



August 18, 2022

2022 COMPREHENSIVE ENERGY STRATEGY

SECTION 16a-3d OF THE CONNECTICUT GENERAL STATUTES

NOTICE OF REQUEST FOR WRITTEN COMMENTS

Pursuant to Conn. Gen. Stat. § 16a-3d, the Department of Energy and Environmental Protection (DEEP) is charged with preparing a Comprehensive Energy Strategy (CES). The CES examines future energy needs in the state and identifies opportunities to reduce ratepayer costs, ensure reliable energy availability, and mitigate the public health and environmental impacts of Connecticut’s energy use, such as impacts from emission of greenhouse gases and criteria air pollutants. DEEP held a Scoping Meeting for the 2022 CES on January 6, 2022 ([notice](#)). A preliminary technical meeting on hydrogen was held April 6, 2022 ([notice](#)), and a notice of additional technical sessions 1-4 was issued August 1, 2022 ([notice](#)).

With this Notice of Request for Written Comments (Notice), DEEP invites stakeholders to submit written comments related to technical sessions 1-4.

Technical Session	Topic	Meeting Date(s)	Deadline for Written Comments
1	Introduction and foundational issues, Part A – End uses that are hard to decarbonize	Sept. 1, 2022 (unchanged)	September 16, 2022, at 5:00 p.m. ET
2	Building thermal decarbonization – Heat pump barriers and market strategies (<i>Meeting in 2 parts</i>)	Sept. 22, 2022 (unchanged) Sept. 23, 2022 (revised)	October 7, 2022, at 5:00 p.m. ET
3	Building thermal decarbonization – Support strategies	Sept. 23, 2022 (revised)	October 7, 2022, at 5:00 p.m. ET
4	Building thermal decarbonization – Economic potential and technology targets (<i>Comments in 2 parts</i>)	Oct. 6, 2022 (revised)	September 9, 2022, at 5:00 p.m. ET PRIOR to MTG.
			October 21, 2022, at 5:00 p.m. ET

Responses to the specific questions detailed below are requested. However, all comments related to technical sessions 1-4 are encouraged.

Written Comment Instructions

All written comments must be submitted electronically via the [Energy Filings web page](#) or submitted directly to DEEP at DEEP.EnergyBureau@ct.gov by the deadlines noted. Please organize comments by comment opportunity and question number (question number is only necessary when a comment is responsive to a specific question posed below). Respondents are invited to address the following specific questions in their comments. Please refer to the meeting [agendas](#) as needed.

Comment Opportunity for Session 1 Introduction and foundational issues, Part A – End uses that are hard to decarbonize

Comment Deadline: September 16, 2022, at 5:00 p.m.

Comments may be filed electronically via the [Energy Filings web page](#) or submitted directly to DEEP at DEEP.EnergyBureau@ct.gov.

DEEP requests written comments in response to the following questions and any topics related to Technical Session 1. Please note question numbers in your response, if applicable.

Questions:

1. During Technical Session 1 on September 1, 2022, DEEP introduced the following topics as priority issues to be given attention throughout all upcoming technical meetings:
 - Electrification and the electricity grid – carbon intensity of electricity; clean-grid supply capacity; distribution system capacity
 - Prioritizing emission-reduction options that facilitate climate change adaptation
 - Fuel price volatility

Are there other issues that deserve attention throughout DEEP’s technical meeting series to help inform the 2022 Comprehensive Energy Strategy?

2. In its August 1, 2022, [notice](#), DEEP identified the following four hard-to-decarbonize end uses:
 - Industrial thermal processes;
 - Long-distance trucking;
 - Aviation; and
 - Maritime

Is this list of hard-to-decarbonize end uses adequate, or are there others that deserve attention?

3. What solution strategies should the CES consider for the listed hard-to-decarbonize end uses? In responding, please identify any equity, economic development, affordability, reliability, and/or resilience impacts that might result from a particular proposed strategy.
4. Beyond the energy resources DEEP identified during Technical Session 1 on September 1, 2022, are there other energy resources that the agency ought to regard as likely to be in limited supply?

Comment Opportunity for Session 2
Building thermal decarbonization – Heat pump barriers and market strategies

Comment Deadline: October 7, 2022, at 5:00 p.m.

Comments may be filed electronically via the [Energy Filings web page](#) or submitted directly to DEEP at DEEP.EnergyBureau@ct.gov.

DEEP requests written comments in response to the following questions and any topics related to Technical Session 2 (Parts A & B). Please note question numbers in your response, if applicable.

Questions:

1. What regulatory or legislative changes would be helpful or critical to accelerate heat pump adoption in Connecticut? Policy examples from other jurisdictions include, but are not limited to, bans on fossil fuel heating in new construction, building code changes, and dedicated funding for electrification programs or incentives. In your response, please note jurisdictions where recommended policies have been successfully implemented.
2. What are the most significant overall barriers to heat pump adoption in Connecticut? What are the primary challenges to heat pump deployment in the following contexts? Are there unique challenges in any of these contexts?
 - a. Large commercial and industrial operations
 - b. Small businesses
 - c. Multifamily housing
 - d. Single-family housing
3. How effective is Connecticut’s public messaging on heat pump adoption? What public outreach, engagement, or messaging strategies employed in other jurisdictions should Connecticut consider adopting?
4. In light of the availability of new national specifications for air-source heat pumps (including the [Energy Star v. 6 specification](#); the [DOE Cold-Climate Heat Pump](#)

[Challenge specification](#); the revised [Northeast Energy Efficiency Partnerships cold-climate specification](#); and [EXP07 Load-based Test Procedure](#)), what technical specifications should be adopted for air-source heat pumps incentive programs through the Conservation and Load Management (C&LM) Plan?

5. What should DEEP regard as best practices for deployment of heat pumps in affordable housing? In particular, DEEP is interested in best practices for:
 - a. Facilitating adoption through landlord and tenant engagement, awareness, and behavioral change;
 - b. Addressing installation barriers in multifamily affordable housing, including barriers related to health and safety, constructability, and specific building typologies; and
 - c. Mitigating utility, operational, and maintenance costs for low-income housing prior to and following the installation of a heat pump.
6. How can Connecticut better support deployment of heat pumps in the commercial and industrial (C&I) sector?
 - a. What technical and financial support is needed for low-carbon technologies in the C&I sector?
 - b. How can the C&LM programs improve promotion of heat pump space and water heating technologies in C&I retrofit and new construction projects?
 - c. How should C&LM programs leverage manufacturer and distributor networks to promote deployment of heat pumps by C&I customers?
7. How can Connecticut effectively incentivize co-delivery of heat pumps with other supportive measures, including weatherization, integrated controls, solar photovoltaic, electricity storage, and demand response?
 - a. To what extent should weatherization be deployed in conjunction with heat pumps? What load reduction, comfort, or other benefits do advanced weatherization techniques, including insulation and advanced duct sealing, provide when installed with a heat pump?
 - b. What role should integrated controls play in Connecticut's heat pump deployment strategy? Should the C&LM programs adopt any specific eligibility or operational criteria for integrated control products?
 - c. What opportunities are there to align the Public Utility Regulatory Authority's new statewide electricity storage [program](#) and solar photovoltaic tariff ([residential](#); [commercial](#)) with the C&LM's heat pump deployment strategies?
 - d. What are the best practices for co-delivery of heat pumps and demand response that the C&LM programs should follow?
8. How can we prepare Connecticut's workforce for increased heat pump deployment?
 - a. What are the specific workforce needs of geothermal heat pump developers?
 - b. How can Connecticut leverage training programs to encourage proper heat pump system design, installation, and maintenance?

- c. What resources do other market actors, including home performance contractors, oil and propane delivery companies, and others need to promote heat pumps among their customers?
9. What support does the heat pump manufacturing sector need to meet increased demand?
10. Should Connecticut consider adding or modifying customer incentives for heat pump technologies, including air-to-water heat pumps and heat pump water heaters? Current incentives are available via the following links: [residential air source heat pumps](#), [residential ground source heat pumps](#), [commercial and industrial rebates](#).
11. How can Connecticut maximize the potential positive reliability and resilience impacts of heat pumps while minimizing any potential negative impacts (e.g., greater dependence on one energy system – the electric grid)?
12. How should Connecticut incorporate equity considerations into its heat pump deployment strategy? In particular, how can Connecticut better ensure that low-income customers and customers who live in affordable housing can access heat pumps?

Comment Opportunity for Session 3 **Building thermal decarbonization – Support strategies**

*Comment Deadline: **October 7, 2022, at 5:00 p.m.***

Comments may be filed electronically via the [Energy Filings web page](#) or submitted directly to DEEP at DEEP.EnergyBureau@ct.gov.

DEEP requests written comments in response to the following questions and any topics related to Technical Session 3. Please note question numbers in your response, if applicable.

Questions:

1. Would a geographic inventory of thermal resources and demand, modeled in some fashion on [Heat Roadmap Europe](#), be helpful in Connecticut? Why or why not?
2. What major changes in building codes, if any, should Connecticut undertake to facilitate building decarbonization? Why?
3. What role should district heating/cooling play in decarbonizing Connecticut's building stock? Which forms of district heating/cooling are most promising for Connecticut? Why?

4. For technologies other than heat pumps (which were addressed above for Session 2), what additional measures are needed in Connecticut to address workforce development challenges for building decarbonization? Why?
5. What additional measures are needed in Connecticut to address educational and promotional challenges for building decarbonization? Why?
6. What are the biggest challenges to building decarbonization affordability? What policies and/or programs have been successful in other jurisdictions in addressing affordability challenges?

**Comment Opportunity for Session 4 – Prior to meeting
Building decarbonization – Economic potential and technology targets**

Note: Additional comment opportunity will follow the meeting

Comment Deadline: September 9, 2022, at 5:00 p.m.

Comments may be filed electronically via the [Energy Filings web page](#) or submitted directly to DEEP at DEEP.EnergyBureau@ct.gov.

DEEP requests written comments in response to the following questions. Responses will help inform the Technical Session 4 agenda. Technical Session 4 will explore the potential decarbonization role of weatherization and a wide range of low- or zero-carbon thermal technologies. Please note question numbers in your response.

Questions:

1. Please share links to any recent reports or analyses that could assist DEEP in developing Connecticut deployment targets for weatherization and thermal decarbonization technologies such as those listed in the table below (i-xi). If you have any concerns about a recent report or analysis related to thermal decarbonization technologies (including but not limited to concerns about methodology or applicability to Connecticut), please describe your concerns.
2. Describe the variables and parameters that you believe are critical for DEEP to consider when developing Connecticut-specific economic potential estimates and/or technology deployment targets for thermal decarbonization technologies such as those listed in the table below (i-xi).
3. For *weatherization* and *each of the thermal decarbonization technologies listed in the table below (i-xi)*, DEEP requests written comments providing:

- A. Assessment of **market barriers** (except for heat pump barriers, which are addressed in Technical Session 2).
- B. Assessment of **economic potential** for 2030 and 2050 (i.e., deployment potential given installation cost, operational cost, and market conditions).
- C. Assessment of non-climate **environmental, equity, and energy justice implications** of this deployment.
- D. Appropriate **deployment targets** and the reasoning and analyses that support these targets. Please address as many of the eleven technologies (i-xi in the table below) as you wish. DEEP recognizes that deployment targets can be expressed in a variety of terms and does not wish to preclude the use of terms that you may find suitable. At a minimum, however, the agency requests that you provide targets framed in two specific ways: (1) percentage of overall residential heating load that the individual technology should cover in 2030 and 2050; (2) percentage of overall commercial heating load that the individual technology should cover in 2030 and 2050. Please disregard cooling capacity.¹ Please distinguish between space heating and water heating.

Please provide this analysis (A-D) for any individual technologies (i-xi) in the table below that you wish to address.

Technology	Space heating		Water heating	
	Residential	Commercial	Residential	Commercial
(i) Weatherization	x	x	n/a	n/a
(ii) Air-source heat pumps (ASHP)	x	x	x	x
(iii) ASHP + thermal storage	x	x	x	x
(iv) GSHP	x	x	x	x
(v) Enhanced geothermal (link)	x	x	x	x
(vi) Solar water heating	n/a	n/a	x	x
(vii) Solar space heating	x	x	n/a	n/a
(viii) Biodiesel	x	x	x	x
(ix) Renewable natural gas	x	x	x	x

¹ DEEP intends to address cooling in the CES. However, please do not address cooling in responding to this question. Some of these technologies do not provide cooling; and addressing cooling deployment targets (etc.) for the relevant technologies would needlessly complicate this exercise.

(x) Green hydrogen*	x	x	x	x
(xi) Compost heat recovery	n/a	x	n/a	x

* Public information that DEEP gathers through other processes addressing green hydrogen in Connecticut and the region (such as Connecticut’s participation in the DOE Hydrogen Hub FOA and the Hydrogen Task Force led by the Green Bank) will inform the CES. However, participants in those processes are welcome to submit comments in response to this Notice.

Comment Opportunity for Session 4 – Following the meeting Building decarbonization — Economic potential and technology targets

Note: This is the second comment opportunity regarding technical session 4

Comment Deadline: October 21, 2022, at 5:00 p.m.

Comments may be filed electronically via the [Energy Filings web page](#) or submitted directly to DEEP at DEEP.EnergyBureau@ct.gov.

DEEP requests written comments in response to the following questions and any topics related to Technical Session 4. Please note question numbers in your response, if applicable.

Questions:

1. What would be appropriate statewide 2030 and 2050 deployment targets for weatherization and each of the other technologies addressed during the session (e.g., ground-source heat pumps)? Please address as many of the technologies as you wish. DEEP recognizes that deployment targets can be expressed in a variety of terms and does not wish to preclude the use of terms that you may find suitable. At a minimum, however, the agency requests that you provide targets framed in two specific ways: (1) percentage of overall residential heating load that the individual technology should cover in 2030 and 2050; (2) percentage of overall commercial heating load that the individual technology should cover in 2030 and 2050. Please disregard cooling capacity.² Please distinguish between space heating and water heating, as outlined in the table above.

2. What is the rationale for each target you proposed in response to question 1? What resources provide support for this rationale?

² DEEP intends to address cooling in the CES. However, please do not address cooling in responding to this question. Some of these technologies do not provide cooling; and addressing cooling deployment targets (etc.) for the relevant technologies would needlessly complicate this exercise.

3. Would additional technologies be needed for your percentages to total to 100 in response to question 1? If so, what are they – and what percentage would you assign to each, and why?
4. How does each of the targets you proposed in response to question 1 relate to existing market barriers, economic potential, and non-climate environmental impacts?

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