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State of Vermont
Public Utility Commission

MEMORANDUM

To: Participants in Case No. 23-2220-RULE
From: Public Utility Commission Staff
Holly R. Anderson, Clerk
Re: Staff Straw Proposal on Pacing – Part I; Comments due June 19, 2024
Date: May 29, 2024

Introduction: On April 19, 2024, the Commission issued a revised work plan for this docket. Responding to participant feedback that the Commission should seek input on groups of related statutory directives, this memo serves as the staff straw proposal on items related to the process for "pacing" the Clean Heat Standard.[1] This memo includes straw proposals on the following elements:

- Process for establishing and adjusting emissions schedule (30 V.S.A. § 8127(g))
- Process for setting declining carbon intensity values (30 V.S.A. § 8127(f))
- Process for setting and adjusting the sector reduction requirements[2] (30 V.S.A. § 8124(a)(1))
- Process for setting and adjusting obligated party annual requirements (30 V.S.A. § 8124(a)(2) and (3))
- LMI equitable distribution[3] (30 V.S.A. § 8124(d))
- Appendix – includes relevant statutory language on these topics for convenience

Elements addressed below include a proposed approach and the justification for that approach. These straw proposals are meant to solicit specific feedback – reasons why the proposals will or will not work well or address the statutory requirements. If a participant does not agree with one or more of the proposals, in whole or in part, the participant is encouraged to offer an alternative approach (that includes its advantages and limitations). Following additional process and feedback on other program elements, the Commission may choose to adjust these proposals so that all elements are compatible in the rule. Comments in response to this proposal must be filed by June 19, 2024, and tagged with the "5 Pacing" dropdown option when filing.

[1] For an overview of the work done to date and other information on the proposed Clean Heat Standard, please see the Commission's Clean Heat website at https://puc.vermont.gov/clean-heat-standard.
[2] The Commission preliminarily addressed this question in the Order Requesting Comments on Process for Determining Annual Greenhouse Gas Emission Reduction Requirements, dated 2/5/24. Because this is directly related to the remaining pacing questions, the Commission has elected to put forth a proposal.
[3] LMI is an abbreviation for customers with low and moderate income.

Process for establishing and adjusting emissions schedule

Proposed approach: The Commission shall hire a technical consultant to review and update the emissions schedule pursuant to 30 V.S.A. § 8127(g) every 3 years. Updates to the schedule will be accompanied by notice of any proposed changes, the Technical Advisory Group's review, and a 30-day public comment period. Pursuant to 30 V.S.A. § 8127(g)(2) and (3), if a fuel pathway is significantly impacted as a result of local, State, or federal legal requirements, technological change, or new evidence on emissions, a regulated entity can petition the Commission to recalculate the fuel's lifecycle emission rate before the regularly scheduled update.

Justification: By rule or order, the Commission will establish the "emissions schedule" – which lists the lifecycle emissions rates for heating fuels and any fuel that is used in a clean heat measure (including electricity) or is itself a clean heat measure (including biofuels). The schedule must be based on GREET, IPCC modeling, or something of comparable analytical rigor to fit the Vermont thermal context. This task falls on two entities: the Technical Advisory Group ("TAG") and the Commission's technical consultant. Pursuant to Section 8128(a)(1), one of the TAG's duties is "establishing and revising the lifecycle carbon dioxide equivalent (CO_2e) emissions accounting methodology to be used to determine each obligated party's annual requirement pursuant to subdivision 8124(a)(2) of this chapter." This is also squarely in scope for the technical consultant to deliver given it is part of characterizing heating fuels, including "fuel" for electrified measures. Reviewing fuel pathways in the emissions schedule will be important to do periodically. This review should be conducted by a consultant with an opportunity for public comment and review by the TAG. The review schedule should also be on a 3-year schedule to match the program's 10-year credit projections that are reviewed and extended every 3 years.

Process for setting declining carbon intensity values

Proposed approach: The Commission will establish and publish carbon intensity values in compliance with 30 V.S.A. § 8127(f). On January 1, 2025, the Commission will adopt a step change in carbon intensity values – adopting the threshold limit of "below 80 in 2025" and "below 60 in 2030" with no rate of decline in in-between years. In preparation for establishing carbon intensity values on January 1, 2030, for the years 2031-2050, the Commission will offer an opportunity for public input to help inform the step change or rate of decline proposed during that period.

Justification: "'Carbon intensity value' means the amount of lifecycle greenhouse gas emissions per unit of energy of fuel expressed in grams of carbon dioxide equivalent per megajoule (gCO_2e/MJ)."[4] 30 V.S.A. § 8127(f) sets carbon intensity value limits for 2025 (below 80), 2030 (below 60), and 2050 (below 20). Because the Clean Heat Standard program already incentivizes the biggest reductions in lifecycle carbon dioxide equivalent ("CO_2e") emissions by way of credits awarded, this is a supplemental and separate policy lever to decarbonize eligible fuels under the Clean Heat Standard. To simplify which fuels are eligible under the program, the Commission proposes using a step change in the initial 5 years.

[4] 30 V.S.A. § 8123(1)

Process for setting and adjusting the sector's emissions reduction requirements

Proposed approach: The Commission will determine the pace required of the Clean Heat Standard to meet the Vermont thermal sector's proportional greenhouse gas emission reductions obligated by the Global Warming Solutions Act (GWSA) in compliance with 30 V.S.A. § 8122. The Commission will, with assistance from the Technical Advisory Group, reconcile the reductions necessary in the Greenhouse Gas Inventory to lifecycle-based emissions that can then be translated into clean heat credits. The Commission proposes the following:

1. Establish a baseline to anchor the trajectory of emissions reductions. One option is to weather-normalize the thermal sector's reported emissions totals from the most recent year offered in the Greenhouse Gas Inventory. Assume no progress has been made in lag years (i.e. the roughly 3-year data lag in the Greenhouse Gas Inventory).
    a. Section 8122(a)[5] establishes that the Clean Heat Standard is tied to emission reductions from the "thermal sector" which is defined in Section 8123(13) as having "the same meaning as the 'Residential, Commercial and Industrial Fuel Use' sector as used in the Vermont Greenhouse Gas Emissions Inventory and Forecast and does not include nonroad diesel or any other transportation or other fuel use categorized elsewhere in the Vermont Greenhouse Gas Emissions Inventory and Forecast." As such, we must remove emissions attributed to non-road diesel and any other emissions counted in this sector but not applicable to the Clean Heat Standard.
2. From the established baseline, linearly project the next 10 years of emissions reductions, with the 2030 obligation met in 2029 and later years linearly tied to meeting 2050's obligation in 2049.[6]
    a. This step will identify limits of the million metric tons (MMT) of CO_2e *inventory-based* emissions that would be allowed in each of the next 10 years.
3. Reconcile the inventory's in-boundary (i.e. within Vermont's borders) emissions totals to lifecycle-based emissions totals.
    a. Each of the reported fuels will have a volume associated with its contribution to emissions from the sector. Obtain the inputs to the inventory (i.e. gallons of fuel oil, propane, etc.), assembling the baseline year's "fuel mix."
    b. Identify each fuel type's in-boundary emission totals.
    c. Using the "emissions factors" identified in the Agency of Natural Resources (ANR) lifecycle-based supplement to the inventory, determine the upstream emissions of each fuel type based on their respective volumes. Add the in-boundary total to the upstream total to arrive at a lifecycle-based total. Sum all lifecycle-based fuel emissions to arrive at the sector's lifecycle-based emissions total.

[5] 30 V.S.A. § 8122 (a): "The Clean Heat Standard is established. Under this program, obligated parties shall reduce greenhouse gas emissions attributable to the Vermont thermal sector by retiring required amounts of clean heat credits to meet the thermal sector portion of the greenhouse gas emission reduction obligations of the Global Warming Solutions Act."

[6] The relevant GWSA emission reduction milestones are on January 1, 2030 and January 1, 2050. Emission goals must then be met in the year prior - 2029 and 2049.

4. Use the same rate of decrease as required in the inventory-based calculations in the lifecycle-based trajectory. This results in the lifecycle-based emission limits for each of the next 10 years.
5. Use the results of the triennial potential study to determine whether it is appropriate to adjust the decade trajectory to something other than a linear decrease in emissions.

Justification: The Clean Heat Standard is designed to meet the proportional thermal sector emission reductions required by 2030 and 2050 in the GWSA.[7] Those emission levels are based on reporting done in the Greenhouse Gas Inventory, compiled by ANR. The inventory only counts emissions that occur within Vermont's borders, sometimes referred to as "in-boundary." Because the Clean Heat Standard is based on lifecycle-based emissions accounting, we need to reconcile in-boundary emissions to lifecycle-based emission totals. The steps above propose a way to translate the RCI sector's in-boundary emissions from the inventory into lifecycle-based emissions that we can then translate into clean heat credit requirements.

Process for setting and adjusting obligated party annual requirements

Proposed approach: The Commission will "establish the number of clean heat credits that each obligated party is required to retire each calendar year."[8] An obligated party's annual credit requirements will "be expressed as a percent of each obligated party's contribution to the thermal sector's lifecycle CO_2e emissions in the previous year. The annual percentage reduction shall be the same for all obligated parties."[9] The Commission proposes the following:

1. After calculating lifecycle emission limits for the entire sector (see above), the year-by-year reductions will need to be translated to credits and distributed to obligated entities.
2. Using the lifecycle emission rates[10] developed by the technical consultant, convert fuel sales reporting from the previous year into a lifecycle emission total for all fuel reported and for each obligated party;
    a. Example: Volumes of fuel reported in the previous year equate to 2.5 MMT of CO_2e (unevenly distributed among reporting entities); Company A is responsible for .5 of those MMT of CO_2e.[11]
3. Calculate each obligated party's proportional contribution to the total emissions reported;
    a. Example: Proportionally, Company A is responsible for 20% of reported lifecycle emissions (.5 of 2.5 MMT of CO_2e).
4. Assign each obligated party's proportional contribution to the lifecycle-based baseline year;

[7] 30 V.S.A. § 8124(a)(1).
[8] 30 V.S.A. § 8124(a)(1).
[9] 30 V.S.A. § 8124(a)(2).
[10] Known as the "emissions schedule" in 30 V.S.A. § 8127(g): "…a schedule of lifecycle emission rates for heating fuels and any fuel that is used in a clean heat measure, including electricity, or is itself a clean heat measure, including biofuels."
[11] The examples offered in this step are solely provided to serve as an aid to understanding the proposal. The numbers are not real and should not be taken literally.

a. Example: The lifecycle-based translation of the inventory baseline year equals 3 MMT of CO_2e. Company A now "owns" 20% of the baseline emissions total, or .6 MMT of CO_2e;
b. NOTE: There is a fundamental conflict with 30 V.S.A. § 8124(a)(2). Credits cannot be expressed as a "percent of each obligated party's contribution to the thermal sector's lifecycle CO_2e emissions *in the previous year*" because there is a lag in inventory reporting data.[12] Additionally, given the Commission needs to publish a decade's worth of credit requirements at a time, the credits for future years cannot be based on the "previous year." The Commission proposes seeking a statutory amendment to tie credit requirements to the "most recent inventory data" instead;

5. Apply the percent decrease required by the lifecycle trajectory;
    a. Example: If the lifecycle-based emissions trajectory requires a 10% decrease across the sector in year one, a 10% reduction of Company A's .6 MMT equates to a 0.06 MMT of CO_2e reduction in year one;
    b. NOTE: This satisfies the requirement that the "annual percentage reduction shall be the same for all obligated parties."
6. This reduction in CO_2e emissions is the obligated entity's proportion of emission reduction that must be translated to clean heat credits;
    a. Example: If 1 clean heat credit = 1 metric ton of CO_2e, Company A must retire 60,000 credits in year one.
7. Assign a decade's worth of credit requirements based on the percent decrease required in the lifecycle-based inventory limits;
    a. Every 3 years, the Commission will use the latest inventory and fuel sales reporting data to recalibrate lifecycle emission limits and percent reductions required.
8. When updating and extending the decade projection of credit requirements every 3 years, the Commission will consider external factors that may affect the clean heat credit market. Examples include:
    a. Relevant policies that may affect emission levels in the RCI sector and therefore should impact credit requirements (e.g. housing-related).
    b. Relevant economic constraints (e.g. workforce, overall health of the economy, product availability) that may affect the ability to obtain and retire credits.

Other considerations:

- This proposal relies, in part, on near-perfect annual registration by fuel dealers and obligated parties. Participants are requested to address how this process could work (i.e., still achieve the intent of the Clean Heat Standard) in a scenario where annual registration is imperfect or incomplete.

Justification: This step translates the MMT of CO_2e emissions reductions required by the sector into credit heat credits that will need to be retired each year to meet those reductions. Because this program is designed to meet emissions reductions in Vermont's inventory, the steps above

[12] A reminder that "'thermal sector' has the same meaning as the 'Residential, Commercial and Industrial Fuel Use' sector as used in the Vermont Greenhouse Gas Emissions Inventory and Forecast." 30 V.S.A. § 8123(13).

factor in the fuel sales reporting to be the proportional allocation of inventory-based emissions reductions.

LMI equitable distribution

Context: In terms of pacing, the Commission will need to decide whether or not to increase the credit requirements associated with low and moderate-income customers. 30 V.S.A. § 8124(d)(2) requires obligated parties to retire 16% from customers with low income and an additional 16% from customers with low or moderate income. 30 V.S.A. § 8124(d)(3) encourages the Commission to frontload the credit requirements for customers with low and moderate income to the extent reasonably possible. This determination should be informed by the estimated costs of adjusting those allocations. Given this information is not yet known, we will not solicit input on this program element at this time.

APPENDIX:

1. Emissions schedule - 30 V.S.A. § 8127(g)

(1) To promote certainty for obligated parties and clean heat providers, the Commission shall, by rule or order, establish a schedule of lifecycle emission rates for heating fuels and any fuel that is used in a clean heat measure, including electricity, or is itself a clean heat measure, including biofuels. The schedule shall be based on transparent, verifiable, and accurate emissions accounting adapting the Argonne National Laboratory GREET Model, Intergovernmental Panel on Climate Change (IPCC) modeling, or an alternative of comparable analytical rigor to fit the Vermont thermal sector context, and the requirements of 10 V.S.A. § 578(a)(2) and (3).

(2) For each fuel pathway, the schedule shall account for greenhouse gas emissions from biogenic and geologic sources, including fugitive emissions and loss of stored carbon. In determining the baseline emission rates for clean heat measures that are fuels, emissions baselines shall fully account for methane emissions reductions or captures already occurring, or expected to occur, for each fuel pathway as a result of local, State, or federal legal requirements that have been enacted or adopted that reduce greenhouse gas emissions.

(3) The schedule may be amended based upon changes in technology or evidence on emissions, but clean heat credits previously awarded or already under contract to be produced shall not be adjusted retroactively.

2. Carbon intensity of fuels - 30 V.S.A. § 8127(f)

(1) To be eligible as a clean heat measure, a liquid or gaseous clean heat measure shall have a carbon intensity value as follows:

(A) below 80 in 2025;

(B) below 60 in 2030; and

(C) below 20 in 2050, provided the Commission may allow liquid and gaseous clean heat measures with a carbon intensity value greater than 20 if excluding them would be impracticable based on the characteristics of Vermont's buildings, the workforce available in Vermont to deliver lower carbon intensity clean heat measures, cost, or the effective administration of the Clean Heat Standard.

(2) The Commission shall establish and publish the rate at which carbon intensity values shall decrease annually for liquid and gaseous clean heat measures consistent with subdivision (1) of this subsection as follows:

(A) on or before January 1, 2025 for 2025 to 2030; and

(B) on or before January 1, 2030 for 2031 to 2050.

(3) For the purpose of this section, the carbon intensity values shall be understood relative to No. 2 fuel oil delivered into or in Vermont in 2023 having a carbon intensity value of 100. Carbon intensity values shall be measured based on fuel pathways.

3. Setting annual requirements - 30 V.S.A. § 8124(a)(2)

(2) Annual requirements shall be expressed as a percent of each obligated party's contribution to the thermal sector's lifecycle CO_2e emissions in the previous year. The annual percentage reduction shall be the same for all obligated parties. To ensure understanding among obligated parties, the Commission shall publicly provide a description of the annual requirements in plain terms.

4. Equitable distribution of clean heat measures - 30 V.S.A. § 8124(d)(2) and (3)

(2) Of their annual requirement, each obligated party shall retire at least 16 percent from customers with low income and an additional 16 percent from customers with low or moderate income. For each of these groups, at least one-half of these credits shall be from installed clean heat measures that require capital investments in homes, have measure lives of 10 years or more, and are estimated by the Technical Advisory Group to lower annual energy bills. Examples shall include weatherization improvements and installation of heat pumps, heat pump water heaters, and advanced wood heating systems. The Commission may identify additional measures that qualify as installed measures.

(3) The Commission shall, to the extent reasonably possible, frontload the credit requirements for customers with low income and moderate income so that the greatest proportion of clean heat measures reach Vermonters with low income and moderate income in the earlier years.

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