Ordinance Committee Meeting - Monday, October 16, 2023, 5:00 PM, Spark Space at Burlington Electric, 585 Pine St.

When: Oct 16, 2023 05:00 PM Eastern Time (US and Canada)
Topic: Ordinance Committee Meeting

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1. Agenda

Subject	**1.1. Motion to amend/adopt agenda**
Meeting	October 16, 2023 - Ordinance Committee Meeting - Monday, October 16, 2023, 5:00 PM, Spark Space at Burlington Electric, 585 Pine St.
Category	1. Agenda
Department	
Type	
Recommended Action	

2. Adopt Draft Minutes from Sept. 21

Subject	**2.1. Adopt Draft Minutes from Sept. 21**
Meeting	October 16, 2023 - Ordinance Committee Meeting - Monday, October 16, 2023, 5:00 PM, Spark Space at Burlington Electric, 585 Pine St.
Category	2. Adopt Draft Minutes from Sept. 21
Department	Council and Board
Type	
Recommended Action	

3. Public Forum

Subject	**3.1. Verbal Comments**
Meeting	October 16, 2023 - Ordinance Committee Meeting - Monday, October 16, 2023, 5:00 PM, Spark Space at Burlington Electric, 585 Pine St.
Category	3. Public Forum
Department	Council and Board
Type	

4. Carbon Impact Fee Discussion

Subject	**4.1. Carbon Impact Fee Discussion**
Meeting	October 16, 2023 - Ordinance Committee Meeting - Monday, October 16, 2023, 5:00 PM, Spark Space at Burlington Electric, 585 Pine St.
Category	4. Carbon Impact Fee Discussion
Department	Council and Board
Type	
Recommended Action	

5. Adjournment

Subject	**5.1. Motion to adjourn**
Meeting	October 16, 2023 - Ordinance Committee Meeting - Monday, October 16, 2023, 5:00 PM, Spark Space at Burlington Electric, 585 Pine St.
Category	5. Adjournment
Department	Council and Board
Type	
Recommended Action	

Ordinance Committee
Thursday, September 21, 2023 at 5:30PM
Remote via Zoom

DRAFT MINUTES

Members Present: Councilor Traverse (Chair), Councilor Carpenter, Councilor Hightower, Councilor Shannon

Staff Present: Kim Sturtevant (Assistant City Attorney), Darren Springer (BED General Manager), Chris Burns (BED), Jen Green (BED)

Public Present: Steve Goodkind, Ashley Adams, Connor Wentz, Dylan Gianbatista, Erik Lohr, Jack Hanson, Karen Vastine, Nick Persampieri, Phil Merrick, Pike Porter, Sharon Bushor, Spencer, David Kelty, Owiso Makuku

Meeting called to order at 5:34 PM.

1. Adopt the Agenda
1.01 Adopt the Agenda

Motion to Adopt Agenda amended to place the BED presentation prior to public comment.
Motion by Councilor Hightower, Seconded by Councilor Carpenter.
Final Resolution: Motion Passes
Yes: Unanimous

2. Adopt Draft Minutes from June 28th
2.01 Adopt Draft Minutes from June 28th

Motion to Adopt Minutes from June 28th, 2023.
Motion by Councilor Hightower, Seconded by Councilor Carpenter.
Final Resolution: Motion Passes
Yes: Unanimous

3. Public Comment (30 minute cap)
3.01 Public Comment

Steve Goodkind: I want to talk about one type of fuel that is exempt from the fee in the ordinance: renewable gas. I was a public works director so I have some experience with this. There is nothing renewable about it and is simply generated from landfills. Are we solving this gas issue from landfills by using it as a fuel? Trees do grow back and are part of the carbon cycle, but renewable gas should not be exempt from the fees and should be treated similarly to natural gas.

Sharon Bushor: I support this ordinance and hope that the impact fee can assist low-income residents to transition off of fossil fuels. I had some difficulty following the process on how organization can state that this fee would affect them economically. I would hope that there

could be a communication that goes with this ordinance that details how an organization could justify their economic challenge with paying this fee. I would also like to know who would decide on these questions.

Nick Persampieri: I sent some public comments in writing before this meeting to the Committee. I am against incentivizing the use of wood biomass heating, liquid biodiesel, renewable natural gas, and green hydrogen. None of these types of heating will help us meet our climate goals. I sent a markup to eliminate these from the permissive uses. I understand the City can't impose fees on fuels other than fossil fuels and it would have to be voted on by the voters. I think it is a mistake to copy what was written in the Affordable Heat Act. The legislature was addressing homes across Vermont that are more rural than Burlington.

Ashley Adams: This ordinance is incentivizing harmful, high-carbon false solutions. It incentivizes wood biomass heating and biomass-based district heating. Burning wood releases VOCs and other harmful gases and particulates. Wood burning releases more CO2 per unit of energy than fossil fuels. Voters passed Question Two to address the climate emergency and this ordinance does not accomplish that.

Phil Merrick: My biggest concern is that this is being promoted by someone who has an interest in promoting biomass. I am afraid this carbon fee is going to be used to persuade the hospital to adopt biomass district heating. I agree with Nick Persampieri's markup of this ordinance and agree with Ashley Adam's comments.

Pike Porter: I sent an email just before this meeting that included more information. District energy will add about 19,000 tons of CO2 and increase fuel usage by 8%. We can't replace fossil fuels with other combustion-based fuels.

Connor Wertz: I live in Ward 2 and work for 350VT. I want to comment on line 58 about sustainable biodiesel. Often this means palm oil. There is a large problem with deforestation in Indonesia because of the demand for palm oil for biodiesel. If this is new information, the Committee should look into the more complicated aspects of biodiesel and other fuel types.

Jack Hanson: The goals in this ordinance are great and we are really on the front lines of decarbonizing existing buildings. I don't think this ordinance is perfect yet. This ordinance makes it too easy for some to avoid doing the work that this ordinance wants. The renewable natural gas section should be reworked and we should focus on decarbonization rather than just paying for credits from a fossil fuel company. I also agree with others that we should remove all carbon-emitting exemptions. I sent an email with some more information.

Dylan Giambatista: I am the director of public affairs at Vermont Gas Systems. We discussed things during the TEUC meetings and other meetings. VGS is both a natural gas provider and also one of three energy efficiency utilities and do in-home service. We are very interested in reducing carbon emissions through three broad categories: weatherization, access to the latest heating solutions, and using short-life cycle carbon fuels. The spirit of the state law and this ordinance is to reduce carbon output while remaining flexible during the transition away from carbon-emitting fuels.

David Kelty: I am the VP of Facilities at the UVM Health Network. We are supportive of the goals in this ordinance toward net zero by 2030. The hospital has very complex engineering requirements and requires reliable thermal energy. Currently, that is high-pressure steam using a HVAC system. There are hospital codes governing air changes and the like, far beyond normal residential or commercial requirements. We are a large consumer of thermal energy. We are looking at an investment at UVMMC soon, including adding more patient beds. That will require additional reliable thermal energy at a low cost so that is does not incur more cost to the patients. Biomass and biogas are the flexible solutions that can be readily implemented as a bridge toward the future.

4.0 Carbon Impact Fee Discussion

4.01 Carbon Impact Fee Discussion

BED General Manager Darren Springer gave a brief overview of the ordinance to date. The Department of Permitting and Inspections will handle the enforcement of the current ordinance. Work on this ordinance began in May of 2022 after the charter change that allowed the City to have authority to do so. In short, this ordinance would make new construction in the City to be required to use renewable heating sources/fuels or pay a onetime fee based on carbon tonnage. For large existing buildings it only applies to heating and water heating. Existing buildings can use the fee to instead pay for renewable systems with a plan.

Councilor Traverse gave a brief disclosure that he now works for the UVM Health Network, but that he no financial stake in the ordinance in one way or another. He did help draft this ordinance before he worked at the Health Network, so he has decided that he won't recuse himself as he is keeping things separated professionally. If necessary, he will seek advice from counsel on this matter.

Councilor Hightower asked Darren Springer about the wording and limitation of the question that voters voted on. Darren Springer responded that the carbon fee would only be applied to fossil fuels and that renewable fuels would not be subject to the fee. Currently, there is no authority to add a fee to something like biodiesel. The language around exempting carbon-reducing systems was added in TEUC.

Councilor Hightower asked about number seven, lines 60-65, about what it included or didn't include. Darren Springer clarified this section was reflective of the state law (AHA) and is meant to convey that buying renewable gas somewhere in the nation is simply not enough to comply. The fuel needs to have a physical pathway to Vermont and has a contractual structure to make sure the fuel could actually get to Vermont.

Councilor Carpenter asked for clarification on how fees could end up being doubled up. Darren Springer responded that if this ordinance was based on equipment rather than energy output as it is currently written, there could be an issue for campus buildings with overlap. BED has discussed this with Attorney Sturtevant and we could include language that indicates that Permitting and Inspections should not apply duplicate fees for any one building.

Councilor Shannon asked about the current state of McNeil and whether it will require an expansion of McNeil for an increased demand. Darren Springer responded that with the planned district energy system, McNeil will remain a 50 megawatt plant and use waste heat to create steam. McNeil will become more efficient as using the heat for thermal heating is more efficient than electrical generation. There will be an estimated 10% increase in efficiency with the current plan. It would not require more wood to run district energy, but the amount of wood burned is variable year to year depending on pricing anyhow.

Councilor Shannon also inquired about green hydrogen. Darren Springer explained that green hydrogen is not readily available today, but green hydrogen would be produced by a renewable source like solar. Hydrogen is just a storage mechanism for energy produced renewably.

Councilor Shannon asked about if this fee should be a tax or should just be in the building code. Darren Springer responded that with the current pricing system, this ordinance will help level the field between electrification and fossil fuels. BED is very interested in moving toward electrification and away from those fossil fuels.

Councilor Shannon asked about the issues raised around biodiesel and if the ordinance should have tighter language around it. Darren Springer said that biodiesel is a small market in Vermont and is undergoing analysis at the state level and this ordinance would allow the City to adjust if the state strikes biodiesel as a viable energy source.

Councilor Hightower wanted some more detail on how this ordinance will promote renewables. Darren Springer said that the charter change vote allowed the City to regulate fossil fuel usage and the fee would both incentivize renewables and also use that fee money to promote renewables. This ordinance also defines what is renewable and not.

Councilor Traverse wanted more detail on the legality and authority that the charter change gave to the City. Darren Springer deferred to the City Attorney, but said something like biodiesel would not be a fossil fuel in his mind. Councilor Traverse continued that something like wood is certainly not a fossil fuel and is outside the charter change. Darren Springer also pointed out from a policy standpoint we would not want to tax a biomass system from a carbon reduction perspective.

Councilor Traverse asked about how switching to renewable gas or a different fuel would work for natural gas users. Darren Springer said that natural gas and renewable gas work like electricity in that they are fed into a grid, whereas propane or oil are delivered directly to your house. The individual amounts of gas are not tracked themselves but rather are bought and sold into and out of the system. This ordinance does not permit carbon offsets such as burning oil while buying renewable credits elsewhere.

The next Committee meeting is October 16th at 5PM at Burlington Electric's Spark Space.

5.0 Adjournment

5.01 Adjournment

The meeting was adjourned at 7:55 PM.

[10/16/2023]

Dear Ordinance Committee,

I'm just writing in advance of tonight's meeting on the carbon fee to voice my support for Nick Persampieri's amendments.

Some are a re-ask for the elimination of carbon emitting fuels from the exemptions, consistent with the arguments made not only at the TEUC's voting meeting but since the beginning of our discussion (including the fact that the state law is not operational until next fall or winter so this allows fuels that are not vetted under that framework). With great respect to my fellow TEUC members, I feel the other 2 were just too cautious and deferential in face of industry opposition given the existential crisis we face.

The others are significant improvements. Much of my efforts to amend the ordinance were designed to make it "workable" and in that effort I was successful in getting a consensus. The magnitude of the workability review and the substantive issues raised above meant that I could not refine and broaden my focus. Nick has taken that next step and I thank him for that and ask that you take his proposals seriously and not dismiss them because they were not raised in the TEUC. For example, I only recently learned of the Thermal Energy Network concepts in the context of the McNeil steam pipe decision we will be making. I mentioned this concept at our last council meeting and I hope you will take it seriously and add it to the list of exemptions. I'm providing a power point on it supplied to me by Jim Dumont and Jared Rodriquez which provides some more detail.

Please add this email and the attachment to the public record of this meeting. I'm not sure if I can attend your meeting tonight so thank you for the chance to weigh in. Please feel free to call or write me if you'd like to discuss this more.

Thank you.

Gene [Bergman]

UVM Medical Center Campus

Source: UVMMC

Planning for Resource Efficient Decarbonization (RED) at Campuses with Central Heating and Cooling Plants

Jared Rodriguez

October 2023

An Alternative Path for Heating and Cooling UVM Medical Center

Plans are underway to switch the primary heating and cooling source for UVMMC from gas to steam supplied by the McNeil Generating Station.

An alternative pathway to achieving lasting, cost-effective emissions reductions is **Resource Efficient Decarbonization**, a stepwise process to reduce emissions using **Thermal Energy Networks**.

Steps to Resource Efficient Decarbonization include:

Maximize efficiency and energy savings

Strategically reduce energy loads and convert to high efficiency distribution

- Address building improvements not already accomplished and continue EUI reduction progress
- Convert to a hydronic (low temperature, water-based) system as needed and where feasible

Implement Thermal Energy Networks

Recover and repurpose on-site waste heat

- Waste heat recovery from ventilation and cooling towers
- Wastewater heat recovery
- Geothermal borefields

Extending steam to UVM Medical Center from the McNeil Generating Station is no less than a 50-year investment.

- The Medical Center is seen as the primary customer of steam, which poses a risk to the viability of the project. A lack of customer diversity raises the risk of default over the contract period.

- The project would encourage the Medical Center to maintain local steam distribution.
  - Steam distribution is inherently inefficient due to significant thermal losses over the length of distribution
  - Hydronic distribution systems perform orders of magnitude more efficiently than steam distribution systems.
  - Hydronic systems are also more technology neutral, meaning other renewable thermal resources can interconnect over time.

- Producing steam through means other than combustion presents technology hurdles and requires high intensity energy consumption.
  - Given the urgent need to decarbonize, steam systems are not ideal.
  - Heat pumps that produce steam are still not commercially available.

Many other district steam system operators are seeking ways to transition to Thermal Energy Networks (TENs) through steam-to-hydronic conversions.

- Carleton College of Northfield, MN transitioned its district steam system to hydronic and built three geothermal bore fields to provide heat to campus, lowering natural gas consumption by 60-70% and aligning with the college's decarbonization plan.

- In New York, Con Edison Steam has lost many customers to installation of electric chillers or natural gas fired boilers, primarily due to high operating costs. The company has developed a long-range plan to decarbonize the steam network, which includes transitioning some parts of the city to hydronic Thermal Energy Networks.

- American University of Washington, D.C. completed a campus-wide conversion of its district steam system to hydronic, greatly improving system efficiency.

- Duluth Energy Systems, the municipal owned district energy system of Duluth, MN converted a network serving 50 customers, or 30% of the total district system, from steam to hydronic as part of a 10-year plan to convert 50% of the total system to hydronic, saving energy and water as well as increasing future thermal energy resource options.

- Princeton University has begun a 30-year plan to convert its entire 150-year-old district steam system to hydronic and integrate geothermal bore fields and other thermal energy resources. The university considers the conversion fundamental to its net zero carbon strategy.

"Princeton [University's] **steam distribution** system runs through a network beneath the campus and serves 180 buildings, some dating back to the 1700s. **'It's a fairly inefficient delivery system, and we can do much, much better than that,' Borer said. 'We estimate that 20% of the energy we create never makes it to the buildings — it's lost out into the ground, which is colder than the steam in the pipe.'**
[Ted Borer, Energy Plant Director, Princeton University]

"Niels Vilstrup, head of district energy advisory in North America for the Danish Trade Council, said **Princeton's approach to district energy on its campus is setting the stage for the types of changes that need to occur at other universities and institutions worldwide.**"

Going deep: Princeton lays the foundation for a 'net-zero' campus

An Alternative Path

Thermal Energy Networks (TENs) are a key alternative to high-temperature steam distribution systems.

TENs are low temperature, hydronic distribution networks.

- Use water source heat pumps and a network of pipes to provide heating, cooling, and hot water.
- Move heat from a thermal energy resource to customers.
- Balance heating and cooling among buildings: customers may also be suppliers of thermal energy.
- Strategically sharing and storing heat across buildings allows for reduced infrastructure sizing and expense.

Hydronic systems are more technology-neutral.

- Can use waste heat, such as recovered heat from wastewater, shallow or deep geothermal boreholes, and other renewable thermal energy resources that can interconnect over time.
- Provide diversity of thermal energy resources and greater resilience.

Waste heat is an existing, significant thermal energy resource often ignored.

- Ventilation and wastewater are key sources of waste heat that can be reused.
- Cooling also produces heat, which may be captured and repurposed.

Current plans tie UVMMC's future to the future of McNeil's century-old generating technology, prolong the use of biomass combustion, and create dependency by UVMMC on continued biomass combustion.

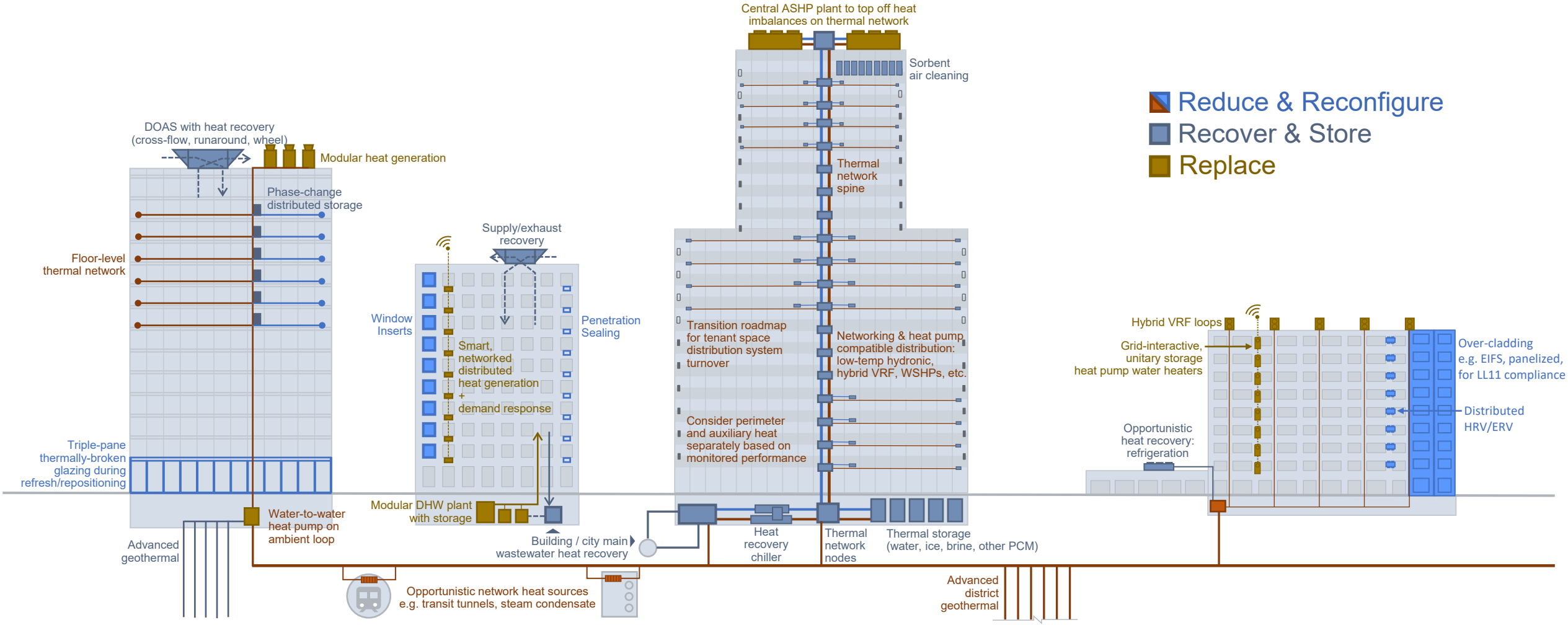
Using heat that already exists on site is a more resource efficient way to decarbonize UVMMC.

A UVMMC Thermal Energy Network could consist of:

- Hydronic systems within and connecting buildings: water source heat pumps and pipes
- Ventilation heat recovery systems
- Cooling tower heat recovery systems
- Other infrastructure or equipment systems capable of extracting heat from nearby thermal energy resources:
    - Thermal energy storage
    - Geothermal facilities
    - Solar thermal facilities and more.

A TEN can take advantage of existing chilled water pipe infrastructure and is expandable to neighboring facilities.

Thermal Energy Networks (TENs) connect multiple heating, cooling, and ventilation systems with a variety of thermal energy resources moving heat or cool to where and when it's most needed.



Infographic Source: New York State Energy Research and Development Authority (NYSERDA)

Resource Efficient Decarbonization (RED) is needed at UVM Medical Center and throughout Burlington.

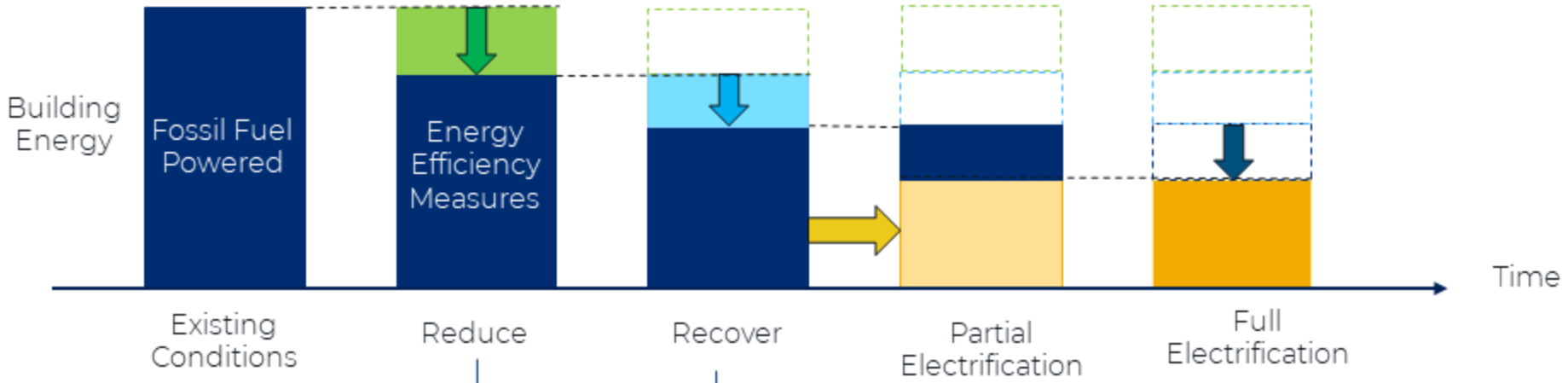
- To actively reduce building-related emissions in time to meet statewide goals, a long-range strategic plan is needed to prioritize projects following the RED model.

- Reducing heating loads is a critical step before switching to new heating systems, allowing the right-sizing of equipment to substantially reduce project capital costs.

- Waste heat is a significant thermal energy resource often ignored. Cooling produces heat, which may be captured to offset fossil fuel consumption. Ventilation and wastewater are also key sources of waste heat.

- Identifying on-site opportunities for energy efficiency and energy production should be prioritized over bringing an inefficient heating source to the campus from a long distance away.

Resource Efficient Decarbonization is a stepwise process to reduce emissions.



Reduce Energy Load and Reconfigure

- Building Envelope Improvements
- Control Optimization
- Ventilation Improvements
- Dedicated Outside Air System
- Hydronic Distribution
- Lower Heating Supply Temp.
- Terminal Units Replacement

Recover Wasted Heat

- Waterside Heat Recovery
- Airside Heat Recovery
- Wastewater Heat Recovery
- Thermal Energy Networks

Partial Electrification

Replace fossil fuel inputs and prioritize the techno-economic portion of load

- Air Source Heat Pumps
- Water Source Heat Pumps
- Geothermal
- Thermal Layering

Full Electrification

In-time, replace or remove the remaining peak load equipment and maintain resiliency.

- Heat Pumps
- Thermal Storage
- District Thermal Network
- Grid-interactivity

Infographic: New York State Energy Research and Development Authority (NYSERDA)

Using on-site Thermal Energy Resources

- Heat Recovery and Recycling: avoid free cooling or cooling tower use and instead provide space heat and domestic hot water with heat otherwise rejected.
- Geothermal Borefield
- Wastewater Heat Exchange
- Solar Thermal and on-site PV (alignment with reducing cooling electric peak)
- Thermal Energy Storage

Creating lasting economic and decarbonization benefits for UVMMC

- District steam offers limited savings to UVMMC while producing returns for the project investors.
- Investing capital in the Medical Center produces lasting energy, carbon, and money savings and transitions the facility to a decarbonized state.


UVM Medical Center
Renewable Thermal Energy Resources
Cooling Tower
Borefield
Ventilation Exhaust
Ventilation Exhaust
Ventilation Exhaust
Cooling Tower
UVM Greenhouse
Borefield
Borefield
Beaumont Ave
Colchester
Parking lo
Visitr Ctr
Google

Champlain College, Burlington, VT

Thermal Energy Resource: Open Loop Geothermal Aquifer
Supplies heating and cooling year-round for seven campus buildings
Average Cost to Connect: $1.66 per square foot
In Service Date: Begun 2010 (45% of campus uses system today)

[Geothermal Heating & Cooling | Campus Operations | Sustain Champlain]

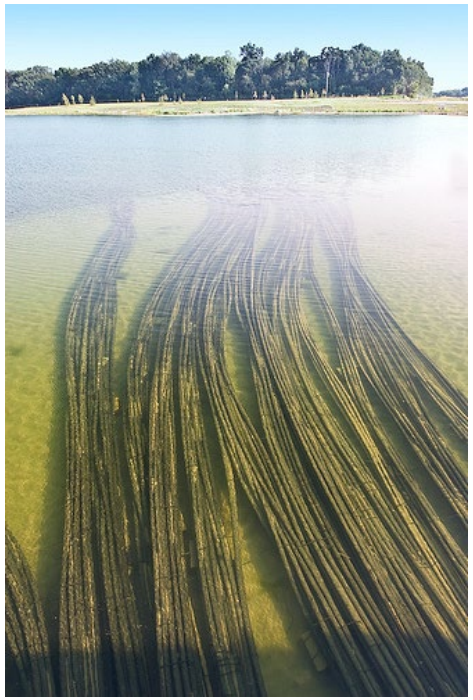
Peel Memorial Centre Hospital, Brampton, ON

Thermal Energy Resource: Geothermal borefield (100 boreholes @ 600-ft deep)
Supplies baseload heating and cooling year-round
In Service Date: 2017

[Peel Memorial Centre for Integrated Health & Wellness - William Osler Health System (williamoslerhs.ca)]

Advocate Sherman Hospital, Elgin, IL

Thermal Energy Resource: Purpose-built 15-acre lake
Savings: $1M per year
Marginal Capital Cost: 13% more in upfront cost than traditional heating/cooling systems
In Service Date: May 2009

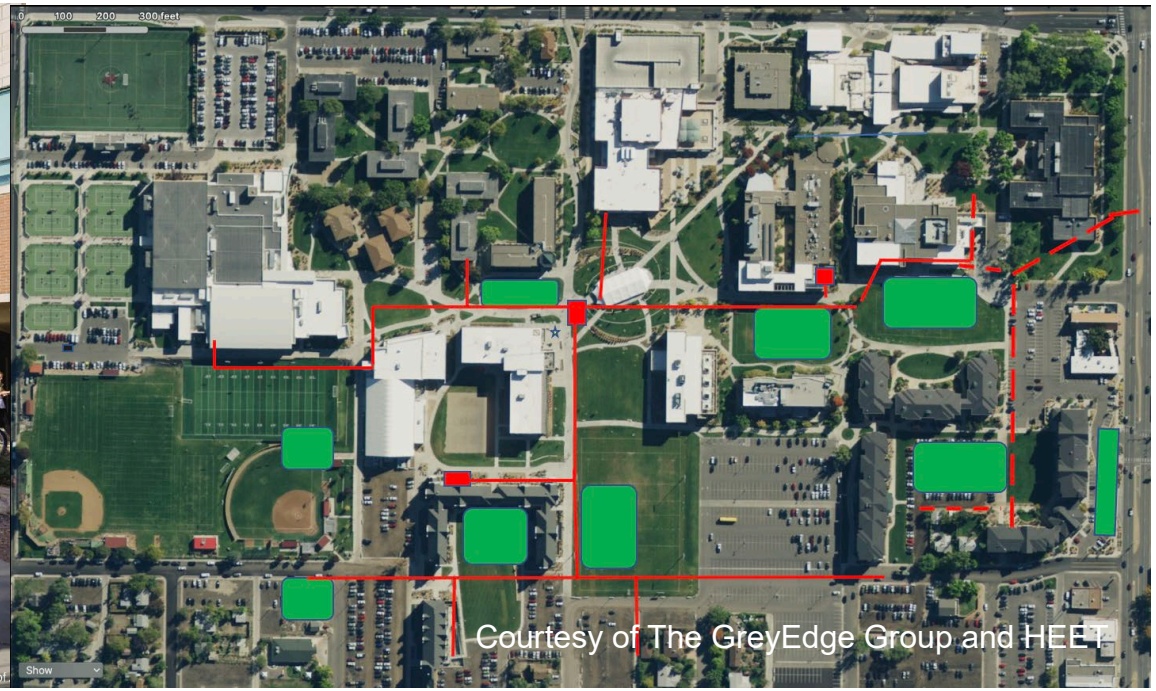


[Geothermal Lake | Advocate Sherman Hospital | Elgin, IL (advocatehealth.com)]

Colorado Mesa University, Grand Junction, CO

Thermal Energy Resource: Geothermal borefields
Savings: $1.5M/year, 14.8M kWh/year, 706k Therms/year
Carbon Reduction: 17.742 metric tons CO2 per year

Facility: 16 buildings, 1.2M square feet
Climate: Low and high temperatures comparable to Vermont



Memo

To: Members of the Ordinance Committee, Burlington City Council

From: Gary Scott, Interim Network SVP Facilities Planning and Design, UVM Health Network Corporate Leadership

Re: Questions about the draft Ordinance of Article V, Thermal Energy Systems

Date: October 13th, 2023

As the largest healthcare institution in the state, we want to express our sincere support for the City of Burlington's commendable pursuit of a Net Zero future. We consider ourselves stewards of this community, dedicated to fostering sustainable practices and minimizing our ecological footprint.

We are committed to understanding how the proposed ordinance aligns with our sustainability commitments and how it may impact our daily operations. It is essential to recognize that, given our critical role, we are obligated to maintain 100% utility backup capability for our critical infrastructure systems. This commitment is at the core of our operational resilience, ensuring uninterrupted patient care during utility disruptions or emergencies. We cannot fully consider the carbon fee proposal without also taking into consideration that we must also account for this utility backup capability.

We have two points we would like to raise, in the hopes that the committee can provide clarity or consider modifications to the ordinance to make it more accessible for review. Our ultimate goal is to gain a comprehensive understanding of the economic implications from a long-term perspective, including updating or upgrading existing thermal equipment and possible building modifications.

1. **Administrative Burden and Project Costs**: It is vital for the Ordinance Committee to understand that the proposed fees will introduce administrative burdens and other operational costs. There is a real potential for future capital maintenance projects to be subjected to a Certificate of Need (CON) Assessment by the State of Vermont due to increased project costs attributed to carbon fees. The CON process can add time and cost to critical projects, potentially affecting patient care.

2. **Clarity on Fee Assessment**: We would appreciate greater clarity on how the fee assessment is calculated. Specifically, we seek answers to questions regarding whether the proposed fee is based on consumption or the use of thermal energy and how double taxation of the same thermal energy is prevented (e.g., generated

thermal energy vs. end-use consumption). We also request clarity on how thermal energy will be accounted for, especially in cases involving the installation of generation systems to support building HVAC and Process systems. Our systems are designed with contingent capacity to ensure patient safety and reliability, but this contingent capacity does not necessarily equate to carbon generation from thermal energy use. We recommend that the Ordinance Committee conduct due diligence to evaluate and detail the process by which the Department of Permitting and Inspections ensures fair and accurate fee assessment based on carbon produced.

While we recognize that increases in fees and other costs may ultimately be passed on to our patients and insurers, we approach the proposed ordinance with an open mind. At this juncture, we reserve formal judgment on the full ordinance until we have a comprehensive understanding of how the fee will be computed.

We thank you for considering our concerns and look forward to continued collaboration to ensure the successful implementation of sustainable practices in our community.

CITY OF BURLINGTON

ORDINANCE _____
Sponsor: Councilors Traverse, Barlow
Public Hearing Dates: _____

_____
First reading: _____
Referred to: _____
Rules suspended and placed in all

In the Year Two Thousand Twenty-Three

An Ordinance in Relation to
stages of passage: _____
THERMAL ENERGY SYSTEMS AND THE ASSESSMENT OF A CARBON POLLUTION IMPACT FEE

It is hereby Ordained by the City Council of the City of Burlington as follows:

That Chapter 8, Buildings and Building Constructions, Article V, Heating Systems, of the Code of Ordinances of the City of Burlington be and hereby is amended to read as follows:

ARTICLE V. THERMAL ENERGY~~HEATING~~ SYSTEMS

8-76 Purpose and Authority.

(a) Purpose. It is in the public interest and in the interest of public health and safety to achieve a high degree of conservation of energy and~~, where possible,~~ reduce emissions of greenhouse gases by requiring buildings to meet specified energy efficiency performance standards and maximum allowable heat loss standards.

(b) Authority. All provisions in this article relating to thermal energy~~heating~~ systems are adopted pursuant to the authority and powers granted by ~~a majority of the legal voters of the City who voted at the annual City meeting on March 7, 2023, in accordance with~~ section 48(66) of the City Charter and its provisions on the regulation of thermal energy systems in residential and commercial buildings, including the assessment of carbon impact or alternative compliance payments, for the purpose of reducing greenhouse gas emissions throughout the City, and the majority of the legal voters of the City who voted at the annual City meeting on March 7, 2023 to authorize assessment of a carbon impact fee on installation of certain fossil fuel thermal energy systems. The provisions in this article are further adopted pursuant to the authority and powers granted by the Vermont Legislature in 24 V.S.A. § 3101 (Chapter 83. Building Inspectors and Regulation of Building; Bylaws and ordinances; penalties), as reasonably necessary to improve the health, safety, and welfare of the public from fuel leaks and explosions, and from air pollution, including that which is causing climate change and thereby threatens the city and its inhabitants.

Commented [NP1]: It seems appropriate to rely directly on the City Charter provision as well as the vote.

8-77 Definitions.

(a) A "fossil fuel ~~renewable primary heating~~thermal energy system" shall be subject to the alternative compliance carbon fee, and shall mean any space conditioning, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy from fossil fuels, including coal, oil, propane, kerosene or natural gas. ~~heating system that meets at least eighty-five (85) percent of the building's design heating load calculated per the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.1) and is fueled by:~~

~~(b) A "low-carbon thermal energy system renewable fuel which reduces greenhouse gas emissions" is, based on the vote at the annual City meeting on March 7, 2023, not subject to the alternative compliance carbon fee, and~~ shall mean any space conditioning, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy from:

(1) Electric-powered thermal equipment~~ity~~, including cold-climate air source heat pumps, ground source heat pumps, and other heat pumps including district, network, grid, microgrid, and building geothermal systems and systems that use waste heat from noncombustion sources; electric appliances providing thermal end uses; and heat pump water heaters (with the exception of electric resistance units prohibited by the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.2.3) or the Vermont Residential Building Energy Standards (RBES) Energy Code (Section 2.4b)); or

(2) ~~Wood pellets or woodchips;~~ Solar water heating systems and solar district heating.~~; or~~

~~(3) Other renewable fuel used by conventional primary heating systems, including renewable gas, biodiesel, and renewable district heating, if the building owner provides a contract demonstrating that the fuel required by the conventional primary heating system is fully sourced from such other renewable fuels for the life of that conventional heating system.~~Renewable energy-based district ~~heating; or~~

~~(4) Green hydrogen sourced exclusively from renewable energy sources; or~~

~~(5) Advanced wood heating systems that meet the 2023 or subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls; or~~

~~(6) Sustainably-sourced biodiesel; or~~

~~(7) Renewable gas, meaning methane produced by organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a Vermont Public Utility Commission-approved tariff or supply contract from a gas utility such as Vermont Gas Systems, provided that the gas utility demonstrates that the renewable gas is purchased along with its renewable attributes and has a secured contractual pathway for the physical delivery of the renewable gas from the point of injection in the pipeline to the gas utility's delivery system; or~~

~~(8) Any other renewable fuel that reduces greenhouse gas emissions, provided the Department of Permitting and Inspections receives sufficient analysis or documentation from the applicant that the fuel reduces greenhouse gas emisssions relative to the fossil fuel it is replacing consistent with the requirements of subsection (c) below.~~

~~(c) The Department of Permitting and Inspections shall disqualify any renewable fuel that reduces greenhouse gas emission from being eligible to satisfy the requirements of 8-78 if such fuel is subsequently deemed by the Vermont Public Utility Commission not to satisfy the carbon intensity requirements of a State of Vermont Clean Heat Standard or any similar state thermal energy policy. In addition, the Department may~~

Commented [NP2]: Permissible district hearing is addressed in subparagraphs (1) and (2). Not all "Renewable energy based district heating is low in greenhouse gas emissions- for example, biomass based district energy has high greenhouse gas emissions.

Commented [NP3]: There is no need for this because we are eliminating the fuels that would be potentially subject to it from the ordinance. If Advanced Wood Heating or biomass based district energy is left in the ordinance this paragraph should be modified to include the situation where fuels are deemed ineligible for clean heat credits under the Affordable Heat Act for reasons apart from the carbon intensity requirement, which applies only to liquid or gaseous fuels and not to biomass. Additionally, the GREET model does not include biogenic emissions.

require an applicant seeking to utilize a liquid or gaseous renewable fuel that reduces greenhouse gas

~~emissions to submit documentation or independent analysis - utilizing the Argonne National Laboratory GREET model or modeling of similar rigor adapted to Vermont's thermal energy context - demonstrating that the renewable fuel proposed for compliance under this section reduces greenhouse gas emissions relative to the fossil fuel system or fuel it is replacing.~~

~~"Renewable gas" shall mean methane produced by the organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a tariff or supply contract from a utility such as Vermont Gas Systems.~~

(d) A "large existing building" shall mean a building with at least fifty thousand (50,000) feet in total floor area of enclosed conditioned space, including hotels, but excepting the following:

(1) All residential buildings; and

(2) Buildings listed, or eligible to be listed, on the National Historic Register, provided the applicant can demonstrate to the satisfaction of the Department of Permitting and Inspections that there is no low-carbon thermal energy system~~thermal energy system that relies on renewable fuel~~ available to the building due to the historic nature of the building and any limitations imposed by the National Historic Register.

(e) A "new building" shall mean the new construction of any building, excepting all additions, alterations, renovations, or repairs to an existing building.

(f) An "existing city building" means all municipal buildings constructed prior to January 1, 2023 and owned by the City of Burlington, regardless of their size or square footage.

~~(b) A "nonprimary heating system" shall include back-up heating system, water heating system, or ventilation/air tempering system.~~

8-78 Applicability.

(a) Applicants seeking permits pursuant to this chapter for a new building~~s~~ shall demonstrate that the new building will utilize low-carbon~~a, renewable primary heating~~thermal energy system~~s. that rely on a renewable fuel~~ ~~which reduces greenhouse gas emissions.~~ Applicants seeking permits to replace space conditioning systems or domestic water heating systems that are in large existing buildings shall demonstrate the new space conditioning or domestic water heating systems are low-carbon thermal energy systems.~~will utilize a renewable fuel which reduces greenhouse gas emissions~~. Existing City buildings shall follow the requirements for large existing buildings, but are not subject to the alternative compliance carbon pollution impact fee.

(b) If an applicant for a new building is seeking to use a fossil fuel thermal energy system ~~that does not rely on a renewable fuel which reduces greenhouse gas emissions~~, or an applicant for a large existing building is seeking to use a space conditioning or domestic water heating system that is a fossil fuel thermal energy system ~~does not rely on a renewable fuel which reduces greenhouse gas emissions~~, the applicant shall prior to receiving a permit pursuant to

~~119~~117 subsection (a) first have to demonstrate that a low-carbon thermal energy~~the renewable~~ system is uneconomical. To be determined to be

~~120~~ uneconomical the twenty-five (25) year capital and operational cost of the least expensive low- carbon thermal energy ~~renewable primary~~

~~121~~118 ~~heating~~ system, including any available incentives from the Burlington electric department or other State or

federal entities, must be more than the twenty-five (25) year capital and operational costs of a fossil fuel thermal energy~~nonrenewable~~ ~~primary heating~~ system, including the cost of externalities calculated by a building carbon price of one hundred fifty dollars ($150.00) per ton for the life of the fossil fuel thermal energy ~~nonrenewable primary heating~~ system. The building carbon price of one hundred fifty dollars ($150.00) per ton shall be annually adjusted by the program administrator equivalent to one hundred (100) percent of the annual change in the Consumer Price Index For All Urban Consumers (CPI-U) in the Northeast Region, to go into effect January 1 of every ensuing year. A system demonstrated to be ~~ing~~ uneconomical~~bility~~ shall be assessed an alternative compliance carbon pollution impact fee. However, an applicant building a new, residential multi-unit dwelling with four or more units shall not be subject to the alternative compliance carbon pollution impact fee as it applies to domestic water heating systems until January 1, 2026.

(c) Effective January 1, 2024, the alternative compliance carbon pollution impact fee shall be equal to one hundred fifty dollars ($150.00) per ton of greenhouse gas emissions produced by the thermal energy system over its lifetime, based on a net present value calculation at the time the permit application is submitted. For large existing building applicants, the alte~~r~~rnative compliance carbon pollution impact fee is capped at no more than 75 percent of the installed cost of the proposed space conditioning or domestic water heating system. On each subsequent January 1, the alternative compliance carbon pollution impact fee shall be increased by any percentage increase of the Consumer Price Index, CPI-U, U.S. city average, not seasonally adjusted, or successor index, as calculated by the U.S. Department of Labor or successor agency for the 12 months preceding the previous September 1, but in no event shall the increase be greater than five percent. The adjusted alternative compliance carbon pollution impact fee shall be rounded off to the nearest dollar.

~~(d) For compliance purposes for all thermal energy systems that are capable of utilizing either a fossil fuel or a renewable fuel that reduces greenhouse gas emissions, an applicant shall demonstrate compliance by providing a certificate and supporting documentary proof, including but not limited to a contract, invoices, and subscription or participation in a tariff program, on an annual basis stating that the applicant is purchasing renewable fuel that is being delivered to that building's thermal energy system, that it reduces greenhouse gas emissions, and that the purchases cover the annual need of the thermal energy system. If the applicant fails to provide an annual compliance certification, the applicant will be assessed an alternative compliance carbon pollution impact fee equal to a pro rata share of the remaining expected life of the thermal energy system. For renewable liquid or gaseous fuels used in a thermal appliance or system capable of also using fossil fuels, to count towards compliance, the purchase of enough renewable fuel to fully offset the annual usage for the appliance or thermal system in question is required.~~

(e) If an applicant with one or more buildings is seeking a permit pursuant to this chapter, and is already using one or more low-carbon thermal energy systems at one or more buildings located in Burlington ~~that rely on a renewable fuel which reduces greenhouse gas emissions~~, the applicant may apply for a credit toward~~s~~ any alternative compliance carbon pollution impact fee equal to the carbon value of the low-carbon thermal energy systems~~renewable fuel which reduces greenhouse gas emissions used for any thermal energy system~~ since January 1, 2024.

Commented [NP4]: There is no need for this provision, which would be burdensome on City staff, because the fuels that would be subject to it have been eliminated.

Commented [NP5]: This may need to be clarified. I am not sure what it means. It might be better to delete this entire subparagraph.

(f) All alternative compliance carbon pollution impact fee proceeds except those funds needed to administer this ordinance, shall be placed in a Clean Energy Fund established and managed by the

Department of Permitting and Inspections with technical support from the Burlington Electric Department. Clean Energy Fund proceeds shall be made available as follows:

(i) The Department of Permitting and Inspections, with technical support from the Burlington Electric Department, shall determine which initiatives are eligible for funding for property owners or low income renters, but they may include, and shall not be limited to, the installation of new low-carbon thermal energy systems ~~that rely on renewable fuel~~, weatherization projects, or subsidizing any increased utility costs associated with using a low carbon thermal energy system ~~purchasing renewable fuel~~ rather than a fossil fuel thermal energy system;

(ii) Half of the proceeds paid into the Clean Energy Fund by a large existing building applicant shall be available to the payor for projects to reduce greenhouse gas emissions at any site City of Burlington owned by the payor. The large existing building applicant must request these proceeds within one (1) year following payment of their alternative compliance carbon pollution impact fee, and any proceeds not requested within that year shall be made available under subsection (iii).

(iii) Any remaining proceeds collected from large existing building applicants and all proceeds paid into the Clean Energy Fund by new construction applicants shall be available to provide financial assistance to help low-income Burlington residents with the purposes described in subsection (i), either through direct payments to homeowners and renters who are income-qualified per the most recent income-qualification levels published by the Community and Economic Development Office ("CEDO"), or through payments to property owners of multi-family buildings where at least 25 percent of the tenants in the building are income-qualified, provided that the property owner must commit to not raising the rent of income-qualified tenants as a result of costs associated with the funded initiatives to reduce greenhouse gas emissions.

(g) Nothing in this section prevents or prohibits applicants from utilizing any and all available local, state, or federal incentives, rebates or tax credits that support implementation of low-carbon thermal energy systems ~~renewable fuels~~ listed above for their buildings, and applicants are encouraged to access available incentives or rebates or tax credits.

~~(h) Any applicant for a permit pursuant to this chapter, for any new or existing building regardless of size, seeking to utilize a wood chip or wood pellet heating system, must demonstrate that the system meets the 2023 or any subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls.~~

~~An applicant is permitted to install and utilize nonprimary heating systems in new buildings that use nonrenewable fuels.~~

8-79 Effective Date~~Waiver~~.

The provisions of this Article shall take effect on January 1, 2024.

~~The department of permitting and inspections may grant a waiver to Section 8-78 on the grounds that~~

~~utilizing a renewable primary heating system in a new building would be uneconomical. To be deemed~~

~~uneconomical, the twenty-five (25) year capital and operational cost of the least expensive renewable primary heating system, including any available incentives from the Burlington electric department or other State or federal entities, must be more than the twenty-five (25) year capital and operational costs of a nonrenewable primary heating system, including the cost of externalities calculated by a building carbon price of one hundred dollars ($100.00) per ton for the life of the nonrenewable primary heating system. The building carbon price of one hundred dollars ($100.00) per ton shall be annually adjusted by the program administrator equivalent to one hundred (100) percent of the annual change in the Consumer Price Index For All Urban Consumers (CPI-U) in the Northeast Region, to go into effect January 1 of every ensuing year.~~

CITY OF BURLINGTON

ORDINANCE _____
Sponsor: Councilors Traverse, Barlow
Public Hearing Dates: _____

_____
First reading: _____
Referred to: _____
Rules suspended and placed in all Stages of passage:

In the Year Two Thousand Twenty-Three

An Ordinance in Relation to
THERMAL ENERGY SYSTEMS AND THE ASSESSMENT OF A CARBON POLLUTION IMPACT FEE

It is hereby Ordained by the City Council of the City of Burlington as follows:

That Chapter 8, Buildings and Building Constructions, Article V, Heating Systems, of the Code of Ordinances of the City of Burlington be and hereby is amended to read as follows:

ARTICLE V. THERMAL ENERGY SYSTEMS

8-76 Purpose and Authority.

(a) Purpose. It is in the public interest and in the interest of public health and safety to achieve a high degree of conservation of energy and reduce emissions of greenhouse gases by requiring buildings to meet specified energy efficiency performance standards and maximum allowable heat loss standards.

(b) Authority. All provisions in this article relating to thermal energy systems are adopted pursuant to the authority and powers granted by section 48(66) of the City Charter ~~a majority of the legal voters of the City who voted at the annual City meeting on March 7, 2023, in accordance with section 48(66) of the City Charter~~ and its provisions on the regulation of thermal energy systems in residential and commercial buildings, including the assessment of carbon impact or alternative compliance payments, for the purpose of reducing greenhouse gas emissions throughout the City, and the majority of the legal voters of the City who voted at the annual City meeting on March 7, 2023 to authorize assessment of a carbon impact fee on certain fossil fuel thermal energy systems. The provisions in this article are further adopted pursuant to the authority and powers granted by the Vermont Legislature in 24 V.S.A. § 3101 (Chapter 83. Building Inspectors and Regulation of Building; Bylaws and ordinances; penalties), as reasonably necessary to improve the health, safety, and welfare of the public from fuel leaks and explosions, and from air pollution, including that which is causing climate change and thereby threatens the City and its inhabitants.

8-77 Definitions.

(a) A "thermal energy system" shall mean any space condition, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy.

(b) "Fossil fuel" shall include all fossil-based heating fuel, including coal, natural gas, kerosene, oil, and propane.

Commented [A1]: Nick Persampieri comment: It seems appropriate to rely directly on the charter change, which authorized the City to regulate, and the subsequent vote, which only authorized the carbon impact fee.

(c) "Clean energy" shall include the following:

(1) Electric-powered thermal equipment, including cold-climate air source heat pumps, ground source heat pumps, and all other heat pumps including district, thermal energy network, ~~grid, microgrid, and~~ building geothermal systems and systems that use waste heat from non-combustion sources; electric appliances providing thermal end uses; and heat pump water heaters (with the exception of electric resistance units prohibited by the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.2.3) or the Vermont Residential Building Energy Standards (RBES) Energy Code (Section 2.4b));

(2) Solar water or air heating systems, solar thermal assisted heat pumps, and solar district heating, or solar thermal systems connected to thermal energy networks;

(3) Thermal energy storage systems including various technologies and thermal storage media including but not limited to thermochemical, moderate-, low-, high-temperature water and ice, phase change material, and other high-temperature thermal energy storage deriving primary energy from non-combusion, non fossil fuel thermal energy sources~~Renewable energy-based district heating~~; or

(4) ~~VGreen hydrogen sourced exclusively from renewable energy sources~~;

~~(5)~~ McNeil District Energy, if and only if the City approves proceeding with the project.~~Advanced wood heating systems that meet the 2023 or subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls; or~~

~~(6) Sustainably-sourced biodiesel; or~~

~~(7) Renewable gas, meaning methane produced by organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a Vermont Public Utility Commission-approved tariff or supply contract from a gas utility, provided that the gas utility demonstrates that the renewable gas is purchased along with its renewable attributes and has a secured contractual pathway for the physical delivery of the renewable gas from the point of injection in the pipeline to the gas utility's delivery system, and further provided that the Department of Permitting and Inspections may require that an applicant seeking to utilize renewable gas submit documentation or independent analysis - utilizing the Argonne National Laboratory GREET model or modeling of similar rigor adapted to Vermont's thermal energy context - demonstrating that the renewable gas proposed for compliance under this section reduces greenhouse gas emissions relative to the fossil fuel it is replacing.~~

(d) Any "clean energy" fuel source set forth in subsection (c) shall be considered excluded from the definition of "clean energy" if the Vermont Public Utility Commission determines a clean energy fuel source does not satisfy the ~~carbon intensity~~ requirements of a State of Vermont Clean Heat Standard or any similar State thermal energy policy.

Commented [A2]: Nick Persampieri comment: Proposed changes to (c)(1) - (c)(3) are from Jared Rodriguez, an expert on thermal energy networks. https://www.communitydecarb.org/jared-rodriguez

Commented [A3]: Nick Persampieri comment: District heating is addressed in subparagraphs (1), (2) and (5). Not all "Renewable energy-based district heating" is low in greenhouse gas emissions.

Commented [A4]: Nick Persampieri comment: I oppose approving and incentivizing McNeil District Energy, but assume that the Council prefers to defer any decision on it to the larger ongoing consideration of it,

Commented [A5]: Nick Persampieri comment: The carbon intensity requirements of the Clean Heat standard apply only to liquid or gaseous clean heat measures and not to solids such as wood; though wood could be found to otherwise not qualify for clean heat credits.

(e) A "large existing building" shall mean a building with at least fifty thousand (50,000) feet in total floor area of enclosed conditioned space, including hotels, but excepting the following:

(1) All residential buildings; and

(2) Buildings listed, or eligible to be listed, on the National Historic Register, provided the applicant can demonstrate to the satisfaction of the Department of Permitting and Inspections that there is no clean energy thermal energy system available to the building due to the historic nature of the building and any limitations imposed by the National Historic Register.

(f) A "new building" shall mean the new construction of any building, excepting all additions, alterations, renovations, or repairs to an existing building.

(g) An "existing City building" means all municipal buildings constructed prior to January 1, 2023 and owned by the City of Burlington, regardless of their size or square footage.

8-78 Clean Energy Requirements.

(a) New Buildings. Applicants seeking permits pursuant to this chapter for a new building shall demonstrate that the new building will utilize clean energy thermal energy systems.

(b) Large Existing Buildings. Applicants seeking permits to replace space conditioning systems or domestic water heating systems that are in large existing buildings shall demonstrate the new space conditioning or domestic water heating systems will utilize clean energy. This subsection (b) shall also apply to existing City buildings, except that existing City buildings are not subject to the carbon pollution impact fee established in Section 8-79.

~~(c) Annual Certification. If an applicant utilizes clean energy in a thermal energy system capable of also using fossil fuels, the applicant must certify prior to receiving a permit and annually thereafter that the clean energy fully offsets the annual usage for the thermal energy system. This certification may include, but shall not be limited to, submitting a contract, invoice, or proof of a subscription to or participation in a tariff program that demonstrates the applicant's purchased clean energy fully covers the annual need of the thermal energy system. If the applicant fails to provide annual certification for any thermal energy system capable of also using fossil fuels, that thermal energy system shall be considered a fossil fuel thermal energy system that may only be utilized pursuant to subsection (d), subject to a carbon pollution impact fee established in Section 8-79 prorated to the remaining lifetime of the fossil fuel thermal energy system.~~

(~~c~~d) Utilization of Fossil Fuel Thermal Energy Systems. An applicant covered by this Section may alternatively utilize a fossil fuel thermal energy system and the applicant's building shall be subject to the carbon pollution impact fee established in Section 8-79, but no permit shall be issued to an applicant utilizing a fossil fuel thermal energy system unless the applicant establishes that the cost of a clean energy thermal energy system is unduly burdensome. To establish that the cost of a clean energy thermal energy system is unduly burdensome, the applicant must demonstrate to the satisfaction of the Department of Permitting and Inspections that the twenty-five (25) year capital and operational cost of the least expensive clean energy thermal energy system, including any available incentives, rebates, or tax credits, is more than the twenty-

Commented [A6]: Nick Persampieri comment: This paragraph is not needed if we are deleting biodiesel and renewable gas.

five (25) year capital and operational costs of the applicant's fossil fuel thermal energy system and the carbon pollution impact fee that will be assessed on the applicant's building.

(~~d~~e) Supporting Incentives, Rebates, or Tax Credits. Nothing in this article prevents or prohibits applicants from utilizing any and all available local, state, or federal incentives, rebates, or tax credits that support implementation of clean energy for their buildings, and applicants are encouraged to access available incentives, rebates, or tax credits.

8-79 Carbon Pollution Impact Fee.

(a) Assessment of Fee. Applicants utilizing a fossil fuel thermal energy system pursuant to Section 8-78(c) shall be assessed a carbon pollution impact fee on the greenhouse gas emissions from the applicant's building that are attributable to the applied-for fossil fuel thermal energy systems.

(b) Amount of Fee. Effective January 1, 2024, the carbon pollution impact fee shall be equal to one hundred fifty dollars ($150.00) per ton of greenhouse gas emissions from the applicant's building that are attributable to the applied-for ~~a building's~~ fossil fuel thermal energy systems over their lifetime, based on a net present value calculation at the time the permit application is submitted. On each subsequent January 1, the carbon pollution impact fee shall be increased by any percentage increase of the Consumer Price Index, CPI-U, U.S. city average, not seasonally adjusted, or successor index, as calculated by the U.S. Department of Labor or successor agency for the 12 months preceding the previous September 1, but in no event shall the increase be greater than five percent. The carbon pollution impact fee shall be rounded off to the nearest dollar.

(c) Exceptions.

(1) For large existing building applicants, the carbon pollution impact fee shall be capped at no more than 75 percent of the installed cost of the proposed space conditioning or domestic water heating system.

(2) An applicant building a new, residential multi-unit dwelling with four or more units shall not be subject to the alternative compliance carbon pollution impact fee as it applies to domestic water heating systems until January 1, 2026.

(3) If an applicant with one or more buildings is seeking a permit pursuant to this chapter, and is already using one or more clean energy thermal energy systems ~~that rely on clean energy~~in Burlington, the applicant may apply for a credit toward any carbon pollution impact fee equal to the carbon value of the clean energy used for any thermal energy system since January 1, 2024.

~~For compliance purposes for all thermal energy systems that are capable of utilizing either a fossil fuel or a renewable fuel that reduces greenhouse gas emissions, an applicant shall demonstrate compliance by providing a certificate and supporting documentary proof, including but not limited to a contract, invoices, and subscription or participation in a tariff program, on an annual basis stating that the applicant is~~

Commented [A7]: Nick Persampieri comment: Jared Rodriguez commented that this may be easy to show because electricity is in most cases more expensive than gas.

Commented [A8]: I think this should address the concern about multiple fossil fuel systems being double counted when they rely on the same fuel source.

Commented [A9]: Nick Persampieri comment: I added this because to avoid confusion I think it would be good to track the language Ben added to (a).

Commented [A10]: I'd like to have further discussion on this section, including whether it should apply only to previously installed thermal energy systems in Burlington.

~~purchasing renewable fuel that is being delivered to that building's thermal energy system, that it reduces greenhouse gas emissions, and that the purchases cover the annual need of the thermal energy system. If the applicant fails to provide an annual compliance certification, the applicant will be assessed an alternative compliance carbon pollution impact fee equal to a pro rata share of the remaining expected life of the thermal energy system. For renewable liquid or gaseous fuels used in a thermal appliance or system capable of also using fossil fuels, to count towards compliance, the purchase of enough renewable fuel to fully offset the annual usage for the appliance or thermal system in question is required.~~

Commented [A11]: I believe the intent of this is now covered elsewhere in this draft, but let me know if you feel differently.

(c) Clean Energy Fund. All carbon pollution impact fee proceeds, except those funds needed to administer this ordinance, shall be placed in a Clean Energy Fund established and managed by the Department of Permitting and Inspections with technical support from the Burlington Electric Department. Clean Energy Fund proceeds shall be made available as follows:

~~(i) The Department of Permitting and Inspections, with technical support from the Burlington Electric Department, shall determine which initiatives are eligible for funding for property owners or low income renters, but they may include, and shall not be limited to, the installation of new thermal energy systems that rely on renewable fuel, weatherization projects, or subsidizing any increased utility costs associated with purchasing renewable fuel rather than fossil fuel;~~

Commented [A12]: I think this was repetitive and is now covered in (ii).

(i) Half of the proceeds paid into the Clean Energy Fund by a large existing building applicant shall be available to the payor for projects to reduce greenhouse gas emissions at any site owned by the payor in the City of Burlington. The large existing building applicant must request these proceeds within one (1) year following payment of their carbon pollution impact fee, and any proceeds not requested within that year shall be made available under subsection (iii).

(ii) Any remaining proceeds collected from large existing building applicants and all proceeds paid into the Clean Energy Fund by new construction applicants shall be available to provide financial assistance to help low-income Burlington residents with funding initiatives that reduce greenhouse gas emissions, including, but not limited to, the installation of clean energy thermal energy systems, weatherization projects, or subsidizing utility costs associated with purchasing clean energy rather than fossil fuel. This funding may be delivered either through direct payments to homeowners and renters who are income-qualified per the most recent income-qualification levels published by the Community and Economic Development Office ("CEDO"), or through payments to property owners of multi-family buildings where at least 25 percent of the tenants in the building are income-qualified, provided that the property owner must commit to not raising the rent of income-qualified tenants as a result of costs associated with the funded initiatives to reduce greenhouse gas emissions.

~~(h) Any applicant for a permit pursuant to this chapter, for any new or existing building regardless of size, seeking to utilize a wood chip or wood pellet heating system, must demonstrate that the system meets the 2023 or any subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls.~~

Commented [A13]: This seems to be covered above in the definition of an advanced wood system.

8-80 Effective Date.

The provisions of this Article shall take effect on January 1, 2024.

[2023-10-13]

I was going to send up a marked up draft, but I agree almost fully with Nick Persampieri's markup of Ben's markup, so I will just second Nick's recommended changes, with one addition.

(3) under "(c) Exceptions" should be deleted.

It directly undermines the policy by allowing those with many properties to continue polluting simply because of assets they hold. The building I live in was built in the 1980's. It uses electric baseboard heating like many buildings constructed at that time. So if a large property owner bought my building to expand their assets, suddenly they would be off the hook for a large portion of the carbon fee for one of their massive buildings. Can anyone explain to me why that is good policy, and why or how that achieves the overall aims of this policy?

It's great that some buildings in Burlington are already clean. That doesn't mean we shouldn't clean up the dirty ones just because a property owner may own a vast array of properties including some clean ones. (Those who only own one building simply have to clean up as they are not eligible for this exception, how is that fair?). Let's clean up these massive buildings, period. If the owners choose not to clean up, they can help fund cleanup efforts elsewhere by paying the fee. The way this is written, **they can even use money from that payment themselves to clean up their own buildings**. But saying they're simply off the hook because of a decision made 5, 10, or 50 years ago is not at all helpful in moving our building stock to cleaner heating/appliances. It's just rewarding a few individuals' vast property ownership at the expense of the policy goals of supporting our climate, health, safety, and lowering utility bills for tenants.

I'm eager to discuss this policy with you all as much as you're willing! Thanks to Ben and Sarah for the recent phone calls. Please let me know if any of the four of you want to talk more!

[Jack Hanson]

CITY OF BURLINGTON

ORDINANCE _____
Sponsor: Councilors Traverse, Barlow
Public Hearing Dates: _____

_____
First reading: _____
Referred to: _____
Rules suspended and placed in all

In the Year Two Thousand Twenty-Three

An Ordinance in Relation to
stages of passage:
THERMAL ENERGY SYSTEMS AND THE ASSESSMENT OF A CARBON POLLUTION IMPACT FEE

It is hereby Ordained by the City Council of the City of Burlington as follows:

That Chapter 8, Buildings and Building Constructions, Article V, Heating Systems, of the Code of Ordinances of the City of Burlington be and hereby is amended to read as follows:

ARTICLE V. THERMAL ENERGY~~HEATING~~ SYSTEMS

8-76 Purpose and Authority.

(a) Purpose. It is in the public interest and in the interest of public health and safety to achieve a high degree of conservation of energy and~~, where possible,~~ reduce emissions of greenhouse gases by requiring buildings to meet specified energy efficiency performance standards and maximum allowable heat loss standards.

(b) Authority. All provisions in this article relating to thermal energy~~heating~~ systems are adopted pursuant to the authority and powers granted by a majority of the legal voters of the City who voted at the annual City meeting on March 7, 2023, in accordance with section 48(66) of the City Charter and its provisions on the regulation of thermal energy systems in residential and commercial buildings, including the assessment of carbon impact or alternative compliance payments, for the purpose of reducing greenhouse gas emissions throughout the City. The provisions in this article are further adopted pursuant to the authority and powers granted by the Vermont Legislature in 24 V.S.A. § 3101 (Chapter 83. Building Inspectors and Regulation of Building; Bylaws and ordinances; penalties), as reasonably necessary to improve the health, safety, and welfare of the public from fuel leaks and explosions, and from air pollution, including that which is causing climate change and thereby threatens the city and its inhabitants.

8-77 Definitions.

(a) A "fossil fuel ~~renewable primary heating~~thermal energy system" shall be subject to the alternative compliance carbon fee, and shall mean any space conditioning, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy from fossil fuels, including coal, oil, propane, kerosene or natural gas. ~~heating system that meets at least eighty-five (85) percent of the building's design heating load calculated per the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.1) and is fueled by:~~

(b) A "renewable fuel which reduces greenhouse gas emissions" is, based on the vote at the annual City meeting on March 7, 2023, not subject to the alternative compliance carbon fee, and shall mean any space conditioning, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy from:

(1) Electric-powered thermal equipment~~ity~~, including cold-climate air source heat pumps, ground source heat pumps, and other heat pumps including district, network, grid, microgrid, and building geothermal systems; electric appliances providing thermal end uses; and heat pump water heaters (with the exception of electric resistance units prohibited by the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.2.3) or the Vermont Residential Building Energy Standards (RBES) Energy Code (Section 2.4b)); or

(2) ~~Wood pellets or woodchips;~~ Solar water heating systems; or

(3) ~~Other renewable fuel used by conventional primary heating systems, including renewable gas, biodiesel, and renewable district heating, if the building owner provides a contract demonstrating that the fuel required by the conventional primary heating system is fully sourced from such other renewable fuels for the life of that conventional heating system.~~Renewable energy-based district heating; or

(4) Green hydrogen sourced exclusively from renewable energy sources; or

(5) Advanced wood heating systems that meet the 2023 or subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls; or

(6) Sustainably-sourced biodiesel; or

(7) Renewable gas, meaning methane produced by organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a Vermont Public Utility Commission-approved tariff or supply contract from a gas utility such as Vermont Gas Systems, provided that the gas utility demonstrates that the renewable gas is purchased along with its renewable attributes and has a secured contractual pathway for the physical delivery of the renewable gas from the point of injection in the pipeline to the gas utility's delivery system; or

(8) Any other renewable fuel that reduces greenhouse gas emissions, provided the Department of Permitting and Inspections receieves sufficient analysis or documentation from the applicant that the fuel reduces greenhouse gas emisssions relative to the fossil fuel it is replacing consistent with the requirements of subsection (c) below.

(c) The Department of Permitting and Inspections ~~may~~shall disqualify any renewable fuel that reduces greenhouse gas emission ~~listed above~~ from being eligible to satisfy the requirements of 8-78 ~~this section~~ if such fuel is subsequently deemed by the Vermont Public Utility Commission not to satisfy the carbon intensity requirements of a State of Vermont Clean Heat Standard or any similar state thermal energy policy.

In addition, the Department may require an applicant seeking to utilize a liquid or gaseous renewable fuel that reduces greenhouse gas emissions to submit documentation or independent analysis - utilizing the Argonne National Laboratory GREET model or modeling of similar rigor adapted to Vermont's thermal energy context - demonstrating that the renewable fuel proposed for compliance under this section reduces greenhouse gas emissions relative to the fossil fuel system or fuel it is replacing.

~~"Renewable gas" shall mean methane produced by the organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a tariff or supply contract from a utility such as Vermont Gas Systems.~~

(d) A "large existing building" shall mean a building with at least fifty thousand (50,000) feet in total floor area of enclosed conditioned space, including hotels, but excepting the following:

(1) All residential buildings; and

(2) Buildings listed, or eligible to be listed, on the National Historic Register, provided the applicant can demonstrate to the satisfaction of the Department of Permitting and Inspections that there is no thermal energy system that relies on renewable fuel available to the building due to the historic nature of the building and any limitations imposed by the National Historic Register.

(e) A "new building" shall mean the new construction of any building, excepting all additions, alterations, renovations, or repairs to an existing building.

(f) An "existing city building" means all municipal buildings constructed prior to January 1, 2023 and owned by the City of Burlington, regardless of their size or square footage.

~~(b) A "nonprimary heating system" shall include back-up heating system, water heating system, or ventilation/air tempering system.~~

8-78 Applicability.

(a) Applicants seeking permits pursuant to this chapter for a new building~~s~~ shall demonstrate that the new building will utilize ~~a renewable primary heating~~thermal energy system~~s that rely on a renewable fuel which reduces greenhouse gas emissions~~. Applicants seeking permits to replace space conditioning systems or domestic water heating systems that are in large existing buildings shall demonstrate the new space conditioning or domestic water heating systems will utilize a renewable fuel which reduces greenhouse gas emissions. Existing City buildings shall follow the requirements for large existing buildings, but are not subject to the alternative compliance carbon pollution impact fee.

(b) If an applicant for a new building is seeking to use a thermal energy system that does not rely on a renewable fuel which reduces greenhouse gas emissions, or an applicant for a large existing building is seeking to use a space conditioning or domestic water heating system that does not rely on a renewable fuel which reduces greenhouse gas emissions, the applicant shall prior to receiving a permit pursuant to subsection (a) first have to demonstrate that the renewable system is uneconomical. To be determined to be

uneconomical the twenty-five (25) year capital and operational cost of the least expensive renewable primary heating system, including any available incentives from the Burlington electric department or other State or federal entities, must be more than the twenty-five (25) year capital and operational costs of a nonrenewable primary heating system, including the cost of externalities calculated by a building carbon price of one hundred fifty dollars ($150.00) per ton for the life of the nonrenewable primary heating system. The building carbon price of one hundred fifty dollars ($150.00) per ton shall be annually adjusted by the program administrator equivalent to one hundred (100) percent of the annual change in the Consumer Price Index For All Urban Consumers (CPI-U) in the Northeast Region, to go into effect January 1 of every ensuing year. A system demonstrating uneconomicability shall be assessed an alternative compliance -carbon pollution impact fee. However, an applicant building a new, residential multi-unit dwelling with four or more units shall not be subject to the alternative compliance carbon pollution impact fee as it applies to domestic water heating systems until January 1, 2026.

(c) Effective January 1, 2024, the alternative compliance carbon pollution impact fee shall be equal to one hundred fifty dollars ($150.00) per ton of greenhouse gas emissions produced by the thermal energy system over its lifetime, based on a net present value calculation at the time the permit application is submitted. For large existing building applicants, the alternative compliance carbon pollution impact fee is capped at no more than 75 percent of the installed cost of the proposed space conditioning or domestic water heating system. On each subsequent January 1, the alternative compliance carbon pollution impact fee shall be increased by any percentage increase of the Consumer Price Index, CPI-U, U.S. city average, not seasonally adjusted, or successor index, as calculated by the U.S. Department of Labor or successor agency for the 12 months preceding the previous September 1, but in no event shall the increase be greater than five percent. The adjusted alternative compliance carbon pollution impact fee shall be rounded off to the nearest dollar.

(d) For compliance purposes for all thermal energy systems that are capable of utilizing either a fossil fuel or a renewable fuel that reduces greenhouse gas emissions, an applicant shall demonstrate compliance by providing a certificate and supporting documentary proof, including but not limited to a contract, invoices, and subscription or participation in a tariff program, on an annual basis stating that the applicant is purchasing renewable fuel that is being delivered to that building's thermal energy system, that it reduces greenhouse gas emissions, and that the purchases cover the annual need of the thermal energy system. If the applicant fails to provide an annual compliance certification, the applicant will be assessed an alternative compliance carbon pollution impact fee equal to a pro rata share of the remaining expected life of the thermal energy system. For renewable liquid or gaseous fuels used in a thermal appliance or system capable of also using fossil fuels, to count towards compliance, the purchase of enough renewable fuel to fully offset the annual usage for the appliance or thermal system in question is required.~~such as gas utility services that could utilize fossil fuel or renewable gas, or oilheat systems that could utilize oil or biodiesel, an applicant shall demonstrate compliance either via (i) a contract demonstrating that the fuel required by the thermal energy system is fully sourced from such other renewable fuels or technologies for the life of that thermal energy system; or (ii) annual compliance certification that the applicant is purchasing renewable fuel to cover the entire need of the thermal energy system. If the applicant uses the annual compliance certification, and the applicant fails to provide an annual compliance certification in any year that the applicant is using renewable fuel that reduces greenhouse gas emissions, the applicant will be assessed an alternative~~

~~compliance carbon pollution impact fee equal to a pro rata share of the remaining expected life of the thermal energy system.~~

(e) If an applicant with one or more buildings is seeking a permit pursuant to this chapter, and is already using one or more thermal energy systems that rely on a renewable fuel which reduces greenhouse gas emissions, the applicant may apply for a credit towards any alternative compliance carbon pollution impact fee equal to the carbon value of the renewable fuel which reduces greenhouse gas emissions used for any thermal energy system since January 1, 2023~~3~~4.

(f) All alternative compliance carbon pollution impact fee proceeds except those funds needed to administer this ordinance, shall be placed in a Clean Energy Fund established and managed by the Department of Permitting and Inspections with technical support from the Burlington Electric Department. Clean Energy Fund proceeds shall be made available as follows:

(i) The Department of Permitting and Inspections, with technical support from the Burlington Electric Department, shall determine which initiatives are eligible for funding for property owners or low income renters, but they may include, and shall not be limited to, the installation of new thermal energy systems that rely on renewable fuel, weatherization projects, or subsidizing any increased utility costs associated with purchasing renewable fuel rather than fossil fuel;

(ii) Half of the proceeds paid into the Clean Energy Fund by a large existing building applicant shall be available to the payor for projects to reduce greenhouse gas emissions at any site City of Burlington owned by the payor. The large existing building applicant must request these proceeds within one (1) year following payment of their alternative compliance carbon pollution impact fee, and any proceeds not requested within that year shall be made available under subsection (iii).

(iii) Any remaining proceeds collected from large existing building applicants and all proceeds paid into the Clean Energy Fund by new construction applicants shall be available to ~~either:~~

~~1.~~ ~~P~~provide financial assistance to help low-income Burlington residents with the purposes described in subsection (i), either through direct payments to homeowners and renters who are income-qualified per the most recent income-qualification levels published by the Community and Economic Development Office ("CEDO"), or through payments to property owners of multi-family buildings where at least 25 percent of the tenants in the building are income-qualified, provided that the property owner must commit to not raising the rent of income-qualified tenants as a result of costs associated with the funded initiatives to reduce greenhouse gas emissions.~~; or~~

~~2.Subsidize the cost of converting the City's vehicle fleet from fossil fuel to electric.~~

(g) Nothing in this section prevents or prohibits applicants from utilizing any and all available local, state, or federal incentives, rebates or tax credits that support implementation of renewable fuels listed above for their buildings, and applicants are encouraged to access available incentives or rebates or tax credits.

(h) Any applicant for a permit pursuant to this chapter, for any new or existing building regardless of size, seeking to utilize a wood chip or wood pellet heating system, must demonstrate that the system meets the 2023 or any subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls.

~~An applicant is permitted to install and utilize nonprimary heating systems in new buildings that use nonrenewable fuels.~~

8-79 Effective Date~~Waiver~~.

The provisions of this Article shall take effect on January 1, 2024.

~~The department of permitting and inspections may grant a waiver to Section 8-78 on the grounds that utilizing a renewable primary heating system in a new building would be uneconomical. To be deemed uneconomical, the twenty-five (25) year capital and operational cost of the least expensive renewable primary heating system, including any available incentives from the Burlington electric department or other State or federal entities, must be more than the twenty-five (25) year capital and operational costs of a nonrenewable primary heating system, including the cost of externalities calculated by a building carbon price of one hundred dollars ($100.00) per ton for the life of the nonrenewable primary heating system. The building carbon price of one hundred dollars ($100.00) per ton shall be annually adjusted by the program administrator equivalent to one hundred (100) percent of the annual change in the Consumer Price Index For All Urban Consumers (CPI-U) in the Northeast Region, to go into effect January 1 of every ensuing year.~~

CITY OF BURLINGTON

ORDINANCE _____
Sponsor: Councilors Traverse, Barlow
Public Hearing Dates: _____

_____
First reading: _____
Referred to: _____
Rules suspended and placed in all stages of passage:

In the Year Two Thousand Twenty-Three

An Ordinance in Relation to

THERMAL ENERGY SYSTEMS AND THE ASSESSMENT OF A CARBON POLLUTION IMPACT FEE

It is hereby Ordained by the City Council of the City of Burlington as follows:

That Chapter 8, Buildings and Building Constructions, Article V, Heating Systems, of the Code of Ordinances of the City of Burlington be and hereby is amended to read as follows:

ARTICLE V. THERMAL ENERGY~~HEATING~~ SYSTEMS

8-76 Purpose and Authority.

(a) Purpose. It is in the public interest and in the interest of public health and safety to achieve a high degree of conservation of energy and~~, where possible,~~ reduce emissions of greenhouse gases by requiring buildings to meet specified energy efficiency performance standards and maximum allowable heat loss standards.

(b) Authority. All provisions in this article relating to thermal energy~~heating~~ systems are adopted pursuant to the authority and powers granted by a majority of the legal voters of the City who voted at the annual City meeting on March 7, 2023, in accordance with section 48(66) of the City Charter and its provisions on the regulation of thermal energy systems in residential and commercial buildings, including the assessment of carbon impact or alternative compliance payments, for the purpose of reducing greenhouse gas emissions throughout the City. The provisions in this article are further adopted pursuant to the authority and powers granted by the Vermont Legislature in 24 V.S.A. § 3101 (Chapter 83. Building Inspectors and Regulation of Building; Bylaws and ordinances; penalties), as reasonably necessary to improve the health, safety, and welfare of the public from fuel leaks and explosions, and from air pollution, including that which is causing climate change and thereby threatens the city and its inhabitants.

8-77 Definitions.

(a) A "fossil fuel ~~renewable primary heating~~thermal energy system" shall be subject to the alternative compliance carbon fee, and shall mean any space conditioning, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy from fossil fuels, including coal, oil, propane, kerosene or natural gas. ~~heating system that meets at least eighty-five (85) percent of the building's design heating load calculated per the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.1) and is fueled by:~~

(b) A "renewable fuel which reduces greenhouse gas emissions" is, based on the vote at the annual City meeting on March 7, 2023, not subject to the alternative compliance carbon fee, and shall mean any space conditioning, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy from:

(1) Electric-powered thermal equipment~~ity~~, including cold-climate air source heat pumps, ground source heat pumps, and other heat pumps including district, network, grid, microgrid, and building geothermal systems; electric appliances providing thermal end uses; and heat pump water heaters (with the exception of electric resistance units prohibited by the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.2.3) or the Vermont Residential Building Energy Standards (RBES) Energy Code (Section 2.4b)); or

(2) ~~Wood pellets or woodchips;~~ Solar water heating systems; or

(3) ~~Other renewable fuel used by conventional primary heating systems, including renewable gas, biodiesel, and renewable district heating, if the building owner provides a contract demonstrating that the fuel required by the conventional primary heating system is fully sourced from such other renewable fuels for the life of that conventional heating system.~~Renewable energy-based district heating; or

(4) Green hydrogen sourced exclusively from renewable energy sources; or

(5) Advanced wood heating systems that meet the 2023 or subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls; or

(6) Sustainably-sourced biodiesel; or

(7) Renewable gas, meaning methane produced by organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a Vermont Public Utility Commission-approved tariff or supply contract from a gas utility such as Vermont Gas Systems, provided that the gas utility demonstrates that the renewable gas is purchased along with its renewable attributes and has a secured contractual pathway for the physical delivery of the renewable gas from the point of injection in the pipeline to the gas utility's delivery system; or

(8) Any other renewable fuel that reduces greenhouse gas emissions, provided the Department of Permitting and Inspections receives sufficient analysis or documentation from the applicant that the fuel reduces greenhouse gas emisssions relative to the fossil fuel it is replacing consistent with the requirements of subsection (c) below.

(c) The Department of Permitting and Inspections shall disqualify any renewable fuel that reduces greenhouse gas emission from being eligible to satisfy the requirements of 8-78 if such fuel is subsequently deemed by the Vermont Public Utility Commission not to satisfy the carbon intensity requirements of a State of Vermont Clean Heat Standard or any similar state thermal energy policy. In addition, the Department may require an applicant seeking to utilize a liquid or gaseous renewable fuel that reduces greenhouse gas

emissions to submit documentation or independent analysis - utilizing the Argonne National Laboratory GREET model or modeling of similar rigor adapted to Vermont's thermal energy context - demonstrating that the renewable fuel proposed for compliance under this section reduces greenhouse gas emissions relative to the fossil fuel system or fuel it is replacing.

~~"Renewable gas" shall mean methane produced by the organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a tariff or supply contract from a utility such as Vermont Gas Systems.~~

(d) A "large existing building" shall mean a building with at least fifty thousand (50,000) feet in total floor area of enclosed conditioned space, including hotels, but excepting the following:

(1) All residential buildings; and

(2) Buildings listed, or eligible to be listed, on the National Historic Register, provided the applicant can demonstrate to the satisfaction of the Department of Permitting and Inspections that there is no thermal energy system that relies on renewable fuel available to the building due to the historic nature of the building and any limitations imposed by the National Historic Register.

(e) A "new building" shall mean the new construction of any building, excepting all additions, alterations, renovations, or repairs to an existing building.

(f) An "existing city building" means all municipal buildings constructed prior to January 1, 2023 and owned by the City of Burlington, regardless of their size or square footage.

~~(b) A "nonprimary heating system" shall include back-up heating system, water heating system, or ventilation/air tempering system.~~

8-78 Applicability.

(a) Applicants seeking permits pursuant to this chapter for a new building~~s~~ shall demonstrate that the new building will utilize ~~a renewable primary heating~~thermal energy system~~s~~ that rely on a renewable fuel which reduces greenhouse gas emissions. Applicants seeking permits to replace space conditioning systems or domestic water heating systems that are in large existing buildings shall demonstrate the new space conditioning or domestic water heating systems will utilize a renewable fuel which reduces greenhouse gas emissions. Existing City buildings shall follow the requirements for large existing buildings, but are not subject to the alternative compliance carbon pollution impact fee.

(b) If an applicant for a new building is seeking to use a thermal energy system that does not rely on a renewable fuel which reduces greenhouse gas emissions, or an applicant for a large existing building is seeking to use a space conditioning or domestic water heating system that does not rely on a renewable fuel which reduces greenhouse gas emissions, the applicant shall prior to receiving a permit pursuant to subsection (a) first have to demonstrate that the renewable system is uneconomical. To be determined to be uneconomical the twenty-five (25) year capital and operational cost of the least expensive renewable primary heating system, including any available incentives from the Burlington electric department or other State or

federal entities, must be more than the twenty-five (25) year capital and operational costs of a nonrenewable primary heating system, including the cost of externalities calculated by a building carbon price of one hundred fifty dollars ($150.00) per ton for the life of the nonrenewable primary heating system. The building carbon price of one hundred fifty dollars ($150.00) per ton shall be annually adjusted by the program administrator equivalent to one hundred (100) percent of the annual change in the Consumer Price Index For All Urban Consumers (CPI-U) in the Northeast Region, to go into effect January 1 of every ensuing year. A system demonstrating uneconomicability shall be assessed an alternative compliance -carbon pollution impact fee. However, an applicant building a new, residential multi-unit dwelling with four or more units shall not be subject to the alternative compliance carbon pollution impact fee as it applies to domestic water heating systems until January 1, 2026.

(c) Effective January 1, 2024, the alternative compliance carbon pollution impact fee shall be equal to one hundred fifty dollars ($150.00) per ton of greenhouse gas emissions produced by the thermal energy system over its lifetime, based on a net present value calculation at the time the permit application is submitted. For large existing building applicants, the alternative compliance carbon pollution impact fee is capped at no more than 75 percent of the installed cost of the proposed space conditioning or domestic water heating system. On each subsequent January 1, the alternative compliance carbon pollution impact fee shall be increased by any percentage increase of the Consumer Price Index, CPI-U, U.S. city average, not seasonally adjusted, or successor index, as calculated by the U.S. Department of Labor or successor agency for the 12 months preceding the previous September 1, but in no event shall the increase be greater than five percent. The adjusted alternative compliance carbon pollution impact fee shall be rounded off to the nearest dollar.

(d) For compliance purposes for all thermal energy systems that are capable of utilizing either a fossil fuel or a renewable fuel that reduces greenhouse gas emissions, an applicant shall demonstrate compliance by providing a certificate and supporting documentary proof, including but not limited to a contract, invoices, and subscription or participation in a tariff program, on an annual basis stating that the applicant is purchasing renewable fuel that is being delivered to that building's thermal energy system, that it reduces greenhouse gas emissions, and that the purchases cover the annual need of the thermal energy system. If the applicant fails to provide an annual compliance certification, the applicant will be assessed an alternative compliance carbon pollution impact fee equal to a pro rata share of the remaining expected life of the thermal energy system. For renewable liquid or gaseous fuels used in a thermal appliance or system capable of also using fossil fuels, to count towards compliance, the purchase of enough renewable fuel to fully offset the annual usage for the appliance or thermal system in question is required.

(e) If an applicant with one or more buildings is seeking a permit pursuant to this chapter, and is already using one or more thermal energy systems that rely on a renewable fuel which reduces greenhouse gas emissions, the applicant may apply for a credit towards any alternative compliance carbon pollution impact fee equal to the carbon value of the renewable fuel which reduces greenhouse gas emissions used for any thermal energy system since January 1, 2024.

(f) All alternative compliance carbon pollution impact fee proceeds except those funds needed to administer this ordinance, shall be placed in a Clean Energy Fund established and managed by the

Department of Permitting and Inspections with technical support from the Burlington Electric Department. Clean Energy Fund proceeds shall be made available as follows:

(i) The Department of Permitting and Inspections, with technical support from the Burlington Electric Department, shall determine which initiatives are eligible for funding for property owners or low income renters, but they may include, and shall not be limited to, the installation of new thermal energy systems that rely on renewable fuel, weatherization projects, or subsidizing any increased utility costs associated with purchasing renewable fuel rather than fossil fuel;

(ii) Half of the proceeds paid into the Clean Energy Fund by a large existing building applicant shall be available to the payor for projects to reduce greenhouse gas emissions at any site City of Burlington owned by the payor. The large existing building applicant must request these proceeds within one (1) year following payment of their alternative compliance carbon pollution impact fee, and any proceeds not requested within that year shall be made available under subsection (iii).

(iii) Any remaining proceeds collected from large existing building applicants and all proceeds paid into the Clean Energy Fund by new construction applicants shall be available to provide financial assistance to help low-income Burlington residents with the purposes described in subsection (i), either through direct payments to homeowners and renters who are income-qualified per the most recent income-qualification levels published by the Community and Economic Development Office ("CEDO"), or through payments to property owners of multi-family buildings where at least 25 percent of the tenants in the building are income-qualified, provided that the property owner must commit to not raising the rent of income-qualified tenants as a result of costs associated with the funded initiatives to reduce greenhouse gas emissions.

(g) Nothing in this section prevents or prohibits applicants from utilizing any and all available local, state, or federal incentives, rebates or tax credits that support implementation of renewable fuels listed above for their buildings, and applicants are encouraged to access available incentives or rebates or tax credits.

(h) Any applicant for a permit pursuant to this chapter, for any new or existing building regardless of size, seeking to utilize a wood chip or wood pellet heating system, must demonstrate that the system meets the 2023 or any subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls.

~~An applicant is permitted to install and utilize nonprimary heating systems in new buildings that use nonrenewable fuels.~~

8-79 Effective Date~~Waiver~~.

The provisions of this Article shall take effect on January 1, 2024.

~~The department of permitting and inspections may grant a waiver to Section 8-78 on the grounds that utilizing a renewable primary heating system in a new building would be uneconomical. To be deemed~~

~~uneconomical, the twenty-five (25) year capital and operational cost of the least expensive renewable primary heating system, including any available incentives from the Burlington electric department or other State or federal entities, must be more than the twenty-five (25) year capital and operational costs of a nonrenewable primary heating system, including the cost of externalities calculated by a building carbon price of one hundred dollars ($100.00) per ton for the life of the nonrenewable primary heating system. The building carbon price of one hundred dollars ($100.00) per ton shall be annually adjusted by the program administrator equivalent to one hundred (100) percent of the annual change in the Consumer Price Index For All Urban Consumers (CPI-U) in the Northeast Region, to go into effect January 1 of every ensuing year.~~

CITY OF BURLINGTON

ORDINANCE _____
Sponsor: Councilors Traverse, Barlow
Public Hearing Dates: _____

In the Year Two Thousand Twenty-Three

_____
First reading: _____
Referred to: _____
Rules suspended and placed in all

An Ordinance in Relation to
Stages of passage:
THERMAL ENERGY SYSTEMS AND THE ASSESSMENT OF A CARBON POLLUTION IMPACT FEE

It is hereby Ordained by the City Council of the City of Burlington as follows:

That Chapter 8, Buildings and Building Constructions, Article V, Heating Systems, of the Code of Ordinances of the City of Burlington be and hereby is amended to read as follows:

ARTICLE V. THERMAL ENERGY SYSTEMS

8-76 Purpose and Authority.

(a) Purpose. It is in the public interest and in the interest of public health and safety to achieve a high degree of conservation of energy and reduce emissions of greenhouse gases by requiring buildings to meet specified energy efficiency performance standards and maximum allowable heat loss standards.

(b) Authority. All provisions in this article relating to thermal energy systems are adopted pursuant to the authority and powers granted by a majority of the legal voters of the City who voted at the annual City meeting on March 7, 2023, in accordance with section 48(66) of the City Charter and its provisions on the regulation of thermal energy systems in residential and commercial buildings, including the assessment of carbon impact or alternative compliance payments, for the purpose of reducing greenhouse gas emissions throughout the City. The provisions in this article are further adopted pursuant to the authority and powers granted by the Vermont Legislature in 24 V.S.A. § 3101 (Chapter 83. Building Inspectors and Regulation of Building; Bylaws and ordinances; penalties), as reasonably necessary to improve the health, safety, and welfare of the public from fuel leaks and explosions, and from air pollution, including that which is causing climate change and thereby threatens the City and its inhabitants.

8-77 Definitions.

(a) A "thermal energy system" shall mean any space condition, domestic hot water, cooking, appliance, process heat, or other building system that relies on thermal energy.

(b) "Fossil fuel" shall include all fossil-based heating fuel, including coal, natural gas, kerosene, oil, and propane.

(c) "Clean energy" shall include the following:

(1) Electric-powered thermal equipment, including cold-climate air source heat pumps, ground source heat pumps, and other heat pumps including district, network, grid, microgrid, and building geothermal systems; electric appliances providing thermal end uses; and heat pump water heaters (with the exception of electric resistance units prohibited by the Vermont Commercial Building Energy Standards (CBES) Energy Code (Section C403.2.3) or the Vermont Residential Building Energy Standards (RBES) Energy Code (Section 2.4b));

(2) Solar water heating systems;

(3) Renewable energy-based district heating;

(4) ~~V~~Green hydrogen sourced exclusively from renewable energy sources;

(5) Advanced wood heating systems that meet the 2023 or subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls; or

(6) Sustainably-sourced biodiesel; or

(7) Renewable gas, meaning methane produced by organic material and sourced from landfills, wastewater treatment facilities, and farms as offered under a Vermont Public Utility Commission-approved tariff or supply contract from a gas utility, provided that the gas utility demonstrates that the renewable gas is purchased along with its renewable attributes and has a secured contractual pathway for the physical delivery of the renewable gas from the point of injection in the pipeline to the gas utility's delivery system, and further provided that the Department of Permitting and Inspections may require that an applicant seeking to utilize renewable gas submit documentation or independent analysis - utilizing the Argonne National Laboratory GREET model or modeling of similar rigor adapted to Vermont's thermal energy context - demonstrating that the renewable gas proposed for compliance under this section reduces greenhouse gas emissions relative to the fossil fuel it is replacing.

(d) Any "clean energy" fuel source set forth in subsection (c) shall be considered excluded from the definition of "clean energy" if the Vermont Public Utility Commission determines a clean energy fuel source does not satisfy the carbon intensity requirements of a State of Vermont Clean Heat Standard or any similar State thermal energy policy.

(e) A "large existing building" shall mean a building with at least fifty thousand (50,000) feet in total floor area of enclosed conditioned space, including hotels, but excepting the following:

(1) All residential buildings; and

(2) Buildings listed, or eligible to be listed, on the National Historic Register, provided the applicant can demonstrate to the satisfaction of the Department of Permitting and Inspections that there is no clean energy thermal energy system available to the building due to the historic nature of the building and any limitations imposed by the National Historic Register.

(f) A "new building" shall mean the new construction of any building, excepting all additions, alterations, renovations, or repairs to an existing building.

(g) An "existing City building" means all municipal buildings constructed prior to January 1, 2023 and owned by the City of Burlington, regardless of their size or square footage.

8-78 Clean Energy Requirements.

(a) New Buildings. Applicants seeking permits pursuant to this chapter for a new building shall demonstrate that the new building will utilize clean energy thermal energy systems.

(b) Large Existing Buildings. Applicants seeking permits to replace space conditioning systems or domestic water heating systems that are in large existing buildings shall demonstrate the new space conditioning or domestic water heating systems will utilize clean energy. This subsection (b) shall also apply to existing City buildings, except that existing City buildings are not subject to the carbon pollution impact fee established in Section 8-79.

(c) Annual Certification. If an applicant utilizes clean energy in a thermal energy system capable of also using fossil fuels, the applicant must certify prior to receiving a permit and annually thereafter that the clean energy fully offsets the annual usage for the thermal energy system. This certification may include, but shall not be limited to, submitting a contract, invoice, or proof of a subscription to or participation in a tariff program that demonstrates the applicant's purchased clean energy fully covers the annual need of the thermal energy system. If the applicant fails to provide annual certification for any thermal energy system capable of also using fossil fuels, that thermal energy system shall be considered a fossil fuel thermal energy system that may only be utilized pursuant to subsection (d), subject to a carbon pollution impact fee established in Section 8-79 prorated to the remaining lifetime of the fossil fuel thermal energy system.

(d) Utilization of Fossil Fuel Thermal Energy Systems. An applicant covered by this Section may alternatively utilize a fossil fuel thermal energy system and the applicant's building shall be subject to the carbon pollution impact fee established in Section 8-79, but no permit shall be issued to an applicant utilizing a fossil fuel thermal energy system unless the applicant establishes that the cost of a clean energy thermal energy system is unduly burdensome. To establish that the cost of a clean energy thermal energy system is unduly burdensome, the applicant must demonstrate to the satisfaction of the Department of Permitting and Inspections that the twenty-five (25) year capital and operational cost of the least expensive clean energy thermal energy system, including any available incentives, rebates, or tax credits, is more than the twenty-five (25) year capital and operational costs of the applicant's fossil fuel thermal energy system and the carbon pollution impact fee that will be assessed on the applicant's building.

(e) Supporting Incentives, Rebates, or Tax Credits. Nothing in this article prevents or prohibits applicants from utilizing any and all available local, state, or federal incentives, rebates, or tax credits that support implementation of clean energy for their buildings, and applicants are encouraged to access available incentives, rebates, or tax credits.

8-79 Carbon Pollution Impact Fee.

(a) Assessment of Fee. Applicants utilizing a fossil fuel thermal energy system pursuant to Section 8-78(c) shall be assessed a carbon pollution impact fee on the greenhouse gas emissions from the applicant's building that are attributable to the applied-for fossil fuel thermal energy systems.

(b) Amount of Fee. Effective January 1, 2024, the carbon pollution impact fee shall be equal to one hundred fifty dollars ($150.00) per ton of greenhouse gas emissions attributable to a building's fossil fuel thermal energy systems over their lifetime, based on a net present value calculation at the time the permit application is submitted. On each subsequent January 1, the carbon pollution impact fee shall be increased by any percentage increase of the Consumer Price Index, CPI-U, U.S. city average, not seasonally adjusted, or successor index, as calculated by the U.S. Department of Labor or successor agency for the 12 months preceding the previous September 1, but in no event shall the increase be greater than five percent. The carbon pollution impact fee shall be rounded off to the nearest dollar.

(c) Exceptions.

(1) For large existing building applicants, the carbon pollution impact fee shall be capped at no more than 75 percent of the installed cost of the proposed space conditioning or domestic water heating system.

(2) An applicant building a new, residential multi-unit dwelling with four or more units shall not be subject to the alternative compliance carbon pollution impact fee as it applies to domestic water heating systems until January 1, 2026.

(3) If an applicant with one or more buildings is seeking a permit pursuant to this chapter, and is already using one or more thermal energy systems that rely on clean energy, the applicant may apply for a credit toward any carbon pollution impact fee equal to the carbon value of the clean energy used for any thermal energy system since January 1, 2024.

~~For compliance purposes for all thermal energy systems that are capable of utilizing either a fossil fuel or a renewable fuel that reduces greenhouse gas emissions, an applicant shall demonstrate compliance by providing a certificate and supporting documentary proof, including but not limited to a contract, invoices, and subscription or participation in a tariff program, on an annual basis stating that the applicant is purchasing renewable fuel that is being delivered to that building's thermal energy system, that it reduces greenhouse gas emissions, and that the purchases cover the annual need of the thermal energy system. If the applicant fails to provide an annual compliance certification, the applicant will be assessed an alternative compliance carbon pollution impact fee equal to a pro rata share of the remaining expected life of the thermal energy system. For renewable liquid or gaseous fuels used in a thermal appliance or system capable of also using fossil fuels, to count towards compliance, the purchase of enough renewable fuel to fully offset the annual usage for the appliance or thermal system in question is required.~~

Commented [A1]: I think this should address the concern about multiple fossil fuel systems being double counted when they rely on the same fuel source.

Commented [A2]: I'd like to have further discussion on this section, including whether it should apply only to previously installed thermal energy systems in Burlington.

Commented [A3]: I believe the intent of this is now covered elsewhere in this draft, but let me know if you feel differently.

(c) Clean Energy Fund. All carbon pollution impact fee proceeds, except those funds needed to administer this ordinance, shall be placed in a Clean Energy Fund established and managed by the Department of Permitting and Inspections with technical support from the Burlington Electric Department. Clean Energy Fund proceeds shall be made available as follows:

~~(i) The Department of Permitting and Inspections, with technical support from the Burlington Electric Department, shall determine which initiatives are eligible for funding for property owners or low income renters, but they may include, and shall not be limited to, the installation of new thermal energy systems that rely on renewable fuel, weatherization projects, or subsidizing any increased utility costs associated with purchasing renewable fuel rather than fossil fuel;~~

(i) Half of the proceeds paid into the Clean Energy Fund by a large existing building applicant shall be available to the payor for projects to reduce greenhouse gas emissions at any site owned by the payor in the City of Burlington. The large existing building applicant must request these proceeds within one (1) year following payment of their carbon pollution impact fee, and any proceeds not requested within that year shall be made available under subsection (iii).

(ii) Any remaining proceeds collected from large existing building applicants and all proceeds paid into the Clean Energy Fund by new construction applicants shall be available to provide financial assistance to help low-income Burlington residents with funding initiatives that reduce greenhouse gas emissions, including, but not limited to, the installation of clean energy thermal energy systems, weatherization projects, or subsidizing utility costs associated with purchasing clean energy rather than fossil fuel. This funding may be delivered either through direct payments to homeowners and renters who are income-qualified per the most recent income-qualification levels published by the Community and Economic Development Office ("CEDO"), or through payments to property owners of multi-family buildings where at least 25 percent of the tenants in the building are income-qualified, provided that the property owner must commit to not raising the rent of income-qualified tenants as a result of costs associated with the funded initiatives to reduce greenhouse gas emissions.

~~(h) Any applicant for a permit pursuant to this chapter, for any new or existing building regardless of size, seeking to utilize a wood chip or wood pellet heating system, must demonstrate that the system meets the 2023 or any subsequently issued Vermont Small Scale Renewable Energy Incentive Program (SSREIP) Advanced Wood Heating System (AWHS) terms conditions and requirements, including for efficiency and emission controls.~~

8-80 Effective Date.

The provisions of this Article shall take effect on January 1, 2024.

Commented [A4]: I think this was repetitive and is now covered in (ii).

Commented [A5]: This seems to be covered above in the definition of an advanced wood system.