Conservation
Law Foundation

For a thriving New England

CLF Vermont 15 East State Street, Suite 4
Montpelier, VT 05602
P: 802.223.5992
F: 802.223.0060
www.clf.org

February 28, 2025

via ePUC
Clerk Holly Anderson
Public Utility Commission
112 State Street
Montpelier, VT 05620-2701

Re: Case No. 24-3460-INV, Public Utility Commission Request for Comments with respect to Thermal Energy Exchange Networks pursuant to Act 142 of 2024 (Case No. 24-3460-INV)

Dear Clerk Anderson:

Thank you for providing the opportunity to interested parties to provide comments with respect to the permitting, construction, operation and rates of thermal energy exchange networks to aid in the drafting of the Public Utility Commission's (PUC) draft report required by Act 142. Conservation Law Foundation (CLF) writes to provide comments regarding the benefits of thermal energy networks (TENs). CLF is a nonprofit, regional environmental organization that uses the law, science, and markets to create solutions that preserve our natural resources, build healthy communities, and sustain a vibrant economy.

CLF supports the expanded development and use of TENs in Vermont. CLF urges the PUC to consider the following benefits that TENs offer in issuing its report.

Reduction of Thermal Emissions. Currently, thermal emissions account for 44% of the state's energy use and 31% of its greenhouse gas emissions.[1] TENs are widely recognized as a highly efficient tool to decarbonize buildings because they use water to continuously circulate thermal energy to heat and cool buildings.[2] TENs produce no emissions themselves. Any associated emissions come from the electricity buildings use via heat pumps for heating and cooling. These reductions should bear on the rates offered to customers and counsel in favor of a

[1] ENERGY ACTION NETWORK, ANNUAL PROGRESS REPORT FOR VERMONT 10 (2024), https://eanvt.org/wp-content/uploads/2025/01/EAN-APR-2024-updatedJan2025.pdf.

[2] Ana Maria Camargo et al., *The Future of Heat: Thermal Energy Networks as an Evolutionary Path for Gas Utilities Toward a Safe, Equitable, Just Energy Transition,* American Council for an Energy-Efficient Economy (2024), https://www.aceee.org/sites/default/files/proceedings/ssb24/assets/attachments/20240722163127593_770c2285-1b3b-4b4c-a1ed-09d4a7ad7e28.pdf. Camargo et al. point out existing projects in Missouri and Colorado have removed 25,017 and 17,742 tons of CO2 emissions every year.

streamlined permitting regime given the urgent need to reduce emissions in this sector under the Global Warming Solutions Act (GWSA).[3]

Grid Benefits. Electrification of the transportation and heating sectors will result in the growth of summer and winter peak loads.[4] These season peaks may be referred to as a "falcon curve."[5] Some forms of intermittent renewable energy, such as solar, do not coincide with peak heating demands. Because geothermal systems are so efficient, they use less energy which eases demand for electricity.[6] This allows TENs to flatten the falcon curve without relying on fossil-fuel energy. TENs also ease the pressure to build out transmission lines, which could result in billions of dollars in savings.[7] An analysis by the Oak Ridge National Laboratory and the National Renewable Energy Laboratory indicates that networked thermal can help avoid the buildout of 24,500 miles of new long distance transmission lines across the country.[8]

Cost Effectiveness. The cost of heating individual homes and businesses decreases with the employment of TENs. A 2021 report drafted by the Applied Economics Clinic for HEET showed that heating an average-size home in Massachusetts using thermal energy networks cost between $420 and $620 per year where heating that same house with a gas furnace cost $1,040 to $1,120 per year.[9] Also, rather than amassing materials and resources for one-off energy systems, TENs developers can bundle the costs of materials, installation, and maintenance to make the entire system cheaper.[10]

---

[3] 10 V.S.A. § 578.

[4] VELCO, 2024 VERMONT LONG-RANGE TRANSMISSION PLAN 7 (2024), https://www.velco.com/sites/default/files/2024-09/101252_Velco_CC24_singles.pdf.

[5] Jonathan J. Buonocore et al., *Inefficient Building Electrification Will Require Massive Buildout of Renewable Energy and Seasonal Energy Storage*, Scientific Reports (2022), https://www.nature.com/articles/s41598-022-15628-2.

[6] *Id*.

[7] Jess Silber-Byrne, *Affordable Heat, Efficient Grid: Using Thermal Energy to Save Time, Money, and Energy*, THE BUILDING DECARBONIZATION COALITION (BDC), https://buildingdecarb.org/why-efficiency-matters (last visited Feb. 25, 2025). Silber-Byrne estimates that thermal energy networks and air-source heat pumps together could save $557 *billion* in infrastructure costs.

[8] ILR CLIMATE JOBS INSTITUTE, UNDERSTANDING THERMAL ENERGY NETWORKS: A BUILDING DECARBONIZATION APPROACH TO ACHIEVING SCALE, EQUITY, AND HIGH-QUALITY UNION JOBS 16 (2024), https://www.ilr.cornell.edu/sites/default/files-d8/2024-12/understanding-thermal-energy-networks.pdf.

[9] Brian Martucci, *Thermal Energy Networks Can Decarbonize Neighborhoods. Meet the U.S. Cities Giving Them a Shot*, UTILITY DIVE (Nov. 20, 2024), https://www.utilitydive.com/news/thermal-energy-networks-us-cities-neighborhood-decarbonization/733225/.

[10] UNDERSTANDING THERMAL ENERGY NETWORKS, *supra* note 8 at 17.

Equity. TENs can transition multiple buildings in a neighborhood to renewable energy because of the networked aspect of the technology. Municipalities are already authorized to build TENs and provide shared thermal energy services. Utilities are in a better position than individuals to undertake the upfront investment TENs may require.[11] Networked systems are also cheaper to construct. Developers can utilize equipment for a networked system servicing multiple buildings at one time, rather than using equipment for a single building.[12] Renters and low-and-moderate income customers could benefit from the employment of TENs without shouldering the construction costs on their own.[13] The PUC's report should highlight the importance of centering environmental justice and low-and-moderate income communities in the deployment of TENs.

Workforce Development and Innovative Partnerships. The development and use of TENs has the potential to add new jobs and repurpose current jobs in the energy sector in the state. To start, water, sewer, gas pipeline and networked geothermal systems have a lot in common in terms of construction, equipment, and maintenance.[14] Workers with experience and expertise in gas pipelines, as well as oil and propane systems, have a similar set of skills and can easily transition to help construct and maintain TENs.[15] While the installation of TENs is not exactly the same as the installation of gas pipelines, pilot programs such as Eversource's TEN project in Framingham have demonstrated the transferability of skills from the gas to networked thermal context.[16]

TENs can bring people together. Utilities, municipalities, legislators, and environmental organizations have a shared interest in bringing more renewable energy online at scale using existing, or similar to existing, infrastructure. For example, New York passed its Utility Thermal

[11] Camargo, *supra* note 2. For example, utilities have more ready access to capital financing which it can recover via ratepayers over an extended period.

[12] *Id.*

[13] *Thermal Energy Networks (TENs)*, THE BUILDING DECARBONIZATION COALITION (BDC), https://buildingdecarb.org/resource-library/tens (last visited Feb. 25, 2025).

[14] Miriam Wasser, *The Country's First Gas Utility-Run Networked Geothermal Heating and Cooling Syste Breaks Ground in Mass.*, WBUR (June 13, 2023), https://www.wbur.org/news/2023/06/13/networked-geothermal-eversource-heat-pump-gas-utility.

[15] June Kim, *Underground Thermal Energy Networks Are Becoming Crucial to the U.S.'s Energy Future*, MIT Technology Review (Oct. 4, 2023), https://www.technologyreview.com/2023/10/04/1080795/us-thermal-energy-networks.

[16] Buonocore, *supra* note 5.

Conservation
Law Foundation

Energy Network and Jobs Act in 2022.[17] That law was passed unanimously and quickly based, in part, on the strength of the coalition between utilities, unions, and activists.[18]

With the passage of statewide municipal authorization to own and operate TENs last year, Vermont is joining the chorus of other states building and employing TENs.[19] CLF hopes to help inform the PUC's consideration of the role regulated utilities will play in deploying TENs due to the myriad benefits—environmental, economic, equity, and workforce development—they could provide Vermonters.

CLF looks forward to working with other parties interested in allowing our regulated utilities to deploy more affordable, renewable energy that can reduce the state's carbon footprint. Please let me know if you have any comments or questions.

Respectfully,

/s/ Adam Aguirre

Adam Aguirre
Staff Attorney
Conservation Law Foundation
15 East State Street, Suite 4
Montpelier, VT 05602
(802) 622-3016
aaguirre@clf.org.

[17] Utility Theral Energy Network and Jobs Act of 2022, S.B. 9422 (N.Y.), https://legislation.nysenate.gov/pdf/bills/2021/S9422.

[18] Savar Van Horn, *The Emerging Green Technology Could Decarbonize Buildings and Provide Good Union Jobs*, IN THESE TIMES (Jan. 9, 2024), https://inthesetimes.com/article/thermal-energy-networks-climate-labor-new-york.

[19] *Our Stories: A Key to the Clean Energy Future Could Lie Under Our Feet*, CON EDISON MEDIA (Jan. 29, 2025), https://www.coned.com/en/about-us/media-center/news/2025/1-29/con-edison-clean-energy-future-geothermal.