

Assessing Thermal Networks: Lessons for New York



from Sweden's Thermal Energy Strategies



Gathering Insights from Abroad to Inform New York's Low-Carbon Future



Sweden is widely recognized as a global leader in sustainable energy practices. Despite being an ocean apart, Sweden and New York share ambitious climate goals, with Sweden aiming for carbon neutrality by 2045 and New York by 2050.

In recognition of these shared goals, the Swedish Energy Agency welcomed a delegation of U.S. industry leaders in 2023 to explore opportunities for collaboration and knowledge sharing regarding building decarbonization solutions.

Organized by Building Energy Exchange (BE-Ex) and the New York State Energy Research & Development Authority (NYSERDA), the delegation identified [district energy](#) and [thermal energy networks \(TENs\)](#) as central to Stockholm's energy and decarbonization success. These approaches also emerged as promising for New York, where interest in low-carbon solutions is growing.

In 2025, BE-Ex and the Swedish Energy Agency continued this exploration by convening a small, select group of real estate leaders and energy experts for an international knowledge-sharing roundtable on advanced district energy and thermal energy networks, followed by a public panel that delved into the experiences from both sides of the Atlantic. These discussions examined large-scale decarbonization challenges and solutions, and examined how Sweden's experience with district heating might inform a viable path forward in New York.

A Note on Terminology:

District Energy is the umbrella term for systems that deliver heating and/or cooling to multiple buildings through a shared piping network. These systems may distribute steam, hot water, chilled water, or lower-temperature water depending on design and energy source. Legacy systems often obtain heat from a cogeneration plant burning fossil fuels, but recently it has become more common to source from renewable options.

Thermal Energy Networks (TENs) are a lower-temperature form of district energy that circulate ambient water and usually enable two-way flow with buildings to exchange thermal energy. They use non-combusting, non-emitting energy sources such as geothermal or waste heat and are often coupled with building level heat-pumps.

What's the Difference?
In Sweden, most district energy systems are high-temperature hot water networks commonly referred to as District Heating. In New York, emerging lower-temperature models are described as Thermal Energy Networks (TENs). In short, District Energy is the broad category and Sweden's District Heating and New York's TENs represent different configurations within it.

Key Findings from the 2025 Thermal Energy Convenings:

High Costs and Weak Market Signals Remain Barriers to Adoption

Across the discussions, participants identified high implementation cost and insufficient market signals as major obstacles to the economic viability of TENs in the U.S. Although Sweden's decades-long success demonstrates that the technology is proven, the business model for modern, newer generation TENs in New York remains underdeveloped. New York's Con Edison District Steam System is already one of the largest district energy systems in North America, though tremendous investment is needed to bring that system to a 21st Century, low carbon network. As noted during the discussions, the technology works, but "the economics don't work yet."

Sweden's district energy systems have benefited from long-term public investment, carbon taxation, coordinated planning, and predominantly municipal ownership. These structural supports are far less developed in the U.S. In New York City, modernizing or replacing the existing district steam network is estimated to cost thousands of dollars per foot for distribution infrastructure alone, excluding potentially tens of billions more in building-level retrofits. Such costs would likely translate into higher consumer energy prices, raising political and public resistance. Without clear financing mechanisms, large-scale deployment remains challenging.

Furthermore, stronger policy and regulatory signals are needed. The European Union's revised Energy Efficiency Directive (EU/2023/1791) significantly raises energy efficiency ambitions, including energy efficiency in heating and cooling supply. In addition, it drives the mandate that requires data centers above 1 MW to recover or reuse waste heat.¹ In New York, initiatives such as NYSERDA's Empire Building Challenge² signal progress, but scaling TENs will require deeper integration of accessible funding, defining the role of existing utilities, and long-term policy drivers.

Ownership and Stakeholder Alignment Are Critical

Ownership emerged as one of the most complex and unresolved issues in New York. In Sweden, approximately 60% of district heating networks are municipally owned, with the remainder structured as public-private partnerships or owned by private actors. This model has enabled long-term investment and stability. In contrast, U.S. ownership structures are generally fragmented. Building owners and developers are often hesitant to assume responsibility for shared systems that require high upfront capital and operational coordination.

As a result, scaling TENs in New York will therefore depend on alignment among utilities, property owners, public agencies, investors, and workforce stakeholders. Many real estate actors continue to prioritize short-term return on investment over long-term operational and compliance benefits. Successful engagement must clearly articulate the value proposition—such as cost stability, regulatory compliance, asset value protection, and reputational benefits.

These challenges are compounded by differences in governance culture. Whereas Sweden's thermal systems evolved through bottom-up coordination among building owners and industry stakeholders, New York's current Utility TENs³ approach has largely been top-down, driven by state policy.

TENs Are a Solution, But Not the Only One

Participants expressed differing views on the long-term role of TENs in dense urban environments like Stockholm and New York. Rapid advancements in heat pump technology may reduce the need for large-scale thermal networks in some contexts.

Large district systems are capital-intensive and spatially complex, making them particularly well-suited to campuses, industrial parks, and suburban developments where land availability and energy density align. Universities, for example, may be ideal candidates, though stakeholders raised concerns about decommissioning legacy steam systems, citing operational efficiency and embodied carbon considerations. Industry representatives also noted that new construction is significantly easier to serve with TENs, as opposed to retrofitting existing buildings.

As a result, participants suggested that hybrid models, combining TENs with decentralized heat pumps and other electrification strategies, may offer the most pragmatic path forward. A flexible, context-specific approach will likely be necessary to serve the diverse building types and ownership structures across New York.



The Path Forward

The workshop and public panel event underscored both the promise and the complexity of advancing thermal energy networks in New York. Although Sweden’s approach provides valuable insights in governance, financing, planning, and long-term policy alignment, it is clear that there is still much more to learn.

As such, a fact-finding mission to Sweden is planned for 2026. Building on the 2023 Stockholm delegation, this 2026 visit will bring together New York policymakers, technical experts, and real estate leaders engaged in low-carbon energy solutions. Participants will explore a range of topics including the integration of high-lift heat pumps with district heating systems, seasonal thermal storage, and industrial heat recovery.

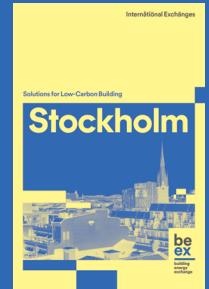
By examining strategies in both major metropolitan areas and smaller communities beyond Stockholm, participants will gain a clearer understanding of scalability and transferability across diverse urban environments. New York leaders will aim to better understand what insights are transferable and what solutions must be adapted to local conditions.

While the path to widespread TENs deployment in New York remains complex, Sweden’s experience offers both inspiration and practical guidance. By learning from proven models while remaining grounded in local realities, New York can continue to build the partnerships, policies, and technical capacity needed to advance a cleaner, more resilient thermal energy future.

This latest initiative builds upon the findings of our 2023 International Exchange delegation to Sweden and the resulting Solutions for Low-Carbon Building: Stockholm report.

learn more:

be-exchange.org/beexreport/low-carbon-stockholm



1 European Commission. “New impetus for energy efficiency.” Energy.ec.europa.eu, 2026, https://energy.ec.europa.eu/topics/energy-efficiency/new-impetus-energy-efficiency_en.

2 New York State Energy Research and Development Authority. “Empire Building Challenge.” NYSERDA.ny.gov, www.nyserda.ny.gov/All-Programs/Empire-Building-Challenge.

3 Governor Kathy Hochul (Office of the Governor). “Governor Hochul Announces Progress toward Implementing Utility Thermal Energy Network and Jobs Act to Reduce Greenhouse Gas Emissions.” Governor.NY.gov, 15 Sept. 2022, www.governor.ny.gov/news/governor-hochul-announces-progress-toward-implementing-utility-thermal-energy-network-and-jobs.

International Pathways: [Thermal Energy Network Knowledge Exchange](#)

September 29, 2025

This private workshop hosted by BE-Ex and the Swedish Energy Agency convened building decarbonization and thermal energy network leaders for an international knowledge-sharing roundtable to discuss low-carbon challenges and solutions. The roundtable provided an open forum to examine specific barriers to scaling TENs and to compare market conditions and implementation strategies in both regions.

facilitators:

Moderator: Adam Hinge, Sustainable Energy Partnerships
Niclas Carlsson, Swedish Energy Agency
Veronica Eade, Swedish Energy Agency
Sofie Fjellgren, Swedish Energy Agency
Mohammed Hasan, Building Energy Exchange
Katie Schwamb, Building Energy Exchange
Paul Westin, Swedish Energy Agency
Richard Yancey, Building Energy Exchange

participants:

Mike Byrnes, Veolia
Julia Casagrande, NYC Mayor's Office of Climate & Environmental Justice
Tria Case, CUNY
Chris Diamond, Port Authority of NY/NJ
Susanne DesRoches, NYSERDA
Adam Friedberg, Buro Happold
Jane Gajwani, NYC Department of Environmental Protection
Colleen Graham, Tishman Speyer
Kevin Hagerty, Vicinity
Laurie Kokkinides, NYS Department of Public Service
Greg Koumoullous, Con Edison
Miguel Maldonado, NYC Economic Development Corporation
Charlie Marino, WSP
Brian McVoy, NY Power Authority
Lauren Moss, Vornado Realty Trust
Peggie Neville, NYS Department of Public Service
Michael Reed, NYSERDA
Adam Shelly, Ecosystem Energy Services
Patrik Schneider, Kraftringen
Mark Spurr, FVB Energy Inc. (Americas)
Carter Strickland, SUNY
Gail Suchman, Sheppard Mullin
Erik Ullenhag, Swedish Consulate
Siobhan Watson, NYC Housing Authority
Dan Zarrilli, Columbia University

Thermal Energy Networks in New York and Sweden: [Lessons across the Atlantic](#)

September 30, 2025

This public program, part of BE-Ex's International Pathways series, expanded the conversation to a broader audience. Panelists explored Sweden's district energy models, enabling policies, and emerging technologies, and discussed their relevance to New York's decarbonization goals. The event featured a moderated discussion and audience Q&A with local, regional, and international leaders advancing TENs initiatives.

opening remarks:

Niclas Carlsson, Swedish Energy Agency
Richard Yancey, Building Energy Exchange

presenters:

Peggie Neville, NYS Department of Public Service
Patrik Schneider, Kraftringen
Travis Smith, Smith Engineering
Paul Westin, Swedish Energy Agency

panelists:

Moderator: Susanne DesRoches, NYSERDA
Charlotte Matthews, CMat Advising LLC
Patrik Schneider, Kraftringen
Travis Smith, Smith Engineering
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