



**Regional Plan Committee
Special Meeting**

January 21, 2025 at 4:00 pm

29 Main Street, Suite 4, Montpelier, VT 05602

To join Zoom meeting:

<https://us02web.zoom.us/j/87815276521?pwd=Mmw5U080SGpCTUFNVHZFSEERQUlI0dz09>

Meeting ID: 878 1527 6521, Passcode: 783374

One tap mobile 1(929)436-2866 or 1(301)715-8592

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AGENDA

- 4:00 pm² Adjustments to the Agenda**
Public Comment
- 4:05 pm Approval of Minutes³**
October 2024 and December 2024 minutes
- 4:10 pm Energy Chapter Decision Points** (*Two memos enclosed - discussion*)
- 5:30 pm Adjourn**

Next meeting: February 4, 2025

¹ Dial-in telephone numbers are "Toll" numbers. Fees may be charged to the person calling in dependent on their phone service.

² All times are approximate unless otherwise advertised

³ Anticipated action item.



MEMO

Date: January 15th, 2025 (on topics put forth in memos December 20th and previously November 16th)
To: Regional Plan Committee
From: Sam Lash, Climate & Energy Planner
Re: Customization of Residential Fuel-Switching Target (Thermal Target)

ACTION REQUESTED: Discuss and confirm customization of residential fuel-switching targets for regional plan.

Staff is asking for feedback and a decision on the draft customization of our residential fuel-switching targets for the regional plan update. CVRPC staff recommends adopting the default regional targets from the state LEAP analyses with the addition of a high-efficiency cord wood stove target. This recommendation was developed in response to municipal feedback since the adoption of the previous plan and was included in the energy update which was adopted in 2024.

What are LEAP Targets?

CVRPC receives regionalized energy targets from the Public Service Department and is tasked with customization and further analyses to satisfy the analysis and target standards. The Low-Emissions Analysis Platform (LEAP) includes statewide targets for the thermal and transportation sectors, which were used to inform the 2022 Comprehensive Energy Plan (CEP) and 2021 Climate Action Plan (CAP). The LEAP was used to identify pathways and targets Vermont can pursue to achieve the GHG reduction requirements codified in the Global Warming Solution Act (GWSA) and 10 V.S.A. 592.

LEAP targets are established for the years 2025, 2035, and 2050, which coincide with the State Comprehensive Energy Plan (update 2022). Targets include both a “business as usual” baseline and the CAP mitigation scenario targets. CVRPC’s analyses, municipalization methodology, data sources, and further discussions are included in the supplement of this plan; accompanying tools and supporting resources are hosted by the Department of Public Service. Furthermore, full details of the State LEAP methods, data sources and assumptions may be found as Appendix D to the 2022 Comprehensive Energy Plan². Municipal analyses and targets will be made available on the CVRPC website and can be customized by request – the default municipal breakouts will follow from our regional results.

Residential Fuel-Switching Targets

In the thermal sector (space and water heating), LEAP targets include weatherization (measured as number of homes) and fuel-switching (measured as number of new heat pump and heat pump hot

water heater installations). These targets, measured in heat pumps and households, are derived from a more abstract target for overall residential thermal energy demand measured in thousand MMBTUs. This overarching target reflects the State’s emphasis on electrification (switching to heat pumps and heat pump hot water heaters). As a result, electricity use is planned to increase while the use of all fossil fuels and wood is intended to decrease. It is important to note that this model also depends on an overall reduction in energy demand resulting from higher efficiency heating systems and weatherization.

Previously, CVRPC used the default regional breakout from these targets. This was a significant issue for several of our communities, for whom cord wood heat is an important fuel source. Staff are recommending the customization of these targets to establish how cord wood heat can be part of our targets and the energy transition in Central Vermont by:

- providing a new high-efficiency cord wood target (to replace outdated inefficient cord wood stoves and boilers as the preferred option where wood heating is chosen in new builds),
- promoting the use of high-efficiency cord wood stoves with heat pumps (we do not reduce the target for heat pumps),
- providing context on the use of wood heat across income-levels, the availability of cord wood including via wood pantries, the intersection with high frequency and duration of electric outages, and the significant reduction in energy use still achieved via wood heat stove conversion (especially when paired with heat pumps).

See tables below (pages 16&17 in most recent energy chapter draft). **Staff recommends replacing the State’s trajectory of residential wood demand (crossed out below), with CVRPC’s targets (bolded below), which achieves demand reductions via high efficiency cord wood stove conversions instead of solely converting wood heat to heat pumps.**

Table 18 CAP Mitigation Regional Residential Thermal Demand (Thousands MMBTUs)

CAP Mitigation Regional Residential Thermal Energy Demand (Thousand MMBTUs)						
Fuel	2015	2025	2030	2035	2040	2050
Electricity	120	264	376	487	595	633
HP	1	136	231	322	413	453
HPWH	2	23	49	76	103	104
Electric Resistance	40	29	21	14	8	7
Wood (State default)	910	733	535	400	286	182
Wood (CVRPC)		455	395	334	273	212
Propane	475	375	273	183	101	67
Wood Pellets	225	69	57	50	45	42
Biodiesel	-	51	224	285	245	176
Heating Oil	1,140	827	404	140	-	-
Biogas	-	-	-	-	-	-
Natural Gas	-	-	-	-	-	-
Total	2,870	2,318	1,869	1,544	1,272	1,100

The following Table 19 outlines how the above goals were conceived:

Table 19 Targets for Residential High Efficiency Wood Heat Conversions

	2025	2030	2035	2040	2050
Existing Wood (homes)	4000	3200	2400	1600	800
New High Efficiency Wood Heat (homes)	0	800	1600	2400	3200
% converted	0%	20%	40%	60%	80%
Total Cords Used	22730	19725	16691	13656	10621
Thousands MMBTUs	454.608	394.507	333.813	273.120	212.427

The bulk of this discussion, originally in the narrative of the chapter, is planned to be abbreviated and moved to the supplemental along with the methodology. Please see draft language below (**optional reading for the 1/21/2025 Regional Plan Committee meeting**).

Wood Heat (as included in the Supplemental)

While up to 47% of Vermonters rely on wood heat as their primary or secondary heating fuel in their homes and state programs have supported advanced wood heat conversions in schools and commercial buildings, the state’s electrification targets include a decline in wood heat use along with fossil fuels. CVRPC takes a different approach tailored to our needs, resources, and communities. CVRPC supports the transition from fossil fuel heating fuels using not only heat pumps, but also strongly supports the conversion of inefficient wood stoves to high efficiency cord wood stoves- our targets for the thermal sector reflect this commitment. This custom target still reduces air pollution emissions, reduces heating costs, the amount of wood fuel used, provides a pathway for those with frequent and long-duration electric outages, and provides an accessible option for many Vermonters.

There are clear geographic and demographic trends across the region regarding wood use; 34-43% of households use wood heating in the north part of our region, 15-26% in the less densely populated municipalities throughout the rest of the region and significantly fewer households use wood heating in our density centers (only 4-14%; see Table 9 in Supplement). In owner inhabited homes wood heating is relatively consistent across income levels. However, several characteristics make efficient wood heat a particularly important pathway for fixed and low-income residents in our region to reduce their costs and greenhouse gas emissions. Unlike heat pumps, for which potential savings or costs can vary significantly depending on utility territory among other factors, cost savings from the use of high efficiency wood stoves are often more straightforward. Furthermore, according to the State’s Residential Fuel Assessment, over 1/3 of households using wood heat (as primary and secondary fuel) report that they, an immediate family member, or friend, cut or gathered the wood personally.

Not all forms of advanced wood heat are equally in line with the state's goals for air quality, forest ecology, and energy (see Challenges starting page 196 2022 CEP, see the CEP for more on wood supply and current programs as well). CVRPC is thus focusing on the hyper-local benefits and opportunities presented via cord wood, while further consideration of wood pellets and chips would

be needed before integration into preferred fuel types. Therefore CVRPC still feels advanced cord wood heat is important to include in our thermal energy transition because wood heat has an additional role to play in managing and reducing peak winter electrical loads, either stand-alone or in combination with heat pumps, wood stoves provide opportunities for homes, schools, and municipal buildings to avoid peak electric costs including during cold snaps. In addition to flexibility, advanced wood heat options can provide resilience benefits, as is included in the CEP and CAP.

Method (brief):

Table 19 provides a new target developed by CVRPC in recognition of the role cordwood heating plays in the region and can continue to do so as part of our energy policy and goals. These targets focus on the conversion of aged and/or inefficient woodstoves to high-efficiency replacements.

These targets are based on:

- the constants used in current use estimates,
- Efficiency Vermont projects that advanced wood heat conversion reduces fuel use by approximately 1/3, which was further reduced to 2/3 when paired with weatherization and conversion of some wood heating use from the primary to secondary heating source (representing an average per household reduction from 5.69 cords per year to 1.9 cords).

While data on wood heating is coarse, see detailed discussion above, this target uses current use as a starting point in 2025, and strives for 20% of households to convert per target year until 80% have converted in 2050. These numbers are broad enough to account for the unknown number of existing high-efficiency wood stoves. Updating these targets increases the demand for wood relative to the LEAP targets provided by the Department of Public Service for the target year 2050 but reflect a significantly lower estimation of demand in all previous years. CVRPC is working with the Department of Public Service and other partners to refine these LEAP targets to better reflect current use. And while these updates are not yet incorporated in the analysis, the proposed CVRPC wood targets for residential heating remains in line with a transition from fossil fuels and inefficient heating types (e.g. electric resistance) towards residential heating demand dominated by high-efficiency cold climate heat pumps and cordwood technologies.



MEMO

Date: January 15th, 2025 (on topics put forth in memos December 20th and previously November 16th)

To: Regional Plan Committee

From: Sam Lash, Climate & Energy Planner

Re: Incremental Renewable Energy Generation Targets (Technology Types, Measures to Reduce Future Generation Needed)

ACTION REQUESTED: Discuss and confirm inputs for establishing Incremental Renewable Energy Generation Targets including distribution across technology type and associated key issues.

Staff is asking for a discussion of some of the inputs to the establishment of our Incremental Renewable Energy Generation Targets (a.k.a. new renewable energy generation target). In the course of updating the analyses in collaboration with the Public Service Department to align with updated State models, Staff has identified several approaches which address concerns raised by the regional plan committee, board, and municipalities

The Incremental Renewable Energy Target (a.k.a. *New renewable energy generation target*)

The incremental renewable energy target is how much new (additional) renewable energy generation is needed to meet our regional share of 25% of the State's energy use produced in state. Different technologies and scales of technology have different land use and grid impacts for a given amount of installed capacity or energy production. Inputs into these analyses developed by the Public Service Department in partnership with the RPCs, Utilities, and PSD, include:

- future demand needs,
- resource potential (tied to the integration of state and regional known and possible constraints in the mapping/siting section)
- existing generation,
- distribution and transmission grid constraints (and costs),
- demographic data.

Updated Target

RPCs worked with the Public Service Department throughout 2022-2023 on their updated tools and analyses. In addition to the updates to the analyses statewide, CVRPC has integrated data

from Distribution Utilities’ Integrated Resource Plans and VELCO’s Long Range Transmission Plan as well as, responded to feedback from the commission and municipalities focused on the impacts of new renewable energy generation projects on our electric grid infrastructure, land and ecosystems, and generally, costs. The table below shows both the original energy plan’s targets and our reduced updated targets.

Incremental Renewable Energy Generation Target			
	2025	2035	2050
2018 Amendment of 2016 Plan (page 212 of 2020 version)	104,620MWh	167,404 MWh	418,531 MWh
Updated Targets	26,957MWh (18.8MW)	97,196 MWh (67.7 MW)	163,094 MWh (113.6MW)

(see expanded table and discussion in chapter)

This significant reduction in our region’s incremental renewable energy generation target stems from quite a few sources:

- the tool, data, and analyses were updated at the state level and better integrated more comprehensive models of future demand,
- staff found inconsistencies in what was used in the analyses in the original plan and the narrative of that plan itself, which lead to a much higher % of demand being met with local renewable energy generation (which is certainly an option we can explore but did not seem consistent with the intention of the plan), it is updated target is set to 25% in line with Vermont’s 25 by 25 goal under 10 V.S.A § 580 (requirement for determination of energy compliance per 24 V.S.A. § 4352 (c) 3).
- there has been an increase in generation in the region.

Staff further made a significant effort to work with distribution utilities and the Public Service Department to:

1. identify and correct errors in existing generation reporting (e.g. the majority of solar generation in Barre Town was misattributed to Barre City; staff identified undercounting of hydrogeneration, etc);
2. update the transmission constraints based on the 2024 update (not 2021) of the Long Range Transmission Plan (still in process- so constraints are considered conservative);
3. update the distribution of those targets across technology type (conscious of changes to grid impact) to reflect concerns about land use impact, technology types, and scales of projects. While the previous plan assessed the resource potential areas across technology types and determined preferences and policies regarding scale and technology type, it did not, as is required, distribute our target across the technology types (necessary to consider land use and grid impacts, which vary across technology and project scale). The default provided by the Public Service Department is provided below, as are **preliminary recommendations to discuss:**

	Solar (Ground Mount)	Solar (Rooftop)	Wind	Hydro	Natural Gas	Biomass
2018 Amendment of 2016 Plan (page 212 of 2020 version)	unclear	unclear	unclear	unclear	0%	unclear
Defaults provided for CVRPC by the State:	65%	10%	25%	0%	0%	0%
Updated Targets	25%	50%	20%	5%	0%	0%

More nuanced work is needed to balance conflicting priorities regarding cost (and to whom), land use impacts, historic and aesthetic considerations, technical conditions, and constraints presented by our existing infrastructure gaps. Ongoing energy planning at the municipal level will help us develop a clearer sense of where preferences and potential resource areas align, as well as the potential land use impacts of different scenarios.

Staff recognizes these preliminary distribution targets may still be jarring, and are providing several recommendations below to better align this with the region:

- A. While wind was reduced from the default, staff perceives that a significant further reduction is required to bring these analyses in line with the CVRPC Board’s and region’s preferences. However, to do so, the additional feedback on recommendations B-D is needed.**
- B. Given hydrogeneration makes up a significant portion of our existing generation, staff recommends the committee consider the feasibility of promoting the optimization of existing projects and the establishment of new hydrogeneration (not limited to dams, could be pumped hydro, in-line, etc). However, staff left this target low given the lack of present discussion on hydrogeneration, the high up-front costs, and the fact that many of our existing facilities are struggling with costly and lengthy FERC recertifications emphasizing that our region is at a crucial pivot point with this technology type.
- C. The Solar targets were shifted to reflect the strong preference of minimizing land use impacts of ground mount solar. However, it should be noted that roof top and small-scale projects do increase costs overall and hasten costly grid infrastructure investment. Therefore staff recommends that we put forth models for how to address these upfront costs if we continue to pursue this pattern of development.
- D. These challenges have led staff to recommend that the region increase its emphasis on reducing future electric demand growth, thereby reducing our incremental renewable energy generation target and some costly investments. Further, in line with our region’s priorities regarding housing, smart growth development, beneficial electrification, and conservation goals, staff recommends we focus on community-scale solutions. These solutions would be in addition to our support for demand management and storage and would include waste heat recovery, thermal networks, and district heat. The goals and strategies throughout the chapter have been updated to reflect this potential.**

Staff is prepared to further discuss the targets across technology type and the impact of considering alternative targets. Future planning should also include additional analysis to assess the relative land use impacts of different types and scales of projects. Such analysis should account for plans for future development and how energy generation can overlap and be integrated with the development of housing and industry.