

Memo

TO: Department of Housing and Community Development,
Agency of Natural Resources
Agency of Agriculture, Food and Markets
Chairs of the Legislative Bodies of the Northeast Kingdom
Executive Director of Northwest Regional Planning Commission
Executive Director of Central Vermont Regional Planning Commission
Executive Director of Lamoille County Regional Planning Commission
Executive Director of Two Rivers-Ottawaquechee Regional Commission

FROM: David Snedeker, Executive Director

DATE: June 20, 2023

RE: Update and Readoption of Northeastern Vermont Regional Plan

The Northeastern Vermont Development Association is proposing to re-adopt the Regional Plan for the Northeast Kingdom 2015-2023. The current plan expires August 27, 2023. Per 24 VSA 117 § 4348b, the following assessment report is included:

(A) The extent to which the plan has been implemented since adoption or re-adoption.

Since adoption of this Plan in 2015, the Northeast Kingdom has continued to experience limited yet incremental growth. As noted in the Plan, the natural beauty and wholesome quality of life in the Northeast Kingdom continues to drive growth and change. The Regional Plan notes that while we are “within a day’s drive of more than 70 million people, the region has become a recreational playground for many out-of-area visitors. Others are seeking to permanently escape the rigors of urban life elsewhere and relocate to the region.” Climate and affinity migration, which intensified during the pandemic, as well as major recreational investments such as the completion of the Lamoille Valley Rail Trail, have intensified those outside interests noted in the 2015 plan, presenting both challenges and opportunities.

As noted in the 2015, we recognize that the cumulative effects of unplanned or uncoordinated growth will have a deleterious effect on our rural communities -- and may negatively affect local economies and the quality of life our residents have come to enjoy and expect. Therefore, our overarching goals remain unchanged:

- **We strive to retain and strengthen existing businesses while creating new economic and employment opportunities for residents from all walks of life.** To this end, we have engaged in public and private partnerships to expand commercial and industrial opportunities such as the repurposing of the Bogner Building in Newport. NVDA also receives and administers funds from EPA to remediate brownfields and provides grant writing and administration to support economic and community development projects. NVDA’s region is part of the 115 municipalities of the Northern Vermont Economic Development District (NVEDD), which consists of

Caledonia, Essex, Franklin, Grand Isle, Lamoille, and Orleans Counties. The district maintains an approved Comprehensive Economic Development Strategy approved by the Economic Development Administration.

- **We must provide quality educational opportunities and skills training for all jobs seekers to make the region’s workforce more attractive to employers.** NVDA has supported Do North Coworking to facilitate KickstartNEK, a 10-week program that uses the nationally recognized Co.Starters curriculum to guide emerging ideas and small businesses through a process to build a sustainable and profitable entity. We also supported and sponsored the Forest Products Accelerator.
- **With an economy that is to a great extent linked to our natural resources base, we will continue to embrace strategies to protect the environmental quality in the Northeast Kingdom.** We continue to provide technical support to regional Tactical Basin Planners, local water quality associations, and municipal conservation commissions. We have also worked with our towns to provide ongoing technical assistance on instilling best practices for promoting flood resilient development.
- **Our regional goal to expand housing availability continues to be shared by every local community, and the upgrade of existing, substandard housing is a particularly urgent priority.** The high cost of heating our older, often substandard housing stock remains a challenge. During this period, our partnerships with local energy committees, HEAT Squad, and Northeast Employment Training Organization expanded participation in weatherization efforts. Like the rest of the state, the availability of quality, affordable housing has been severely strained in this post-pandemic economy. To that end, we have supported and served on a local housing commission and have assisted municipalities in applying for Bylaw Modernization Grants to eliminate needless barriers to housing.
- **We encourage our communities to work with their local, regional, and state agencies and officials to revitalize downtowns, village centers, and cultural institutions to preserve our cherished way of life.** Our communities continue to participate in the Downtown Designation and Village Center Designation programs, which provides incentives for reinvestment in traditional centers of development. Hardwick, which has maintained a Village Center Designation since 2003, became a Designated Downtown in early 2023, joining St. Johnsbury and Newport City. Our region currently has 38 Village Centers. NVDA also provides outreach and support to applicants seeking tax credits through the Designation programs.
- **Local communities and state agencies must continue to upgrade public infrastructure in a coordinated manner, to protect the health, safety, and welfare of local residents.** To this end, we assist communities with feasibility studies and master plans. We also direct communities to wastewater planning programs with the Department of Environmental Conservation and community facilities planning and construction programs, such as USDA Rural Development. Through emergency planning, we work with communities to develop and implement Local Emergency Management Plans and Local Hazard Mitigation Plans.
- **We strive to provide a reliable and safe transportation system with improved access to destinations within and outside the region for a greater number of people.** NVDA coordinates the Transportation Planning Initiative (TPI) through an annual contract with VTrans to provide a statewide framework for public involvement in planning improvements to Vermont’s transportation system, with communities represented through regional

Transportation Advisory Committees (TACs). The TAC prioritizes projects, identifies local and regional transportation needs, and provides the platform for public involvement in the planning and development of the state's transportation system. NVDA also supports our communities with traffic counts, speed counts, and bike/pedestrian counts, Municipal Roads General Permit reporting and compliance, and training for local road foremen. NVDA serves on the board of directors for Rural Community Transportation (RCT), the nonprofit transportation serving the Northeast Kingdom and Lamoille County. We also co-facilitate RCT's Elders and Persons with Disabilities committee with the Lamoille County Regional Planning Commission.

(B) An evaluation of the goals and policies and any amendments necessary due to changing conditions of the region.

The readoption changes no plan policies, goals, or objectives. The purpose of the plan readoption is to give the NVDA the time it needs to deeply engage with the towns and the public in a substantial update to the Regional Plan. Without readoption, the current plan will expire on August 27, 2023. Readoption will allow the NVDA to take the time that is necessary to update the regional plan, which we anticipate will take 18 to 24 months after the current plan is readopted.

The current Regional Plan (as well as its prior iterations) contains all the required elements of 24 V.S.A 4348a and has served the region well as a resource to local planning commissions as well as Act 250 and Section 248 hearings. In 2018, the plan was amended to receive substantial deference in Section 248 hearings.

NVDA's current Regional Plan for the Northeast Kingdom is here: <http://www.nvda.net/regional-plan.php>

C) an evaluation of the land use element and any amendments necessary to reflect changes in land use within the region or changes to regional goals and policies;

The vast majority of the Northeast Kingdom remains forested, and the region still retains a substantial holding of agricultural lands. The land use element of NVDA's Regional Plan strongly supports the statewide goal of maintaining traditional centers of development while minimizing the fragmentation of surrounding open lands. While the Land Use plan acknowledges that recent development patterns may be contributing to incremental sprawl, the Plan proposes to work with Towns to identify and implement strategies that reverse the current suburbanization trend. The Plan also promotes an economically vital mix of commercial and residential uses in established centers of development, as well as a variety of housing types at different price points to support long-term sustainability.

Our land use classifications remain in the Plan remain unchanged, including the Plan's specifications for sensitive rural lands containing one or more of the following attributes:

- State natural areas and fragile areas: The region has two such areas, which are both designated as National Natural Landmarks, the Willoughby Cliffs area and the Barton River Marsh;
- Lands managed by the Department of Forest Parks and Recreation;
- Highest priority forest habitat blocks;
- Forested coverage of Site Class 1, 2, and 3 soils of 25 acres or more;
- Headwaters;
- Upland areas of 2,000 or higher;

As stated in our 2015 Plan, lands containing one or more of these attributes shall not be developed, as their best uses are a combination of forest and conservation purposes. Appropriate uses include sustainable forestry and logging practices, maple syrup production, wildlife habitat, and passive recreation.

NVDA is aware that the Department of Housing and Community Development (DHCD) is developing guidelines for all 12 regional planning commissions to map future land uses in a consistent manner. NVDA staff participated in an advisory group to develop recommendations, and those recommendations were shared with the Vermont Association of Planning and Development Agencies. Last week, VAPDA sent the recommendations to the DHCD. The new Regional Plan, which is currently under development, will adhere to whatever guidelines are ultimately adopted by the regional planning commissions. However, we do not anticipate that our land use goals and strategies will change.

(D) Priorities for implementation in the next five years.

Priorities for implementing the plan include continuing to work with member municipalities to enact the policies set out in the Plan; guiding growth into compact settlements while preserving and encouraging agricultural, natural resource, silvicultural, and recreational activities; fostering economic opportunities through new and expanded businesses that enhance the region’s economic base; and completing the Regional Plan amendment to reflect current needs and trends.

(E) Updates to information and data necessary to support goals and policies.

The updated Regional Plan will use information and data in a more meaningful way. While the current Regional Plan has a wealth of data, it can feel overwhelming to the citizen planner. Our substantial update to the Regional Plan therefore proposes to make the content more accessible, while still meeting state requirements for content. We intend to clearly explain the key issues affecting the NEK from a single voice. (The current regional plan has an entirely separate Transportation Plan, making it difficult for readers to see the interrelated goals and impacts between transportation, land use, energy, housing, and utilities and facilities.) Our new plan will break down these silos by organizing core planning concepts and issues around major themes that include equity, sustainability, community empowerment, and relevance and usefulness to the community. Supporting the last theme, the Plan will contain case studies on local actions and outcomes. Additionally, data will be integrated into the plan more thoughtfully to support the plan’s narrative and recommendations. Relevant data tables and studies will be available to readers in appendices.

We also anticipate that an update to the information in the housing element will be necessary to meet the requirements of Act 47, also known as the HOME Act.

Information accompanying the energy element has been updated and attached to this Report and Assessment. The standards for regional plans to receive Substantial Deference from the Public Utilities Commission in Section 248 proceedings have been revised since the update to the Regional Plan in 2018. While not all the information regarding new projections for weatherization and fuel switching is available, we believe that this interim update will allow the updated and readopted Regional Plan for the Northeast Kingdom to continue to receive Substantial Deference.

A copy of the Regional Plan, as well as the Update and Assessment Report is being electronically mailed to all parties identified in 24 V.S.A 4348a, 30 days prior to the first hearing. If you have any questions about readoption of the Regional Plan for the Northeast Kingdom, please contact me at dsnedeker@nvda.net or 802-748-8303.

Two Public Hearings are Scheduled:

St. Johnsbury: Thursday, July 20th, 36 Eastern Avenue, 6:00 p.m.

Newport: Friday, July 21st, Gateway Center, 4:00 pm

NVDA Regional Energy Plan Assessment and Report – June 2023

Note: NVDA is proposing an update and re adoption of its regional plan in accordance with [24 V.S.A. § 4348b](#). If readopted, this plan will remain in place until a new regional plan is proposed. Since NVDA last amended its energy plan to meet the requirements for Substantial Deference under Act 174, the requirements for certification to receive Substantial Deference from the Department of Public Service have changed. This Assessment and Report, which accompanies the readopted plan, addresses the updated requirements.

NVDA's Energy Plan aims to guide the region's energy development for the next eight years in support of Act 174, aligning with [Vermont's 2022 Comprehensive Energy Plan](#) (CEP), and [Vermont's 2021 Climate Action Plan](#). To meet state energy and climate goals, Vermont is planning for a major shift away from fossil fuels in the transportation and heating sectors to renewable sources of energy, efficiency in all sectors, and increase in-state renewable energy generation. Equity and justice must be integrated into all planning aspects; and as regional goals, objectives and actions are considered and implemented, it is critical to consider to three questions to empower more inclusive decision-making in the NEK:

1) Who is helped?

2) Who is harmed?

3) Who is missing?

NVDA strives to be consistent with the following state goals and policies:

- Greenhouse gas (GHG) reduction requirements under [10 V.S.A. § 578\(a\)](#)
 - 26% from 2005 levels by 2025
 - 40% from 1990 levels by 2030
 - 80% from 1990 levels by 2050
- The 25 x 25 goal for renewable energy under [10 V.S.A. § 580](#)
 - 25% in-state renewables supply for all energy uses by 2025
- Building efficiency goals under [10 V.S.A. § 581](#)
 - e.g., reduce fossil fuel consumption across all buildings by 10% by 2025
- State energy policy under [30 V.S.A. § 202a](#) and the recommendations for regional and municipal planning pertaining to the efficient use of energy and the siting and development of renewable energy resources contained in the State energy plans adopted pursuant to [30 V.S.A. §§ 202](#) and [202b](#)
- The distributed renewable generation and energy transformation categories of resources to meet the requirements of the Renewable Energy Standard under [30 V.S.A. §§ 8004](#) and [8005](#)

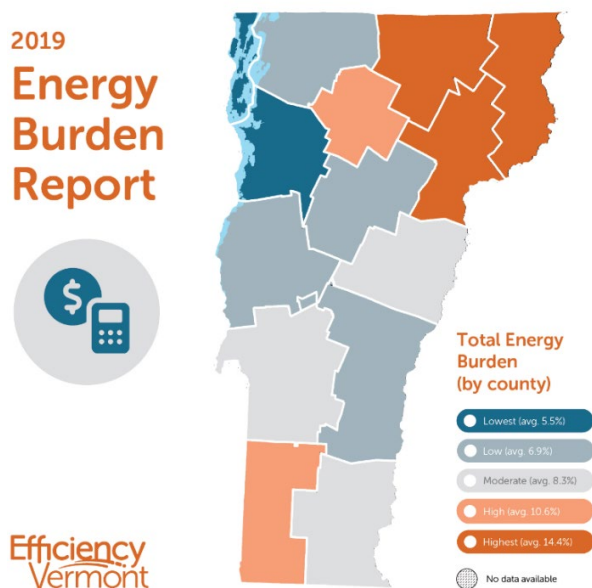
In addition, NVDA's Energy Plan aspires to follow the overarching goals and principles detailed in the [Energy Equity Project \(EEP\) Framework](#):

- 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.

Ultimately, NVDA's Regional Energy Plan strives to improve the outcomes for **environmental justice populations**, as defined by [Act 154](#), meaning "any census block group in which: (A) the annual median

household income is not more than 80 percent of the State median household income; (B) Persons of Color and Indigenous Peoples comprise at least six percent or more of the population; or (C) at least one percent or more of households have limited English proficiency.” Priority populations also include older, and chronically ill Vermonters and people with disabilities. For more information on how to internalize equity into policy and a list of populations vulnerable to the impacts of climate change, see the State of [Vermont Climate Council's Guiding Principles for a Just Transition](#).

For the Northeast Kingdom (NEK), one strategy for enhancing environmental justice means reducing energy burden, defined as the proportion of household income spent on energy costs, because the NEK experiences the highest energy burden in the state ([Efficiency Vermont 2019 Report](#)).



While Vermont's average energy burden is 10%, the NEK experiences some of the highest energy burdens (14-20%) statewide, reflecting around \$5,500 in household annual energy expenses. Of NEK household average energy costs, nearly half (46%) is spent on transportation, followed by heating, then electricity expenses. Essex County has the highest total energy burden in the NEK, followed by Orleans County, then Caledonia County. Nationally, an energy burden greater than 6% is considered high and is correlated with a “greater risk for respiratory diseases, increased stress and economic hardship, and difficulty in moving out of poverty” ([ACEEE](#)).

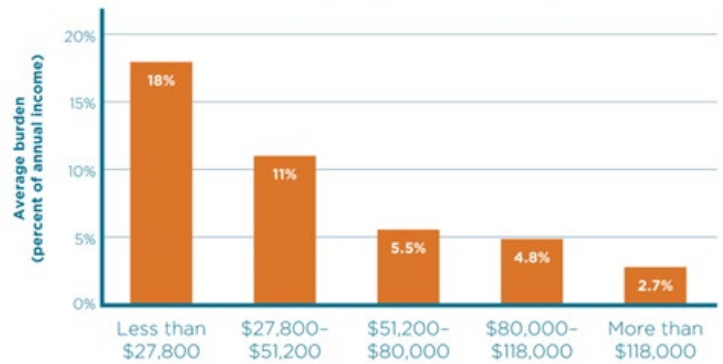
The 2019 Efficiency Vermont report uses 2017 data and was undergoing an update in 2023; while there are considerations that could improve this methodology and alternative proxies for energy burden, this is currently the most comprehensive Vermont data set available. Best available energy burden data continues to inform state, regional and local energy programs and strategies and is intended to steer resources to reach those greatest in need.

In Vermont, energy expenses disproportionately hurt those who are rural, lower-income, non-white, and non-homeowners ([UVM](#)). It is also important to note how energy spending often competes with other basic needs such as housing, healthcare, and food. As shown in [EAN's](#) chart (right), households earning less than \$27,800 pay an estimated 18% of their income towards heating and electricity bills, compared to less than 5% for households earning more than \$80,000. Lower-income households are

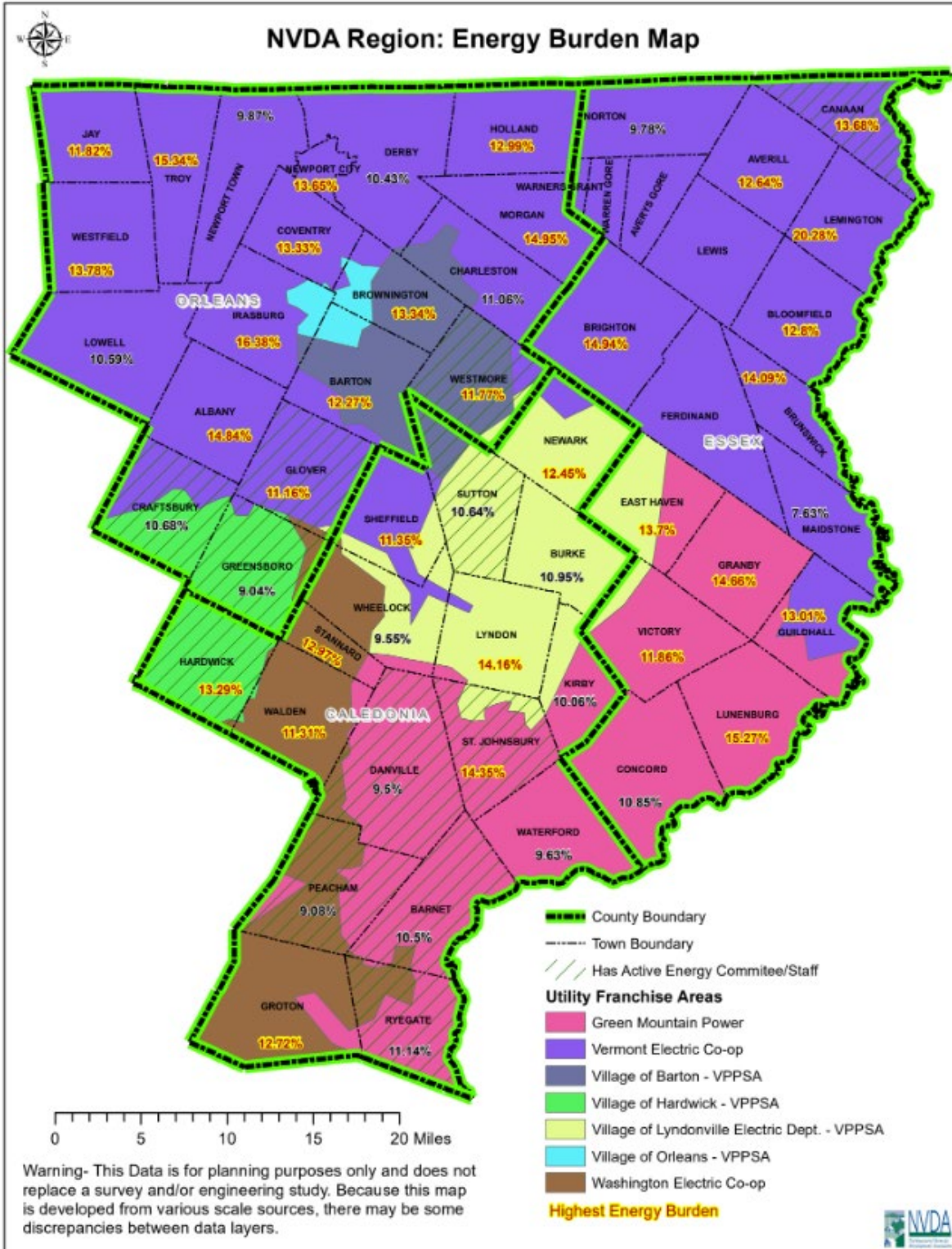
more likely to rent or own older homes, which in turn are less efficient and more expensive to heat and cool ([VHFA](#)).

NVDA prepared the [NEK Energy Burden Map](#) below to explore in more detail where the highest energy burdens are experienced in our region.

Combined heating and electricity energy burden in Vermont, by income quintile



Source: U.S. Census Bureau. American Community Survey, 2018.



HOW TO USE THIS ASSESSMENT & REPORT

The 2023 NVDA Regional Energy Plan includes the data required to meet the State of Vermont’s Act 174 energy planning standards and to inform the region’s advancement of the state’s energy and climate goals; it is divided into the following three sections:

- Section 1 – Updated NEK Energy Data & Analysis
- Section 2 – Renewable Energy, Storage, Transmission & Distribution Resources
- Section 3 – Pathways: Goals, Objectives, & Actions

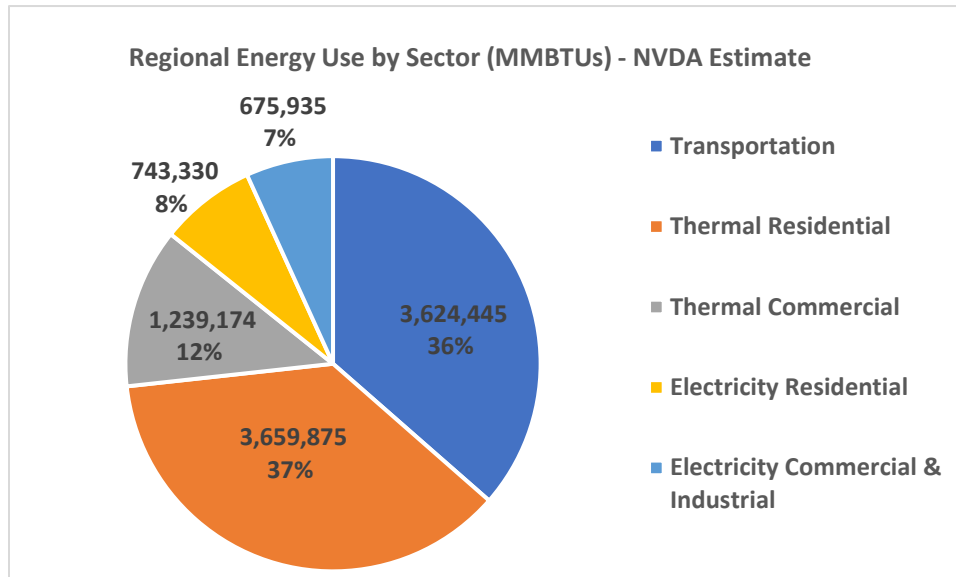
NVDA analysis in Sections 1 & 2 provide estimates for current regional energy use across all sectors: transportation, heating (thermal), and electricity. The data estimates also include renewable energy generation targets, anticipated for siting within the Northeast Kingdom (NEK), to contribute to the state’s energy and climate goals. Check NVDA’s website for the latest regional and local energy analysis including updated mapping of renewable resources, and forecasting from the Low Emissions Analysis Platform (LEAP), a software tool for energy system modeling and emissions accounting, across residential, commercial, industrial and transport energy use.

Section 3 Pathways lay out NVDA’s recommended goals, objectives, and actions for achieving the targets and addressing the challenges described in Sections 1 & 2. When it comes to equitable energy planning, NVDA recommends prioritizing access, affordability, and participation among high energy burden and environmental justice community members *first*. As evidenced in the [2023 Vermont Health Equity Toolkit](#), ensuring access to clean, affordable energy can lead to more resilient and sustainable communities. Transitioning away from fossil fuels, promoting energy efficiency, weatherization, and renewables, while addressing energy burden will have direct and positive impacts for all Vermonters.

SECTION 1 - UPDATED NEK ENERGY DATA & ANALYSIS

The data in this section is intended to provide an overview of current Northeast Kingdom (NEK) energy use and a sense of the trajectories and pace of change needed to meet the State’s goals. According to NVDA estimates, residential and commercial thermal use (heating space and water) is still the largest

energy use at 49%. Transportation¹ is still the second largest energy use in the NEK, accounting for 36% of total usage measured in MMBTUs, followed by electricity at 15%. Seen below, these estimates of regional energy use by sector have remained relatively consistent since the last NVDA plan, changing only a percentage or two, with the exception of residential electricity use, which increased by 4% since 2018.



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.

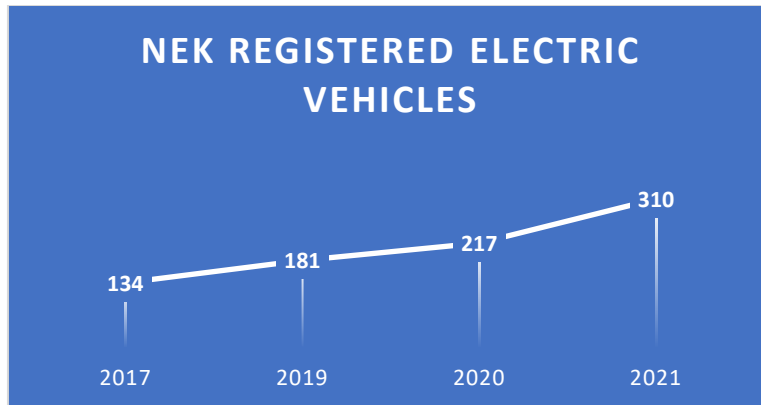
Current Energy Use

The data below are from various data sources and represent actual current consumption and generation in the NEK, rather than estimates from the Low Emissions Analysis Platform (LEAP), currently being updated by the Department of Public Service (PSD). Visit NVDA’s website (NVDA.net) for updates on the 2025, 2035, and 2050 LEAP Targets across all energy sectors.

Transportation Energy

The following data provides an overview of the passenger vehicle fleet composition by fuel source in the Northeast Kingdom and serves as a proxy for transportation energy use. Based on ACS 2015-2020 data, the NEK has around 48,247 fossil-fuel burning, light-duty vehicles. As of 2021, the NEK has 310 electric vehicles (EVs) registered, this includes all-electric and plug-in hybrid vehicles. Since NVDA’s last Regional Energy Plan, the number of EVs registered in the NEK has more than doubled – going from 134 (in 2017) to 310 (in 2021).

¹ Transportation data only includes light-duty vehicles, and commercial transportation data is not available.



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

Public EV Charging Infrastructure

As of 2023, there are over 350 public EV charging stations listed on Drive Electric Vermont website ([view the map](#)). NEK options for public EV charging have more than doubled since NVDA’s previous Regional Energy Plan, which listed only seven (7) charging stations for the region. While most EV drivers will charge at home (typically overnight) or sometimes at their place of employment, public charging infrastructure still will be needed for longer trips, visitors, or for those without charging access at home. 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.

Equity considerations must be thoughtfully integrated throughout ESVE planning process to ensure benefits and costs are fairly distributed throughout the NEK. Historically, clean energy and transportation innovations have not been deployed evenly across communities -- resulting in higher energy burden and rural, lower-income communities being left behind. EVSE equity concerns that can come up include a project’s affordability, accessibility, reliability, location, safety, and related employment and economic opportunities. The VTrans [NEVI program](#) and the U.S. Department of Transportation’s [Toolkit for Planning and Funding Rural Electric Mobility Infrastructure](#) offers helpful equity planning considerations and strategies relevant to the NEK. When assessing where EV charging stations should be located, engagement with rural, underserved, and high energy burden communities is essential to prevent delayed and diminished access to clean energy and transportation infrastructure vital to a healthy economy.

According to the U.S. Department of Energy (DOE), over the long term, EV ownership is usually less expensive than ownership of fossil-fuel vehicles. Additionally, low operation costs make some EVs less expensive on a monthly basis compared to equivalent fossil-fuel vehicles (when the vehicle purchase is financed). Therefore, increased EV adoption in the NEK could contribute to community-wide reductions in transportation energy cost burdens, of which our region has some of the highest rates. As stated by [Drive Electric Vermont](#), “It costs less to own an EV. Plugging in is like paying \$1.50 a gallon, and EVs need less maintenance than gasoline cars.” Energy stored in electric vehicle batteries, combined with bidirectional capabilities, shows promise for powering critical services in an emergency and potential to help to balance the grid.

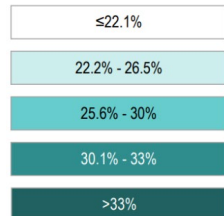
Increasing Transportation Equity - Transportation Demand Management (TDM)

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, ride share, 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. “These choices make the transportation system more accessible and equitable. They also create more livable, vibrant communities, and they can reduce transportation-related energy use and emissions.” ([CEP 2022](#))

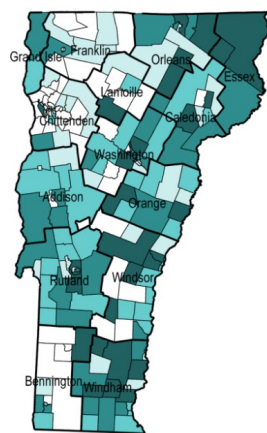
According to the Vermont Department of Health, the NEK has some of the highest percentages of the state population aged 60 years or older, as well as individuals with a disability. Lack of transit and safe walking infrastructure makes it harder for older adults to stop driving, even if they want to. Long travel distances in the NEK amplify the challenges of aging. Transportation is the top concern of people who want to age in place. Low-income people, 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.

Percent of Population Aged 60 Years or Older

Percent of all people aged 60 years or older by census tract (quintiles)

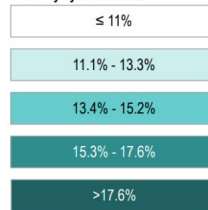


— County Boundary
— Census Tract Boundary

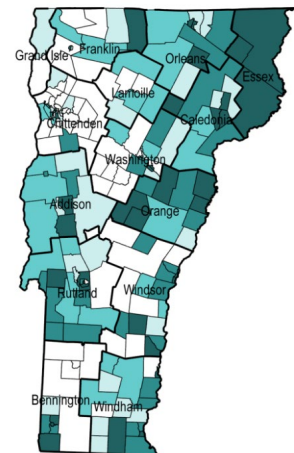


Individuals with a Disability

Percent of total civilian non-institutionalized population with a disability by census tract



— County Boundary
— Census Tract Boundary



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)

Multi-modal transportation that connects people to jobs and services (affordably and conveniently) can reduce single-occupancy trips, lower transportation costs and fossil fuel pollution, while improving health and economic opportunities.

As transportation and land use policies are considered for the NEK, it will be important to closely work and plan *with*, not just *for*, our most impacted community members. This will help ensure that NEK transportation energy burden, the highest in the state, is reduced equitably and that people with low incomes, disabilities, older Vermonters, and renters do not struggle to afford electric vehicles, electric bikes/scooters, charging equipment, and other desired mobility options.

Development Patterns and Transportation Use

Understandably rural development patterns directly impact transportation energy usage, especially regarding individual behaviors. With limited transit infrastructure, the region is dominated by single-

occupancy fossil-fuel vehicles. Residents typically commute to disparate labor market areas, reducing opportunities for carpooling. VTrans offers guidance and grant assistance to municipalities who wish to establish park and rides on municipal, state, or leased property on or near state highways, as well as other TDM options. Mixed-use, higher density neighborhoods encourage more pedestrian and micro-mobility options. The following land use² and mobility principles encourage not only reduced transportation energy consumption, but also offer important health equity benefits:

- Encourage the location of new development in or near traditional village and city centers to reduce both sprawl and the number of vehicle miles driven.
- Support transit-oriented development that fosters the expansion of public transportation, micro-mobility (e.g., bikes, e-bikes/scooters), and rail use.
- Encourage the construction of Park and Ride facilities to support carpool and rideshare efforts.
- Encourage the expansion of bicycle and pedestrian facilities such as safe sidewalks and bike lanes, as well as secure parking options for micro-mobility.
- Promote the development of EV charging stations (also known as electric vehicle supply equipment, or EVSE) in NEK village centers and downtowns like Hardwick, Newport and St. Johnsbury.

Additionally, improved telecommunications infrastructure in this region has the potential to reduce annual vehicle miles traveled (VMTs) by allowing more workers to telecommute.

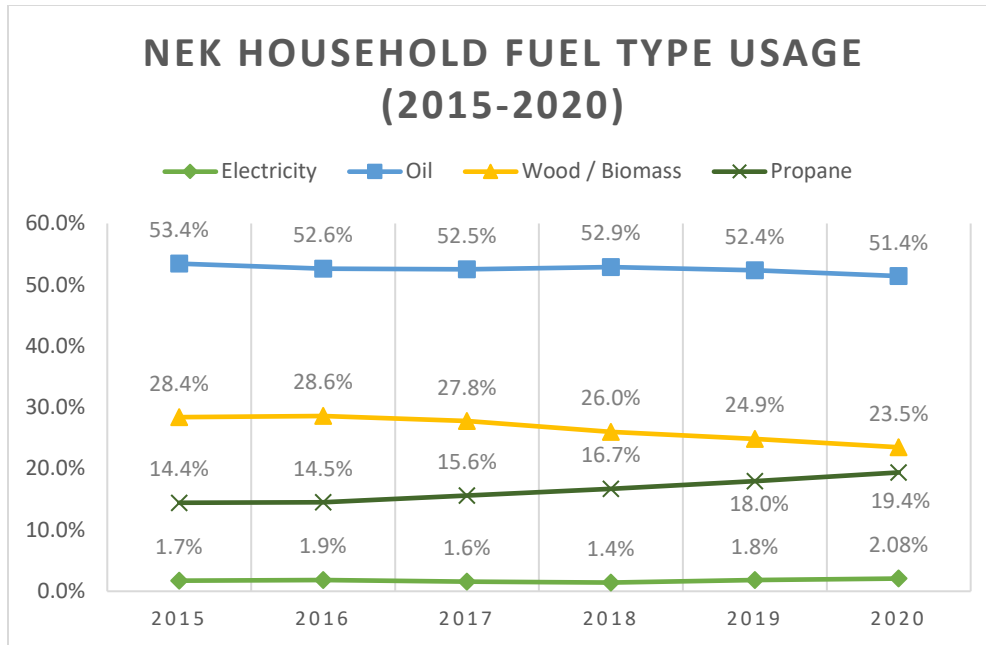
Commercial Transportation

Commercial shipping is one of the highest consumers of transportation fuels and another area in which the region can reduce consumption. As gas prices started to climb in the past decade area, businesses looked for alternative shipping methods and inquiries into the region's rail infrastructure grew. Railroad shipping is most desirable for non-perishable commodity goods. Upon further review it was found that regional rail infrastructure has the potential for growth, with room for increased traffic and a number of underutilized sidings. The Kingdom may also be able to attract additional rail usage if rail beds are upgraded to meet the 286,000 lb. weight limit standard and bridge heights are increased. Both improvements will allow rail cars to be filled to capacity and allow for the double stacking of rail cars, which is now standard across the country. NVDA also supports the re-establishment of the Twin State Line to better connect the Kingdom with greater rail markets in New England. Additionally, as [CAE Farm Connex](#) expands its capacity to help connect local agricultural producers to more regional and external markets, NVDA supports improved efficiency and reduced fossil fuel emissions for freight services.

Heating (Thermal) Energy

The data below describe how homes are heated in the Northeast Kingdom. 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. In fact, 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.

² See the Transportation, Land-Use, and Housing Sections of the *Regional Plan for the Northeast Kingdom* for additional energy-related recommendations.



Source: American Community Survey 2015-2020

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

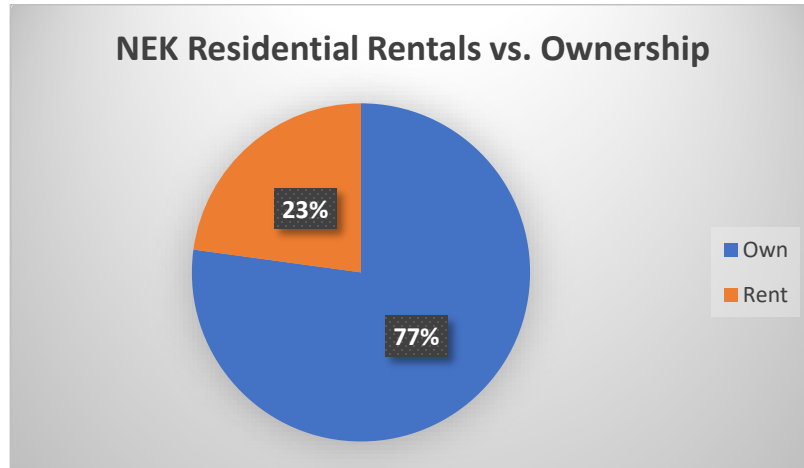
The Energy Action Network (EAN) estimated that Vermont needs to weatherize 13,400 homes each year (or at least 90,000 total) by 2030 to meet its climate goals ([Efficiency Vermont](#)). Currently, less than 2,000 homes are weatherized a year in Vermont. According to 2020 Census data, there are approximately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

Challenge: To meet these weatherization goals, EAN estimates the weatherization workforce needs to increase five-fold in the next five years.

Energy-burdened Vermonters spend more of their income on energy and their health is more likely to be affected by asthma, cold and heat. Additionally, [research](#) shows multiple, interrelated health risks linked to and intensified by energy burden. For example, high and/or overdue energy bills can contribute to stress and mental health concerns, that lead to unfavorable decision-making about how much to heat or cool the home, which can then further exacerbate health issues such as asthma, heart disease, and malnutrition, as well as physical inactivity.

Most weatherization assistance funds in Vermont are available to homeowners, leaving renters out of the resulting health, comfort, and financial savings. Rental housing represents about 30% of Vermont’s housing stock and almost 75% of people who rent their homes have incomes under Vermont’s median household income of approximately \$63,500. Tenants often cannot weatherize their homes because it is

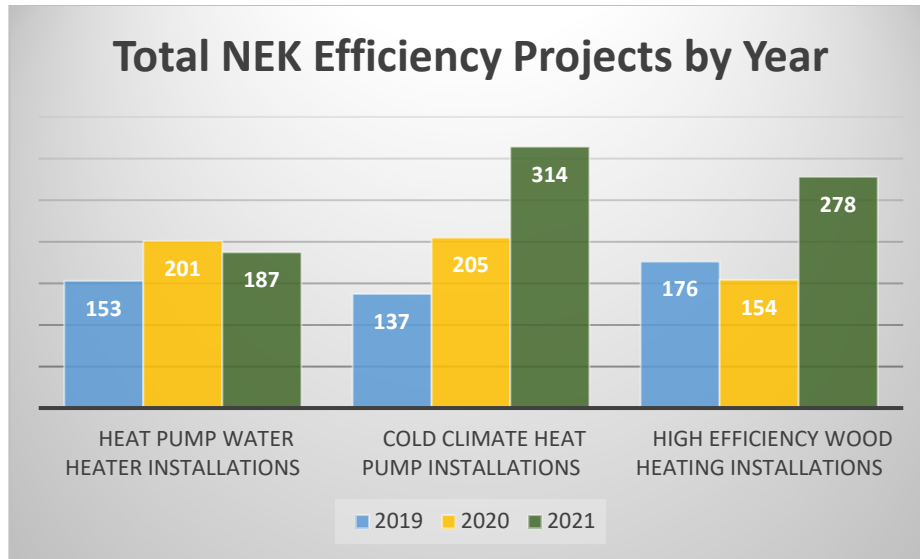
cost-prohibitive, but also because major structural changes to a building must include a willing landlord to participate. ([Rights & Democracy VT](#))



Source: American Community Survey 2020

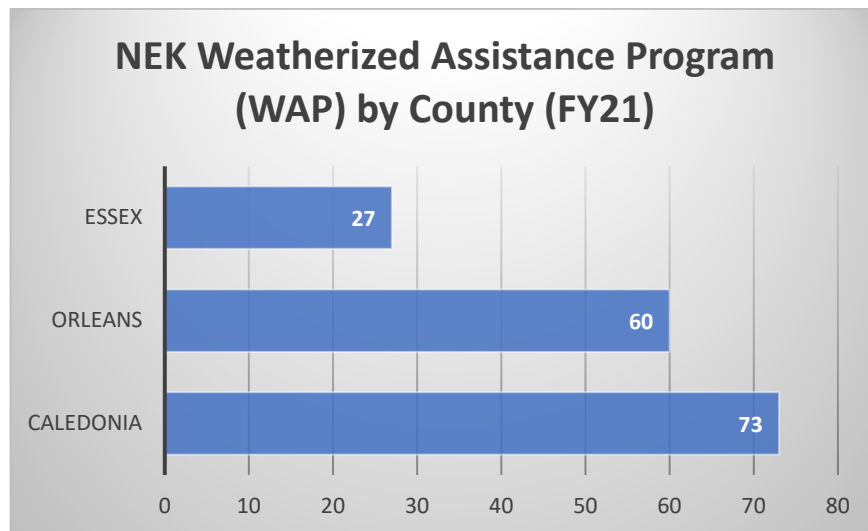
The best available data source for home weatherization implementation is Efficiency Vermont. Efficiency Vermont only monitors home weatherization programs done through the Home Performance with ENERGY STAR® (HPwES) program. HPwES is a comprehensive whole-house approach to diagnosing and addressing thermal and health/safety issues in the home to ensure a more energy efficient, comfortable, safe, and healthy home. A project is a collection of one or more energy efficient measures that have been implemented at a customer's physical location. A customer can be associated with one or more projects and in some cases, a project may be associated with multiple customers. Efficiency Vermont's data does not capture do-it-yourself projects or projects that do not go through the HPwES program. The data below indicates the number of weatherization and energy efficiency projects completed per year across the NEK (2019-2021). It is not intended to represent the total number of homes weatherized.

NEK Total Residential Weatherization by Year	2019	2020	2021	Total
Home Performance with ENERGY STAR® Projects	70	165	116	351
Other Weatherization Projects	55	39	40	134
Residential New Construction Projects	8	3	8	19



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

In FY2021, only 160 NEK homes (less than 1%) participated in the Weatherization Assistance Program (WAP), out of 1,050 statewide WAP projects, further detailed in the [Performance Indicators for the Vermont Weatherization Assistance Program Report](#) to the Vermont Legislature in 2022. The mission of the Vermont WAP is to help low-income Vermonters save fuel and money by improving the energy efficiency, health and safety of their home while reducing carbon emissions. In the NEK, WAP is free for all income-eligible participants and is administered by NETO. On average, the program makes about \$10,000 worth of improvements per home, installs about 1,500 square feet of insulation, and reduces drafts by about 40 percent.



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

NEK Commercial Thermal Energy Use

	# of Commercial Establishments	Average Heating Load (MMBTUs)	Total MMBTUs
Caledonia	722	829	598,292
Essex	103	1,118	115,174
Orleans	631	833	525,708
TOTAL	1,456	851	1,239,174
Source: Department of Public Service, Vermont Department of Labor			

Challenge from WAP report above: “The largest barrier to low-income home weatherization continues to be the presence of vermiculite insulation, a material known for containing asbestos. Unfortunately, there are also many other structural issues present in Vermont’s older housing stock which can prohibit Weatherization such as leaky roofs, wet basements, knob and tube wiring, and other structural issues. Historically, these issues would “defer” weatherization of a home indefinitely. Vermont’s Weatherization Program has adopted a “zero deferral” policy in recognition that addressing non-energy related issues that otherwise prevent weatherization is a critical equity policy. OEO secured \$125,000 of Vermont Low Income Trust for Electricity (VLITE) funds for vermiculite remediation and continues to leverage Zonolite Trust Funds. Additional funding to address deferral issues comes from the Vermont Community Foundation, as well as ARPA State Fiscal Recovery (SFR) funds.”

Commercial/Industrial Thermal

Most of the region’s commercial/industrial energy usage can be attributed to space heating and process heating. This table identifies average heating load per establishments and total MMBTUs consumed annually. Heating loads vary significantly and may be highly specific to the type of industrial processes. NVDA’s estimates were developed using assumptions about business patterns. For example, types of businesses that tend to employ more workers per establishment can be expected to be the larger consumers of heat energy – schools, hospitals and clinics, hotels, and restaurants. On the other hand, businesses that have few on-site employees – like real estate agencies – use significantly less.

Electricity

An estimate of current electricity consumption by residential and commercial/industrial sector in the Northeast Kingdom is shown in the table below.

NEK Electricity Consumption	kWh Usage by Year		
	2019	2020	2021
Commercial & Industrial	226,584,720	207,838,094	219,150,067
Residential	190,079,533	199,280,474	204,955,840

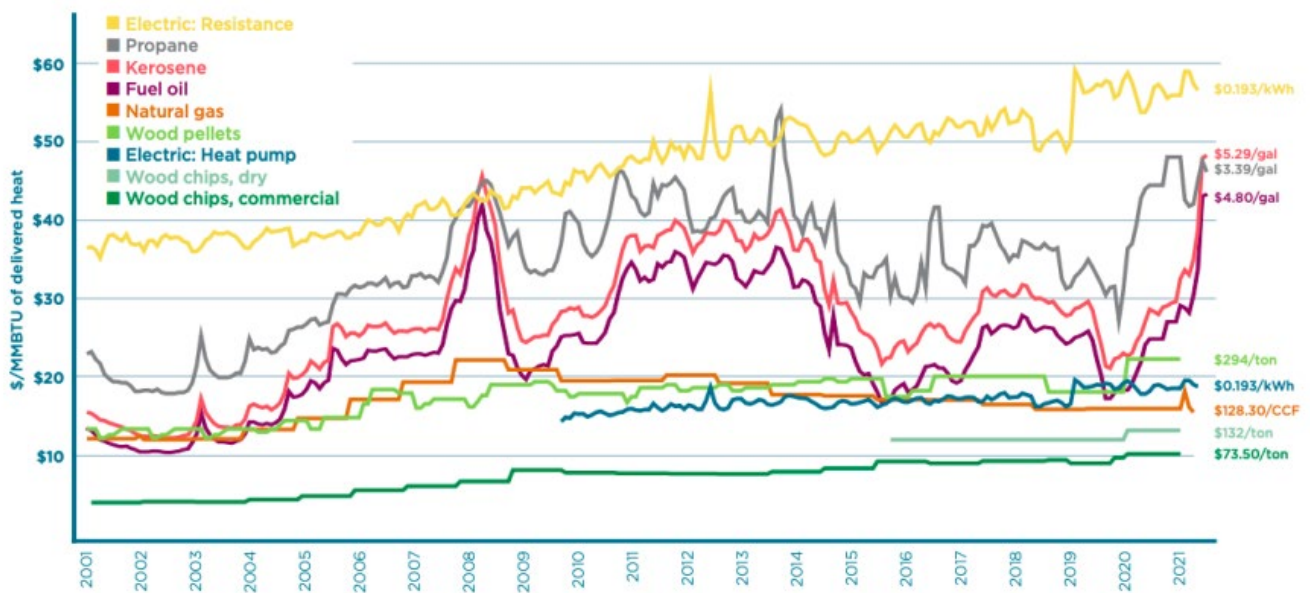
Total	416,664,253	407,118,568	424,105,907
Average Residential Usage	5,903	6,161	6,292

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.

In Vermont, renewable heat sources have historically seen less price volatility over time than fossil fuel options. The following EAN chart shows the cost of various Vermont heating fuels through April 2022.

Cost comparison of different heating options over time



Sources: Fuel Oil, Propane, Kerosene, Gasoline, Diesel, Wood Pellets: VT Department of Public Service, Fuel Price Report, 2021. Fossil Gas, Electricity: EIA, 2021. Wood Chips: Biomass Energy Research Center, 2021. Note 1: Electricity prices presented here are a statewide average. Electricity prices vary by utility territory. Note 2: The reason propane is more expensive per MMBTU than fuel oil but less expensive on a per gallon basis is because propane has a lower energy content per gallon. Propane’s energy content is 66% that of fuel oil, by gallon (EIA).

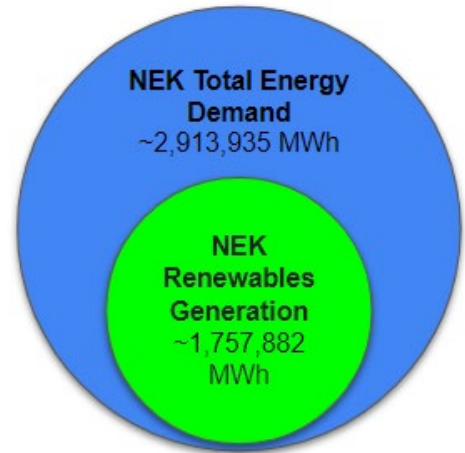
SECTION 2 - RENEWABLE ENERGY, STORAGE, TRANSMISSION & DISTRIBUTION RESOURCES

The 90x2050 projections – which will nearly eliminate the use of fossil fuels—will require transferring many of our uses to electricity. Therefore, even while electrical systems, appliances, and vehicles will likely continue to increase in efficiency, more electricity will need to be produced to meet our total regional energy demand. Some of that will continue to come from imported sources, such as hydroelectricity from Hydro Quebec and other sources from the New England Power Grid (ISO-NE), of which Vermont is connected. 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.

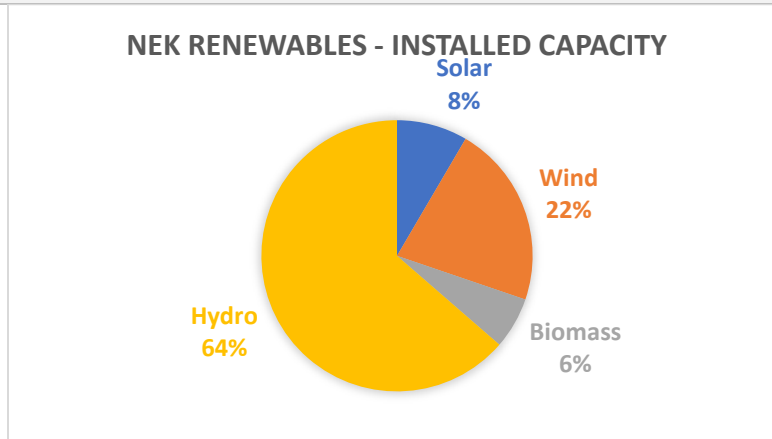
The NVDA infographic to the right shows the Northeast Kingdom’s total energy demand across all sectors (transportation, thermal, and electricity), compared to current renewable energy generation located within the region. It is an important reminder that the NEK hosts a lot of existing renewables and not much load (relative to other regions).

The following data shows existing renewable energy generation in the NEK, and a visualization of regional installed capacity in megawatts (MW), with hydroelectricity dominating at 64%, followed by wind (22%), then solar (8%) and biomass (6%).



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

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. See the updated NEK Energy Maps

for a full analysis (online at NVDA.net). Nevertheless, great care and consideration shall be given to the siting of new energy generation in the NEK.

VT LEAP Targets	In-state gen: 10%	In-state gen: 25%	In-state gen: 50%	Units
Target Year: 2032	811,165	2,027,912	4,055,825	MWh
Target Year: 2040	1,073,186	2,682,965	5,365,930	MWh
Target Year: 2050	1,194,382	2,985,954	5,971,908	MWh

Source: Vermont Public Service Department (PSD) Generation Scenario Tool, 2023

NEK Policy on the Development of Renewable Energy Resources

This region has a responsibility to plan for adequate supply of energy to meet local energy demand and reduce energy burden. Planning activities may include the production, storage, siting, and distribution of energy. Individuals, businesses, organizations, and communities are encouraged to explore emerging energy supply, efficiency, and distributed energy resource (DER) opportunities that meet accepted environmental and social standards and contribute to Vermont’s climate and energy goals.

New renewable energy development shall meet the highest standards required by law, while prioritizing safety, reliability, grid stability, affordability, equity, and environmental stewardship. Permitting authorities shall first consider current and historical land use and the culture of the region, community opinion, economic and health benefits, as well as the landowner’s rights. Any development shall, to the extent possible be done to mitigate adverse impacts to the region. Any utility-scale energy generation project deemed acceptable by the Public Utility Commission shall include a plan for distributing benefits to the towns in the region proportional to the adverse effects experienced by that town. Long term maintenance, safety issues, decommissioning, and land reclamation procedures required at the end of the energy project’s life must also be included in the project plan.

This plan aims to balance environmental quality and important natural resources with energy production, with special emphasis on the value of forest lands in sequestering and storing carbon. Significant local and regional support and clearly demonstrated benefits, especially affordability and accessibility, should exist in any energy proposal.

NVDA has a commitment to ensure that such development is equitable, affordable, feasible and ideally results in additionality. NVDA supports energy development that will not worsen already congested transmission, particularly in the Sheffield-Highgate Export Interface (SHEI), where several existing generators are frequently curtailed by the ISO. It is unlikely that any single solution will solve congestion within the SHEI and, as such, it is anticipated that incremental progress will be achieved as partial solutions are implemented. In the meantime, NVDA will support projects that are consistent with the land use and conservation measures in this plan and in duly adopted plans of impacted municipalities. Additionally, we will expect project developers to work with utilities and other stakeholders to explore innovative strategies that shift generation away from the hours when generation exceeds load within the SHEI area or otherwise avoids exacerbating congestion on the grid. An example of such a project would pair battery storage with a solar system to control when the project’s power is exported to the grid. In determining support for such a measure, NVDA will seek guidance from the long-range Transmission Plan and Integrated Resource Plans in the region and will consult with utilities, VELCO, and other stakeholders.

NEK Siting Guidelines for Renewable Energy Generation

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. NVDA Energy Maps, available online at NVDA.net, can be used to identify areas unsuitable for development, but more importantly guide decision-making around identified potential (and preferred) areas for renewable energy development to meet regional energy demand, reduce energy burden, and contribute to the state energy and climate goals.

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:

Known constraints are areas not likely to be developed for renewable energy because they contain one or more of the following: vernal pools; river corridors; FEMA floodways; significant natural communities; rare, threatened and endangered species, national wilderness areas, wetlands (Class 1 and Class 2).

Possible constraints are areas that would likely require mitigation because they contain one or more of the following: agricultural soils; special flood hazard areas (outside of the floodway); protected (conserved) lands; deer wintering areas; Act 250 mitigated agricultural soils; hydric soils, highest priority forest, connectivity, and physical landscape blocks, and highest priority surface water and riparian areas.

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).

The maps accompanying this plan do not carry the weight of zoning, and the siting of renewables on prime acreages (i.e., without known constraints) is not a foregone conclusion. Rather regional maps should be viewed as a starting point for our member municipalities to determine suitable and unsuitable locations for renewable energy development. NVDA strongly encourages municipalities to conduct additional site investigations to identify local constraints (as well as preferred sites in addition to existing statewide preferred sites) in order to address the environmental, aesthetic, civic, economic, and cultural concerns unique to each community.

Equity Strategies for Renewable Energy Access & Affordability

Renewed efforts across Vermont are focusing on reducing energy burdens and improving access to heating and cooling, broadband, healthy and affordable food, transportation options, and reliable well-compensated work. All these efforts increasingly depend on clean, reliable, and affordable energy

infrastructure, as do many of the recommendations in this plan. Black, Indigenous, People of Color, (BIPOC), as well as low-income, and rural Vermonters have largely been left out from major economic, social, and environmental benefits associated with investments in climate resilience and renewable energy infrastructure. BIPOC Vermonters were seven times more likely to have gone without heat in the past year, over two times more likely to have difficulty affording electricity, and seven times less likely to own solar panels than white Vermonters ([Act 154 Sec 1.10](#)), while rural and low-income communities consistently carry the highest energy burden.

For healthy communities to thrive, local leaders should look to programs and policies that encourage locally generated and managed fossil-fuel-free energy, while prioritizing access and affordability for historically underserved community members. 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. DERs like community-owned solar and utility-led energy programs that promote energy savings and [energy storage](#) are both strategies that can lead to improved health and equity in Vermont communities, and are explored in more depth below. NEK communities are encouraged to work with NVDA to assess local potential renewable energy projects and adopt an enhanced energy plan that identifies and prioritizes energy efficiency and generation goals and renewable energy siting that is desirable and beneficial to the community at large.

- **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.

SECTION 3 - NEK PATHWAYS: GOALS, OBJECTIVES & ACTIONS

The following policy pathways outline NVDA's recommended goals, objectives, and actions for achieving the targets and challenges addressed in Section 1 & 2. Furthermore, these pathways are aligned with the goals of Vermont Climate Action Plan and Comprehensive Energy Plan. NVDA regional energy planning aspires to internalize the overarching goals and principles from the [Energy Equity Project](#) (EEP):

- 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.
 - Use Vermont's [Guiding Principles for a Just Transition](#) (Scoring Rubric)
 - Use [Initiative for Energy Justice Scorecard](#) (+ [Interactive PDF](#))
 - Use the [EPA Environmental Justice Screening and Mapping Tool](#)
 - Use [UVM's Vermont Environmental Disparity Index](#)

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.

ACTIONS:

- Continue and evaluate partnerships with existing utilities and other energy and conservation programs and funding sources to facilitate weatherization, fuel switching, and increased energy savings and comfort within NEK housing and other building stock.
- Decrease fossil fuel heating and increase affordable electrification by working with Energy Committees and other NEK Energy Network partners to raise awareness among homeowners, renters, landlords, developers, etc. on the benefits of fossil-fuel-free technology such as cold-climate heat pumps, advanced wood heating and geothermal systems. Examples include thermal-led combined heat and power (CHP), biomass district heating and biogas generation (capturing the methane produced by landfills or farms and using it instead of fossil fuels).
- Support upgrade and trade-out programs and incentives for retiring outdated, higher-emission, polluting wood burning stoves and boilers.
- Reduce fossil fuel consumption in the transportation sector, through Transportation Demand Management (TDM) and the electric vehicle promotion strategies outlined further in the NVDA Transportation & Land Use Plan.
- Provide assistance to municipalities when requested to enhance town plans to be consistent with Act 174 standards for the purpose of enabling municipalities the ability to gain substantial deference in the Certificate of Public Good Section 248 process. This assistance will include working with municipalities and businesses to identify natural, cultural, historic, or scenic resources to be protected from all development types, identify preferred locations for renewable energy generation facilities, and encourage "leading by example" with respect to energy efficiency for buildings and transportation and the deployment of renewable energy.
- Empower the NEK Energy Network to engage with residents and municipalities about opportunities to reduce energy burden and switch to affordable renewable energy sources. Additionally, continue to collaborate and partner with organizations (including municipalities, educational institutions, businesses, and non-profits) to help meet the State's energy and climate goals.
- Support a wide variety of renewable energy generation types, including, but not limited to, sustainable uses of biomass for heating, passive solar building design, biodigesters for electricity

generation, photovoltaic solar, agrivoltaics, small-scale wind turbines, and optimizing the energy potential for existing hydro-electric dams.

- Work with the distribution utilities on long-range infrastructure capacity planning.
- Support in-place upgrades of existing facilities, including existing renewable energy generation, storage, transmission lines, distribution lines and substations as needed to reliably serve municipalities and the region.
- Support changes in federal, state, and local policies to achieve the state of Vermont’s goals related to the Comprehensive Energy Plan, Climate Action Plan, and Environmental Justice law.
- Encourage the legislature to adopt policies and increase incentives and rebates that reduce energy burden.

Objective:

Promote climate-ready and resilient buildings and communities.

ACTIONS:

- Promote Vermont’s residential and commercial building energy standards (RBES/CBES) for new construction and existing buildings, including additions, alterations, renovations, and repairs.
 - Host and facilitate building science/standards training and education opportunities for local officials, zoning administrators, and relevant workforce development groups. Encourage communities with zoning to require Certificates of Occupancy. Encourage the local adoption of “stretch energy codes.”
 - Review local zoning bylaws and offer technical assistance to development review boards when evaluating the energy, climate, and health implications of site plans for proposed developments.
 - Work with housing and energy efficiency organizations to promote and improve the regional supply of affordable, high efficiency manufactured housing, such as Zero Energy Modular homes.
- Continue collaborations with key partners, such as Vermont Department of Health, state and regional emergency management, regional hospitals and community groups; identify buildings and facilities that serve critical community functions, including as emergency heating and cooling sites.
- Pilot Community-led Resilience Hubs in the NEK to advance climate and energy resilience, emergency management, and social equity while providing expanded opportunities for communities to be successful before, during, and after disruptions. ([2022 EAN Action Team Proposal](#))

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.

ACTIONS:

- Support the development and siting of renewable energy, storage, transmission, and distribution resources on state and regionally preferred (and potential) locations, as identified by NVDA Act 174 Energy Maps (available online at [NVDA.net](#)).

- Investigate public benefits provided to communities either directly from renewable energy developers or as a condition of a Certificate of Public Good. Assess if the current system is equitable to all municipalities impacted by a renewable generation facility, or if the current system can be improved to provide greater equity to all community members impacted by a renewable energy generation facility.
- Support the economic viability of farms through appropriate renewable energy development as a complementary use that keeps farms in agricultural production while preserving agricultural soils and working lands.
- Promote the use of and increase the amount of on-farm power and community energy generation and the use of renewable energy for farming and food production (such as anaerobic digesters, solar, wind, biomass, and biodiesel) in accordance with local and regional planning priorities.
 - Encourage [agrivoltaics](#) that co-locates solar energy generation with active farming.
 - Encourage and support agricultural production of biofuels and oilseed crops and explore ways to broaden access to processing infrastructure.

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:

ACTIONS:

- Follow the [2023 Vermont Transportation Equity Framework](#) to help decision makers plan for and prioritize projects, ensure accurate representation in decision making, and enhance the equitable delivery of services. Continually assess NEK transportation access and barriers.
- Expand walking and biking infrastructure to support active, multi-modal transportation and to provide interconnection with the region’s transit system by:
 - Implementing the strategies and priorities identified in the [Vermont Health Equity Planning Toolkit](#) that are relevant to the NEK.
 - Working with municipalities to update municipal road standards (for maintenance and new construction) to reflect [Complete Streets](#) principles.
 - Reviewing state transportation projects to ensure that Complete Streets are implemented.
 - Ensuring that site plans include adequate bike and pedestrian infrastructure and safety measures, through participation in the Act 250 hearing process.
 - Assisting municipalities with scoping of future bike and pedestrian facilities to improve safety, accessibility, efficiency, and continuity of the system. Municipalities could use the outcomes of the scoping studies to apply for various VTrans implementation grants.
 - Promote the use of the region’s infrastructure such as the Lamoille Valley Rail Trail (LVRT) and support the efforts of local groups maintaining them and providing enhancing amenities.
- Promote Transportation Demand Management (TDM) and Ridesharing programs:
 - Promote and support the [Go!Vermont](#) program that links travelers to a variety of transportation resources and mobility options.
 - Support the continued development and expansion of Park-and-Ride facilities.

- Support employer programs to encourage telecommuting, carpooling, vanpooling, walking, and biking for employee commute trips.
- Continue to advocate for better telecommunications infrastructure so employees can work remotely.
- Encourage increased use of public transit by:
 - Increasing investment in Rural Community Transit (RCT) services in the NEK
 - Working in cooperation with RCT and VTrans to identify opportunities for transit improvement/expansion. Integrate park-and-ride facilities with transit routes.
 - Maximizing ridership for public school buses and minimizing use of private vehicles for student transport.
- Adequately fund the maintenance and preservation of our existing transportation assets including roads, bridges, rail, transit, walking/biking, park-and-ride facilities, and transportation demand management (TDM) programs.
 - Promote and support rail infrastructure as a cost-effective transportation resource.

Objective:

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

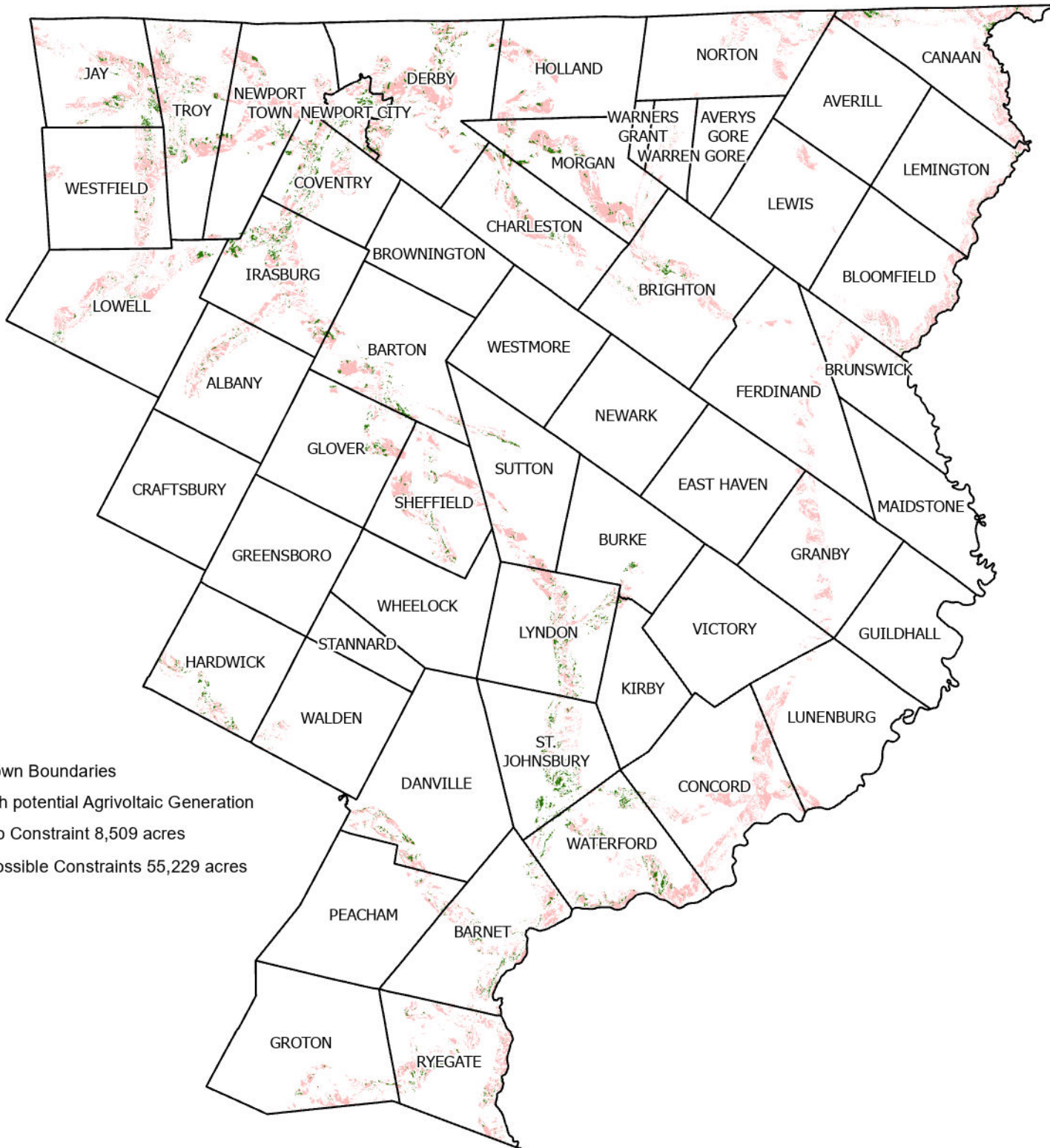
ACTIONS:

- Encourage 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.
- Support and encourage municipalities and businesses to install EV charging stations at convenient and desirable locations, such as in front of restaurants, stores, tourist and recreational destinations, and community sites like Town Halls and libraries, where users would want to park for several hours. Explore and pursue incentives to defray the cost of installation and administration so that users pay only for electricity.
- Support and expand access to liquid biofuels for use in commercial vehicles and heavy equipment, as well as electrification.
- Support and expand the use of electric powered buses and vans among the public and private transportation providers serving the region, including school districts ([EPA Clean School Bus Program](#)).
- Work with cycling advocacy groups such as Local Motion by hosting safe on-road cycling workshops and raise awareness about the viability of micro-mobility (such as electric bikes and scooters).
- Provide training to local zoning and development review boards to consider infrastructure for alternative transportation in their review of site plans.
- Provide technical and grant writing assistance to municipalities who plan for multi-modal transportation and better connectivity with alternative transportation modes.



NVDA Energy Map Potential Agrivoltaic Areas

05/31/2023



- Town Boundaries
- Areas with potential Agrivoltaic Generation
 - No Constraint 8,509 acres
 - Possible Constraints 55,229 acres

0 10 20 Miles

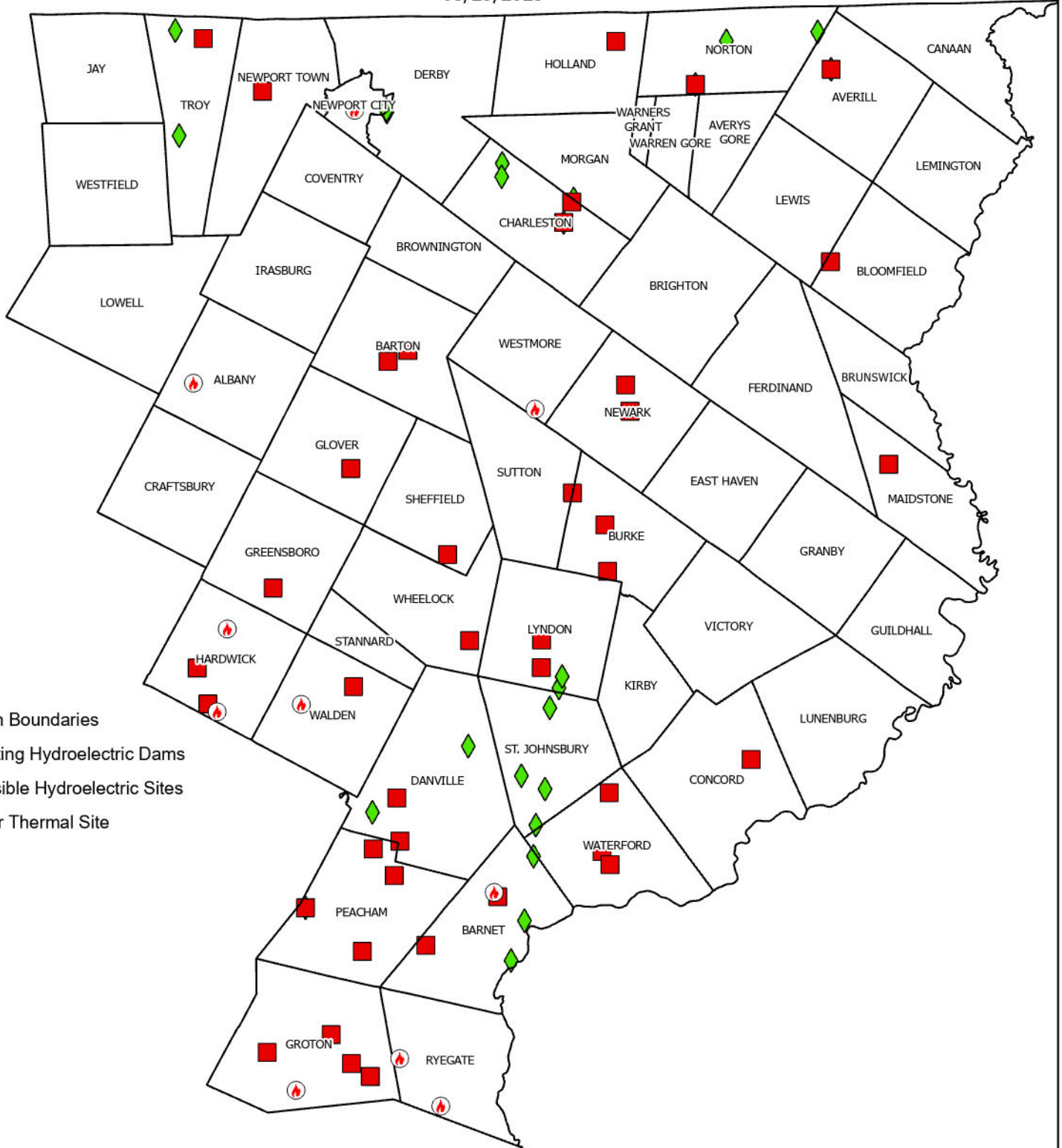
Warning- This Data is for planning purposes only and does not replace a survey and/or engineering study. Because this map is developed from various scale layers, there may be some discrepancies between data layers.



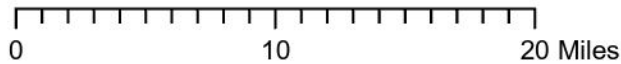


NVDA Energy Map Hydroelectric Generation

05/25/2023



- Town Boundaries
- Existing Hydroelectric Dams
- Possible Hydroelectric Sites
- Solar Thermal Site

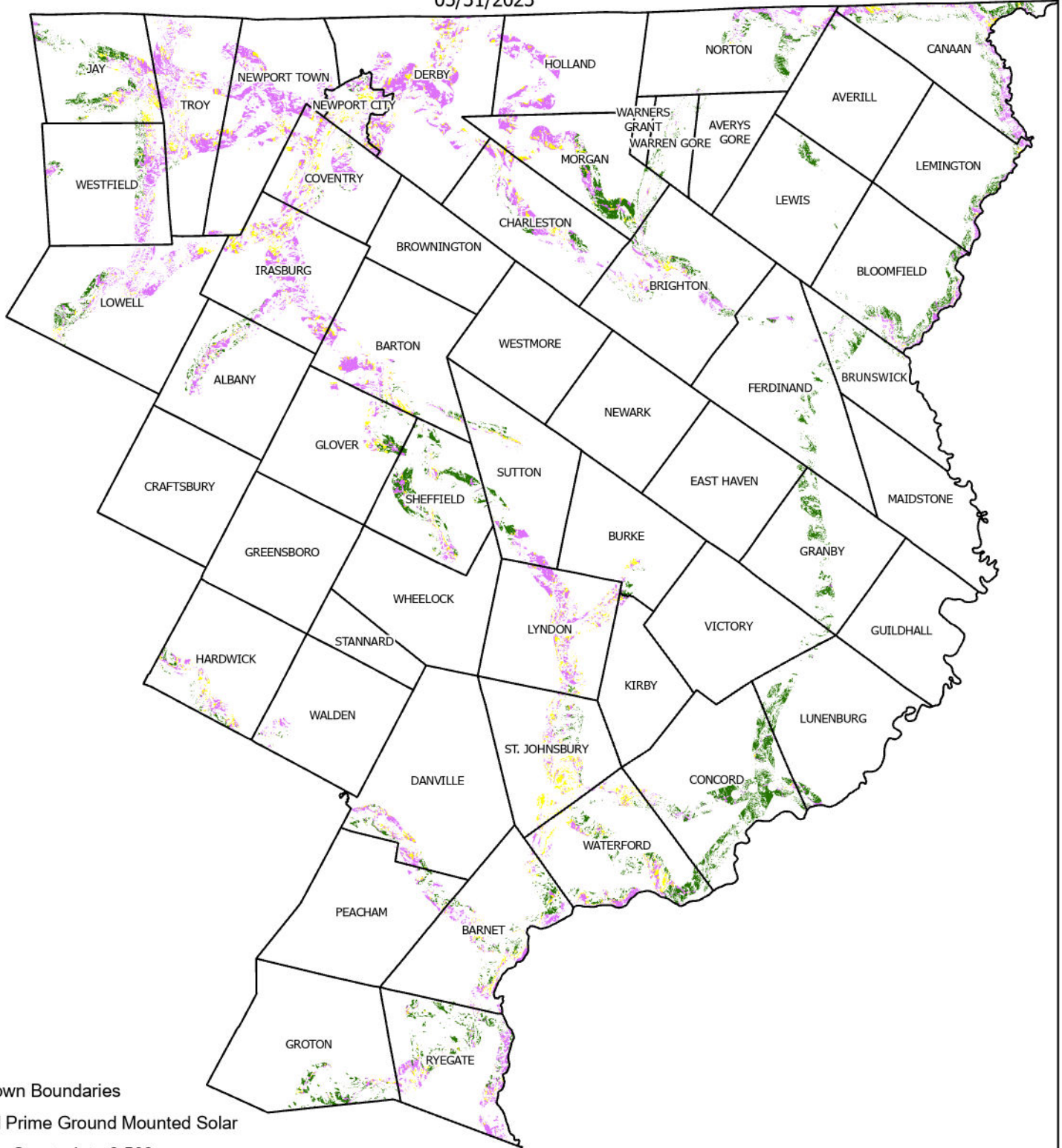


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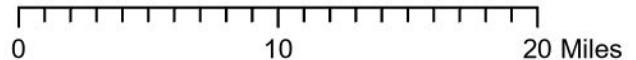


NVDA Energy Map Preferred Ground-Mounted Solar Energy Sites

05/31/2023



- Town Boundaries
- Preferred Prime Ground Mounted Solar
 - No Constraint - 8,509 acres
 - Possible Constraint, Other - 34,534 acres
 - Possible Constraint - Forest Blocks/Connectivity - 20,695 acres



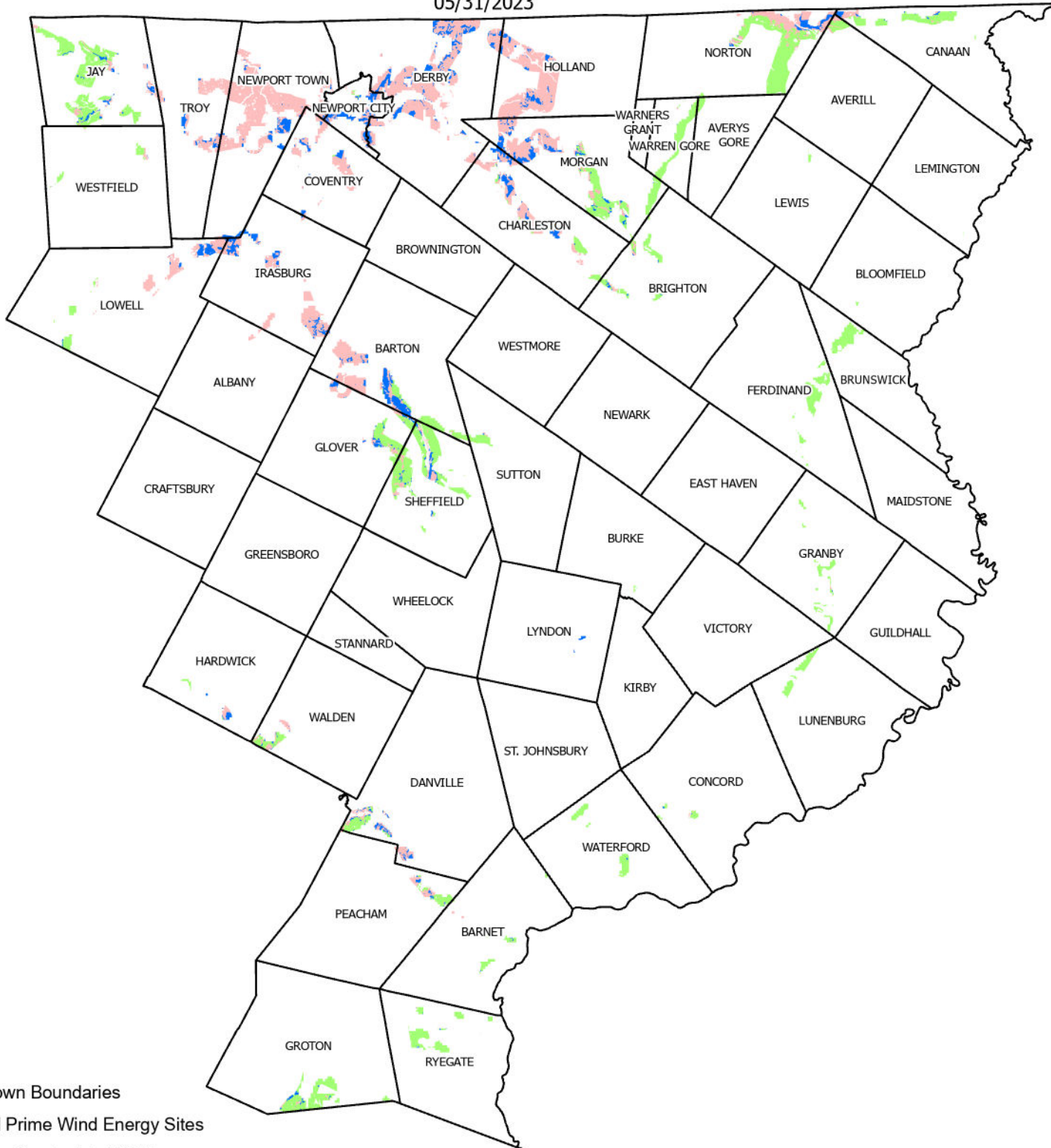
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NVDA Energy Map Preferred Wind Energy Sites

05/31/2023



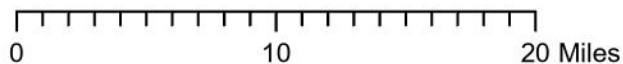
Town Boundaries

Preferred Prime Wind Energy Sites

No Constraint - 7,927 acres

Possible Constraint, Other - 30,065 acres

Possible Constraint - Forest Blocks/Connectivity - 23,310 acres



Warning- This Data is for planning purposes only and does not replace a survey and/or engineering study. Because this map is developed from various scale sources, there may be some discrepancies between data layers.

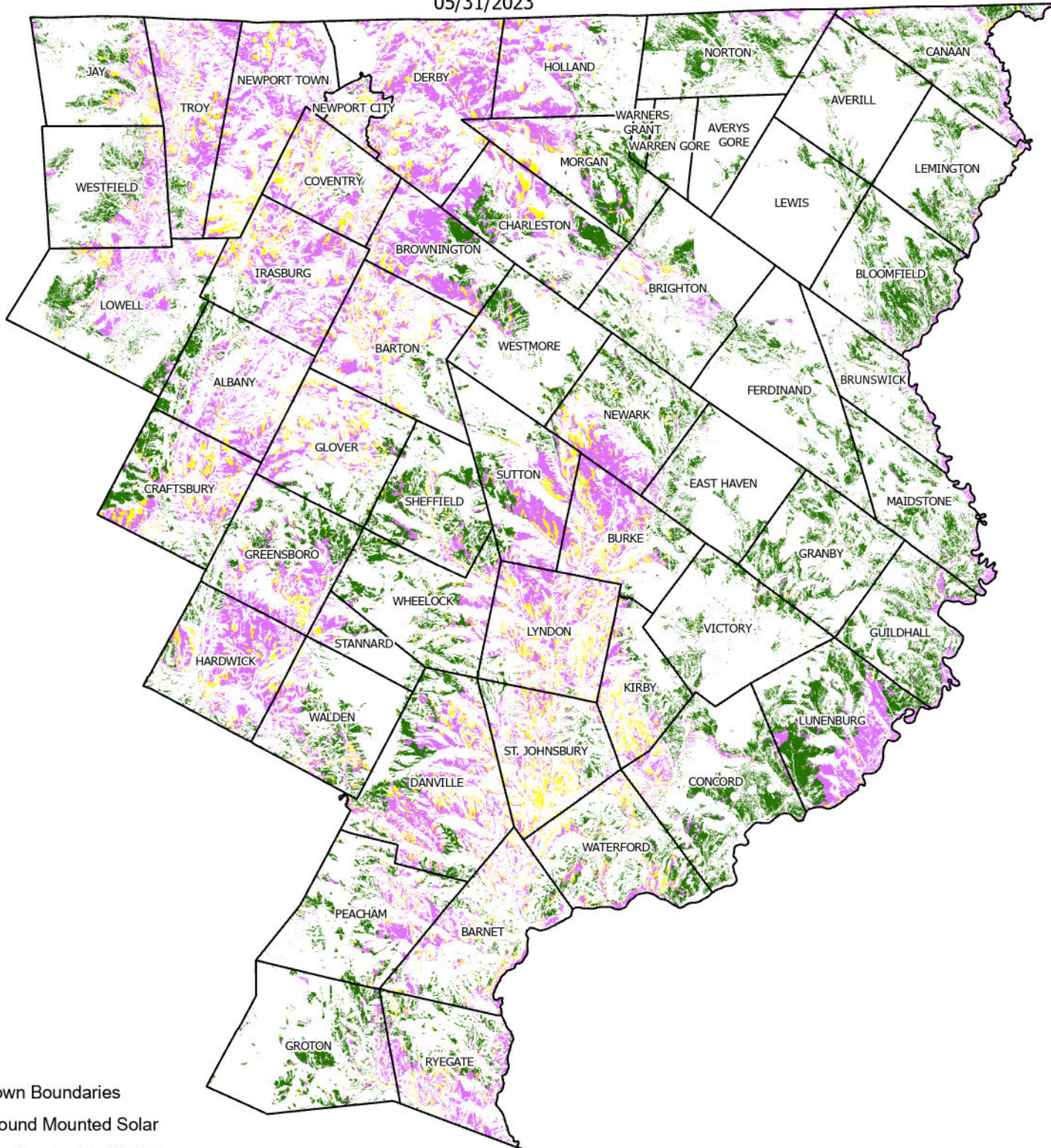
As detailed in our Energy Plan, NVDA's position is that no further development of industrial-scale wind turbines should take place in the Northeast Kingdom.





NVDA Energy Map Prime Ground-Mounted Solar Energy Areas

05/31/2023



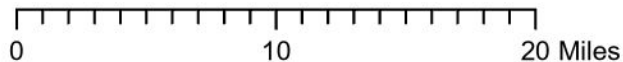
 Town Boundaries

Prime Ground Mounted Solar

 No Constraint - 33,378 acres

 Possible Constraint, Other - 141,483 acres

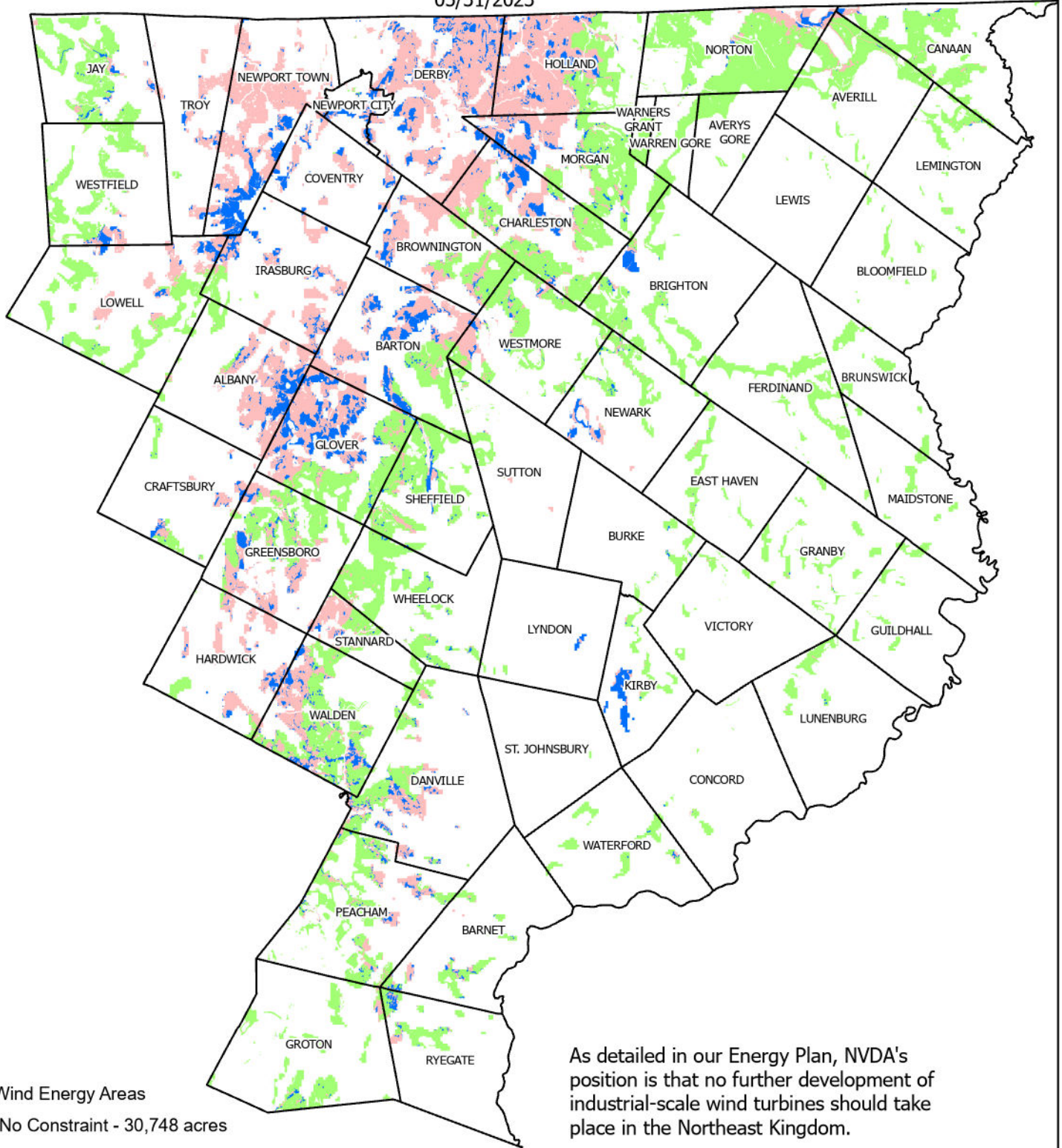
 Possible Constraint - Forest Blocks/Connectivity - 131,172 acres



Warning- This Data is for planning purposes only and does not replace a survey and/or engineering study. Because this map is developed from various scale sources, there may be some discrepancies between data layers.

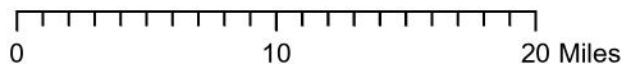
NVDA Energy Map Prime Wind Energy Areas

05/31/2023



- Prime Wind Energy Areas
- No Constraint - 30,748 acres
 - Possible Constraint, Other - 107,977 acres
 - Possible Constraint - Forest Blocks/Connectivity - 163,839 acres

Town Boundaries



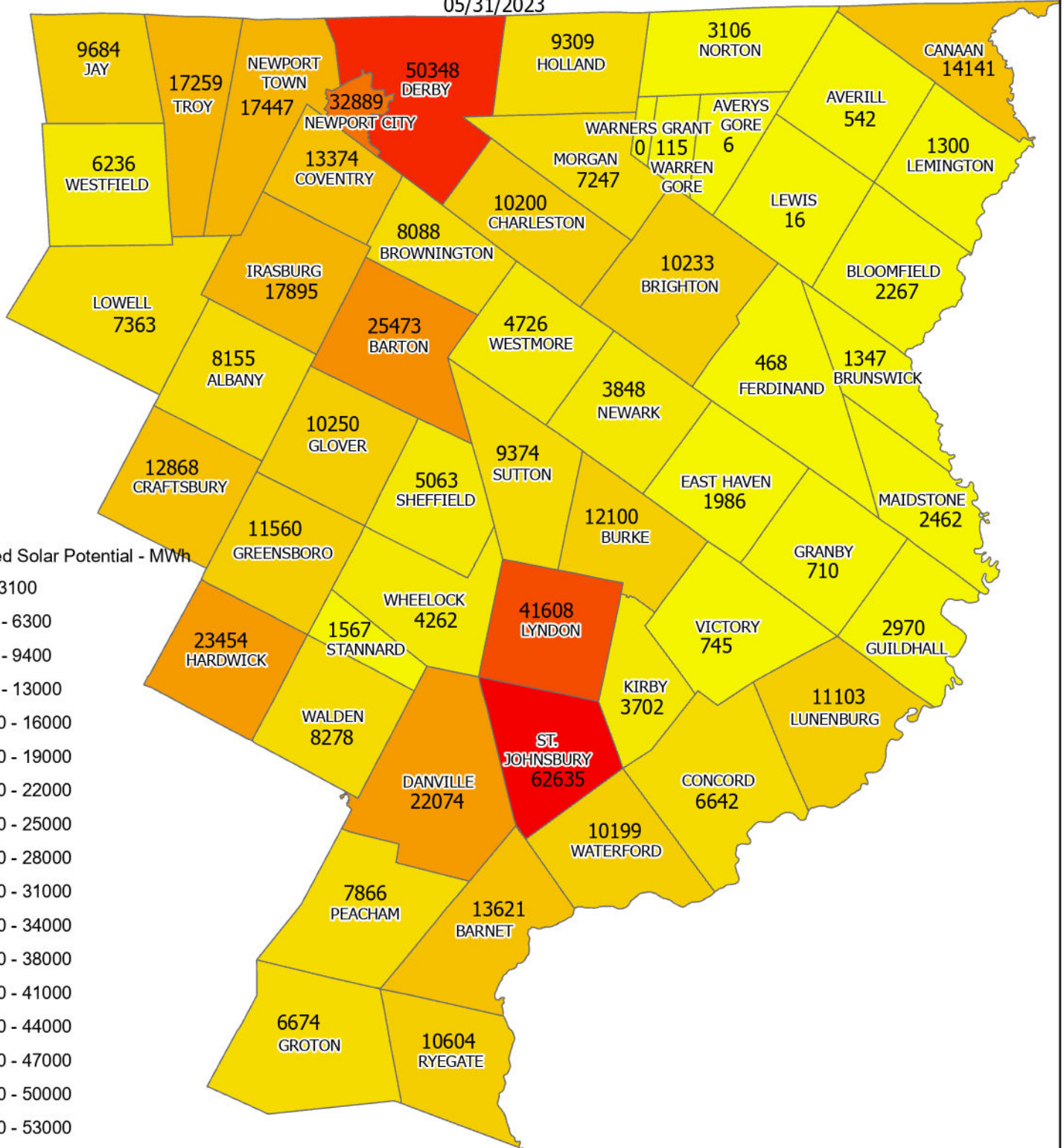
As detailed in our Energy Plan, NVDA's position is that no further development of industrial-scale wind turbines should take place in the Northeast Kingdom.

Warning- This Data is for planning purposes only and does not replace a survey and/or engineering study. Because this map is developed from various scale sources, there may be some discrepancies between data layers.

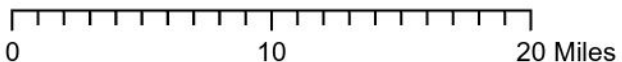
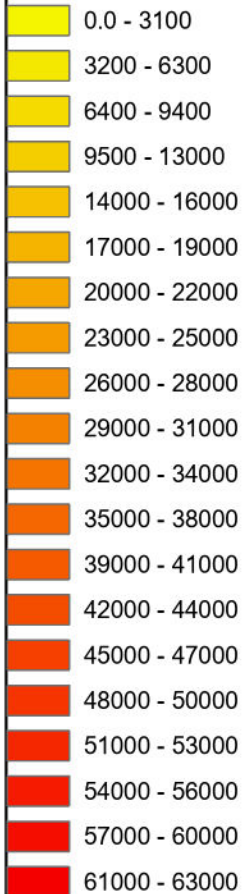


NVDA Energy Map Roof-mounted Solar Energy Generation Potential by Town

05/31/2023



Roof-mounted Solar Potential - MWh



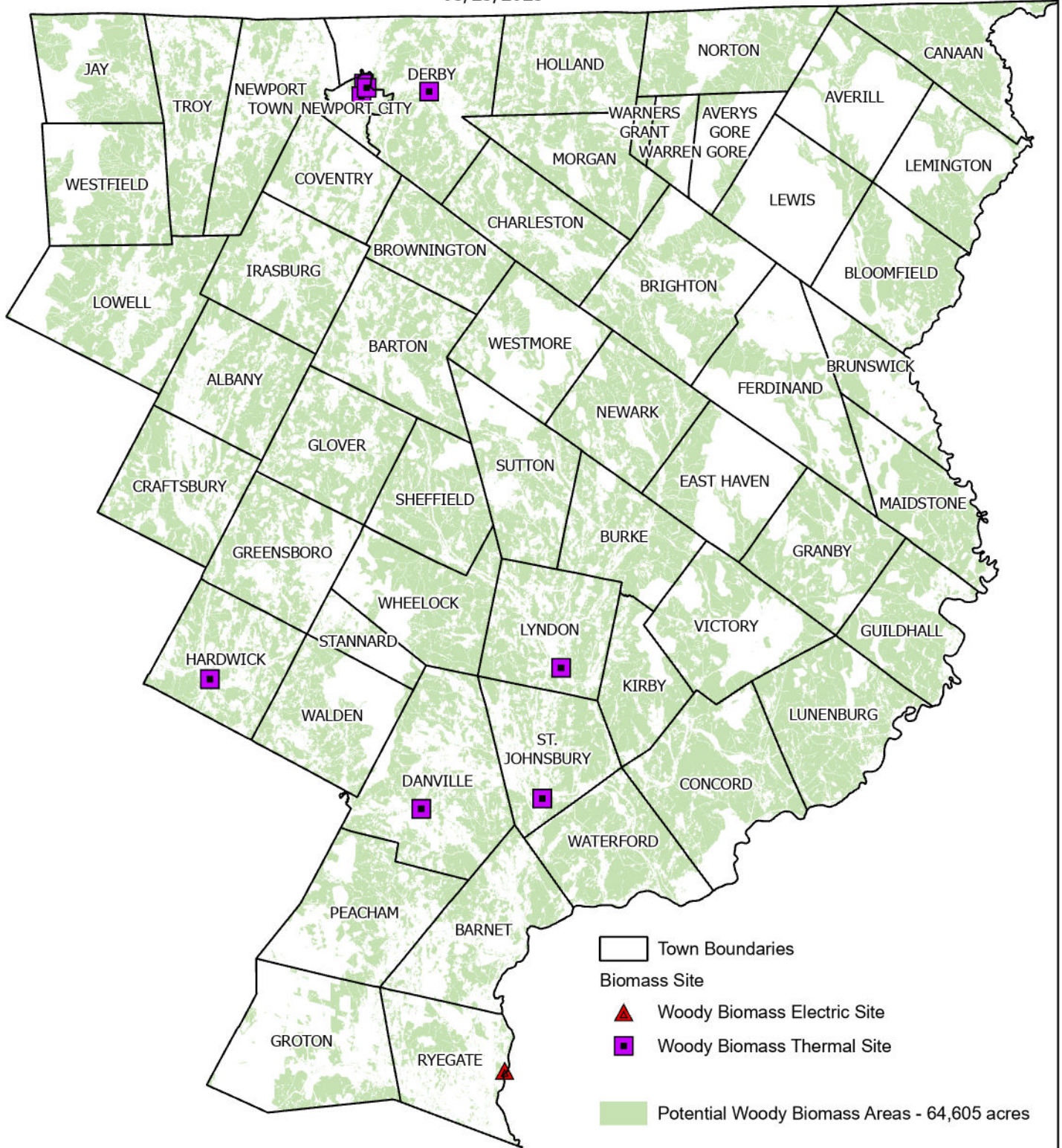
Warning- This Data is for planning purposes only and does not replace a survey and/or engineering study. Because this map is developed from various scale layers, there may be some discrepancies between data layers.





NVDA Energy Map Woody Biomass

05/25/2023



0 10 20 Miles

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