REPORT TO THE VERMONT GENERAL ASSEMBLY

Thermal Energy Exchange Network Development Report

Pursuant to § 17 of Act 142 of 2024

Submitted by the Vermont Public Utility Commission

October 20, 2025

VERMONT

PUBLIC UTILITY COMMISSION

I. Introduction

In 2024, the Vermont General Assembly added "thermal energy exchange networks" ("TENs") to Title 30 for two purposes: (1) to define whether a person constructing or operating a TEN constitutes a "public utility company" under 30 V.S.A. § 203 and is therefore subject to Public Utility Commission ("Commission") regulation; and (2) to exempt municipalities under 30 V.S.A. § 231 from Commission regulation when municipalities own and operate TENs. The Commission regulates public utility companies, pursuant to 30 V.S.A. § 203. TENs are defined as "all real estate, fixtures, and personal property operated, owned, used, or to be used for or in connection with or to facilitate [a] distribution infrastructure project that supplies thermal energy to more than one household, dwelling unit, or network of buildings that are not commonly owned."

The legislation excludes from the Commission's regulation certain thermal energy exchange projects and networks. Therefore, the Commission does not have regulatory authority over thermal energy exchange projects and networks in three categories. The first two categories are not TENs, by definition.

- "Single" unit: thermal energy exchange projects that do not meet the definition of a TEN because they serve one household, one dwelling unit, or a network of buildings that are commonly owned;[1] or
- Owners served: mutual benefit enterprises, cooperatives, or common interest communities that are owned by the persons they serve and that provide thermal energy exchange services only to their members, a landlord providing thermal energy exchange services only to its tenants where the service is included in the lease agreement, or any entity that provides thermal energy exchange services only to itself.[2]

The third category is an exemption for municipalities that construct, operate, set rates for, finance, and use eminent domain for a TEN.[3]

Pursuant to § 17 of Act 142, by December 1, 2025, the Commission

> shall issue a report to the House Committee on Environment and Energy and the Senate Committee on Natural Resources and Energy on how to support the development of thermal energy exchange networks and the permitting of thermal energy exchange network providers. The report shall address all aspects of the permitting, construction, operation, and rates of thermal energy exchange networks and recommend necessary statutory changes.

[1] 30 V.S.A. § 201(8).
[2] 30 V.S.A. § 201(8).
[3] 30 V.S.A. § 231(d).

Based on the legislative exclusions described above, the Commission focuses this report on the remaining areas where Commission regulation may still exist.

At the outset, we note that the market expectations for the development of TENs have changed significantly since the Vermont General Assembly passed Act 142. Stakeholders inform us that up-front costs have consistently been an obstacle to the development of TENs.[4] Subsidization of the initial investment is often key to the success of multi-customer projects.[5] The general unavailability of federal funding for TENs greatly reduces the likelihood that TENs will be developed by private entities in Vermont in the near future.[6]

In order to support the development of TENs, we recommend that the Vermont General Assembly (1) maintain the exclusions already established in 30 V.S.A. §§ 201 and 231; (2) add a further entity — fire districts — for the development of TENs that would not fall under Commission regulation; and (3) decline to develop additional statutory requirements that the Commission must impose on the operators of TENs. Minimal regulation to encourage the development of TENs — if development proves to be possible at all — will offer an opportunity for TEN demonstration projects in the near term. With experimentation and greater data and understanding, the issue of additional regulation can be revisited. This approach also fits with the Commission's core roles: the regulation of monopoly-utility activities and the siting of facilities connected to the grid.

This report is organized into four sections.

- Section I introduces TENs and the legislative directive for the Commission to submit this report.
- Section II identifies the participants and process the Commission conducted, pursuant to Act 142's reporting requirement.
- Section III sets out and explains the Commission's recommendations.
- Section IV concludes this report.

II. Commission's Process and Participants

On November 19, 2024, the Commission opened a proceeding to investigate TENs pursuant to Act 142. All submissions and Commission-issued documents on this matter are available in the Commission's electronic filing system, ePUC, in Case No. 24-3460-INV.[7]

The following people and entities participated in the Commission's proceeding by filing comments: the Vermont Department of Public Service, Vermont Gas Systems, Inc., the

[4] Vermont Gas Systems, Initial Comments at 5 [change citation format for a letter[.
[5] Vermont Gas Systems, Initial Comments at 5 [change citation format for a letter[.
[6] Vt. Dep't of Pub. Serv., Response to Request for Information (6/30/25) at 1-2.
[7] https://epuc.vermont.gov/?q=node/64/202042

Geothermal Exchange Organization, Conservation Law Foundation, the Building Decarbonization Coalition, HEET, and Deborah New and James A. Dumont, Esq. (jointly).

In addition to conducting a proceeding, Commission staff attended the U.S. Climate Alliance Buildings Working Group and the Geothermal Network Regulator Forum.

III. Recommendations Regarding TENs

As outlined in the Introduction, the Vermont General Assembly has excluded from Commission regulation single-unit, owner-served, or municipal thermal energy exchange projects. A TEN, therefore, is defined mostly by what it is *not*. "In a [TEN], buildings are connected to a network of underground pipes that utilize zero-carbon, non-emitting, non-combusting thermal resources to provide heating and cooling."[8] TENs extract thermal energy from available sources, such as traditional ground-source energy from boreholes, bodies of water, or underutilized sources like wastewater systems or waste heat from data centers.[9]

The Vermont General Assembly has tasked the Commission with explaining what, if any, regulation should apply to only a sliver of potential thermal energy exchange systems — whatever that is left that does not fall into a statutory exemption or exception.[10] Essentially, the Commission may only regulate a TEN owned and operated by a private entity that is not itself served by the TEN when the TEN serves more than a single building or commonly owned group of buildings. Such a system might be a neighborhood-scale TEN for new, clustered housing or business developments.

We see the simplest pathway to development of TENs to be minimal statewide regulation, especially at this nascent stage. This approach is particularly well-suited for nascent technologies like TENs, which do not fit the Commission's traditional regulation of entities or programs. Especially in the early stages of development, reduced regulatory burdens can foster innovation by lowering barriers to entry and making it more attractive for developers to experiment with and adopt new approaches. Given the changes in federal funding that would have fostered demonstration projects, we understand the barriers to the development of TENs are greater now than when this report was requested.

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[8] REYNA COHEN ET AL., CORNELL UNIV. ILR CLIMATE JOBS INST., UNDERSTANDING THERMAL ENERGY NETWORKS: A BUILDING DECARBONIZATION APPROACH TO ACHIEVING SCALE, EQUITY, AND HIGH-QUALITY UNION JOBS 11 (2024), https://www.ilr.cornell.edu/sites/default/files-d8/2024-12/understanding-thermal-energy-networks.pdf.

[9] *Id*.

[10] Above, we outlined the exceptions to the definition of TENs as projects serving a single unit (*e.g.*, house, dwelling unit, or commonly owned buildings) as well as owner-served projects (*e.g.*, mutual benefit enterprise, cooperative or common-interest community, landlord) and the exemption for municipally owned TENs.

In Vermont, it makes sense to rely on existing permitting frameworks, such as Act 250 and local zoning, so that developers can engage processes they already understand rather than navigate an additional regulatory system at the Commission. For an emerging technology such as TENs with uncertain pathways and high potential benefits, it is possible to minimize the Commission's role given the other regulatory safeguards already available for ensuring safety, environmental protections, and appropriate local review.

Therefore, we make the following recommendations:

- Modify the definition of TENs in 30 V.S.A. § 201(8) to clarify the term "network of buildings that are not commonly owned";
- Add TENs to the permissible purposes for the establishment of a fire district and exclude fire districts from Commission regulation under 30 V.S.A. § 231(d);
- Only require a "public utility company" certificate of public good ("CPG") under 30 V.S.A. § 231 to operate TENs for private networks not otherwise excluded from Commission regulation; and
- Decline to require statewide siting approval for TENs.

We further explain each of these recommendations below.

a. Clarify the term "network of buildings" in the definition of TEN in 30 V.S.A. § 201(8)

Currently, the definition of a TEN in 30 V.S.A. § 201(8) is:

> "Thermal energy exchange network" means all real estate, fixtures, and personal property operated, owned, used, or to be used for or in connection with or to facilitate distribution infrastructure project that supplies thermal energy to more than one household, dwelling unit, or *network of buildings that are not commonly owned*. This definition does not include a mutual benefit enterprise, cooperative or common interest community that is owned by the persons it serves and that provides thermal energy exchange services only to its members, a landlord providing thermal energy exchange services only to its tenants where the service is included in the lease agreement, or any entity that provides thermal energy exchange services only to itself.[11]

We recommend that the Vermont General Assembly define the concept "network of buildings that are not commonly owned" in the current definition. This part of the definition requires that a "network of buildings" be commonly owned to be excepted from the definition of TENs.

[11] (Emphasis added.) Section 201(7) further defines "thermal energy exchange" as "noncombustible fluids used for transferring heat into and out of buildings for the purpose of avoiding, eliminating, reducing any existing or new on-site greenhouse gas emissions of all types of heating and cooling processes, including comfort heating and cooling, domestic hot water, and refrigeration."

However, the concept of a "network" of buildings is not clear. If the intent is that a group of buildings served by a single thermal energy exchange project and with a single owner be outside of the definition of TENs, then we suggest that the definition replace the word "network" with "group."

b. Exclude fire districts under 30 V.S.A. § 231(d)

To further limit the Commission's regulation of TENs, we suggest adopting a model for determining when a TEN should be regulated based on how Vermont regulates public water systems. For context, 30 V.S.A. § 203 reads, in relevant part:

> The Public Utility Commission and the Department of Public Service shall have jurisdiction over the following described companies . . . (3) A company other than a municipality or a water system exempted under the provisions of 10 V.S.A. § 1675a engaged in the collecting, sale, and distribution of water for domestic, industrial, business, or fire protection purposes.

Section 1675a of Title 10 sets the parameters for when a public water system is regulated by enumerating six requirements (with subparts) that, when met, exempt a public water system from regulation. A "public water system" is defined as:

> any system, or combination of systems owned or controlled by a person, that provides drinking water through pipes or other constructed conveyances to the public and that:
>
> (i) has at least 15 service connections; or
>
> (ii) serves an average of at least 25 individuals for at least 60 days a year.[12]

Thus, public water systems below a certain service threshold (size or time period) are exempt from statewide regulation.[13]

Like the Commission's regulation of water utilities under 30 V.S.A. § 203(3), the Vermont General Assembly has exempted TENs owned by their users (30 V.S.A. § 201(8)) and TENs owned or operated by a municipality (30 V.S.A. § 231(d)). However, the Commission also does not regulate water utilities owned by a fire district. Fire districts are municipal corporations, or special-purpose entities, formed to manage public infrastructure, works, or services, such as sewer systems, water systems, sidewalks, fire departments, or street lighting. We recommend that the

[12] 10 V.S.A. § 1671(5)(A). "Public water system shall also mean any part of a piped system that does not provide drinking water, if use of such a part could affect the quality or quantity of the drinking water supplied by the system. Public water system shall also mean a system that bottles drinking water for public distribution and sale." 10 V.S.A. § 1671(5)(B).

[13] *See also* 30 V.S.A. § 203(6) (requiring a CPG for wastewater and sewage operation only for companies that serve 750 or more household or dwelling units).

Vermont General Assembly consider expanding the exclusion provided for in 30 V.S.A. § 231(d) to allow the formation of a fire district for the special purpose of constructing and operating a TEN.[14] The framework for establishing a fire district is well established and would not require the creation of an entirely new regulatory regime.

We propose the following statutory language to add TENs to the permissible purposes for the establishment of a fire district under 20 V.S.A. § 2601.

> A fire district may vote to adopt the town manager system in compliance with 24 V.S.A. chapter 37. It may vote a tax upon the taxable estate for the protection of property in the district from damage by fire; for the acquisition, construction, and maintenance of sewers and sewage treatment works; sidewalks; public parks; water works, water companies, and equipment and real estate used in connection therewith, including reservoirs and dams; for lighting; <u>for the construction, operation, and maintenance of thermal energy exchange networks;</u> and for other lawful purposes. The prudential committee and collector shall have the same power in assessing, levying, and collecting the tax, as town officers have in assessing and collecting town taxes, including the collection of interest on overdue taxes. The prudential committee may expend such sums for acquiring, constructing, and maintaining sewers and sewage treatment works; sidewalks; public parks; water works, water companies, <u>thermal energy exchange networks;</u> and all equipment and real estate used in connection therewith, including reservoirs and dams; and for lighting purposes as the fire district may vote. The committee may use and occupy such portions of the highways within the district as may be necessary for constructing and maintaining sewers and sewage treatment works; sidewalks; public parks; water works and mains, <u>thermal energy exchange networks;</u> and for lighting purposes.

We propose the following statutory language to include fire districts in the exemption under 30 V.S.A. § 231(d).

> Notwithstanding any other State law to the contrary, a municipality <u>or fire district established for the purpose of operating a thermal energy exchange network utility</u> shall have the authority to construct, operate, set rates for, finance, and use eminent domain for a thermal energy exchange network utility without a certificate of public good or approval by the Commission. Nothing in this section shall alter the requirements of 10 V.S.A. chapter 151, including for district energy projects such as those described in subdivision 209(e)(1) of this title.

[14] *See* 20 V.S.A. ch. 171; Vt. Environ. Conser. Drinking Water and Groundwater Protection Div., How to Form a Fire District: A Step-by-Step Guide to Help a Community Get Organized (), available at https://dec.vermont.gov/sites/dec/files/dwgwp/capacitydev/pdf/How%20to%20Form%20a%20Fire%20District.pdf.

c. CPGs under 30 V.S.A. § 231 to operate a TEN

Given the above recommendations, there is still potential for private entities to develop and operate TENs in Vermont. When private entities not excepted or exempted from Commission regulation operate a TEN, those entities could be serving as a public utility company. In such circumstances, the Vermont General Assembly should add statutory language to 30 V.S.A. §§ 203 and 231. This language would (1) clarify that electric and gas distribution utilities that already possess a Section 231 CPG would not need to amend their CPGs to operate a TEN, and (2) private entities that operate a project within the definition of a TEN must obtain a CPG under Section 231 to serve as a public utility company.

The proposed statutory language is as follows:

30 V.S.A. § 203(7) is added before the current (7):

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(7) A person or company, other than a municipality or entity otherwise exempted under section 231 of this title, that owns or operates a thermal energy exchange network as defined in section 201 of this title.

~~(7)~~(8) Notwithstanding subdivisions (1) and (2) of this section, the Commission and Department shall not have jurisdiction over persons otherwise not regulated by the Commission that are engaged in the siting, construction, ownership, operation, or control of a facility that sells or supplies electricity to the public exclusively for charging a plug-in electric vehicle, as defined in 23 V.S.A. § 4(85). These persons may charge by the kWh for owned or operated electric vehicle supply equipment, as defined in section 201 of this title, but shall not be treated as an electric distribution utility just because electric vehicle supply equipment charges by the kWh.

~~(8)~~ (9) For purposes of this section, "storage" has the same meaning as "energy storage facility" as defined in section 201 of this title.

30 V.S.A. § 231(d) is amended to read:

(d) Any person or company may petition for a certificate of public good pursuant to subsection (a) to own or operate a thermal energy exchange network; provided, however, that any utility with existing authority established before [effective date of act] to provide retail electric or natural gas service shall also be authorized to own or operate a thermal energy exchange network subject to the provisions of this title and rules issued by the Commission. Notwithstanding any other State law to the contrary, a municipality or fire district established for the purpose of operating a thermal energy exchange network utility shall have the authority to construct, operate, set rates for, finance, and use eminent domain for a thermal energy exchange network utility without a certificate of public good or approval by the Commission. Nothing in this

section shall alter the requirements of 10 V.S.A. chapter 151, including for district energy projects such as those described in subdivision 209(e)(1) of this title.[15]

d. No further statewide siting requirements

Section 248 establishes the Commission's regulatory jurisdiction regarding the construction and operation of electric generation, electric transmission, storage, and natural gas facilities in large part because these facilities interconnect to a statewide (and beyond) electric or gas system. The Commission regulates the siting of transmission-level infrastructure but not distribution-level infrastructure. For electricity, transmission generally refers to power conveyance from a generating site, such as a power plant, to an electrical substation. Distribution generally refers to local wiring between substations and customers. For natural gas, transmission refers to gas supplied from interstate supply locations to delivery ports called "gate stations." Distribution refers to pipelines that convey gas from the gate station to individual customers.

TENs do not present the same statewide implications because they function like distribution by bringing energy directly to buildings over a localized area. The primary function of a TEN is final-stage delivery of thermal energy to end-users for heating and cooling.

Therefore, we recommend that the Vermont General Assembly refrain from making changes to 30 V.S.A. § 248 to require that the owners of TENs obtain a CPG. The Commission has the authority to make and amend rules to accommodate new technologies, if necessary. Siting TENs may be more appropriately regulated by localities through Act 250 or municipal zoning. Further, safety issues associated with TENs are outside of the traditional scope of Commission regulation.[16]

e. Using ratepayer funds for TENs

To clarify, however, use of ratepayer funds (electric or natural gas) to finance the development of TENs falls squarely within the Commission's jurisdiction. Only when a regulated electric or gas distribution utility seeks to use ratepayer funds for the development of TENs, or when another private entity that obtains a Section 231 CPG to operate a TEN proposes rates for service, should the Commission play a role.

[15] This proposed statutory language also includes the recommendation from section III.b. above.
[16] Potential safety issues concern burns and fires, chemical hazards from leaks, system pressure or equipment failure, thermal runaway in batteries, and cybersecurity vulnerabilities. These issues are jurisdictional to the Division of Fire Safety and the Agency of Natural Resources.

In those situations, existing statutes and Commission rules and practice establish the framework for evaluating rates for service that would be charged to TEN customers or proposals to use ratepayer funds for the development of TENs.[17]

There are other existing statutory provisions that could allow the use of ratepayer funds to support the development of TENs. For example, a distribution utility providing an incentive payment for implementation of a TEN under Tier III of the Renewable Energy Standard ("RES") would be subject to the Commission's review under the RES and possibly in a utility's rate proceeding. Similarly, if an incentive were offered by an energy efficiency utility to support the development of a TEN, the Commission would have jurisdiction over such incentives in the context of an energy efficiency demand resources plan proceeding or annual plan review.

We recommend no statutory changes to address TENs in these contexts.

IV. Conclusion

As detailed above, the Commission recommends that the Vermont General Assembly take the following actions to support the development of thermal energy exchange networks:

- Modify the definition of TENs in 30 V.S.A. § 201(8) to clarify the term "network of buildings that are not commonly owned";
- Add TENs to the permissible purposes for the establishment of a fire district and exclude fire districts from Commission regulation under 30 V.S.A. § 231(d);
- Only require a "public utility company" certificate of public good ("CPG") under 30 V.S.A. § 231 to operate TENs for private networks not otherwise excluded from Commission regulation; and
- Decline to require statewide siting approval for TENs.

Otherwise, the Commission suggests minimal regulation to ensure the smoothest pathway for the development of TENs in the near term. As experience with this nascent technology grows, the Vermont General Assembly can revisit whether further regulatory mechanisms are needed. The Commission also has the statutory authority and expertise to set rates for a public utility; there is no need for additional action here.

[17] *See, e.g.*, 30 V.S.A. §§ 209, 218c, 225, 226, and 227.