

Energy Chapter

Decision Points

CVRPC Board of Commissioners

February 2025

Work to date:

- Data, target & analyses updates
 - Demographic data, existing generation, distribution and transmission grid constraints, resource potential (mapping), etc.
 - example existing generation data fixes, collaboration with Capstone & Efficiency VT and DMV tracking target progress, etc.
 - Act 174 Standards were updated as part of the 2022 Comprehensive Energy Plan (CEP) update and in line with updates to analyses conducted as part of the Climate Action Plan (e.g. LEAP) according to GWSA
 - RPCs supported the Public Service Department to update regional breakouts from state modeling and corresponding analytical tools which underpin our Targets & Analyses for the thermal, transportation, and electric sector, as well as our Incremental Renewable Energy Generation Target
- Mapping updates (in progress)
- Ongoing work with municipalities on local enhanced energy plans- restructuring as an iterative process to build local knowledge
- Updated relevant sections in Transportation and Infrastructure Chapters

Key Decision Points:

1. Custom High-Efficiency Cordwood Stove Conversion Target

Recommended: The adoption of the default regional targets from the state LEAP analyses with the addition of a custom high-efficiency cord wood stove target in response to municipal feedback since the adoption of the original regional enhanced energy plan.

Our priority targets now include:

- Weatherization (Residential, goal to establish Commercial targets)
- Fuel-switching (Residential & Commercial)
 - Electrification via heat pumps and heat pump hot water heaters
 - Conversion of wood stoves to high-efficiency cord wood stoves
- EVs and reducing vehicle miles traveled (e.g. smart growth)

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

Nota bene:

- Narrative in the plan provides some context on the use of wood heat across the region (geographically distinct) and across income levels (consistent across), the intersection with energy burden, and concerns around electricity outages. The narrative of the plan also discusses the impacts of all fuel types (pros&cons) including wood.
- We promote the use of high-efficiency cord wood stoves with heat pumps (we do not reduce the targets for heat pumps)
- Our residential thermal energy demand from wood is still projected to decline as higher efficiency wood stoves significantly reduce the amount of wood needed; our overall residential thermal energy demand still declines as required.
- Our target narrowly focuses on cordwood for residential heating given local wood resources and scale of collection/transport (local), etc.
- Not to be confused with wood for electricity generation which is not supported by our current plan given overall regional priorities, resources, and needs.

2. Incremental Renewable Energy Generation Target

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)

2050 is the total goal (cumulative)!

The significant reduction in our region's incremental renewable energy generation target is not a shift in policy away from supporting renewable energy generation but a result of a few things:

- The analytical tool (Generation Scenarios Tool), data and analyses were updated at the state level and better integrated more comprehensive models of future demand and grid constraints; CVRPC further integrated Distribution Utilities' Integrated Resource Plans and VELCO's Long Range Transmission Plan to inform inputs, and began integrating municipal preferences.
- Corrected inconsistencies in what was used in the analyses in the original plan, our new goal is in line with the narrative of our original plan and with state targets: we updated the analyses with 25% generated in-region (25 by 25 goal in-state (10 VSA 580)).
- There has been an increase in generation in the region (we are making progress).

3. Distribution of Incremental Renewable Energy Target Across Technology Types:

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). The default provided by the Public Service Department is provided below, as are 2 custom alternatives (leaning towards 3):

NOTE: these are intended as our regional DEFAULTS- that is, as towns establish&update their enhanced energy plans they have the opportunity to customize these inputs inconversation with the RPC. With 7-10 towns currently in some stage of this process, we would like this to remain a key point of discussion in the future to work towards optimizing our regional approach based on municipal strengths and burdens.

	Solar (Ground Mount)	Solar (Rooftop)	Wind	Hydro	Natural Gas	Biomass
Scenario 1: Defaults provided for CVRPC by the State:	65%	10%	25%	0%	0%	0%
Scenario 2: Updated Target Distribution	25%	50%	20%	5%	0%	0%
Scenario 3: Alternative Update 1	50%	25%	20%	5%	0%	0%

3. cont'd

- The solar targets in **Scenario 2**, were initially shifted to reflect the strong preliminary preference of minimizing land use impacts of ground-mount solar. However, it was noted that rooftop and small-scale projects do increase costs overall and hasten costly grid infrastructure investment. Furthermore, it was noted that given general building condition and age across our region, the 50% distribution was concerning to some.
- **Scenario 3** switches distribution of ground mount and rooftop so that 50% of the region's generation would come from ground-mount and 25% rooftop solar. Note this shift results in a small (1MW) overall reduction in our overall target. This shift has two major impacts:
 - This lowers the overall number of municipalities where grid capacity issues related to rooftop solar are anticipated to be a concern. The number of towns with capacity or *headroom* concerns would drop from eight to four (Barre City, Montpelier, East Montpelier, and Waterbury are still flagged, while Duxbury, Calais, Middlesex, and Worcester are no longer flagged as a concern).
 - The other major impact is on land-use. Increasing our reliance on ground mount solar will double the footprint of ground mount arrays from an estimated 217 acres to 434 acres (0.04% to 0.08% of our region)
- Other configurations were considered including where wind was further reduced, these resulted in a small shift (increase) in overall target and no relief for towns in terms of constraints relative to scenario 2.

3. Cont'd

Key discussions included:

- Importance of **integrated energy planning into planning for housing targets and other development** to optimize co-benefits and minimize footprints where possible
- The **future of hydrogeneration in central Vermont** (opportunities and big barriers), and importance of balancing priorities in flood mitigation, energy generation, recreation, and minimizing/remediating negative ecological impacts of our infrastructure on our environment.
- **Landuse impacts of Wind and Solar**, plus other technology-specific concerns- overarching is the emphasis **on right-sizing and prioritizing infrastructure for local offtakers**
- **Understanding Grid Capacity**- while we have ample resources available to meet targets, we are constrained by our transmission and distribution grid capacities- we can reduce costly grid investment via several mechanisms including: demand and load management, storage, but also via **key community-scale approach including waste-heat recovery, thermal energy networks, geothermal, etc which reduce our future electric demand growth**
- **Municipal Customization**

4. Siting (and mapping!)

Mapping Analyses that are required include integrating CVRPC regional constraints with the state's known and possible constraints, renewable wind & solar energy potential analyses, and rooftop solar analyses...

Notably:

- all towns have enough primary and base solar potential to meet their targets, Duxbury and Fayston have the least available coverage
- Wind potential is more limited in our region geographically, along our eastern towns including Woodbury, Cabot, Marshfield, Plainfield, Berlin, Barre Town, Orange, Williamstown, and Washington, with a few patches in Northfield, Roxbury, Waitsfield, and Warren (remember elevations above 2500ft and slopes greater than 25% have been removed by RPC constraints)

4. Cont'd

- We have reviewed State Known & Possible Constraints, as well as Regional Constraints which are applied to our potential resource areas,
- We have reviewed preferred locations types,
- While these very basic analyses indicate there are ample resource to reach out targets, in practice, there are significant issues related to the fragmentation of those resource areas and their proximity to existing infrastructure, the condition of that infrastructure (whether interconnection is possible), and recurrent discussions around scale of projects.

4. Cont'd

Next steps: we will identify resource potential areas that can support larger projects (500kw+) with proximity to intentional growth areas and existing electric infrastructure in order to:

- **integrate scale and demand into our mapping,**
- De-couple individual and commercial scale from larger scale projects (different considerations),
- Provide a **framework and base mapping for municipal discussions evaluating preferred sites and unsuitable areas for larger projects** (e.g. 500kW+- staff anticipates state-funded and utility projects will prioritize 500kw+ projects, and recommends we consider and direct where these larger-scale projects may be located and how they do/do not fit into local and regional visioning of our communities)
- **Help us advocate for where costly grid investment is needed, where it can be avoided, and where investment in community-scale infrastructure may delay and/or defray costs!**

Next Steps:

- Continue to update strategies and ensure language is aligned with what CVRPC does/can do
- Consider where “should”s can become “shall”s where CVRPC policy and authority allows
- Ensure continuity across chapters (Natural Resources, Housing, Economic Development, Infrastructure, and most importantly Future Land Use)
 - In designating constraints for the development of renewable energy due to the desire to protect a locally designated resource (whether a natural resource, like forests) or community-identified resource, state rules require that the land use policies applicable to other forms of development must be similarly restrictive
 - Optimize co-benefits, minimize landuse impacts, invest in community-scale infrastructure!