In their filings, the Utilities propose to recover the costs of the pilot projects, in excess of those costs to be recovered through rates charged to pilot participants, through a surcharge to their other customers. There are differences among the proposals regarding the specific details of the surcharge. Most notably, all the Utilities, except for O&R and Con Edison, propose to recover the costs through a surcharge applicable to all firm gas customers as provided for in the Initiating Order. Con Edison and O&R propose to recover the costs from electric customers. Another notable difference relates to the amortization periods over which the Utilities proposed to recover the costs, which ranged from 10 to 30 years. The Commission notes that many of the filings lack a bill impact analysis or details of how each utility would allocate the costs or develop the surcharge. MI disagrees with utility proposals that seek to recover the entirety of project costs through a surcharge and, instead, recommends that costs of the pilot projects be reflected in base delivery rates as soon as

possible. Additionally, MI indicates the costs should be allocated to a utility's service classes utilizing cost causation principles prior to turning to rate design and recovery and to avoid recovering all costs on a volumetric basis. NRDC recommends amortizing UTEN infrastructure costs over a longer period, in the range of 60 to 70 years, to align more closely with the expected useful life of the thermal energy network and to reduce the short-term rate impacts of the pilot projects. NYC disagrees with the Con Edison and O&R cost recovery proposals that only electric customers bear the costs of the pilot projects. For the Mount Vernon Project, NYC indicates that there should be some costs borne by gas customers as it would involve electrification as an alternative to leak-prone gas pipe replacement.

The pilot project proposals lack necessary details for the Commission to approve specific cost recovery mechanisms at this time. The stage-gating process, as discussed previously, will provide structure to the project approval process and clarity to the utilities as to expectations they need to meet to advance projects. As such, the Utilities shall include any updated costs, the associated bill impacts and any other specific details regarding the allocation of costs, rate mechanisms to be used, and proposed treatment of any future unknown costs in their Final UTEN Pilot Project Engineering Design and Customer Protection Plan filings. Based on this information, and further public comments, the Commission will have the information necessary to decide on the appropriate cost recovery mechanism(s) for the pilot projects in a subsequent order or orders. The Commission expects to balance, among other things, the anticipated useful life of the project with ratepayer impacts. In the event the Commission determines a project should not proceed to Stage 3, the Commission will

provide a determination for cost recovery of all prudent pilot project expenditures incurred through Stage 2.

To better monitor the progress of the development of the pilot projects, including incurred costs, the Utilities shall file monthly Progress and Expenditure Reports detailing the pilot projects' status and associated expenditures. Specifically, the Progress and Expenditure Report shall describe, by pilot project, the activities accomplished since the prior report, anticipated activities within or beyond the current stage, and any major changes in the scope of the project. The report shall also include the actual costs incurred during the reporting period and the total costs incurred to date and an updated forecast of project costs, indicating the amount of expenditure required to advance through each phase of the stage-gate process. The Utilities shall break down the reported costs by cost type at a minimum, including engineering, consulting, and legal.

The Utilities shall each file their first Progress and Expenditure Report by November 15, 2023, reflecting all of the costs and associated activities incurred through October 31, 2023. Subsequent reports shall be filed on the 15th of every month thereafter, reflecting the previous month's information.

UTEN Rates

Most Utilities propose to institute a fee or thermal rate to charge the pilot project participants and the revenues received would be used to offset the revenue requirement for the projects. Certain filings did not specify how the fees or rate structure would be implemented, as the projects are still in the conceptual phase and the Utilities do not presently have the data available to develop the rates. However, the filings did provide an overview of how the Utilities propose to design rates. Con Edison proposes to allocate to participating

customers costs equivalent to what they otherwise would have paid if they were using natural gas to meet energy needs provided by the UTEN. Similarly, National Grid proposed to calculate a thermal fee based on the participant's current gas usage and total energy costs so that the participants will not experience an increase in their total energy bills if they participate in the pilot.

NRDC comments that the Mount Vernon Pilot should not utilize flat-rate billing based on class average demand. NRDC indicates that such an approach removes the ability of individual customers to control their own bills, is regressive, charging lower-use customers proportionally more and higher-use customers proportionally less, and can create a feedback loop of increasing demand. NYC recognizes that there can be a need to provide attractive rates to induce customers to participate in the UTEN pilot projects, however, NYC raises concerns that settings rates below cost is not sustainable and should not be replicated on a large scale. NYC also argues that the results of the pilot projects may be questionable since they will not provide a clear picture of customer acceptance of the UTEN.

It is critical for the Utilities to implement rate designs for the pilot projects that provide insights to the effectiveness of the various rate designs themselves, in sending desired price signals, and to assess any metering or billing issues that may arise. These insights will be valuable in guiding the design of rates for post-pilot UTENs. The Commission appreciates the concerns raised by stakeholders regarding pilot projects potentially charging a rate that is not reflective of true costs. However, the costs of a pilot project differ in important ways from those of a project undertaken once UTENs business models are mature and broadly understood by developers and potential participants. First, pilot projects

must entice customers to participate in spite of unfamiliar technology and business models. Second, the operating costs of a small-scale pilot project may not be indicative of costs at full-scale deployment. Lastly, the intention of the pilot projects is to test out various models, which may include alternative rate designs for the provision of thermal energy. To the extent the Utilities propose pilot projects with a fee that is not reflective of cost, such proposals must include a level of "shadow-billing" that can be utilized to gather the necessary information to inform future rate design or thermal energy fees. The Commission directs the Utilities to further consider stakeholders' comments on this topic in the development of the proposed fees or rate structures that the Utilities shall include in their Final UTEN Pilot Project Engineering Design and Customer Protection Plan filing.

Performance Metrics

For the pilot projects to provide meaningful information, a set of clear, uniform metrics must be established. The pilot project proposals submitted to date have included various metrics, the diversity of which would make it difficult to assess relative system performance and cost effectiveness across the pilot projects. Additionally, applying a minimum set of uniform metrics across all the pilot projects will help identify best practices for future recommendations of system requirements.

HEET comments that the process of deployment and scaling of UTEN is novel and this pilot phase will produce the data needed to achieve more regulatory certainty. HEET asserts the pilots, therefore, must include the opportunity for all stakeholders to learn. HEET further recommends that the Commission direct the Utilities toward guiding principles and building a standardized data set in an open source. HEET

identifies the importance of data from the pilot projects to inform the development of the broad eco-system for UTENs including supply chain, geology, customer acquisition, workforce, and equity.

The Commission requires that metrics for these pilot projects be categorized as follows: (1) technical; (2) financial; (3) customer/societal; and (4) safety/reliability. At present, the Commission provides the guidance below regarding the pilot project metrics, but we seek further input from stakeholders before we adopt a required set of metrics.

Technical metrics will measure system performance and include individual metrics such as, hydronic temperatures and thermal capacity and output. Given that the pilot projects are testing the UTEN's ability to serve varying types of customers, the suite of technical metrics will track the network performance and quality of energy produced and shared to measure aspects of UTENs that perform better and under different operational and environmental demands.

Financial metrics will measure the cost effectiveness of the pilot projects and include individual metrics such as, capital expenses and operating expenses in total and on a per unit basis. This will provide meaningful information necessary to develop appropriate rate structures as well as to compare costs for the provision of services between the UTEN and legacy fuels and/or other forms of building electrification.

Customer and societal metrics will measure participating customers' experience and satisfaction as well as overall societal benefits of the UTEN and include individual metrics such as GHG emission reductions and customer satisfaction. Customer satisfaction data points will serve as key indicators of the Utilities' success in implementing their pilot projects. This data will help the Utilities, Staff, and

the Commission assess the performance of the UTEN customer-facing processes, to gain a better understanding of customers' needs and concerns and create an opportunity for improvement.

Safety and reliability metrics will measure indicators such as system leaks and customer outages. Collection of this data will inform the development of safety and reliability standards and help identify any necessary improvements in the design and operation of UTENs.

Appendix B lists a sampling of the various metrics proposed by one or more Utility in their pilot project proposals as well as some additional possible metrics. Identifying standardized metrics is of paramount importance as it will provide the necessary data to assist the Commission in adopting rules to promote the use of thermal energy networks and to ensure that we maximize learnings from the ratepayer investments in these pilot projects. Accordingly, we direct Staff to convene one or more technical conferences regarding performance metrics. The first technical conference shall be held before March 31, 2024. The technical conferences will provide an opportunity for Staff, the Utilities, and interested stakeholders to discuss data needs and the appropriate metrics to meet these needs. The Commission advises that participants in these technical conferences should recognize that the metrics that may be appropriate to establish during the pilot phase may be more robust than the metrics that may continue with full scale UTEN implementation. Participants in the technical conferences should also consider how to balance the need for this level of information with the administrative or system related costs associated with requiring the various metrics. Following the final technical conference, Staff will make a filing documenting the outcome of the technical conferences, including agreed upon performance metrics for each category that

the Utilities will track and report for each pilot project. The filing will also summarize metrics proposed, but that were not ultimately agreed upon, if any.

The Utilities shall include the agreed upon metrics in their respective Final UTEN Pilot Project Engineering Design and Consumer Protection Plan filings. In addition to prescribing the use of a set of uniform metrics, the Commission recognizes that some pilot projects may warrant additional metrics tailored to the unique features of a particular pilot project. The Utilities can propose to use additional metrics in their respective Final UTEN Pilot Project Engineering Design and Consumer Protection Plan filings.

The Commission recognizes the need to establish the expectation of full transparency of pilot project data to facilitate learnings throughout the pilot phase of the UTEN. This data may include, but not be limited to, certain customer-specific data such as on-site equipment and housing stock characteristics and operational characteristics, including annual and peak consumption data. Customer specific data can be appropriately anonymized for public reporting purposes. The Utilities are instructed to ensure Customer Agreements associated with the pilot projects include appropriate language to facilitate the provision of this data.

While specific reporting requirements for pilot projects that continue to Stage 4 will be detailed in subsequent order(s), the Commission expects metrics reporting to occur on a quarterly basis once pilot projects have been constructed and are operational and will continue for the term of the pilot

phase of the projects.²⁴ Utilities shall file all metrics reports with the Secretary to the Commission to be publicly available in this proceeding.

Relatedly, the Joint Environmental Commentors note "a clear data acquisition and management protocol must be promulgated, and the data must be provided in a standard, open-source fashion, anonymized at as granular a level possible." HEET advocates building a standardized data set in an open source. The Commission agrees with the Joint Environmental Commentors and HEET that access to information from the UTEN pilot projects is important. We expect that, as the pilot projects advance through the stages, Staff in consultation with the Utilities and other interested stakeholders, will explore additional ways to ensure data accessibility for all stakeholders.

Labor Requirements

In the Act's legislative findings section, three of the five enumerated subparagraphs relate to labor and workforce development. The Act clearly calls for the Utilities to not just develop and operate UTENs but to do so in ways that support good jobs and training opportunities in the localities where UTENs are to be located. This purpose informs UTEN development and operation generally, including in the pilot phase.

Utilities' initial filings contain varying levels of detail on their plans for compliance with the requirements in the Act's operative provisions related to contracting for labor to construct and operate UTENs. They vary even more with respect to their plans for workforce development.

²⁴ We anticipate that the Utilities would report most metrics quarterly, however the frequency for some metrics may differ, e.g., annually, if a particular metric is not anticipated to have significant new detail from one quarter to the next.

Several commenters suggest that the Commission take measures to ensure consistent compliance with the Act's labor and workforce development provisions across utilities and projects. The New York State Building and Construction Trades Council urges the Commission to direct the use of labor agreements in pilot projects. The New York Pipe Trades Council suggests that regulations should be adopted to ensure that LDCs are aware of the Act's labor requirements. The Joint Environmental Commenters propose convening a working group among organized labor and the Utilities to create uniform standards for workforce development and training.

The Commission directs the Utilities to indicate the status of the labor agreements required to implement any of the approved pilot project proposals in their Final UTEN Pilot Project Engineering Design and Customer Protection Plan filings. The Commission encourages stakeholders, including the Utilities, to align their approaches to workforce development and training, and directs each Utility to describe how it plans to support local workforce development, consistent with the Act.

CONCLUSION

As discussed in the body of this Order, the Commission finds that the pilot project proposals to date represent a good first step in the development of UTENS, but they include insufficient detail to justify Commission approval at this time. Accordingly, the Commission establishes a phased implementation process, providing structure, transparency, and clarity to the Utilities regarding the requirements they must meet to advance their projects. This process, known as "stage-gating," will allow the Utilities to demonstrate that their proposed pilot projects are in the public interest and to advance such projects as quickly as possible, while mitigating the risk of prematurely

advancing an unrefined project. This Order also provides guidance to enable the Utilities to further refine their proposals with the goal of developing diverse types of thermal energy networks to test unique engineering, customer acquisition, and business models. The implementation of diverse UTEN pilot projects will provide critical learnings for the statewide advancement of thermal energy networks and the decarbonization of New York's building stock, to meet the goals of the CLCPA.

The Commission orders:

1. Department of Public Service Staff shall convene a technical conference, by public notice and within 30 days of the effective date of this Order, to identify key terms and develop agreed upon definitions for use within this proceeding, which Department of Public Service Staff shall file with the Secretary to the Commission upon completion.

2. Consolidated Edison of New York, Inc., Orange and Rockland Utilities, Inc., New York State Electric & Gas Corporation, Rochester Gas and Electric Corporation, Central Hudson Gas & Electric Corporation, National Grid USA (collectively, Niagara Mohawk Power Corporation d/b/a National Grid, The Brooklyn Union Gas Company d/b/a National Grid NY, and KeySpan Gas East Corporation d/b/a National Grid), and National Fuel Gas Distribution Company shall file their respective Final UTEN Pilot Project Proposals no later than December 15, 2023.

3. Department of Public Service Staff shall conduct a compliance review to determine whether the Final UTEN Pilot Project Proposals meet the requirements set forth in this Order. If a Final UTEN Pilot Project Proposal is found to be compliant, the Director of the Office of Energy System Planning and Performance (or successor) shall issue a letter confirming

compliance and allowing the pilot project to advance to Stage 2 described in the body of this Order.

4. Consolidated Edison of New York, Inc., Orange and Rockland Utilities, Inc., New York State Electric & Gas Corporation, Rochester Gas and Electric Corporation, Central Hudson Gas & Electric Corporation, National Grid USA (collectively, Niagara Mohawk Power Corporation d/b/a National Grid, The Brooklyn Union Gas Company d/b/a National Grid NY, and KeySpan Gas East Corporation d/b/a National Grid), and National Fuel Gas Distribution Company each shall, within nine months following the issuance of a letter allowing its pilot project(s) to advance to Stage 2 as described in Ordering Clause 3, file with the Secretary to the Commission its Final UTEN Pilot Project Engineering Design and Customer Protection Plan for that pilot project, as described in the body of this Order.

5. Department of Public Service Staff shall convene one or more technical conference(s) to address performance metrics including, but not limited to, the categories of: (1) technical; (2) financial; (3) customer/societal; and (4) safety/reliability. The first technical conference shall be held before March 31, 2024.

6. Department of Public Service Staff shall, following the final technical conference required in Ordering Clause 5, make a filing documenting the outcome of the technical conferences, as discussed in the body of this Order.

7. Consolidated Edison of New York, Inc., Orange and Rockland Utilities, Inc., New York State Electric & Gas Corporation, Rochester Gas and Electric Corporation, Central Hudson Gas & Electric Corporation, National Grid USA (collectively, Niagara Mohawk Power Corporation d/b/a National Grid, The Brooklyn Union Gas Company d/b/a National Grid NY, and KeySpan Gas East Corporation d/b/a National Grid), and National

Fuel Gas Distribution Company shall file monthly Progress and Expenditure reports detailing the pilot project(s) status and associated expenditures to date, as discussed in the body of this Order. The first report shall be filed by November 15, 2023, with subsequent reports to be filed on the 15th of every month thereafter.

8. In the Secretary's sole discretion, the deadlines set forth in this Order may be extended. Any requests for an extension must be in writing, must include a justification for the extension, and must be filed at least three days prior to the affected deadline.

9. This proceeding is continued.

By the Commission,

(SIGNED)

MICHELLE L. PHILLIPS
Secretary

FUNDING AMOUNT AUTHORIZED THROUGH STAGE 2

The Table below presents the total pilot project costs estimated by the Utilities as of September 14, 2023, and the amount the Commission is authorizing to be incurred through Stage 2. The Utility shall not incur costs greater than the 10 percent of the total estimated costs, as indicated, from project inception through finalizing pilot project engineering design and Customer Protection Plans.

Utility	Estimated Cost of Proposed Pilot Projects (\$million)	Authorized Maximum Costs to be Incurred through Stage 2 (\$million, 10% of total estimated costs)
Central Hudson	Poughkeepsie, \$17.4	Poughkeepsie, \$1.7
Con Edison	Chelsea, \$62.4 Mount Vernon, \$51.4 Rockefeller, \$58.4	Chelsea, \$6.2 Mount Vernon \$5.1 Rockefeller, \$5.8
NFG	Pilot withdrawn, \$18.0	Pilot withdrawn, \$1.8
NiMo	Syracuse, \$66.7 Troy, \$12.27	Syracuse, \$6.7, Troy, \$1.2
KEDNY	Heating & Cooling, \$67.7 Heating only, \$38.7	Heating & Cooling, \$6.8 Heating only, \$3.9
KEDLI/LIPA	Pilot withdrawn, \$33.5	Pilot withdrawn, \$3.4
NYSEG	Ithaca, \$15.4 Norwich, \$13.5	Ithaca, \$1.5 Norwich, \$1.3
RG&E	\$13.2	\$1.3
O&R	\$45.5	\$4.6

POTENTIAL PERFORMANCE METRICS

The Commission is interested in a common set of metrics to be applied across all UTEN pilot projects. These metrics are categorized by technical, financial, customer/societal, and safety/reliability. The list below represents a sampling of the various metrics proposed by one or more Utility in their pilot project proposals as well as some additional possible metrics. The technical conference(s) convened by Staff will utilize this list as the starting point for the development of performance metrics to be employed by the Utilities when gathering information from pilot projects. It is expected that other metrics may be raised during the Technical Conference for consideration.

Technical:

- Type of thermal energy network system
- Time hydronic temperature is within/outside a defined range
- Frequency system is operating outside of temperature range
- Hydronic flow to each customer at various stages of operation and peak design demand
- Duration of time UTEN system is operating outside of optimal flow requirements
- Thermal energy capacity and output of each thermal source
- Frequency and duration backup heating is required for customer and system
- Electricity consumption at customer site, both pre- and during project operation
- Other fuel consumption at customer site, both pre- and during pilot project operation
- Permits required
- On-site energy consumption relative to various levels of energy efficiency.
-

Financial:

- UTEN Capital Expenses
- UTEN Customer Expenses
- UTEN System Operating Expenses
- Customer bill impacts compared to previous energy costs

- Customer bill impacts, without protections, compared to previous energy costs
- UTEN System cost compared to individual customer owned geothermal and air source installations
- Cost performance with varying levels of energy efficiency
- Company's capital expenses on a per customer basis
- Company's capital expenses on a per unit output basis
- Company's capital expenses on a maximum system output basis
- Company's operating expenses on a per customer basis
- Company's operating expenses on a per unit output basis
- Company's operating expenses on a maximum system output basis

Customer/Societal:

- Customer site emissions
- UTEN system emissions
- Billing accuracy and timeliness
- Customer complaints
- Customer engagement
- Customer service
 - Customer billing
- Customer participation
- Jobs and economic impacts

Safety/Reliability:

- Number of leaks
- Cause of each leak (corrosion, natural force, excavation, other outside force, pipe/weld/joint failure, equipment failure, incorrect operation, other)
- Incidences of facility failures including types of failure
- Number of customer outages
- Duration of customer outages
- Emergency response time
- Excavation damages
- Pipe data, including miles of main, number of services, material, size, and installation year(s)*
- Solution type (water, glycol, mix solution, etc.)
- System operating hours, including planned and forced maintenance hours

* Appropriate terminology may be changed as a result of the technical conference identifying key terms and definitions.

SUMMARY OF COMMENTSINITIAL COMMENTS IN RESPONSE TO FEBRUARY 1, 2023 SOLICITATIONThe City of New York (NYC)

NYC recommends the Commission require the high-rise commercial and large residential building projects be located in Disadvantaged Communities. NYC states that the needs best addressed by Utility Thermal Energy Networks (UTENs) are most pronounced in Disadvantaged Communities. Additionally, NYC submits that more benefits would be gained by locating the pilot within an affordable housing complex because the air quality, building envelope and other energy efficiency, reliability, and resiliency benefits associated with the pilot will be most helpful to LMI customers.

NYC suggests that the Commission impose cost controls, noting that Con Edison's proposals are the most expensive. NYC urges the Commission to require the Utilities to file clearer upfront cost estimates and reasonable estimates of ongoing costs. NYC recommends, in the event of significant cost increases, that the Commission should examine whether the project should continue and should offer stakeholders an opportunity to provide input. NYC also proposes that the Commission require excessive cost overruns to be absorbed by shareholders to induce the Utility to control costs.

NYC supports Con Edison's proposed approach for evaluating its pilots, which includes technical, financial, and customer-related metrics. NYC proposes requiring progress reports that describe the Utilities' activities in choosing locations, engaging and enrolling customers, preparing and finalizing designs, developing billing processes, and rate designs, lessons learned, construction progress, and experience once the pilots are operational. NYC also requests that the Commission require Utilities to file reports on how their pilots

comply with Climate Leadership and Community Protection Act (CLCPA) mandates, promote clean energy and equity goals to reduce emissions and prevent unintended environmental justice impacts.

The Natural Resources Defense Council (NRDC)

NRDC believes that the pilots should not utilize fossil-fired equipment to meet peak loads or system balancing needs. NRDC states that designing networks that rely on natural gas for the coldest periods of the year removes the possibility of exploiting or testing the efficacy of all UTEN benefits.

NRDC avers that the pilot proposed by National Fuel Gas is not a thermal network as defined in the Act. NRDC states that National Fuel Gas's (NFG) technical diagrams are inconsistent with what the Utility states in the text and is not compatible with their proposed central plant. Also, NRDC claims the central plant system relies on a large central heat pump, which is less commercially proven and is not widely available in the United States. NRDC suggests NFG use an ambient loop system with heat pumps located in individual buildings instead. Further, NRDC urges the Commission to discourage utilities from listing supplemental gas boilers as potential methods for maintaining system balance.

NRDC supports locating pilots where they will avoid or defer gas system investment because it will test UTEN's ability to replace gas and the avoided investment will reduce ratepayer impacts. Additionally, NRDC supports the inclusion of air-source heat pump conversions in pilots to serve as a direct comparison to evaluate thermal energy network cost and performance. NRDC urges a comparison of thermal energy networks' efficacy and cost-effectiveness relative to ASHPs as a key metric for informing the future use and regulation of UTENS. Additionally, NRDC states that pilot rate designs should reflect

the necessity to recover expected UTEN costs through flow metering, Btu metering, or fixed fees for connection.

NRDC recommends using two separate amortization periods for the UTEN infrastructure, based on its expected useful life. One period for the customer side HVAC appliances, such as heat pumps, that average about 15-20 year expected useful life. Another period should be used for the Utility side infrastructure, such as ambient loop piping and geothermal wells, which average about 60-70 year expected useful life. NRDC states, the longer amortization period of the Utility side infrastructure could reduce the short-term rate impacts of the pilots and will help Utilities treat UTENs like the long-term infrastructure investments they are.

Multiple Intervenors (MI)

MI urges the Commission to evaluate the proposed costs of UTENs carefully and to seek to moderate costs to the extent practicable. MI recognizes the requirements of the Act but notes only a very limited number of customers will be served by UTENs. MI also notes a great discrepancy in Utility efforts to manage cost impacts. Further, MI suggest the Commission limit costs by: rejecting proposals that are too costly and/or lack sufficient cost justification, requiring Utilities to provide some degree of cost certainty and holding the Utilities to their cost estimates, requiring Utilities to pursue all sources of alternative funding, and ensure that participants contribute a fair amount toward the projects.

MI believes the Commission should consider adopting a uniform approach to the depreciation of UTEN pilots. Due to the significant cost, MI recommends a depreciation period of at least 20 years.

MI asserts that the Commission should ensure that costs are allocated equitably prior to recovery. MI disagrees

with Utility proposals that seek to recover the entirety of project costs via surcharge because pilot costs are predominately capital expenditures. MI urges that costs of pilots should be reflected in base delivery rates as soon as practicable and that costs be allocated to a Utility's service classes in accordance with cost causation principles. Inasmuch as pilots are intended to replace gas, according to MI, costs should be allocated on some basis related to class contribution to system demand. Alternatively, MI suggests that the Commission could use a neutral allocator, such as class delivery revenues, but urges that the Commission avoid recovering all costs on a volumetric basis.

Sane Energy Project (Sane)

Sane urges the Commission to reject Brooklyn Union Gas d/b/a National Grid's (KEDNY) proposal and either require modifications to the proposal or the selection of a more suitable site. Sane states that KEDNY has not proposed a real UTEN. The pilot describes a large geothermal system which would capture thermal energy from boreholes but does not recirculate. Additionally, Sane says the fundamental balancing principle of UTENs requires diverse buildings and needs, both of which are absent from KEDNY's proposal.

Sane also opposes the pilot because it will only provide heating. Providing heating only would be a waste of money and technology, according to Sane, while forcing residents to rely on external window AC units. Additionally, Sane claims that the Public Service Law requires heating and cooling be provided. KEDNY's filing states that providing cooling would be too expensive, but Sane notes that costs could be recovered from the Inflation Reduction Act and other sources. Further, according to Sane, reliance on external AC units drives up demand for electricity and increases the chance of a blackout.

Designing a system that provides cooling would cut electricity use, increase reliability, and allow for the storage of underground heat to be used for next winter, Sane reasons.

Sane also objects to KEDNY's use of the 100-year timeframe for measuring climate change potential of greenhouse gas emissions. Accordingly, Sane insists that the pilots, including their methane accounting, should be in accordance with the CLCPA.

Joint Environmental Commenters

The Joint Environmental Commenters include The Building Decarbonization Coalition, Alliance for a Green Economy, Building Decarbonization Coalition, Home Energy Efficiency Team, New York League of Conservation Voters, Sierra Club Atlantic Chapter, The Alliance for a Greater New York, and WE ACT for Environmental Justice. The Joint Environmental Commenters recommend requiring details about workforce development and holding a technical conference for stakeholders on training and development of the clean energy workforce. Additionally, the Joint Environmental Commenters suggest that the Commission require the Utilities to clearly communicate detail and answer stakeholder questions before the Commission approves the pilot projects. They also recommend that the Commission require all project costs be reported separately, including soft and hard costs disaggregated in manner similar to the uniform system of accountants. The Joint Environmental Commenters recommend the Commission require all utilities include detailed square footage, building counts, and unit counts to be served by the UTEN and identify which buildings reside in a Disadvantaged Community.

Additionally, the Joint Environmental Commenters request that the Commission adopt a clear data acquisition and management protocol so that data be provided in a standard,

open-source fashion, anonymized at as granular a level possible. They propose data including: three years of historical energy use and cost data, building stock and envelope data, all thermal resource performance data, all thermal loop performance data using a real time or five-minute interval temperature and flow meter, all energy usage and cost data by load after UTEN installation, relevant applicable tariffs, and local weather data.

The Joint Environmental Commenters recommend rejecting or modifying projects that incorporate non-zero emission thermal resources as anything other than for emergency or backup purposes to ensure reliability. Additionally, the Joint Environmental Commenters state that the Commission should require cooling and associated waste heat recovery in all projects and should consider allowing for third-party ownership and supply of thermal energy resources. Further, the Joint Environmental Commenters recommend the Commission ensure system interoperability by requiring standardized interconnections and heat exchanges, pipe typologies, system working temperatures, thermal distribution media, and means and methods to regulate system flows and working temperatures.

The Joint Environmental Commenters suggest establishing working definitions for primary, secondary, supplemental and emergency or back up thermal resources, and emergency or back up electrical resources and propose definitions for those terms.

The Joint Environmental Commenters also recommend the Commission ensure that all emergency or back up resources derived from non-zero emission thermal resources are designed to minimize local air emissions, including exploring reasonable paths to capture and sequester GHG emissions. Emergency or back up resources, according to the Joint Environmental Commenters,

would ideally use waste heat by capturing and routing such waste heat into the UTEN.

To maintain cost competitiveness with incumbent utility service, the Joint Environmental Commenters suggest the Commission peg UTEN customer costs to gas or electric customer costs. Utilities should be allowed to include customer-side building retrofits in approved project costs, but these costs should be transparent and separately accounted, states the Joint Environmental Commenters, to make it easy for new customers to participate in the UTEN.

They urge the Commission to align all proposals on a standard, maximized cost recovery or depreciation period and to prioritize projects that develop UTENs in gas-constrained areas, within new developments that would otherwise require gas system expansion, and areas where there is a possibility of retiring leak prone fossil gas pipe. Projects proposed in other areas should only be approved if they provide a unique learning opportunity, the Joint Environmental Commenters suggest. Also, they state the Commission should allow capital and operating costs of the demonstration projects to be recovered across both electric and gas customers, if applicable. In the Joint Environmental Commenters' opinion, the Commission should also clarify that the intent of the pilot projects will be to consider UTENs as non-pipe and non-wire alternatives.

The Joint Environmental Commenters recommend protecting wildlife by prohibiting rejection of excessive heat from cooling function into bodies of water. They also ask the Commission to adopt methane and other local emissions reduction metrics. The Joint Environmental Commenters also suggest the Commission require short-, medium-, and long-term compliance with CLCPA and require initial plans to transition away from gas-fired back up resources in accordance with CLCPA.

The Joint Environmental Commenters assert Central Hudson's proposal satisfies the requirements of the Act and appreciate its location in a Disadvantaged Communities. The Joint Environmental Commenters also ask that Central Hudson develop and submit a workforce development plan, and have questions related to retrofiting, heat extraction, and cost recovery.

The Joint Environmental Commenters state that NFG's proposal does not align with the goals of the Act because it will not derive 100% of peak needs from CLCPA-compliant sources. However, they believe NFG's plan to cover all upfront capital costs for equipment and residential upgrades will likely allow for greater customer participation.

The Joint Environmental Commenters state that NMPC's project in Troy has low upfront capital costs and offers a learning opportunity due to the leasing of Troy Local Development Corporation's geothermal borefield. Similarly, they state that NMPC's Syracuse project represents desirable thermal resource diversity with low upfront capital costs. The Joint Environmental Commenters approvingly note the Syracuse project's use of the Metro Wastewater Treatment Plant for outfall, but have questions related to the usage of wastewater and rejection of heat. The Joint Environmental Commenters urge the Commission to delay approval of KEDNY's proposal until KEDNY offers evidence for not providing cooling and for the location being outside a gas constrained area.

The Joint Environmental Commenters state the LIPA project has exciting load diversity. The Joint Environmental Commenters also request Long Island Power Authority (LIPA) provide in-depth details about the structure of the thermal fee and include more detail on the backup electric- and gas-fired boilers. The Joint Environmental Commenters have questions

related to the LIPA project's costs, cost recovery, backup heating, and CLCPA compliance.

The Joint Environmental Commenters support NYSEG's Ithaca proposal that represents a diversity of ZETRs, including the open loop geothermal aquifer system. The Joint Environmental Commenters ask questions related to environmental regulations governing water withdrawals and injections and the use of aquifers. The Joint Environmental Commenters similarly find NYSEG's Norwich proposal to be detailed. The Joint Environmental Commenters also appreciate the location of the project in a Disadvantaged Community.

Home Energy Efficiency Team (HEET)

HEET states it supports the comments filed by the Joint Environmental Commenters. HEET has proposed six demonstration installations in the Commonwealth of Massachusetts. In HEET's experience, the process of deployment and scaling of UTEN is novel and this innovation regulatory stage will result in the data needed to get more regulatory certainty. They believe this can be achieved by directing the Utilities toward guiding principles and building a standardized data set in an open source. HEET requests that the Commission allow time for the Utilities to carefully select site locations with robust levels of community engagement and assemble engineering teams with experience installing these technologies. HEET expects the pilot projects to inform the development of aspects of UTENs including supply chain, geology, customer acquisition, workforce, and equity. Additionally, uniform system accounts across all pilots will be necessary to iterate beyond these pilots, according to HEET.

HEET suggests permitting UTEN cost recovery to follow gas recovery timelines until more data is available and notes that current cost recovery proposals are below the expected

useful life of the infrastructure. HEET urges the Commission to encourage Utilities with proposals including glycol to consider the use of water instead, because glycol is not needed and added cost and environmental risks. HEET encourages prioritization of building envelope weatherization as a necessity, and strongly encourages proposals to be modeled after the loop designs set forth by the NYSEG and National Grid proposals. HEET discourages the implementation of fourth generation district heating and cooling systems because they do not optimize interconnectability and efficiency, and instead supports directing the Utilities to develop pilots with single-pipe ambient temperature loop designs.

Individual Comments Regarding KEDNY's Proposal

The Department received over 500 comments from individual citizens urging the Commission to reject KEDNY's proposal. The comments oppose the KEDNY proposal mainly because the project will not provide cooling. Additionally, Commentors express concern that KEDNY is not proposing to use enough thermal sources for the size of the project.

REPLY COMMENTS IN RESPONSE TO FEBRUARY 1, 2023 SOLICITATION

Con Edison and Orange & Rockland (O&R)

Con Edison and O&R generally support party comments that advocate for placement of pilots in Disadvantaged Communities, but state that this must not inhibit the Commission's ability to fully evaluate and/or scale the use of energy networks across a range of statewide environments. Con Edison and O&R also state that the Utilities should retain flexibility for site selection of pilots to expand learning opportunities. Con Edison and O&R state that the Act did not require locating UTENs in gas constrained areas, and adopting

such a requirement could constrain the Commission's evaluation of proposals.

Con Edison and O&R state that construction costs are generally higher in New York City, but that Con Edison will strive to reduce costs and impacts on customers wherever reasonably possible and will submit updated cost estimates in their supplemental filings. Con Edison and O&R support the use of a depreciation and amortization period that aligns with standard accounting practices. Con Edison and O&R assert that cost recovery from electric customers best matches pilot costs with the predominate beneficiaries of UTEN.

Con Edison and O&R state that the Commission should not require that every customer receive cooling from the pilots. One expected take away from the pilots, according to Con Edison and O&R, is to see the extent to which redundancy is needed for future projects and, as such, pilots should have redundancy to maintain loop temperature and service in case of contingency conditions.

NYC

NYC reiterates its support for KEDNY's pilot. NYC disagrees with the assertion of other commenters that the location of the pilot is inappropriate because the buildings are all owned by single entity. NYC notes that the pilot includes two commercial buildings located near the New York City Housing Authority (NYCHA) complex, and that customer diversity will provide important information that can be evaluated to support further thermal energy development.

NYC states that although it would like the pilot to include cooling, NYC understands that KEDNY reports there is a significant cost difference if the pilot were to include cooling. NYC would support modifying the KEDNY proposal to include cost-effective cooling.

KEDNY

KEDNY states the Vandalia NYCHA property the most desirable because it provided a large anchor property, load diversity, open space for borefield installations, while also providing learning opportunities for similar NYCHA buildings. Further, KEDNY states the location would allow KEDNY to manage pilot costs while converting the entire complex. Additionally, the Vandalia buildings are all connected in a common mechanical room, which allows the pilot to reuse existing distribution piping to provide geothermal heating, resulting in lower costs and less disruption to tenants.

KEDNY explained that the mechanical system of the NYCHA buildings would require an additional \$29 million to provide cooling, as each of the 293 apartments needing electrical and equipment upgrades, and the risers in the buildings require modification to distribute the thermal energy to the equipment in the apartments. KEDNY is prepared to design the pilot to include heating and cooling and enable the necessary mechanical modifications to the NYCHA buildings. In the alternative, KEDNY intended to install individual through-the-wall air conditioning units within the wall sleeves located in each apartment.

KEDNY asserts that, although the pilot only includes two thermal sources, more commercial buildings are not needed for load balancing and would increase cost of the pilot. Further, KEDNY states that commenters criticisms of the pilot as not effectively using a networked geothermal system and being inadequately balanced are inaccurate. The benefit of a networked system and load balancing can still benefit a building that is too costly to retrofit for cooling, as is here, as such a building benefits from efficient non-gas heating and hot water via interconnection with cooling dominant buildings.

KEDNY notes that neither the Act nor the Initiating Order mandate that pilots be located in a gas constrained area. Further, states KEDNY, electrification of buildings in KEDNY's service territory will lower peak gas demand and assist with gas supply constraints, even if the UTEN pilot is not itself located in a gas constrained area.

COMMENTS RECEIVED IN RESPONSE TO JUNE 8, 2023 SOLICITATION
State University of New York, et al.

The Commission received a dozen comments supporting Con Edison's pilot project and feasibility study portfolio from the State University of New York, the Real Estate Board of New York, the New York Energy Consumer Council, the Westchester County Airport, the Barclay's Team at 745 7th Avenue, the Commissioner of the Westchester County Department of Public Works and Transportation, Councilman Keith Powers, Hippodrome NYC, Purchase College, the New York League of Conservation Voters, the International Ground Source Heat Pump Association, and the Quebec Government Office. These commenters state that UTENs will help New York meet its climate and equity goals, while providing climate benefits to New York by reducing GHG emissions and recycling waste heat, as well as reducing impacts to the electric system. The commenters state that Con Edison's approach of selecting three unique pilots and funding two feasibility studies will help to determine the viability and scalability of UTENs across all building types. The commenters state that the pilots and feasibility studies will enable Con Edison to explore the creation of a large district network using boreholes and waste heat recovery across diverse building typologies in dense, urban environments.

Endurant Energy

Endurant Energy supports Con Edison's feasibility study for a UTEN project in downtown Mount Vernon. Endurant is a New York City-based developer of ground source heat pumps, who has assembled a team to assist Con Edison with feasibility and development of the Mount Vernon project. The feasibility study, which includes sewer waste heat recovery, will allow Con Edison to explore the use of an innovative heat recovery technology in a UTEN.

In addition to Endurant's comments, Endurant included additional letters from community leaders and potential customers of the UTEN to underscore the community's commitment to supporting this project. The included letters of support are from a Mount Vernon City Council member, the Mayor of Mount Vernon, and a Westchester County legislator.

New York State Building and Construction Trades Council (Trades Council)

The Trades Council asks that all guidance and rules issued by the Commission regarding the development and implementation of UTENS ensure that utilities are aware of the labor requirements and include them in their construction planning and contract documents. The Trades Council strongly encourages the Commission urge the use of project labor agreements for all construction work. The Trades Council also urges the Commission to approve as many pilots as possible because it will enable Trade Council affiliate unions to maximize their recruitment and training capabilities. Additionally, the Trades Council asks that all utilities demonstrate how the construction and installation work associated UTENS meet the requirements of §224-d of the New York State Labor Law.

New York Geothermal Energy Organization (NY-GEO)

NY-GEO supports Con Edison's and O&R's UTEN portfolio. NY-GEO believes the diverse set of these projects will produce valuable learning for future projects. The proposals describe an array of innovative technologies and address Disadvantaged Communities, workforce, and stakeholder interests. NY-GEO supports Con Edison's proposed metrics that include the measurement of system and customer electricity consumption accompanied by financial cost comparisons. NY-GEO requests expanding the metrics to include information on grid infrastructure cost savings resulting from the projects, evaluating whether the cost of individual geothermal systems utilizing individual boreholes would be more or less expensive than UTENS, and the impact of these projects on peak shaving/peak reduction. NY-GEO recommends setting UTEN rates that focus on simplicity and actual cost of service in each pilot to answer questions related to proper/optimal rate design.

NRDC

NRDC states pilots should be designed to test realistic conditions and gather as much data on implementation and operation as possible. NRDC supports realistic rate structures for pilot participants. Further, NRDC states the installation, operation, maintenance, and cost recovery pilots should align with future anticipated business models. NRDC opines, however, the deployment of UTENS may not be cost-effective as a means for reducing the cost of infrastructure investments borne by ratepayers.

NRDC recommends against using flat-rate billing based on class average demand for the Mount Vernon Pilot because it is regressive and removes the ability for customers to control their own bills. NRDC states that class average billing may create a feedback loop of increasing demand, which increases

bills without the option for customers to individually reduce their usage.

NRDC states that the Act's intent to retain and retrain gas employees aligns with gas business operation of thermal energy networks and planned reduction in the expansion and replacement of the gas distribution system. Additionally, NRDC asserts that recent modeling shows that even with costs of geothermal drilling and UTEN installation reflecting a mature market, UTEN infrastructure is more than five times as expensive as electric infrastructure upgrades needed to electrify the same customers with air-source heat pumps. Locating UTENS where they will avoid investment in new or replacement gas pipes may be the most prudent business models and align with retraining the gas laborer workforce.

NRDC supports the inclusion of comprehensive metrics for pilot evaluation to the extent practicable. NRDC believes comparing UTEN performance to air-source heat pumps is the most important metric.

Joint Environmental Commenters

The Joint Environmental Commenters find all UTEN pilots submitted by the Utilities encouraging and should be supported by the Commission. The Joint Environmental Commenters urge the Commission to request additional rounds of UTEN pilot and feasibility study submissions, because the Act authorized up to five pilots per utility. The Joint Environmental Commenters appreciate the sequencing approach Con Edison is using by proposing initial pilots while continuing to pursue feasibility studies for a second round of projects, which allows for additional learning and builds a larger variety of projects. The Joint Environmental Commenters also recommend the Commission engage with industry experts and the Utilities to develop thermal energy resource maps, existing thermal load maps,

thermal energy load growth projections, and regional plans to combine UTEN development with gas transmission planning. The Joint Environmental Commenters recommend that the Commission should encourage more than one proposed pilot from each of the utilities to ensure all Utilities are ultimately able to advance at least one project to completion.

The Joint Environmental Commenters reiterate their request for standardized terms and definitions and propose revised definitions for Primary Thermal Resource, Secondary Thermal Resource, Supplemental Thermal Resource, Emergency or Backup Thermal Resource, and Zero Emissions Thermal Resource. Additionally, The Joint Environmental Commenters urge the Commission to seek UTEN pilots that demonstrate a variety of business and ownership models, including considering "common carrier" models. The Joint Environmental Commenters state that allowing only the regulated utilities to own all thermal energy resources would drive up costs, stifle innovation, and suppress the emergence of efficient markets. The Joint Environmental commenters propose that utilities seeking to own thermal energy resources should be required to demonstrate that it is acquired in a least-cost manner through an integrated resource planning process. The Joint Environmental Commenters support proposed pilots that include multiple owner stakeholders, third-party owned thermal energy resources, municipal partnership and ownership, and compensation of customers who help balance the supply of thermal energy.

The Joint Environmental Commenters believe the Commission should require standards for data reporting and transparency to inform other TEN projects and create standardized cost recovery methods. The Joint Environmental Commenters recommend that the Commission form a working group to develop a consensus proposal on data, metrics, and project

transparency. The Joint Environmental Commenters propose that the Commission disallow cost recovery for pilots if the utilities fail to comply with the data governance procedures. The Joint Environmental Commenters propose minimum required data and data acquisition efforts to be discussed in their proposed working group.

The Joint Environmental Commenters urge the Commission to require that the Utilities utilize the New York State Building and Construction Trade's and affiliate union's recruitment and training capabilities. They also urge the Commission to support the use of Project Labor Agreements. The Joint Environmental Commenters also urge the Commission to convene a working group with representatives from the New York State Buildings and Construction Trade and their affiliated unions and the Utilities to create uniform standards and workforce development, recruitment, training, and hiring strategy and program across all pilots.

The Joint Environmental Commenters assert that KEDNY's proposed project costs and lack of consideration of possible options for cooling indicate a lack of proper vetting. The Joint Environmental Commenters urge KEDNY to issue a request for proposals. The Joint Environmental Commenters state that KEDNY does not provide a description of the proposed cooling system for the project. They assert that KEDNY should select an option that does not require an electrical upgrade and engage with a technical consultant. The Joint Environmental Commenters state that through the wall air conditioners will not reduce peaking loads during the winter and fails to deliver key system performance characteristics. To avoid costs, the Joint Environmental Commenters suggest KEDNY explore water-cooled air conditioners with heating hydronic fan coils to utilize the existing heat riser for rejection of heat in cooling mode, which

would avoid electrical upgrades, eliminate the need for additional risers, and avoid condensation.

The Joint Environmental Commenters suggest NFG pursue an ambient temperature loop to supply heating and cooling. They assert that NFG is pursuing an outdated district energy technology. Further, the Joint Environmental Commenters state that NFG's assumption that heat pumps connected to UTENs are not capable of producing domestic hot water is inaccurate.

The Joint Environmental Commenters generally support NYSEG's and RG&E's proposed pilots. The Environmental Commenters question what RG&E means by "auxiliary sources of heating or cooling," and whether RG&E intends to use gas as an auxiliary source. The Joint Environmental Commenters state RG&E should conduct additional work to refine its system design and cost estimates. On reliability, the Joint Environmental Commenters believe NYSEG and RG&E should consider distributed energy resource possibilities. The Environmental Commenters encourage NYSEG and RG&E to assess each project individually instead of relying on rule of thumb estimates, particularly on the topic of reduction in source energy use.

HEET

HEET supports the Joint Environmental Commenters' comments. HEET states it collects data from thermal energy network installations in Massachusetts in a standardized, normalized, and shareable data set is intended to benefit the industry nationally. HEET asks that the Commission ensure that all UTEN projects in New York also collect the same data in a shareable and normalized fashion.

NYC

NYC supports Con Edison's Chelsea Project. The Chelsea Project will avoid the need to combust fossil fuels on site and will lower the demand for electric cooling. The

Chelsea Project will also provide an opportunity for learnings on whether a thermal network can be constructed and operated in a dense-urban environment cost-effectively, whether the system can perform as the design and calculations suggest, and whether residential customers can be kept comfortable year-round at reasonable cost.

NYC reiterates its concern with the total cost of Con Edison's proposed projects. NYC asserts that while Con Edison's Chelsea project is in the public interest, Con Edison's other two projects are not. NYC states Con Edison's Rockefeller Center Project does not meaningfully decarbonize existing buildings or reduce fossil fuel use because the project will supplant steam service for thermal energy service. Additionally, the pilot may include natural gas-fired equipment to provide supplemental or backup service. NYC states the Commission should require Con Edison to provide more details and properly demonstrate that the Mount Vernon Project is an appropriate thermal network pilot before approving it. NYC notes that there is no requirement that the Commission approve more than one project per Utility, thus the Commission need not authorize Con Edison to pursue its other feasibility studies.

NYC states that Con Edison's proposal does not provide a description or details on potential cost controls. The Commission should not accept this vague reference to cost controls and should set a budget and require Con Edison to adhere to it. If unforeseen costs arise, NYC recommends that the Commission require Con Edison to demonstrate why the projects should continue to be pursued at a higher cost. Further, NYC disagrees that only electric customers should bear the costs of pilots, noting that some costs should be borne by some gas customers because where projects would involve

electrification as an alternative to leak-prone gas pipe replacement.

Regarding setting UTEN rates, NYC notes the tension between setting a rate below cost to include customer participation in the pilot and using the pilot to test economic viability of the networks. NYC asserts that setting rates below cost is not sustainable and should not be replicated on a large scale. Further, NYC questions how useful the results of the pilot will be with below-cost rates, since they will not provide a clear picture of customer acceptance. NYC recognizes the need for providing attractive rates to induce customers, but in the subsequent evaluation stage, the use of such rates must be taken into account in developing conclusions regarding viability.

New York City Housing Authority (NYCHA)

NYCHA supports Con Edison's Chelsea Project because the project is consistent with NYCHA's redevelopment plan and has the ability to provide immediate benefits to NYCHA residents. NYCHA states it is prepared to support the project through making up front modifications to the buildings to accommodate the thermal network. Longer-term, continues NYCHA, it could design new buildings to incorporate thermal networks and avoid the need for large-scale building electrification. NYCHA states the project will also provide opportunities to determine whether it will be efficient and cost-effective to capture waste heat and use it to provide comfortable living conditions for residents and to understand and assess the challenges of constructing a thermal system in a dense urban environment. Additionally, the similarities between NYCHA buildings will provide an opportunity to evaluated thermal networks against a control group. Finally, NYCHA notes that the Chelsea project will provide low-income customers with an opportunity to obtain air quality and public health benefits.

New York Pipe Trades Council (NYPTC)

The New York Pipe Trades Council recommends that the Commission draft regulations to ensure that the Utilities include the Act's labor requirements in their construction planning and contract documents. NYPTC states that a recent study found that union projects result in at least 4% cost savings. NYPTC also states that Project Labor Agreements can offer an efficient strategy for ensuring compliance with the Act's labor requirements and maximize benefits. NYPTC also recommends the Commission design implementing regulations to foster development of as many pilot programs as possible to advance UTENS as a core energy strategy. Additionally, NYPTC recommends the Commission hold a public forum to allow stakeholder collaboration. Attached to its comments, NYPTC provides studies regarding the benefits of prevailing wage policy, registered apprenticeship programs, pre-apprenticeship programs, and project labor agreements.

Con Edison

Con Edison replies to the comments of NYC regarding Con Edison's Mount Vernon proposal, stating that Con Edison plans to connect all pilot buildings to the UTEN for high-efficiency, low-carbon electric heating and replace any other gas appliances with electric to completely disconnect the buildings from the gas system. Con Edison also states that census data shows that most Mount Vernon residents are low-to moderate income or earning less than the area median income, and the Mount Vernon project includes an affordable housing complex.

Con Edison also addresses NYC's comments regarding Con Edison's Rockefeller Center project. Con Edison states that the project decarbonizes the buildings by replacing steam heating equipment with electric water-source heat pumps connect to the thermal network, resulting in a CO2e reduction in lifetime GHG

emissions from fossil fuels. Additionally, Con Edison states that while the Rockefeller Center project will use steam condensate as a waste heat source, the system will not be reliant on it. Con Edison confirms that the proposed UTEN system does not combust fossil fuels, rather, the project uses waste heat for its energy.

While Con Edison appreciates NYC's recognition of the value the Chelsea project offers, Con Edison does not agree with NYC that this single pilot will provide sufficient learnings to evaluate UTENs viability in Con Edison's diverse service territory. Con Edison urges the Commission to reject NYC's position and not bind UTEN learning opportunities within the Company's service territory to one project. Regarding NYC's concerns about the UTEN pilots cost-effectiveness, Con Edison agrees that there should be little expectation that these pilots will be cost effective upfront, but each pilot will test the economic viability of future UTENs by examining costs over the project's full lifecycle to inform construction of post-pilot systems. Further, Con Edison reiterates its intention to implement bill caps to protect customers participating in these pilots.

COMMENTS RECEIVED IN RESPONSE TO JULY 6, 2023 SOLICITATION

Joint Environmental Commenters

The Joint Environmental Commenters appreciate the level of detail Central Hudson included in its Supplemental Plan. The Joint Environmental Commenters generally support the Commission approving ratepayer funds to develop and construct the proposed UTEN project. The Joint Environmental Commenters also support Central Hudson's proposal to offer an extended warranty for equipment within customer buildings. The

commenters believe this provision would reduce risk for customers and could provide a model for other utilities.

However, the Joint Environmental Commenters highlight the Central Hudson's lack of domestic hot water production in the proposed project. They state Central Hudson proposes to dump heat using dry coolers instead of recovering and recycling it. The Joint Environmental Commenters propose that Central Hudson could reduce the need for dry coolers if the project included a mechanism to provide domestic hot water. Further, the Joint Environmental Commenters state that a UTEN that does not make use of waste heat during all seasons is neither optimized nor balanced, leading to inefficiencies and sometimes excess capital costs in the short- and long-term because it leaves underutilized gas infrastructure in service.

The Joint Environmental Commenters recommend Central Hudson seek alternative sites to build a portfolio of projects. Additionally, The Joint Environmental Commenters urge the Commission to allow for the longer requested cost recovery period of 15 years to minimize cost impacts on ratepayers. The Commission should balance deployment of UTENS and customer cost in the context of the otherwise required capital and operating costs of electric or gas network expansion and repair. The Joint Environmental Commenters urge the Commission to consider and formally recognize that UTENS are both an electric and gas capacity resource and work with the regulated utilities and consultants to create a process to accurately identify the capacity impacts on gas and electric distribution networks.

Egg Geo, LLC (Egg)

Egg states that KEDNY's proposed UTEN pilot has an overwhelmingly heat-dominant load, and therefore may not be an acceptable project. Egg states Sane has asked it to complete a

high-level scoping study to determine what may be done to improve KEDNY's submission.