City of Boston
Environment

City of Boston
Mayor Michelle Wu

Commissioner Elizabeth Mahoney
Department of Energy Resources
100 Cambridge Street, Suite 900
Boston, MA 02114

July 16, 2025

By Electronic Submission to stretchcode@mass.gov

Re: ***Guideline on District Energy Systems***

Dear Commissioner Mahoney:

Thank you for the opportunity to provide written comments on the Guideline on District Energy Systems ("Guideline"), released by the Department of Energy Resources ("Department") on June 24, 2025. The City of Boston appreciates the Department including district energy systems ("DESs") in the Stretch and Specialized Energy Codes and providing this Guideline outlining the process for DESs to receive an Order of Conditions ("OoC").

DESs are critical to the Commonwealth and the City achieving our collective climate goals and decarbonizing buildings. In Boston, buildings account for nearly 70% of the city's greenhouse gas emissions. Fossil-free DES provide efficient heating and cooling solutions that lower emissions on a large scale and reduce energy burdens on building owners and residents. A clear and rapid decarbonization regulatory framework for existing DES and deployment of new fossil fuel-free DES align with the City's climate policies, and we offer the following comments with respect to more closely aligning the City and State processes.

The Department should further clarify the progress commitments outlined in the Decarbonization and Efficient Electrification Plan ("DEEP") requirements, in particular the future decarbonized conditions and disclosures of transitions and milestones. The Guideline should clearly define who is setting these commitments and how they will be reviewed and evaluated over time. Further, the Department should clarify whether the approximate growth (or reduction) projections of production in the "Maximum DES Growth and Utilization" section of the DEEP should be annual or part of the 2030, 2035, 2040, and 2045 projected outlooks. Finally, the Department should consider whether there are incentives or opportunities to encourage accelerated compliance for DES decarbonization. Greater transparency and defined roles and responsibilities will support municipal alignment and consistency across plans.

The City appreciates the inclusion of verification steps for municipalities to confirm whether a project is subject to a valid OoC; however, the Guideline should include a more proactive and defined role for municipalities in both the DEEP review process and development of the OoC. The Department should consider opportunities to direct DES owners to work with

municipalities directly to best coordinate and provide guidance for building retrofits and change of use. With ownership over local permitting authorities and community planning, the City is best positioned to appropriately assess DES feasibility and align future system decarbonization goals with the City's climate and development goals. To decrease delays or denial of OoC applications, municipal consultation could be integrated into the DOER DEEP review process.

Thank you for your attention to these comments. Should you have any questions, please do not hesitate to contact me at (617) 635-0031 or Oliver.SellersGarcia@boston.gov.

Sincerely,

Oliver Sellers-Garcia
Green New Deal Director, Office of Mayor Michelle Wu
Commissioner of the Environment Department, City of Bosston

Section D.1 Bullet point 2

- Highly ventilated[8] buildings – **Heat Recovery Enabled DESs** can satisfy this requirement in new buildings, large additions, and buildings where the total compliance pathway is used. **DESs which are not Heat Recovery Enabled cannot satisfy this requirement** and therefore consistent with C407.2.1 must install electric heat pumps in the building, sized to 25% of peak space heating load, and the heat pump shall be used as the primary heating source.

Comment:

Rephrase the paragraph for clarity:

Highly ventilated[8] buildings must install electric heat pumps in the building, sized to 25% of peak space heating load, and the heat pump shall be used as the primary heating source per section C407.2.1.

- **Heat Recovery Enabled DESs** can satisfy this requirement in new buildings, large additions, and buildings where the total compliance pathway (C407) is used.
- **DESs which are not Heat Recovery Enabled cannot satisfy this requirement.**

Section D.1 Bullet point 3

For building projects in Specialized jurisdictions connecting to a qualifying DES:

- Both Heat Recovery Enabled and non-Heat Recovery Enabled DESs are relieved from the electrification readiness (pre-wiring) requirements of the mixed fuel compliance path (Section CC105). Note that there is no relief from the solar PV requirement of the mixed fuel pathway, but this requirement already includes exceptions, e.g. for heavily shaded sites

Comment: Add a preceding bullet point similar to section D.2.ii that states “The two bullets above, **plus**”.

Section D.3 second bullet point

- provided the scope of the project does not include creating a new highly glazed envelope or new highly ventilated building, the DES can be used for all space and service water heating in an alteration, change of use, or small addition; or

Comment:

This paragraph appears out of place, as it is in the “Large additions” section and refers to DES use in alterations, change of use, and small additions.

Section D.3 appears to apply to large additions that are not currently connected to an existing non-qualified DES that are connecting only the new addition to an existing non-qualified DES. Does this case warrant its own sub-section?

Section D.4.i Bullet 3

- If the building is not highly ventilated and is undergoing an alteration or change of use which will result in a highly ventilated building, in-building heat pumps are required to be added for a minimum of 25% of primary space heating capacity and the non qualified DES can continue to be used for secondary **space heating only.**

Comment:

Clarify if DES can be used for service water heating as well

Section D.4.ii

Comment:

The first bullet point in this section appears to contradict section D.3, which allows the use of non-qualified DESs in high ventilated building.

Highly glazed or highly ventilated large additions (20,000 sf or greater, or more than doubling the conditioned floor area of the existing building) shall have in-building heat pumps, as required.

Section D.4.ii

Comment:

The statement “A non-qualifying DES cannot be “extended” into the addition in these cases” makes it unclear if an addition that is not highly glazed or highly ventilated can utilize a non-qualifying DES.

Sections D.3 and D.4

These two sections appear contradictory at times. Recommended rewrite of sections D.3 and D.4 into a combined D.3

Example rewrite:

D.3 Alterations, Change of Use, and Additions at Buildings with Existing, non-qualified, DES connection

i. The following provides clarification for buildings having an existing connection to a non-Qualified DES undergoing alteration or change of use.

- If the building is already highly glazed and is undergoing an Alteration or Change of Use, in-building heat pumps are not required and the existing, non-qualified DES can continue to be used so long as the amount of glazed wall system is not increased
- If the building is already highly ventilated and is undergoing an alteration or change of use, in-building heat pumps are not required and the existing, non-Qualified DES can continue to be used.
- If the building is not highly glazed and is undergoing an alteration or change of use which will result in a highly glazed building, in-building heat pumps are required to be added for a minimum of 100% primary space heating load. The non-qualified DES can continue to be used for all service water heating in stretch code communities, but may not be used for service water heating in specialized code communities.
- If the building is not highly ventilated and is undergoing an alteration or change of use which will result in a highly ventilated building, in-building heat pumps are required to be added for a minimum of 25% of primary space heating capacity and the non-qualified DES can continue to be used for secondary space heating and all service water heating.

ii. The following provides clarification for buildings having an existing connection to a non-qualified DES undergoing a large addition project. (20,000 sf or greater, or more than doubling the conditioned floor area of the existing building).

- Highly glazed large additions shall have in-building heat pumps for 100% of the addition's primary space heating capacity. The non-qualified DES shall not be used for primary space heating capacity. The non-qualified DES can continue to be used for all service water heating in stretch code communities, but may not be used for service water heating in specialized code communities.
- Highly ventilated large additions shall have in-building heat pumps for a minimum of 25% of the addition's primary space heating capacity. The non-qualified DES can continue to be used for secondary space heating and all service water heating.

- In stretch code communities, large additions that are not highly glazed or highly ventilated may utilize a non-qualified DES for all primary space heating and service water heating.
- Add opt-in specialized code requirements if applicable to large additions

iii. The following provides clarification for buildings having an existing connection to a non-qualified DES undergoing a small addition project. (up to 100% of the size of the existing building and less than 20,000 sq. ft.)

- Highly glazed small additions shall have in-building heat pumps for 100% of the addition's primary space heating capacity. The non-qualified DES shall not be used for primary space heating capacity. The non-qualified DES can continue to be used for all service water heating in stretch code communities, but may not be used for service water heating in specialized code communities.
- Highly ventilated small additions utilizing the total building performance compliance pathway (C407) shall have in-building heat pumps for a minimum of 25% of the addition's primary space heating capacity. The non-qualified DES can continue to be used for secondary space heating and all service water heating.
- Highly ventilated small additions complying with section C502 Additions prescriptively may utilize a non-qualified DES for primary space heating and service water heating.
- Small additions that are not highly glazed or highly ventilated may utilize a non-qualified DES for all primary space heating and service water heating.
- Add opt-in specialized code requirements if applicable to large additions

Finlayson, Ian (ENE)

From: studeradmin@tnzenergy.com
Sent: Tuesday, July 15, 2025 6:17 PM
To: STRETCHCODE (ENE)
Subject: Guideline on District Energy Systems - Comments from TNZ Energy Consulting, Inc.

Hello,

These are my comments on the "Draft Guidelines for District Energy Systems June 2025":

1. First off, please do not produce documents that use bullet points – it makes it very hard to make comments, reference the document, and even to use it. Do you really want to ask people to find the third sub-bullet under the second bullet on PDF page 5?

2. PDF Page 2 of 13 DES Type

a. I suggest using the term 'Hydronic Heat Recovery' to specifically refer to transferring waste heat from one hydronic loop to another. The current language is almost complete as-is, but hydronic heat recovery is unique and different from other forms of heat recovery (e.g. exhaust air heat recovery).

b. I suggest dropping the word 'Enabled' since it does not add anything to the differentiation between plants that have or do not have heat recovery.

c. I suggest establishing and then using the acronyms HR DES and NHR DES in the paragraphs to make them less wordy/easier to follow.

d. In the first bullet point, second paragraph, last sentence, there is reference to "transfer its excess energy via a heat exchanger to offset hot water (or steam) production." This is not a good use of the term 'heat exchanger' since the temperature ranges do not support passive heat transfer via a heat exchanger. This requires a heat pump or other active heat transfer device. The return HW temp is probably always going to be hotter than the return CHW temp, so there is no chance that a 'heat exchanger' would work the way that is intended elsewhere in this section (e.g. the heat would flow the wrong way).

3. PDF Page 3 of 13, Min Std for HR DES and NHR DESs Item b

a. "Enabling all or almost all" is flakey and needs to be specifically defined. If the intent is to have ≥90% of buildings on a DES to have inter-building hydronic heat recovery, then say it.

4. PDF Page 3 of 13, Min Std for HR DES and NHR DESs Item c

a. "Demand Reduction" is not a good use of words for hydronic loops since demand reduction is generally associated with electric efficiency on the grid. TNZ suggests using 'Thermal Load Reduction".

b. The current stretch energy code provides adequate envelope and energy recovery requirements to reduce hydronic loop loads. TNZ suggests requiring compliance with the current stretch energy code rather than adding a lot of extraneous requirements to external standards. (Does someone at DOER work on the down low for PHIUS?) You folks made a highly effective code, so lean on it.

5. PDF Page 4 of 13, Preparing the DEEP, Item a

a. First bullet should require 1-line diagrams showing how all relevant pieces of equipment are interconnected.

b. First bullet should be focused on describing the equipment, it should not include references to production and consumption information. This is handled in the next bullet point.

c. Second bullet, fourth open sub-bullet – "equipment efficiencies under all operating conditions" needs to be far more specific. "Equipment design efficiencies at 100% heating operation, 100% cooling operation, and balanced heating/cooling operation" would be reasonable and informative. Rating conditions need to reference specific standards designers already use such as the following. It is important to use these rating standards instead of some random condition such as the current stretch code's heat pump performance at 5°F db (IECC 2021 MA Amendment C406.2.3)

i. Air-to-Water Heat Pumps: AHRI Std 550/590-2020 with Addendum 1, Table 4, Cooling 95°F db OA/44°F CHW, Heating 17°F db OA/120°F HW

ii. Loop-to-Loop Heat Pumps @ Balanced Load: 120°F HW, 44°F CHW

iii. Ground Loop Heat Pumps: ISO 13256-2 2021; Table 1 Cooling (86°F Return to Well, 53.6°F CHW Return), Table 2 Heating (32°F Return to Well, 104.0°F HW Return)

d. Second bullet, fourth open sub-bullet - A separate requirement for average annual heating-dominated performance and average annual cooling-dominated performance would also be reasonable and informative. You could also have them provide total annual COP for the system: (all heating Btu output + all cooling Btu output) ÷ total input utility energy in Btu.

e. Fifth bullet, second open sub-bullet – I suggest requiring metered energy use results, not estimated. If estimates are provided, the estimation methodology should need to be provided.

f. Fifth bullet, fourth open sub-bullet – Distribution losses are already covered in the third bullet's second open sub-bullet (why, oh why, did someone issue this with bullet points?) It is unreasonable for this document to require distribution losses to be reported within the service destination.

g. Fifth bullet, fifth open sub-bullet – This needs to be re-written to only include a description of whether DES heating and cooling is used directly in end use equipment or if it is isolated. I do not think this document should be required to go into detail regarding anything downstream of the energy delivery point.

6. PDF Page 5 of 13, Preparing the DEEP, Item b

a. The future decarbonized conditions need to make some kind of assumption about loading: use known loads or estimate how loads are going to change (covered in Item B.2.d). The future decarb condition probably needs to assume the same loading as quantified in Item 2.a since it is a known load condition. You could not use B.2.d estimates of full utilization because the coincident load patterns that impact HR DESs are unknowable and easily manipulated. If I wanted to get 95% heat pump utilization, all I need to do is assume there is always going to be a lot of waste heat to transfer to the HW loop during the winter. Voila – decarb goal satisfied! It would be better to use historical loads reported in Item B.2.d.

7. PDF Page 5 of 13, Preparing the DEEP, Item d

a. Coincidence of heating and cooling loads are key to HR DES performance and is also key to considering whether to do hydronic heat recovery in NHR DESs as a retrofit. I suggest that the document include requirements for reporting historical and future estimates of % of annual heating load occurring during cooling-dominated operation and % of annual cooling load occurring during heating-dominated operation.

8. PDF Page 5 of 13, Preparing the DEEP, Item e

a. I suggest changing the title of Item e to "Supporting Design Information"

b. First bullet point – isn't this already covered in Item a?

c. Second bullet point – 'equipment specifications' means something very specific – do you want the design specs? Why not also the drawings? I suggest requiring the central heating and cooling equipment final approved submittal information.

d. Third bullet point – I suggest including a requirement for the test well thermal performance report. If you want to see how the long-term time step analysis, you want to include the load assumptions that were used in that analysis (expressed as annual aggregate cooling and heating loads, coincident loads, and excess cooling and heating loads actually placed on the well field).

9. PDF Page 6 of 13, Preparing the DEEP, Item f

a. This seems redundant to the minimum standard for HR DES and NHR DESs discussed on PDF Page 3. What is the point of including this here if the stretch code is already required and adequate for reducing thermal loads?

Thank you for the opportunity to comment!

Eric

Eric Studer · TNZ Energy Consulting, Inc · (617) 894-1464 · 1251 West St, Stoughton, MA 02072

CITY OF CAMBRIDGE
Office of Sustainability

Julie Wormser | Chief Climate Officer

July 15, 2025

Commissioner Elizabeth Mahony
Massachusetts Department of Energy Resources
100 Cambridge Street, 9th Floor
Boston, MA 02114

Re: Draft *Guideline on District Energy Systems* under the Stretch and Specialized Codes

Dear Commissioner Mahony,

Thank you for the opportunity to comment on the draft *Guideline on District Energy Systems* under the Massachusetts Stretch and Specialized Codes (225 CMR 22.00 and 23.00). Cambridge was one of the first municipalities to adopt the Specialized Stretch Code and is one of the ten Fossil Fuel Free Demonstration communities in Massachusetts. We are committed to implementing advanced building codes that ensure our new buildings are constructed in line with our climate goals.

Cambridge is also home to four district energy systems, and we work closely with the owners of each system on climate strategy and decarbonization goals. In particular, many of the buildings served by the district energy systems are subject to Cambridge's Building Energy Use Disclosure Ordinance (BEUDO), requiring them to achieve emissions reductions on a trajectory to net zero by 2035 or 2050, depending on building size. As we implement BEUDO, we are working closely with each system owner to understand their operations, measure the emissions of their energy outputs, and track progress on decarbonization over time.

We are also currently undertaking a planning process to understand the role that networked geothermal and thermal energy networks (TENs) can play in enabling building decarbonization in Cambridge. These systems can be a type of district energy system that provides highly efficient, electrified heating and cooling.

Based on our ongoing work to implement both the Specialized Stretch Code and BEUDO and to examine the role of TENs, we would like to provide the following feedback on the draft *Guideline*:

- **We support the requirement for plant owners to create long-term District Energy Electrification Plans (DEEP) with milestones and capacity planning** if they are to qualify under the Code. We agree that the Plans should be detailed in identifying a pathway to decarbonization, its five-year milestones, anticipated demand, and planned equipment upgrades. The DEEP approach will ensure that system decarbonization happens at a measurable pace towards net zero, in line with BEUDO's approach to decarbonization over time, with the understanding that technologies will continue to advance and plans will accordingly evolve over time.
- **We support the proposal to require clear, standardized reporting for qualifying district energy systems.** The requirement for the DEEP to include information on DES infrastructure and

operations will provide a clear understanding of system configuration, energy use, energy outputs, connected buildings, system losses, and performance. This largely aligns with the annual reporting requirements of BEUDO.

- **The proposal to require electrification over time for a district energy system aligns with BEUDO.** BEUDO requires that covered properties achieve emissions reductions on a path to zero fossil fuel emissions by 2050, which will require eliminating fossil fuels from any DES product serving the building. In particular, BEUDO regulations have established a framework under which the thermal products of a DES that are generated using renewable electricity will qualify as having zero emissions. We expect that several plant owners will pursue such a path of electrification, coupled with renewable energy procurement and energy efficiency, to achieve system decarbonization. We do not envision a future where current DESs add fossil fuel-based generation, nor does BEUDO currently allow for biofuel combustion as the path to decarbonization.
- **Section B.2.f should be reviewed** to ensure that it applies only in cases where the plant owner also owns and operates the buildings connected to the DES.
- **The *Guideline* should enable the development of community networked geothermal and TENs.** Like many communities in Massachusetts, we are exploring the potential of TENs to serve as a pathway to decarbonization, and we want to ensure that the *Guideline* does not delay the development of these projects. Specifically, Section B.1.b may impose requirements on a TEN that serves existing, retrofitted buildings that want to connect to the network. However, a third-party TEN may have limited control over the retrofit that the building undertakes. Second, TENs are intended to be expandable and flexible, growing over time; the requirements of the DEEP in B.2.c-d should allow for that.
- **The implementation process for communities should be streamlined and well-supported**. We appreciate the proposed approach in C.4 under which a municipal inspectional service department can check with DOER on system qualification. We would encourage DOER to continue to support municipalities in implementing the *Guideline*.

Thank you for your work to advance building codes in Massachusetts, and thank you for the opportunity to comment. We look forward to continuing to work with DOER towards our shared climate goals.

Sincerely,

Julie Wormser
Chief Climate Officer

July 7, 2025

Commissioner Elizabeth Mahony
Department of Energy Resources
100 Cambridge Street, 9th Floor
Boston, MA 02114

ELECTRONIC SUBMISSION: stretchcode@mass.gov

RE: Massachusetts Stretch and Specialized Codes (225 CMR 22.00 and 23.00); *Guideline on District Energy Systems*

Dear Commissioner Mahony:

On behalf of Vicinity Energy ("Vicinity"), we would like to thank you and the team at the Department of Energy Resources ("DOER") for the recently released *Guideline on District Energy Systems* under the Massachusetts Stretch and Specialized Codes (225 CMR 22.00 and 23.00) ("Guidelines"). We appreciate the engagement and collaboration with Vicinity throughout this process. We are excited about the important role district energy can play in decarbonizing buildings in the Commonwealth of Massachusetts, and we are dedicated to supporting and accelerating the state's efforts to reduce greenhouse gas emissions.

Vicinity is committed to compliance with the framework, and we are aligned on nearly every front. However, we would like to raise two key concerns and ask for relief regarding the treatment of "highly ventilated buildings." Specifically, the current language emphasizes heat recovery enabled systems as the only path to compliance for these buildings. See Guidelines at pp. 8 and 9 (citing 225 CMR 23.00, Section C407.2.1). We respectfully recommend revising this requirement to allow district energy systems ("DES") with an approved Order of Conditions ("OoC") to serve highly ventilated buildings, recognizing different pathways for renovations and new construction. As you know, these building types typically have ventilation needs that may preclude the use of heat recovery, and the current requirement poses a significant barrier for our customers and overall expeditious advancement of the Commonwealth's decarbonization goals. Without this revision, critical facilities such as laboratories and hospitals would be forced to install duplicative heating systems, at significant cost, thereby limiting the decarbonization benefits that a DES can provide. Moreover, experience in DESs in several European countries has demonstrated that modern, central industrial scale heat pumps can achieve coefficients of performance ("COP") that surpass the efficient electrification benchmarks specified in the February 2025 updates to the Stretch and Specialized Code. We are confident that allowing qualified district energy systems to serve the primary space heating loads of highly ventilated buildings will create a viable and effective pathway for those buildings to meet—and even exceed—the Commonwealth's decarbonization targets.

Additionally, thermal storage systems are a key component of Vicinity's electrification and demand management strategy. However, the current language in the framework is ambiguous as to whether thermal storage is included within the 5% electric resistance heat limit. Thermal storage is different

from standalone electric resistance heating because it leverages power surplus events, enabling Vicinity to pull electrons off the grid overnight during low demand periods, rather than consuming electricity in real time for heating. This approach is particularly valuable given the growing frequency of renewable energy surplus events in ISO-NE. For example, from 2023 to 2024, ISO-NE recorded a 24% increase in maximum behind-the-meter solar generation on peak days, and a further 3.6% increase already in 2025 year-to-date. Similarly, the number of 'duck curve days', days when mid-day demand drops below overnight levels due to high solar output, rose 45% from 2023 to 2024 and reached a record 69 days through May of 2025. These trends will be further exacerbated as offshore wind continues to come online and underscore the increasing need for flexible, grid-aligned technologies like thermal storage that can absorb and shift load to periods of lower demand and pricing. To avoid unintended restrictions on the use of this technology, we respectfully request that resistive electric heating integrated or used in tandem with thermal storage be explicitly carved out from this 5% cap, with guidelines that provide clarification that it does not count against the electric resistance heating allowance under the Decarbonization and Efficient Electrification Plan ("DEEP") and OoC compliance.

We value the ongoing collaboration between Vicinity and DOER and are encouraged by the productive dialogue to date. We look forward to continuing this engagement and discussing these recommendations further as the OoC and DEEP frameworks evolve. We are happy to provide language suggestions on the two recommendations outlined above.

Thank you for your continued leadership and partnership. Vicinity continues to advance district energy in ways that support the Commonwealth's climate objectives, and we welcome the opportunity to provide additional information or engage in further discussions.

Sincerely,

Kevin Hagerty
CEO, Vicinity Energy