NVDA Regional Energy Plan

October 25, 2023 - 6:30pm
Public Hearing

NVDA Regional Energy Plan Assessment & Report - June 2023

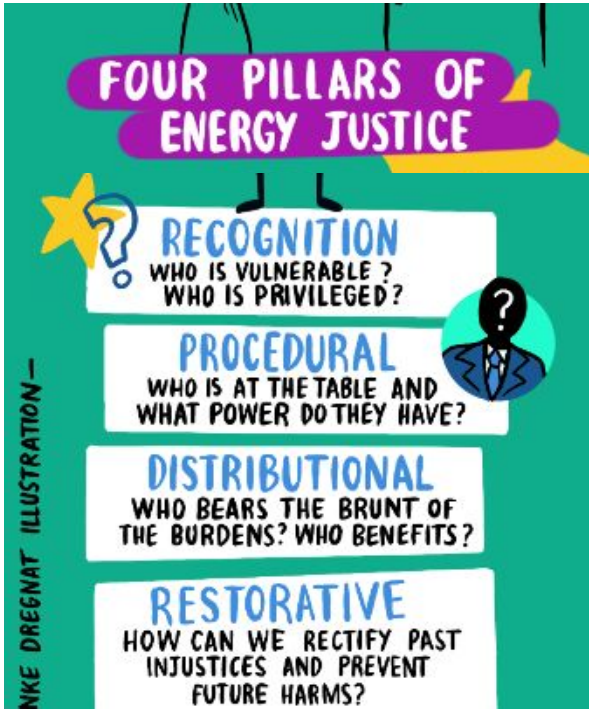
Please note that NVDA's Regional Plan was updated and readopted on July 29, 2023 in accordance with 24 VSA 4348b, which allows regional planning commissions to readopt plans that are approaching expiration. In accordance with statute, we have prepared an Assessment and Report. The report addresses the new requirement for certification of regional plans by the Department of Public Service, including equity requirements. The plan update, however, does not include new municipal breakouts of LEAP analysis, as the new LEAP analysis was being completed just as the readoption of the plan commenced.

NVDA is working on a new regional plan that will incorporate new municipal targets for 2023 LEAP projections, and we will begin making this information available to towns as soon as possible. In the meantime, the existing municipal energy targets, based on 2018 data, can be found in the Appendix of the energy plan. This data is valid until new data is available.

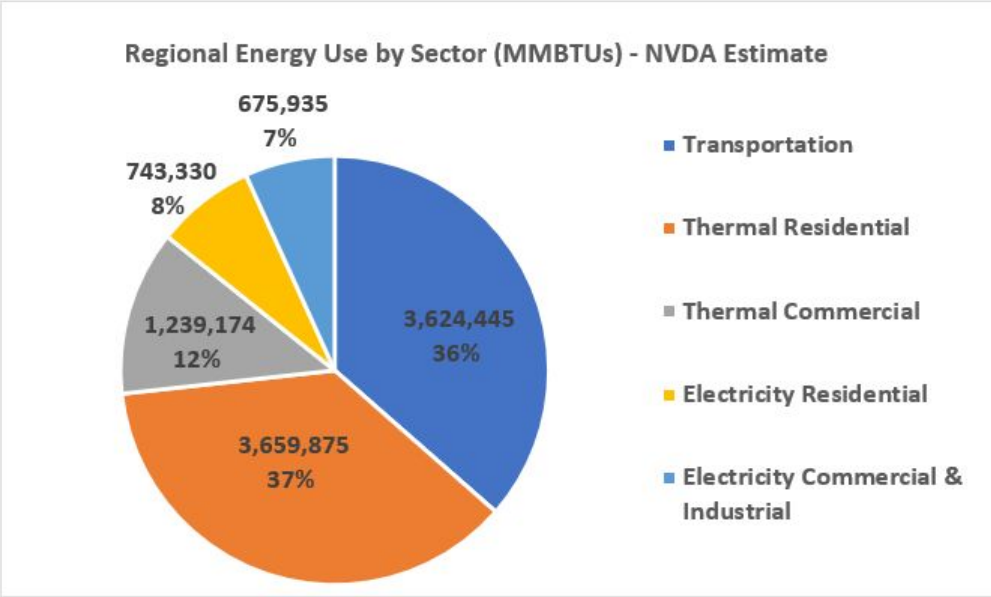
In addition to meeting **Vermont's Climate & Energy Goals**, and **Environmental Justice Law** (Act 154)…

The **NVDA Regional Energy Plan** aspires to follow the goals and principles detailed in the [Energy Equity Project (EEP) Framework]**:**

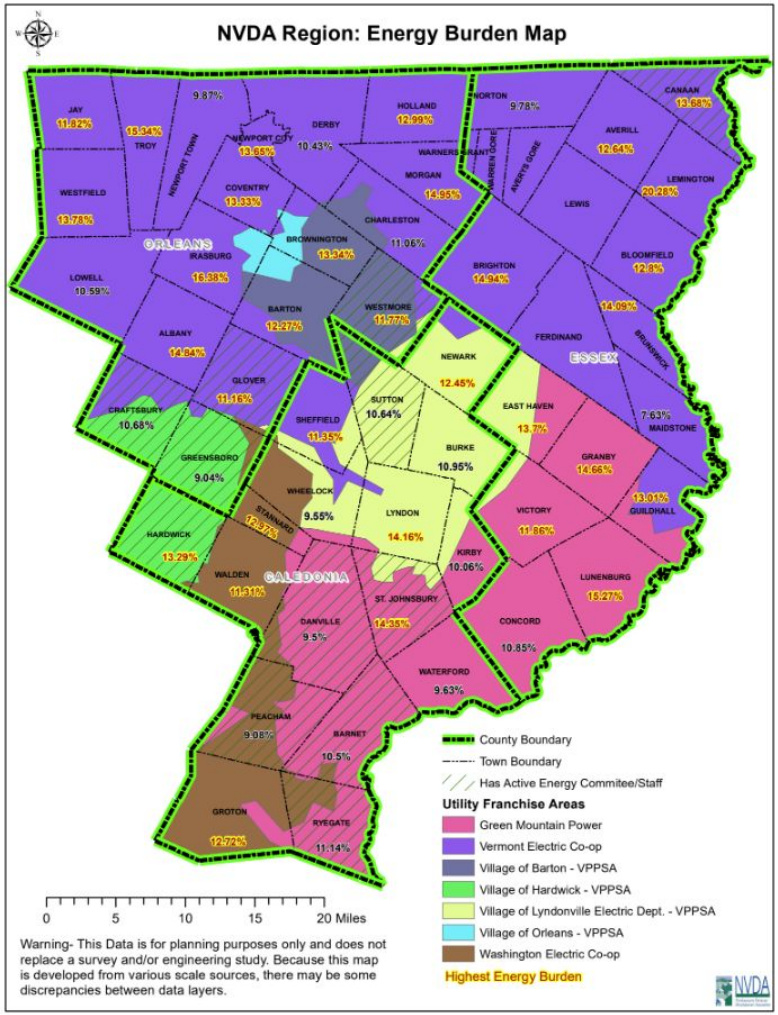
- Everyone has continuous **access to energy**.
- Everyone lives in a **healthy, safe, and comfortable home**.
- No one spends more than 6% of their income on **energy bills**.
- Those who are most impacted have the most **powerful voice** in decision making and receive a **share of benefits**.



Energy Use by Sector



The regional estimates were developed using multiple sources, including the Vermont Department of Public Service, American Community Survey, & Vermont Department of Labor. For more information about how these estimates were developed, please visit NVDA.net.



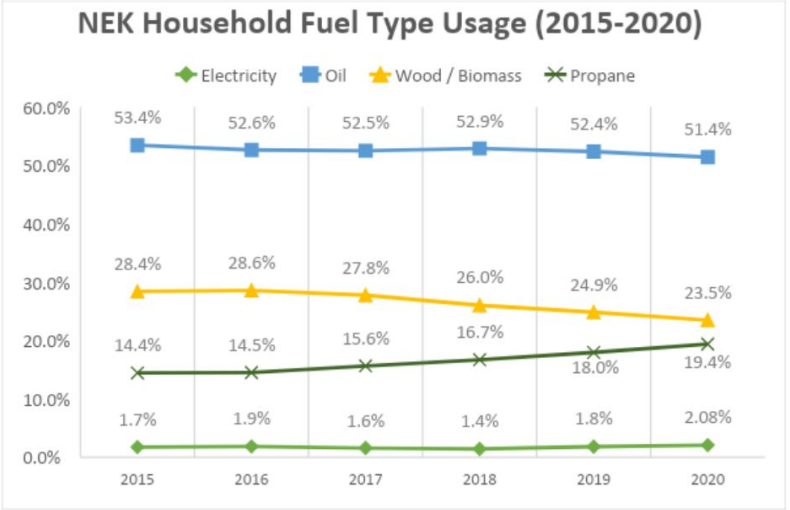
Heating (Thermal) Energy - 49%

Fossil fuel oil continues to be the most widely consumed residential heating fuel, followed by **wood/biomass**.

In 2020, of the NEK's approximate 27,178 occupied households, **51.4% burned oil**, followed by **23.5% wood/biomass**.

Oil is often the back-up fuel source for homes that heat primarily with wood. While the region has no utility fossil gas, **propane was used by 19.4%** of homes in 2020.

Electricity is used least, at just 2 percent for NEK household heating needs.



Source: American Community Survey 2015-2020

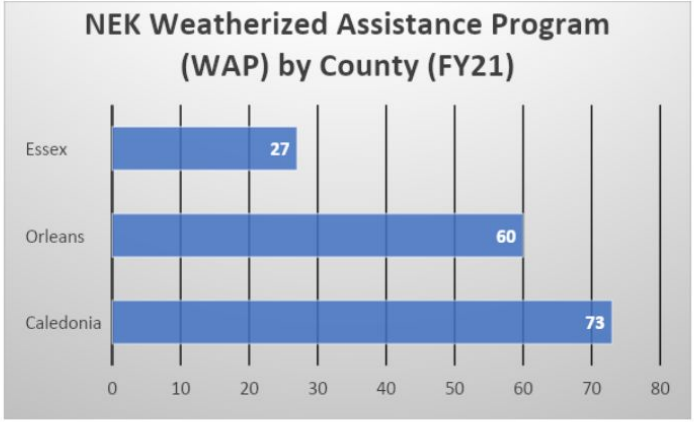
NEK Thermal Challenges

Challenge: *The age of the Northeast Kingdom's housing stock is likely the most significant contributor to the overall thermal usage. According to most recent American Community Survey Five-Year Estimates (ACS),* ***nearly one-third of housing units were built prior to 1940.*** *Older homes are likely to be poorly insulated and leakier, driving up energy consumption and costs.*

Weatherization

The Energy Action Network (EAN) estimated that Vermont needs to weatherize 13,400 homes each year (or at least 90,000 total) by 2030 to meet its climate goals (Efficiency Vermont). Currently, less than 2,000 homes are weatherized a year in Vermont. According to 2020 Census data, there are approximately 27,000 homes in the Northeast Kingdom.

In FY2021, **only 160 NEK homes (less than 1%) participated in the Weatherization Assistance Program (WAP)**, out of 1,050 statewide WAP projects.



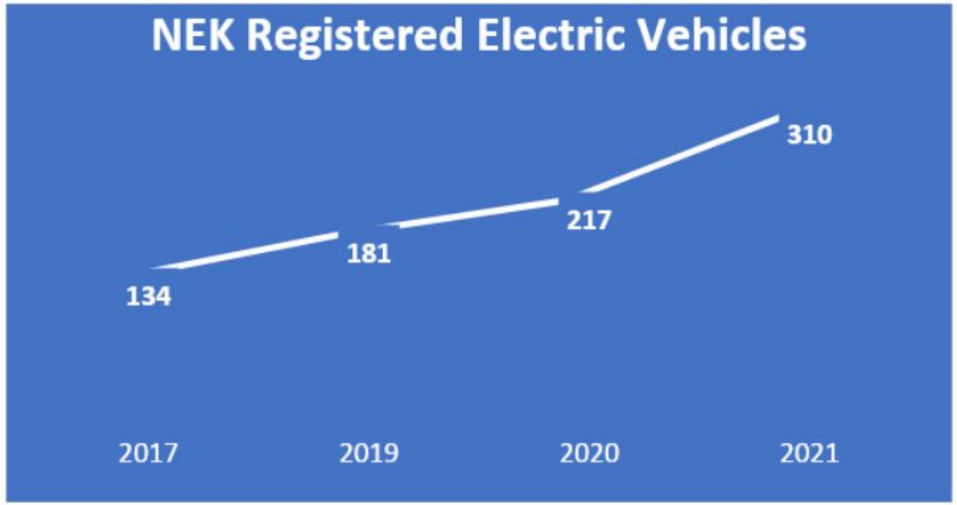
Source: Performance Indicators for the Vermont Weatherization Assistance Program Report, Vermont Legislature 2022

Transportation Energy - 36%

EVSE Planning Recommendation:

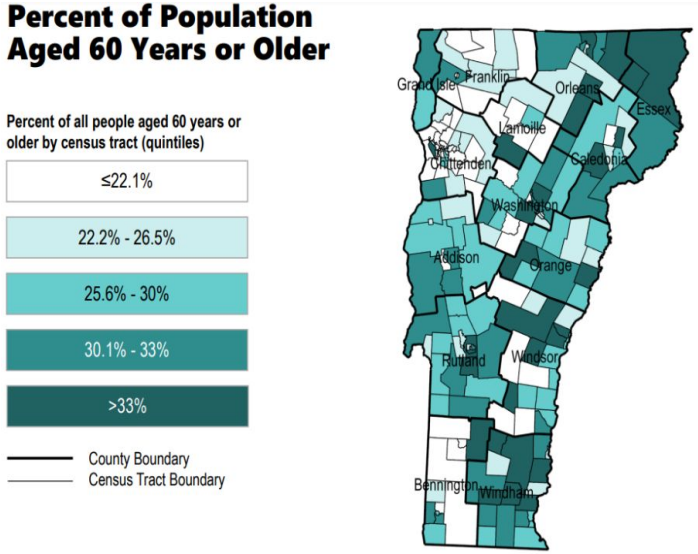
NVDA continues to encourage municipalities and local businesses to install EV charging stations at convenient and desirable locations, such as in front of restaurants, stores, tourist and recreation destinations, and community sites such as libraries, where users would want to park for several hours.

NVDA also recommends the development of electric vehicle supply equipment (EVSE), like Level 2 and 3 charging stations, in our regional downtowns, village centers, and opportunity zones, as well as along key interstate and state highway corridors in the NEK.



Sources: VTrans, American Community Survey, Drive Electric Vermont, DMV

Increasing Transportation Equity - Transportation Demand Management (TDM)



Source: 2022 Analysis by the Vermont Department of Health for the Vermont SNAP-Ed Needs Assessment (ACS 2019 5-year estimates, Tables S0101 & S1810 respectively)

Transportation infrastructure that increases the quality and types of available transportation choices is referred to as **Transportation Demand Management, or TDM,** and is a priority of the Vermont Comprehensive Energy Plan.

Multi-modal choices like public transit, rideshare, bicycling, and walking — all of which provide alternatives to getting around by single-occupancy vehicle — can increase the affordability of transport for Vermonters, encourage economic development in downtowns and village centers and promote an active and healthy lifestyle.

Low-income households, children, older adults, people with a disability and those who can't or choose not to own a car benefit most from safer streets and other mobility options. Infrastructure for walking, biking, and rolling makes rural communities more attractive places for young people to live, work, and start businesses.

Electricity - 15%

NEK Electricity Consumption	kWh Usage by Year		
Sector	2019	2020	2021
Commercial & Industrial	226,584,720	207,838,094	219,150,067
Residential	190,079,533	199,280,474	204,955,840
Total	**416,664,253**	**407,118,568**	**424,105,907**
Average Residential Usage	***5,903***	***6,161***	***6,292***

Source: Efficiency Vermont Summary Report for NVDA region, June 2022

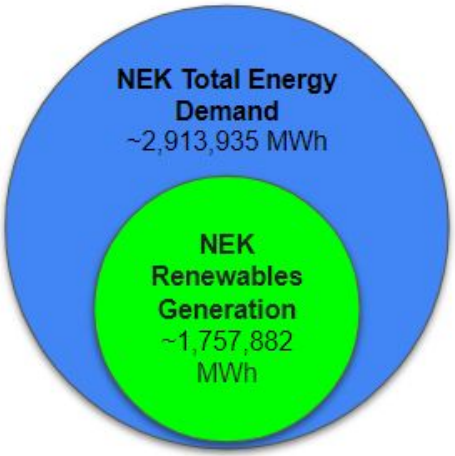
As a comparison to the NEK's 6,292 kilowatt hours (kWh) per year, the United States' average residential electricity usage was 10,632 kWh in 2021, an average of about 886 kWh per month (EIA). Electricity consumption patterns are expected to increase as more beneficial electrification takes place.

Section 2 – Renewable Energy, Storage, Transmission & Distribution Resources

To meet energy, climate, and equity goals much of our power will also need to be generated by in-state renewable facilities that prioritize access and affordability to reduce energy burden.

The NVDA infographic to the right shows the Northeast Kingdom's total energy demand across all sectors (transportation, thermal, and electricity), compared to current renewable energy generation located within the region.

It is an important reminder that the NEK hosts a lot of existing renewables and not much load (relative to other regions).

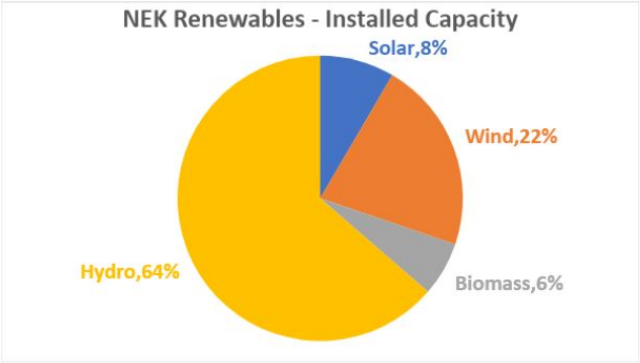


Existing Renewable Energy Generation

In support of the 90x2050 goals, each region has a set of generation targets. Generation targets can be met through a variety of renewable technologies, including solar, wind, hydro and biomass.

Because our region already generates a disproportionate share of renewables relative to our low population, the Northeast Kingdom is well on track for its contributions to the 2050 targets for renewable energy generation, based on our population and energy resource potential.

NEK Existing Renewable Energy Generation			
	Sites*	Installed Capacity (MW)	Annual Production (MWh)
Solar	737	40	50,663
Wind	34	103	203,763
Hydroelectric	21	302	1,322,554
Biomass (Wood)	5	29	178,901
Total	**797**	**474 MW**	**1,757,882 MWh**
*These sites represent facilities that have been permitted.			



Sources: PSD Generation Scenario Tool, 2023 & VT Community Energy Dashboard, 2021

NEK Siting Guidelines for Renewable Energy

NVDA Energy Maps have been updated to be consistent with the Climate Action Plan and 2022 Act 174 standards, with an emphasis on the value of forest lands for sequestering and storing carbon.

Underlying assumptions were made about suitability factors, such as slope and direction of land, elevation and wind speeds, and access and proximity to grid-related infrastructure. Additional statewide layers identified known constraints and possible constraints, and a third layer has identified regional constraints:

Regional constraint:

NVDA's regional plan has long held that rural areas should receive very little commercial or industrial development unless it occurs in an established industrial park, or in an area specifically designated in the local bylaw or plan as being well suited to such uses. Lands with an elevation of 2,000 feet or more merit consideration as a special class of rural lands that should be protected from any large-scale commercial or industrial development characterized by a constructed height of 100' or more, and an acre or more of permanent site disturbance, such as clear-cutting. These lands, as indicated on NVDA's renewable energy maps, contain one or a combination of factors that make them unsuitable to such development – contiguous forest cover; sensitive wildlife and plant habitat; conservation lands and recreational assets; managed forestland; and headwaters and ephemeral surface waters, which are highly vulnerable to erosion and man-made disturbance. High-elevation forest cover must be kept unfragmented for the attenuation of flood flows, carbon storage/sequestration potential, the benefit of wildlife habitat and linkage, and public enjoyment through passive recreation. It is NVDA's position that no further development of industrial-scale wind turbines should take place in the Northeast Kingdom (see the 2018 Energy Plan for more details).

Equity Strategies for Renewable Energy Access & Affordability

Providing renewable power and services close to where it is used, also known as distributed energy resources (DERs), has multiple benefits including the potential to lower costs for consumers, improve the reliability and resilience of the grid, and increase equity among community members.

- **Community-Owned Solar** has the ability to provide a number of meaningful benefits to participants and their communities, especially increased access for low- to moderate-income households, greater bill savings, resilience, community ownership and wealth-building opportunities, and equitable workforce development. For rural areas, solar arrays can have a positive multiplying effect when combined with agriculture, also known as agrivoltaics. Additionally, siting renewable generation (possibly combined with storage) in proximity to key food resources like food shelves, community gardens/fridges, grocery stores, etc. can be a way to improve access to local, more affordable, and healthier food options.
- **Utility-led Energy Programs:** Increasingly, distribution utilities must play a role in providing fossil fuel-free energy infrastructure and storage to ensure reliable, affordable clean energy for all. Some utilities offer programs for income-eligible Vermonters to help lower the cost of energy at home. For example, and further detailed by the Vermont Department for Children and Families, a household of four earning less than $50,000 a year can receive a 20-25% discount on their monthly energy bill.
- **State-led Energy Programs:** The Vermont Clean Energy Development Fund (CEDF), with its Affordable Community Renewable Energy (ACRE) program is encouraging distribution utilities to connect more income-qualified customers to renewable energy. Programs like these will help thousands of eligible community members reduce energy burden costs while growing new Vermont community solar.

NEK Pathways: Goals & Objectives

GOAL - Move the Region's Energy System to meet the goals of Vermont's energy and greenhouse gas reduction goals while balancing economic vitality and affordability.

Objective:
Reduce regional energy burden and fossil fuel pollution to support the State's climate and weatherization goals.

Objective:
Promote climate-ready and resilient buildings and communities.

Objective:
Support the development of new, community-scale renewable energy in the region to meet the Vermont Comprehensive Energy Plan's goal of using 90% renewable energy by 2050, in a manner that is affordable, equitable, and respects the natural environment and its inhabitants.

GOAL – Decrease Transportation Energy Burden Costs & Fossil Fuel Pollution

Objective:
Promote a shift away from single-occupancy vehicle (SOV) trips and reduce fossil-fuel Vehicle Miles Traveled (VMT) in the NEK.

Objective:
Shift away from gas/diesel vehicles to electric or other non-fossil fuel transportation options.

See Energy Plan for detailed Actions within each Goal/Objective…

Thank you!

Questions?

Comments?

Allie Webster, Energy Planner

Alison Low, Senior Planner

nvda.net/energy