CHITTENDEN COUNTY RPC
Communities Planning Together

Energy Sub-Committee

April 18, 2023
6:30 to 8:00 PM

Remote Access ONLY Meeting via Zoom

Please join the meeting by clicking: https://us02web.zoom.us/j/85344726263

For those who would prefer to join by phone or those without a microphone on your computer, please dial in using your phone.
(For supported devices, tap a one-touch number below to join instantly.)
Dial: 1 305 224 1968 US Meeting ID: 853 4472 6263
For supported devices, tap a one-touch number join instantly: +13052241968,, 85344726263

Agenda

1. **Welcome**

2. **Approve March 20, 2023 Minutes**
   Please review the minutes of the March 20, 2023 Meeting here

3. **Renewable Energy Generation Target (Darren Schibler)**
   Please see the attached memo which describes the methodology for establishing renewable energy generation targets.

4. **EECBG Program Formula Grant Update (Ann Janda)**

5. **Schedule of Energy Sub-Committee Work (Melanie Needle)**
   The schedule has been updated. Please review the attached schedule.

6. **ECOS Plan Energy Key Trends and Issues, Strategies and Actions (Melanie Needle)**
   Please review the energy related sections of the ECOS Plan contained in the packet and come prepared with comments. Our discussion will focus on the key trends/insights, strategies and associated actions. The purpose of the energy goal and key trends/insights section of the ECOS Plan is to describe existing conditions within the energy sector, discuss progress made towards meeting our energy targets, and review challenges and opportunities with meeting the ECOS Plan's energy goal and strategies. The ECOS Plan strategies are CCRPC's action agenda for implementation. Strategy 2 focuses on the land use goal of encouraging a majority of new growth in a compact development pattern within our areas planned for growth. Energy Strategy 4, Action a focuses on the implementation work CCRPC does in the electric and heating sectors. Strategy 4, Action b, and the actions f. and h. under Strategy 6 and Strategy 7, are intended to be the siting policies related to avoiding or mitigating impacts to natural resources from renewable energy generation development. CCRPC utilizes these siting policies when participating in the Section 248 process for siting renewable energy generation in Chittenden County. The transportation components of the enhanced energy plan are covered in the Metropolitan Transportation Plan Public Hearing Draft which can be found here. Maps contained in the packet are provided for context but have not been updated yet.

CHITTENDEN COUNTY REGIONAL PLANNING COMMISSION
ENERGY SUB-COMMITTEE - MINUTES

DATE: Monday, March 20, 2023
TIME: 6:30 p.m. to 8:00 p.m.
PLACE: Virtual Meeting via Zoom with link as published on the agenda

Members Present:
Keith Epstein, South Burlington
Henry Bonges, Milton
Daniel Parkins, Essex
Kevin Thorley, Williston
Jim Donovan, Charlotte

Staff:
Ann Janda, Senior Energy Project Manager
Melanie Needle, Senior Planner
Taylor Newton, Planning Program Manager
Darren Schibler, Senior Planner
Charlie Baker, Executive Director

M. Needle called the meeting to order at 6:31pm.

1. Welcome and Introductions

Staff and board members introduced themselves and offered energy "fun facts."

- Melanie Needle has had an EV for several years.
- Darren Schibler's house had no insulation when they moved in, but it does now!
- Ann Janda just had a heat pump installed in her house.
- Taylor Newton just had his heat pump cleaned.
- Keith Epstein shared an article he wrote for The Other Paper about his journey to net zero.
- Daniel attended a recent webinar and learned that every dollar installed in geothermal heat saves $3 in electricity infrastructure.
- Jim Donovan designed his current house with passive solar and wood heat.
- Henry Bonges is happy to report he has had no car maintenance costs on his electric vehicle in several years.
- Kevin Thorley's home energy is now fully electrified.
- Charlie Baker got an e-bike for Christmas and is excited to try it out.

2. Overview of Chittenden County ECOS Plan with a focus on energy sections

M. Needle reviewed the schedule for preparation and adoption of the energy element of the ECOS Plan (Chittenden County's regional plan), including review of data and text in April and May, finalizing content in June, and approving a draft in July for review by the Long Range Planning Committee (LRPC). A draft ECOS plan is scheduled for November, and adoption is scheduled for June 2024 after the public review process.

M. Needle noted that statewide Low Emission Analysis Platform (LEAP) data release has been delayed from the Public Service Department but should be out soon. K. Epstein asked whether data will show differences and additional generation from the last time the plan was adopted. M. Needle responded that it will be shown in the data.

M. Needle then reviewed Vermont's standards for regional plans and specifically enhanced energy plans (EEPs), which are required to obtain "substantial deference" for use policies conservation measures from the Public Utilities Commission in their review of development of renewable energy generation projects. The goals and standards for EEPs were laid out in Act 174 and are consistent with the Vermont Comprehensive Energy Plan.

K. Epstein asked about the difference in obtaining substantial deference for regions as opposed to municipalities. T. Newton responded that the process is very similar for regions, whose EEPs are reviewed and approved by the Vermont Department of Public Service (PSD); regional planning commissions then review and approve municipal plans. The authority / legal rights granted by substantial deference are the same for regions and municipalities, but apply specifically to each of their plans. However, since municipal plan policies must be consistent with regional plans, a regional plan with substantial deference provides similar protections as the municipal plan (though a municipal plan may get more specific within their jurisdiction).

T. Newton also clarified the meaning of substantial deference, which means that the PUC must follow a higher legal standard and more directly follow guidance for placement of renewable facilities in local and regional plans rather than simply giving plans "due consideration." In response to K. Thorley's question, Newton further clarified that it's unclear how this process plays out in regulatory proceedings since there isn't much case law. C. Baker provided some history about the origins of the law, which came about after controversies about siting of wind turbines. He said that the intent is more to specify where renewable generation should NOT be sited and has reduced the amount of debate about the location of renewables.

M. Needle discussed the process for analyzing the region's energy data and establishing targets for the electric, heating, and transportation sectors. She also discussed the process of disaggregating regional demand and generation data to municipalities for use in their EEP process. One new element is a tool provided by the Public Service Department (PSD) to allow targets for renewable energy generation to be adjusted by factoring in constraints on the electric grid.

K. Epstein wondered how targets that are included in plans get used by people who read the plan. M. Needle responded that the targets are meant to be check points and milestones for reaching the state's CEP goals by 2050. The targets also support development of public policies and support applications for grants; for example CCRPC is currently applying for a federal grant to build more electric vehicle (EV) charging stations. D. Parkins asked whether Act 174 and substantial deference affects grant opportunities; T. Newton clarified that substantial deference only comes into play within the regulatory development review process.

M. Needle discussed the pathways section, which detail how regions and municipalities will achieve their energy targets and include some specific elements required by Act 174. These include:

- Energy conservation and efficient use of energy in buildings
- Reducing transportation energy demand and single occupancy vehicle use, encourage use of renewable/lower emission energy sources
- Patterns and densities of land use that results in conservation of energy and climate resilience
    - Note that the ECOS plan primarily achieves this by allocating 80% of our new development (now proposed for 90%) in 15% of our land area.
- Development and siting of renewable energy, storage, and transmission/distribution resources

K. Epstein noted that in the future he would like to discuss the fact that the current sound impact rules around wind turbines seem to make it impossible to build wind facilities anywhere in Chittenden County (and Vermont). M. Needle agreed and said one option could be to include a policy statement asking the state to reconsider the sound rules, or else whether regions and municipalities should be required to plan for wind energy development. T. Newton asked Epstein for suggestions about how to approach the conversation about sound and wind generation. Epstein would want to invite a wind developer to discuss the requirements and technology to see if it is feasible to actually develop under the current rules, and then whether the policy could be changed. H. Bonges noted that the technology for small-scale wind turbines has improved substantially, and it might be more worthwhile to support those rather than large-scale wind given the technology available at this time. D. Parkins is concerned that waiting for technology to meet certain outcomes will undermine our ability to achieve our renewable energy goals. T. Newton also noted that it would be worth updating the committee on changes in offshore wind development which could be factored into meeting the goals.

M. Needle noted that there is a new standard requiring plans to assess equity impacts of energy planning. She noted that CCRPC is already doing internal work on equity with a new Equity Manager staff person. The energy equity assessment includes consideration of what communities will:

- Be most impacted by the policies,
- Distribution of benefits and burdens of specific actions,
- Whether actions will address inequities
- Consultation with communities in the development of actions.

M. Needle envisioned that for CCRPC, this will involve reviewing policies in the current ECOS plan to see whether disadvantaged communities need to be given priority in taking action, and to invite more of their input to the policies.

Finally, new mapping data is available that updates resource areas, including potential for rooftop solar. M. Needle noted that resource areas for solar and wind are broken down into prime areas (good resource availability without development constraints) and base areas (good resource availability with possible development restraints). Development constraints themselves are broken up into state vs. local "known constraints" (areas where no development is allowed) as well as "possible constraints" (areas which need to be avoided or impacts mitigated). The mapping exercise also includes creating a map of preferred sites for renewable energy development.

H. Bonges noted that Milton is pursuing development of some large solar sites on brownfields, but has come up against a rule that prevents development of more than 500 kilowatts on a single parcel unless there is a contract with a public utility. H. Bonges and J. Donovan asked whether this rule could be changed. M. Needle and T. Newton said this is part of the net-metering rules (which were just recently amended), and this could be explored by the committee as part of the planning process.

J. Donovan expressed concern about whether the list of state constraints were appropriate and asked whether these standards could be changed. M. Needle said it is unlikely since the standards were also recently changed and are updated on a regular schedule, but this could be included for consideration as a policy in the ECOS Plan for when the standards are updated in the futue

M. Needle reviewed the maps for solar and wind generation potential in the current ECOS plan. K. Epstein asked whether the color scheme on the maps could be changed so that the prime areas are not shown in red, which generally denotes "bad" areas. M. Needle agreed that this could be done.

Review of 2018 ECOS Plan Energy Elements

M. Needle reviewed the current ECOS plan's energy elements, which are located in several places throughout the various documents.

K. Epstein asked if there has been progress in getting non-electricity, non-natural gas data (unregulated delivered fuel data) – in other words, how much delivered fuel (propane and fuel oil) is used in the state. M. Needle noted that a provision to track this data this is included in the Affordable Heating Act currently being debated by the Legislature, but it will not be settled and data will not be available before the ECOS plan needs to be finalized.

D. Parkins asked whether CCRPC's standards account for the increased amount of in-state generation that could be required under the draft renewable energy standard. M. Needle stated that the current plan accounts for Chittenden County generating 50% of renewable electricity in-state. T. Newton noted that the renewable energy standard only applies to utilities, whose service territories go beyond Chittenden County's boundaries and aren't considered so directly in the plan. D. Parkins agreed and noted that this can still have a policy impact on the development of renewable energy.

K. Thorley asked whether the narrative that locally-developed renewable energy (specifically renewable energy credits) is exported out of state plays into this plan. M. Needle stated that the targets and mapping exercise simply account for the location of renewable sites, even if a utility that developed them sells the renewable energy credits elsewhere. K. Epstein noted that this goes both ways, and that a region / municipality cannot reach its targets by purchasing RECs from elsewhere.

M. Needle quickly reviewed the siting policies contained in the plan, which can be discussed in more detail at a future meeting.

At K. Epstein's question, M. Needle said that committee members can provide feedback on the plan verbally at the next meeting or by sending them in writing to Melanie to be distributed at the next meeting (in keeping with Vermont Open Meeting Law).

3. EECBG Program Formula Grant

A. Janda presented a proposal for use of some federal grant funding (the Energy Efficiency & Conservation Block Grant or EECBG Program) that was allocated to Chittenden County. We will receive $76,390 through a non-competitive process to spend on certain eligible activities.

Janda noted that in keeping with the Biden Administration's Justice40 initiative, the goal is for 40% of certain types of federal funding to be allocated to disadvantaged communities. Janda noted that the amount of money CCRPC received isn't substantial, so staff developed a set of options for use of the money, including:

1. **Option 1:** Assisting with the purchase of 2 electric vehicles for the staff Champlain Valley Office of Economic Opportunity's Low Income Weatherization Program.
    a. H. Bonges noted that EVs may not be the best option for CVOEO's program if they are driving the vehicles all day and for construction purposes. K. Epstein stated that he has no concerns with this if the program director, Dwight Decoster, says the vehicles will work.
2. **Option 2:** Contribute matching funds to Vermont Gas (VGS) for Burlington International Airport's sound insulation project for Winooski homes which are in the airport's noise exposure area. Insulation will not only reduce sound impacts but also reduce thermal energy use. VGS can supply 4.5% of the local 10% match under a Federal Aviation Grant, but VGS needs more assistance for the remainder. CCRPC's EECBG funding could cover the local match for 12 out of the 25 eligible homes in Winooski.
    a. H. Bonges noted that it appeared the Winooski homes were not in the airport's most sound impacted area and asked for clarification. He also felt that the Winooski homes were less impacted than South Burlington and advocated for funds to go to those that were most impacted. Staff clarified that staff selected Winooski partly because it is a disadvantaged community and because they didn't receive their own EECBG funding allocation.
3. **Option 3:** Distribute funding to municipalities who didn't receive EECBG funding for installation of heat pumps or renewable energy generation at municipal buildings.
    a. K. Thorley suggested that this could also include installation of electric vehicle charging equipment so that individuals who can't afford to install chargers at home can charge in public locations. T. Newton noted that CCRPC is already pursuing a grant for substantially more EV charging than this grant could fund.

D. Parkins wondered if the money could be better used as a "force multiplier" to move larger issues forward, such as filling data gaps for development of renewable energy like geothermal. T. Newton said that approach could work, but more details would be needed; in addition, the focus would need to be on benefiting low and moderate income areas / households. Newton noted that VGS is the current leader in geothermal and staff could ask whether more funding would be helpful to obtain data or generally support initiatives to implement geothermal. A. Janda noted that consultant services are an allowed use of the EECBG funds. Also, VGS is trying to work with affordable housing developers in their geothermal initiatives, which could be a way to achieve the Justice40 goals for use of the funds.

M. Needle and A. Janda noted that staff are not looking for a vote from the Energy Subcommittee, just to solicit additional ideas. Janda noted that we are still awaiting input from the Vermont Environmental Justice Steering Committee before action by the CCRPC Board. The deadline spending funds is fairly far off and flexible.

K. Epstein spoke in support of option 1 (funding CVOEO's EV purchase) because of the opportunity to increase exposure to EVs for communities that wouldn't normally see them, including both clients and employees of CVOEO. K. Thurley spoke in favor of option 3 and option 1 in that order.

4. Next Steps

M. Needle asked the committee members to fill out a Doodle poll for the next meeting in April, at which we hope to be able to review the LEAP data. In the meantime, committee members can review the current plan and send comments to Melanie. D. Parkins noted that the Essex Energy Committee is looking to do a Button Up event at the Champlain Valley Fair and invites other energy committees to join as well.

The meeting adjourned at 8:15pm.

CHITTENDEN COUNTY RPC
Communities Planning Together

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MEMORANDUM

To: Energy Subcommittee, Long Range Planning Committee
From: Darren Schibler, Senior Planner; Melanie Needle, Senior Planner; Taylor Newton, Planning Program Manager
Date: April 13, 2023
Re: Methods for Creating Renewable Generation Targets in the ECOS Enhanced Energy Plan

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Background

When the Chittenden County Regional Planning Commission (CCRPC) developed the 2018 ECOS Plan, it established a range for renewable energy generation targets. The low scenario, based on the share of land area available for solar and wind energy production, resulted in the county planning to produce 15% (or 756,250 MWh annually) of the state's in-state renewable electricity demand. The high scenario was based on the county's share of the total state population and has the county planning for 25% (or 1,265,134 MWh annually) of the state's in-state electricity generation. The 2018 Plan identified sufficient land for solar and wind development to meet this demand under either scenario and disaggregated targets for each scenario to the municipal level.

Current Methods

Total Regional Electricity Generation Targets

The current PSD guidance and modeling tool sets a single regional share of the state's overall target. For Chittenden County, the regional share is 16%, which is the average of the county's portion of the state's population (26.2%) and land area (5.8%). These regional shares are applied to three milestone years (2032, 2040, and 2050). The resulting total regional electricity generation targets are compared to the 2018 ECOS Plan targets, the county's existing generation, and the required new generation in the table below. Note that the 2018 ECOS Plan did not set generation targets for 2032 and 2040.

Target Year	2018 ECOS High Target (MWh)	2018 ECOS Existing (MWh)	2018 ECOS New – High Target (MWh)	Total New Target – 16% of In-State (MWh)	2023 Existing (MWh)	Regional New (MWh)
2032	n/a	n/a	n/a	648,475	598,409	50,067
2040	n/a	n/a	n/a	857,945	598,409	259,536
2050	1,265,134	501,196	763,938	954,833	598,409	356,424

Source: 2018 ECOS Plan Supplement 6, Table 29.

In short, the 2023 ECOS Plan target for total regional electricity generation will be lower than the 2018 target. Therefore, Chittenden County will still be able to achieve its goal of providing 16% of the state's in-state renewable electricity generation, which in turn is 50% of the state's total electricity demand.

Technology Mix

The PSD modeling tool allows planners to set specific generation targets at the regional and municipal level for specific technologies, including ground-mounted solar, rooftop solar, wind, renewable natural gas, biomass, and hydroelectric. The tool then projects the land area needed to achieve these goals.

In the 2018 Plan, CCRPC staff demonstrated that the county's generation goals could be achieved with either 100% ground-mounted solar or 100% wind energy (or a mix thereof). However, it seems unlikely that state regulations will permit the development of new facilities using wind or hydroelectric resources. In addition, the large-scale viability of renewable natural gas and biomass electricity has not been demonstrated yet. However, a new dataset is available to model the potential electricity generation from rooftop solar separately from ground-mounted solar. There are limitations to its accuracy, but preliminary staff estimates indicate that rooftop could provide between 29%-87% of generation needed to reach the 2050 goal.

Grid Constraints

The PSD modeling tool also allows for calculation of municipal targets based on electricity consumption in addition to population and existing generation. This will be discussed at a future meeting.

Decision and Recommendation

CCRPC staff seek guidance from the Energy Subcommittee on the desired mix of technologies to achieve the renewable electricity generation targets. Staff recommend 50% rooftop solar and 50% ground-mounted solar, since these are the only two demonstrated viable technologies at present, and both could provide 100% of the total goal.

Energy Sub-Committee Schedule

*subject to change

March 2023	April 2023	May 2023	June 2023	July 2023
• Overview • Initial Content Review	• EECBG Funding • Energy Trends and Key Issues • Energy Strategy and Actions + Siting Policies	• Energy Resource Area Maps • Renewable Energy Targets • Equity Assessment • LEAP Data?	• LEAP Data? • Finalize all content	• Approve Draft Enhanced Energy Plan for LRPC Review • Possible Board Presentation

Complete Full ECOS Plan Draft--- Nov 2023

Adopted Plan---June 2024

X. ENERGY AND GREENHOUSE GAS EMISSIONS REDUCTION

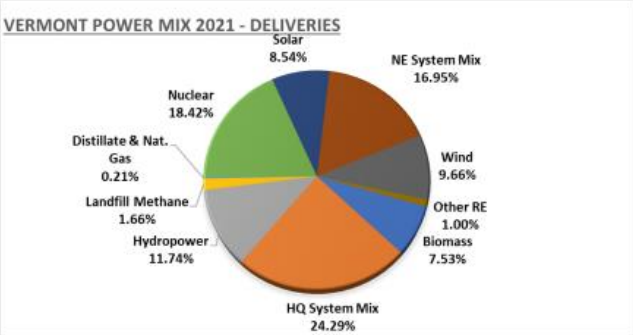
Energy Goal: Move Chittenden County's energy system toward cleaner, more efficient and renewable sources that benefit health, economic development, and the local/global climate by working towards the State's Comprehensive Energy Plan goals.

Key Issues/Trends/Insights

[Data for this section drawn from: Energy Analysis, Targets & Methodology in Supplement 6 of this Plan, Energy Analysis Report, the State of Vermont Comprehensive Energy Plan, and associated appendices and Climate Change Trends and Impacts Report].

Energy Overview

- To meet state energy goals, the region 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 an increase in ~~state~~ renewable energy generation within the state and from outside the state. ~~ors~~.
- Vermont citizens, businesses, and industries spend about $1.5 billion a year to pay for imported fossil fuels (202~~1~~2 Energy Action Network (EAN) Annual Report). Much of this money leaves the County and state immediately. This outflow of energy dollars acts as a drain on the local economy.
- According to the 2023 Vermont Annual Energy Report published by the Public Service Department, the Vermont power mix based on contractual, or ownership entitlements is as shown in the pie chart below. The power mix looks different after renewable energy credits are sold. See the annual report for further information.



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- The price of energy is forecasted to continue increasing in the future, which will result in an additional burden on the County's residents and businesses~~.~~. Reducing energy consumption and generating on-site renewable energy are ways to mitigate the increasing costs of energy. ~~unless energy consumption can be reduced.~~

Commented [RM53]: From Anne Margolis conversation on 6/23 - really thinks the map layer changes in the requirements is the most important; and the policy changes with equity/forest protection stuff. Doing this work is more important than the LEAP data. And then maybe you do the LEAP modeling afterward because the standards don't really say that you have to use the most recent LEAP model. There is also the renewable generation targets, and their tool will consider the grid/transmission constraints. In accordance with the guidance we can keep our current generation targets (but the constraints will change that).

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Commented [MN55]: 75%, EAN graphic, hydro quebec imports, staying in the US?

Commented [RM56R55]: Could we include a pie chart of where our energy comes from?

- Fossil fuel combustion increases the atmospheric concentration of carbon dioxide and other greenhouse gases, which are the causes of global climate change. Climate change will have profound impacts on the environment, public health, infrastructure, and economy of Chittenden County.
- Vermont, and the County, relies heavily on gasoline and diesel for transportation. However, gasoline usage for transportation has decreased due to improved fuel economy standards and the inclusion of electric vehicles in the light duty sector. According to the Energy Information Administration, between 2010 and 2019, motor gasoline consumption decreased by 8.9% or from 7,710 to 7,022 thousand barrels.
- Chittenden County is home to an international airport and a National Guard base. Transportation fuel consumption in the County not only includes gasoline, diesel, and compressed natural gas, but also aviation gasoline and jet fuel.

Weatherization and Energy Efficiency

- Chittenden County has a long history of electrical and natural gas energy efficiency programs, dating back to 1990, which have provided significant energy savings and economic benefits to the state and County. These programs along with improvements in federal standards have led to a reduction in per household and per employee energy consumption of electricity and natural gas. Reduction in energy consumption directly results in a reduction in energy bills. Following the Home Performance with ENERGY STAR® guidelines, and building/renovating to the State's Building Energy Code, are two programs which assist Vermonters with reducing energy consumption from heating and electricity in homes and businesses. See Indicators for data on efficiency gains.
- The 2016 Comprehensive Energy Plan (CEP) included a goal to weatherize 80,000 homes by 2020; according to the 2021 Vermont Energy Action Report, only 10% or 29,289 homes have been weatherized. The 2022 CEP calls for an even more ambitious target to weatherize 120,000 homes by 2030, therefore approximately 90,000 homes need to be weatherized by 2030. To meet this target, the Energy Action Network estimates that Vermont's qualified weatherization workforce needs to grow five-fold in fewer than five years (EAN 2021 Annual Report). To meet the weatherization goal, the State needs to address all the challenges affecting weatherization workforce. These challenges include shortages of skilled workers willing to work in uncomfortable conditions, wage competition with less-strenuous working conditions, fluctuations in funding/incentives for weatherization projects, and affordable housing (Weatherization Workforce Plan, Efficiency Vermont 2021).
- There is a need for focused study to determine solutions for vermiculite removal as it relates to weatherization, in particular low-income weatherization. Vermiculite was used as an insulator for decades (1960-1990) and was mined with asbestos. Thus, any home with vermiculite is assumed to be contaminated.
- While efficiency programs targeting electricity and natural gas have been largely successful in the commercial and residential sectors, there is an urgent need to fund and develop similar programs and policies for non-regulated thermal fuels to accelerate switching to fuels with less greenhouse gas emissions.
- According to the LEAP analysis, Chittenden County would need to weatherize 14% of homes by 2025 and 70% of homes by 2050.

Fuel Switching and Electrification

- Vermont's energy future includes a transition to beneficial electrification in the heating and transportation sector. Beneficial electrification is a term for replacing fossil fuel powered appliances and vehicles with ~~includes~~ heat pumps, electric vehicles, energy storage and smart appliances to reduce emissions and energy costs. Increased electricity end use coupled with

Commented [MN57]: wait for 2021 Efficiency VT Report to display progress on efficiency with the most current data

Commented [MN58]: Darren: Are we documenting GHG emissions reductions from weatherization? Would be curious to see the #s for that.

Commented [RM59]: Clarify what this means.

renewable energy generation and storage may create challenges for the electric grid and for homes. A modern electric grid is necessary to maintain reliability and affordability. Homes and businesses may need upgrades to electric service to ensure adequate amperage for increased electrical appliances like EV charging and cold climate heat pumps. Smart Grid technology coupled with education, behavior change, price signaling (e.g., time of use rates), and load control technologies can help reduce peak demand and defer substation upgrades, which can result in substantial cost saving.

- To prepare for electric / zero-emission vehicles accounting for 100% of light-duty vehicle sales by 2035, electric vehicle charging station equipment (EVSE) should be installed as part of new development or redevelopment to ensure charging is available at homes, businesses, and workplaces as these are the locations where people are most likely to be charging their vehicles given current technology. Retrofitting existing residential multi-unitfamily properties with EVSE and the necessary electric service amperage is imperative to ensure that electric vehicle adoption is equitable, and all drivers have adequate access to charging infrastructure. Multi-unit dwelling (MUD) residents in apartments and condominiums often have more challenges in gaining access to home EV charging due to parking issues and cost. Renters in MUDs have additional barriers to long-term investments in charging infrastructure for shorter-term housing. In addition, policies and pricing structures to encourage off peak charging need to be considered to mitigate grid constraints associated with electric vehicle charging. Refer to the EV Charging Equipment Location Prioritization Technical Report for specific priority locations for EVSE.
- It is necessary to shift the heating sector away from fossil fuel use. Promoting cold climate heat pumps (powered by a renewable electric grid), in addition to sustainably harvested wood/biomass systems, biogas and geothermal heating systems, is key to meeting the Global Warning Solutions Act requirements and the 2022 CEP goals. However, Currently natural gas prices are not cost competitive with electricity, so customers are not likely to save money by replacing existing natural gas heating systems with cold climate heat pumps., except in the summer for cooling. According to the Energy Information Administration, the residential natural gas rate was $16.23.thousand cu ft as of December 2022 compared with the residential electricity rate of $20.15/kWh. Cold climate heat pumps do offer customers the benefit of air conditioning during hot summer months and are relatively easy to install for existing buildings that do not have central air conditioning. Switching from fuel oil or propane to a heat pump system will save customers money and protect customers from price volatility. Net-zero buildings and cold climate heat pumps as the primary fuel source in new buildings will help the region meet its goal of shifting the heating sector away from fossil fuels.
- VGS's comprehensive strategy for NetZero by 2050, with an immediate goal of reducing GHG emissions for customers by 30% by 2030, is critical to achieving the State's energy and climate goals. Expanding renewable natural gas to make up 20% of the supply mix by 2030 is also part of VGS's strategy.

Transition to Renewable Energy

- In analyzing Chittenden County's ability to meet the 90% renewable energy by 2050 goal the Long-Range Energy Alternatives (LEAP) model was utilized to understand the type and amount of fuel needed to meet the State's energy goals. It is important to note that Chittenden County's LEAP scenario reflects 87% renewable by 2050. Although the level of renewability is not 90%, the ECOS Plan is deemed to be consistent with the State energy goals because the policy statements within this plan are aligned with the framework for advancing state energy goals and Chittenden County is well suited to move in the right direction. See Supplement 6 for more information on LEAP.

Commented [MN60]: needs to be linked

Commented [MN61]: need data on rates

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- The LEAP model shows a significant reduction in natural gas as one scenario to achieve the ambitious 90% renewable energy by 2050 goal in Chittenden County. This scenario will be challenging because of the region's current reliance on natural gas for heating in significant portions of Chittenden County, recent and planned service area expansions, and the relatively low cost of the fuel source. The natural gas infrastructure in Chittenden County also represents a significant investment on the part of utility companies, and much of the County's dense residential and commercial growth is dependent on this fuel. Therefore, fulfillment of this scenario requires aggressive weatherization of the region's building stock, switching to heat pumps and other renewable heating technologies. The shift to renewable energy sources for heating will also require the involvement of private-sector energy developers, regional and state-wide utilities, and individual energy users; as well as changes to state energy policy implementation. Despite challenges related to natural gas, CCRPC will work to the best of our ability to meet the 90x2050 goal via the actions discussed in Strategy 2. It is important to note fuel use in the aviation sector was removed from CCRPC's LEAP analysis and modeling of future energy use, as this is a sector the region will have little influence over.
- A transition to renewable energy will drive down carbon emissions. This will require electrifying the heating and transportation sectors and generating more electricity from renewable sources to power these sectors.
- As we transition to more renewables, grid resilience is valued by both residents and business, especially because Vermont's climate makes us vulnerable to grid outages. When storage is coupled with distributed energy generation it can provide a source of backup power and also offer the potential to minimize loads at peak times, thereby reducing energy costs.
- A Vermont statute passed in 2015, Act 56, established a renewable energy standard (RES) which requires Vermont's Electric Utilities to be 55% renewable by 2017, 75% by 2032, and 90% by 2050. Also as part of Act 56, electric utilities need to work with customers to reduce fossil fuel and decrease carbon emissions from transportation and thermal heating by offering new innovative programs and services to their customers. The electric utilities subject to Act 56 are offering innovative products for electrification and incentives to meet the statute and deliver innovation. Green Mountain Power's supply is now 100% carbon free and 68% renewable now and will be 100% renewable by 2030. Burlington Electric Department's portfolio is also 100% renewable. Vermont Electric Co-op plans to meet or exceed its RES obligations by 2030.

Commented [MN63]: will update this section after PSD LEAP data and guidance becomes available.

Commented [MN64]: Darren:2 things: 1. Is it true that the RPC can't influence aviation? What about supporting rail? 2. How does removing this from LEAP affect the ability to achieve the CEP goals (i.e., do we have to raise other targets to account for not having control over this one)?

Commented [MN65]: link to franchise areas

Renewable Energy Generation

- Chittenden County has many non-fossil fuel based, renewable energy production sites owned by utilities, private parties, and municipalities. Reliable, cost effective, and environmentally sustainable energy availability is critical to support the economy and natural resources of Chittenden County.
- Vermont's rural nature offers challenges for the transmission and distribution of energy. It is important to maintain and develop an energy production, transmission, and distribution infrastructure in Chittenden County that is efficient, reliable, cost-effective, and environmentally responsible. Current energy distribution projects include: Extension of 3-phase power in south Hinesburg along VT116 by Green Mountain Power; and the City of Burlington and partners are planning to advance a district heating system using McNeil's waste heat for distribution to the University of Vermont Medical Center. See the CEDS Project list in Supplement 4 for cost estimates, funding sources and proposed timelines for these projects.
- The cost of electricity is impacted by the distance it travels. When electricity is transmitted over long distances a significant amount of electricity is lost. Locating distributed generation near electric loads reduces transmission losses and could result in more cost-effective retail electricity rates.

Commented [MN66]: needs to be updated

Commented [TN67R66]: I think that 3-phase line was built...but can't find anything online to confirm.

- Every three years, Vermont Electric Power Company (VELCO), the State's transmission utility, completes a Long-range Transmission Plan. This plan identifies transmission-constrained areas and reliability concerns. The plan also identifies potential infrastructure projects that may be needed to address identified concerns. The 2021 Long-range Transmission Plan identifies several projects within Chittenden County, and in areas immediately adjacent to the County, that will likely need to be installed over the next decade due to anticipated growth in electric demand due to mass electrification and due to the State's increasing reliance on distributed generation (See page 38-39: https://www.velco.com/assets/documents/2021%20VLRTP%20to%20PUC_FINAL.pdf). Adequate transmission and distribution grids that are able to accommodate the planned increase in electricity use, and reduces energy loss, are necessary to meet the goals of this section.
- CCRPC has undergone a process to look at areas suitable for solar and wind energy generation to determine our ability to meet the 90% renewable by 2050 goal. See the key indicators below for an analysis of existing generation and future generation possibilities.

Energy and Land-Use Planning

Commented [MN68]: Darren:Should this section be moved to the start to greater emphasize its importance?

- One of the most impactful ways to reduce greenhouse gas emissions is to enable more compact walkable neighborhoods in areas planned for growth. Chittenden County, perhaps more so than other regions of the State, can achieve great energy efficiency and GHG benefits because of development density and infill development goals. Compact walkable neighborhoods encourage smaller building footprints with lower heating and cooling needs, promotes efficient travel that is less dependent on cars and provides more opportunity for walking, biking, and transit. Compact development also decreases development pressure on Vermont's working and natural landscapes, preserving land for existing and future carbon sequestration and storage.
- Dense population centers make distributed generation easier, because energy can be produced near significant numbers of customers. Additionally, portions of the county's dense land use pattern may allow for innovative energy solutions, such as district heating and microgrids.
- In 2016, the Vermont Legislature Enacted Act 174 to improve energy planning and give town and regional plans greater weight or "substantial deference" in Public Utility Commission (PUC) proceedings. As of 2022, Bolton, Burlington, Charlotte, Colchester, Essex Junction, Huntington, Jericho, Richmond, Shelburne, Williston, Winooski, Hinesburg, Underhill, and Westford have adopted enhanced energy plans.

Key Indicators

Additional indicators can be found on the ECOS Scorecard.

Indicators	Location
Annual Natural Gas Consumption	Scorecard
Annual Electricity Consumption	Scorecard
Percent of Electricity Saved	Scorecard

Renewable Energy Capacity Sited in Chittenden County	Scorecard

See Supplement 6 for the complete Act 174 Energy Planning Analysis and Targets

2. STRIVE FOR 90% OF NEW DEVELOPMENT IN AREAS PLANNED FOR GROWTH, WHICH AMOUNTS TO 15% OF OUR LAND AREA.

The areas planned for growth are defined as the Center, Metro, Suburban, Village, and Enterprise Planning Areas (all but Rural) as displayed on the Future Land Use Map. This strategy mimics the development patterns we've seen in the recent past. A Transit Oriented Development (TOD) overlay planning area has been added to depict and encourage a higher concentration of growth within walking distance to bus routes to reduce transportation energy consumption, carbon emissions, and preserve our natural and working landscapes. This overlay is within the areas planned for growth.

Increasing investment in denser, mixed use growth areas will improve economic opportunities, housing options, transportation options and improve community health. Focusing growth in the appropriate planning areas is also a cost-effective approach to increasing the supply of affordable housing and using existing infrastructure efficiently. Also, this pattern of growth reduces energy consumption for transportation. Homes are in closer proximity to jobs and other services, making trips shorter and making travel by walking, biking, transit and carsharing more feasible.

Actions

1. **Invest in Areas Planned for Growth** -

    a. Invest in wastewater, water and stormwater infrastructure, energy systems (e.g. distribution, storage, and generation) and transportation infrastructure (including bike, pedestrian and public transit) in areas currently developed and/or planned for growth.
    b. Target reuse, rehabilitation, redevelopment, infill, and brownfield investments to the non-rural Planning Areas.
    c. Retrofit existing buildings to reduce energy use and greenhouse gas emissions.
    d. Improve design quality of high density areas, and allow flexibility for creative solutions.

2. **Municipal Planning and Zoning** - Strengthen and direct development toward areas planned for growth through infill development and adaptive reuse of existing buildings through municipal plan and bylaw revisions and state designation programs.

    a. Municipal Development Review Regulations should be revised to improve the mix of uses, shared parking, support for transit, access to a variety of services (for example restaurants, grocery stores, parks, entertainment) via active transportation, energy efficiency, renewable energy and the affordability of housing. A particular emphasis is needed on providing for affordable rental housing.
    b. Integrate capital planning and budgeting in planning efforts to provide the right mix of infrastructure over time. Official maps can also be a useful tool to drive infrastructure improvements in the areas planned for growth.
    c. Health Impact Assessments (HIA) provide a tool to use at the regional, municipal, agency, and organizational level to assure that planning decisions maintain or improve the public health. Access can be improved by co-locating public facilities, in particular, medical and mental health facilities in areas with easy access via active transportation and public transit. Town health officers should be encouraged to participate in community planning efforts.

5. **Housing Proximity** – The proportion of Chittenden County employees who live outside the county has increased since 2002; this increases greenhouse gas emissions as workers travel greater distances to work. While some may be living outside of the County by choice, others have no choice because they can't afford a home in the County. Reversing this trend to achieve 75% of Chittenden County workers living in the region will require two things: enough housing to accommodate more Chittenden County workers, and housing stock that is affordable and accessible to a wide variety of residents.

4. CLIMATE/ENERGY STRATEGY: TRANSFORM THE REGION'S ENERGY SYSTEM TO MEET THE GOALS OF VERMONT'S ENERGY AND GREENHOUSE GAS REDUCTION GOALS WHILE BALANCING ECONOMIC VITALITY AND AFFORDABILITY.

a. Reduce energy consumption and decrease greenhouse gas emissions, to support the State's energy goals in the 2022 Vermont Comprehensive Energy Plan and the Global Warming Solutions Act as incorporated by reference here:

- Meet the Global Warming Solutions Act greenhouse gas emissions (GHG) requirements:
  - 26% reduction from 2005 levels by 2025
  - 40% reduction from 1990 levels by 2030
  - 80% reduction from 1990 levels by 2050
- Weatherize 120,000 Vermont homes by 2030 (relative to the 2008 baseline)
- Meet 90% of Vermont's energy from renewable sources by 2050
  - Intermediate goals of 25% of energy from renewable sources by 2025 and 45% by 2035.
  - In the transportation sector, 10% of energy needs will be from renewable energy by 2025, and 45% by 2040. Zero-emission vehicles account for 100% of light-duty vehicle sales by 2035.
  - In the thermal sector, 30% of energy needs will be from renewable energy by 2025, and 70% by 2042. Weatherizing 120,000 households by 2030. Achieve net-zero ready construction for newly constructed buildings by 2030.
  - In the electric sector, be 100% decarbonized and at least 75% renewable by 2032.

i. Assist municipalities with revising zoning regulations to enable more compact walkable neighborhoods in areas planned for growth.

ii. Continue partnerships with VGS, Burlington Electric Department, Efficiency Vermont and the Champlain Valley Office of Economic Opportunity Weatherization Assistance Program to promote weatherization and energy efficiency programs and incentives for homes and businesses.

iii. Decrease fossil fuel consumption in the thermal sector by working with partners such as Green Mountain Power, Efficiency Vermont, Burlington Electric Department, and other energy service providers to educate developers, businesses, and homeowners about cold climate heat pumps, heat pump hot water heaters, wood heating, biofuels, and geothermal systems. Reduce fossil fuel consumption in the transportation sector, through transit oriented development particularly in bus and rail served locations, transportation demand management (TDM) and electric vehicle promotion strategies outlined in Part 6 of this section and in the Metropolitan Transportation Plan (MTP) included in this plan.

iv. Collaborate with the State of Vermont and utilities to ensure that state energy policy implementation (i.e. permits for non-renewable fuels) reflect state energy goals and our policies in Section b.

v. Encourage the State of Vermont to implement a single building energy code standard for all new development and retrofits that requires enforcement at the state level, accelerates net zero building practices and electric vehicle charging infrastructure installations in a manner that ensures progress is made on the Global Warning Solutions Act requirements.

vi. 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 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 municipalities to lead by example with respect to energy efficiency for buildings and transportation and the deployment of renewable energy.

vii. Support a wide variety of renewable energy generation types, including storage, sustainable uses of biomass for heating, passive solar building design, bio-digesters for electricity generation, photovoltaic solar, wind turbines, and optimizing the energy potential for existing hydro-electric dams.

viii. Work with the utilities on long-range infrastructure capacity planning.

ix. 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.

x. Support changes in federal, state, and local policies to achieve the state of Vermont Comprehensive Energy Plan goals.

xi. Provide assistance to municipalities on implementing enhanced energy plans.

xii. Support investments in distribution and transmission infrastructure upgrades necessary for handling increased electricity loads and renewable energy generation.

xiii. Advocate for the State, utilities, and workforce/business development organizations to address weatherization workforce challenges identified in the 2021 Weatherization Workforce Report. Promote the expansion of current workforce training programs that are effective, such as ReSOURCE's weatherization and HVAC 101 training programs.

xiv. Address barriers and empower multi-unit housing owners to retrofit parking to include electric vehicle charging equipment that is adequate to advance widespread electric vehicle adoption.

~~xiv.~~ FOR DISCUSSION WIND POLICY STATEMENT GIVEN SOUND RULES

b. CCRPC supports the generation of new renewable energy in the County to meet the Vermont Comprehensive Energy Plan's goal of using 90% renewable energy by 2050, in a manner that is cost effective and respects the natural environment. Specifically, Chittenden County needs to generate a total of 756,250 MWh (Megawatt hours) of energy to meet the low target (a 51% increase), or 1,265,134 MWh to meet the high target (a 152% increase). Currently, Chittenden County generates 501,661 MWh of renewable energy. The targets are technology neutral, meaning that they can be met with any mix of technologies. The following statements are CCRPC's renewable energy generation facility siting policies and will inform CCRPC's preferred sites policy.

Constraint Policies: Ground mounted renewable energy generation is constrained in certain areas due to state and local restrictions on development.

Commented [MN142]: will be updated once PSD guidance and LEAP data is available. July/August timeframe

i. Site renewable energy generation to avoid state and local known constraints and to minimize impacts to state and local possible constraints, as defined in Strategy 3, Action 1.f, and Strategy 4, Action 1.f, and Action 2.e. Renewable energy generation sited on existing structures or parking lots complies with this policy.
ii. Site ground-mounted solar development in accordance with setback standards as defined in 30 V.S.A. §248(s) and municipal screening requirements adopted in accordance with 30 V.S.A. §248(b)(B).

Suitability Policies: After considering the constraints referenced above and found in Supplement 3, different levels of suitability exist for different scales and types of renewable energy generation depending on location within the County. To determine an appropriate location for a facility, first review the constraints above and then look at the polices below to determine how and where CCRPC encourages renewable energy generation facilities. CCRPC recommends the location of renewable energy generation facilities in accordance with the relevant guidelines below. Inability to meet these guidelines does not necessarily preclude the ability to develop renewable energy generation development.

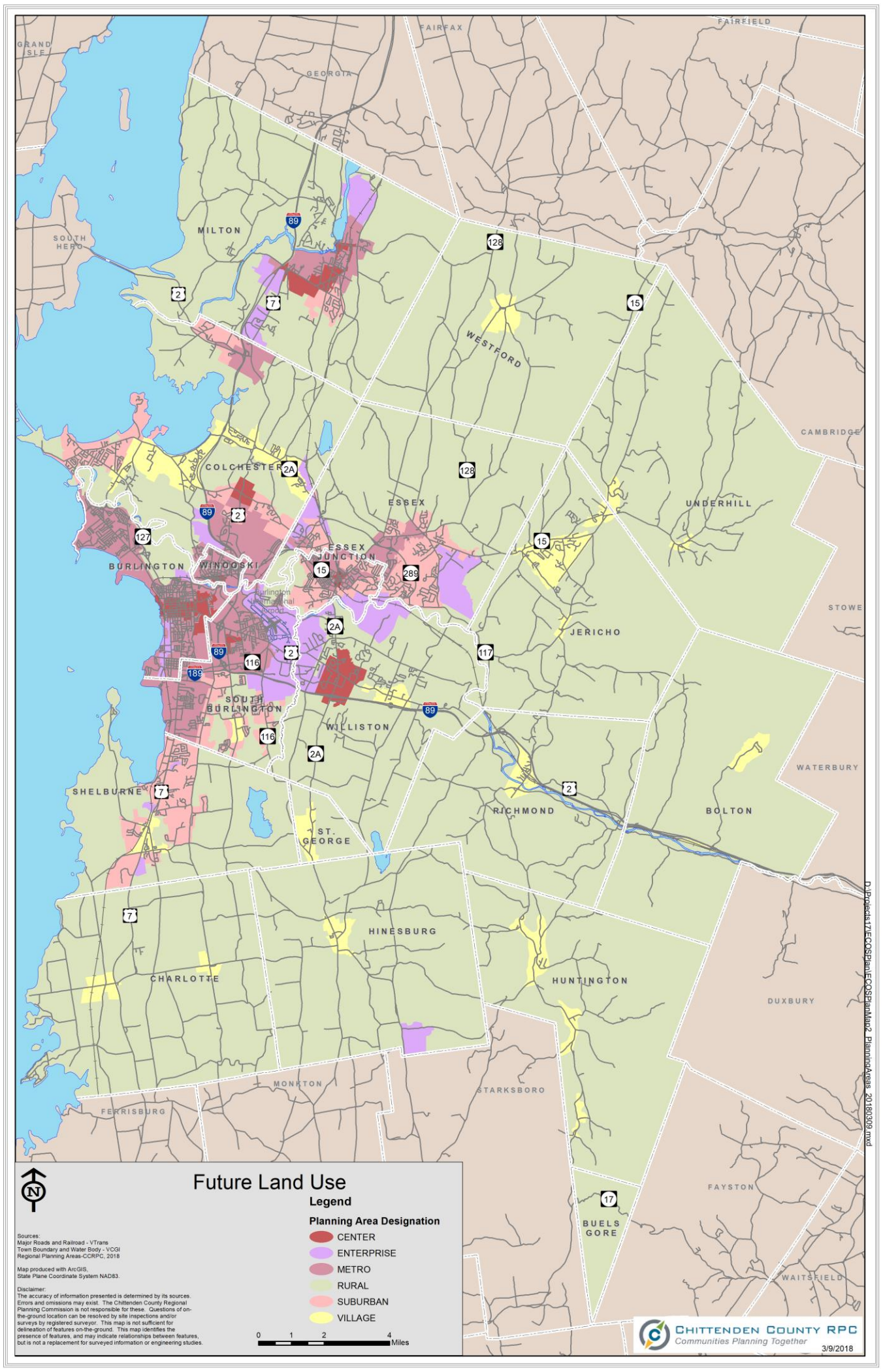
Commented [MN143]: wind rules?

i. Locate energy generation proximate to existing distribution and transmission infrastructure with adequate capacity and near areas with high electric load (See Green Mountain Power's Solar Map and Burlington Electric Department's Distributed Generation Map)
ii. Locate renewable energy generation in areas designated by a municipality in an adopted plan for such use, including specific preferred sites for solar (state preferred sites are mapped on Map 5).
iii. Locate solar generation (including but not limited to net metering) on previously impacted areas (such as, parking lots, previously developed sites, brownfields, State regulated landfills with post-closure certification, gravel pits/quarries, or on or near existing structures).
iv. Locate ground-mounted solar larger than 15 kW AC and wind turbines with a hub height larger than 30 meters (98 ft.) outside of state designated village centers, growth centers, downtowns, new town centers, neighborhood development areas, and historic districts on the State or National Register.
v. ~~Locate ground-mounted solar generation, and small-scale wind (1 or 2 turbines, up to 50 meters (164 ft.) in Chittenden County's areas planned for growth, while allowing infill development wherever reasonably practical~~. Integrate renewable energy generation facilities in a manner that allows infill to be the priority within areas planned for growth but outside designated areas mentioned above to mitigate load growth.
vi. Locate wind generation in areas with high wind potential, such as the prime and base wind potential areas shown on Map 7.

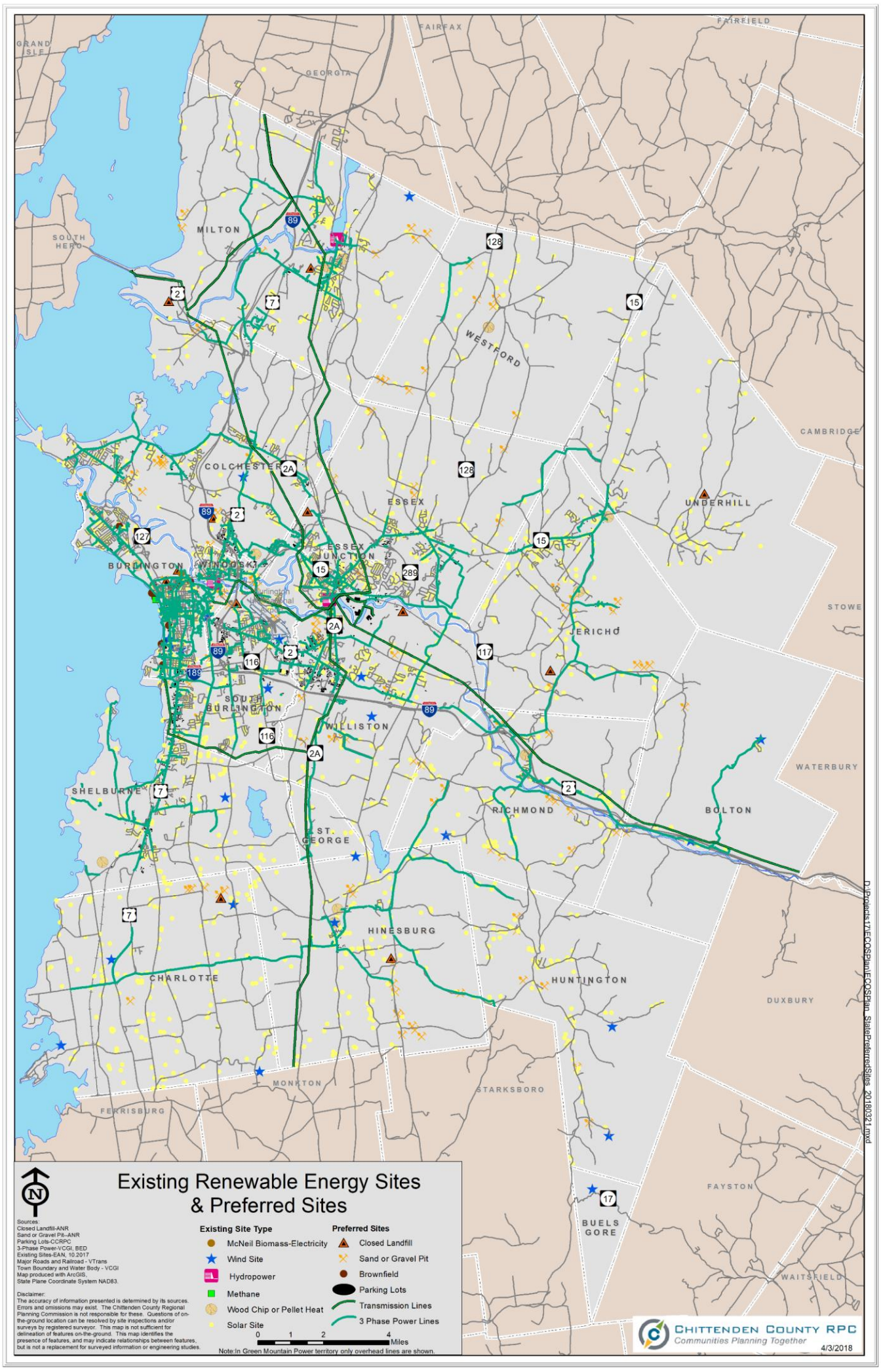
Commented [MN144]: clarify that these generation faciliteis are to be integrated to keep load and generation. clarify that areas planned for growth is minus designated areas

Commented [MN145R144]: This modification also addresses the removal of Burlington's Mixed Use Institutional Core Campus and Enterprise Zoning from list of possible constraints. The PAC had a conversation about these districts not fitting as a possible constraint because possible constraints need to be equally restrictive across all types of development.

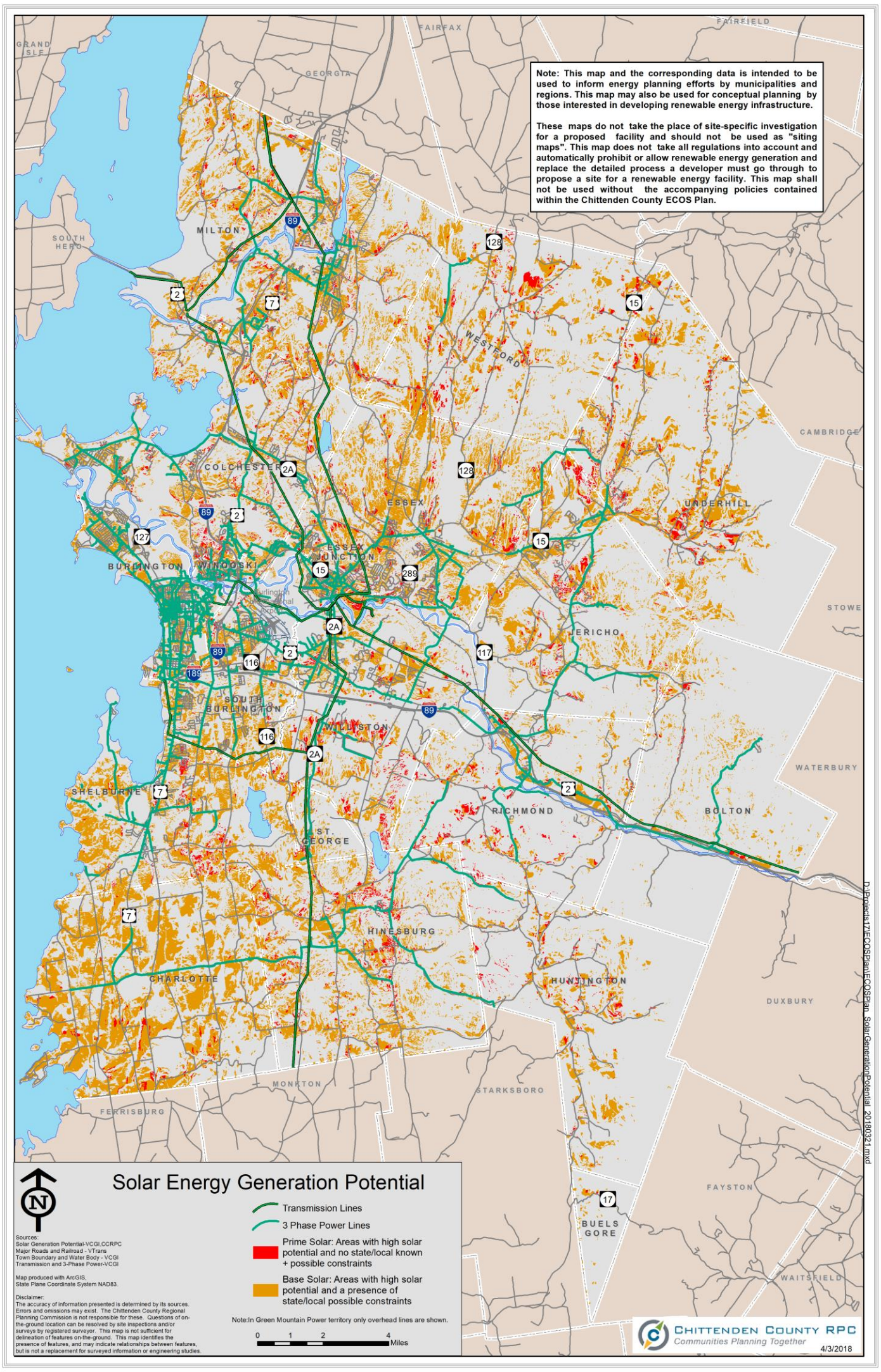
MAP 2 – FUTURE LAND USE



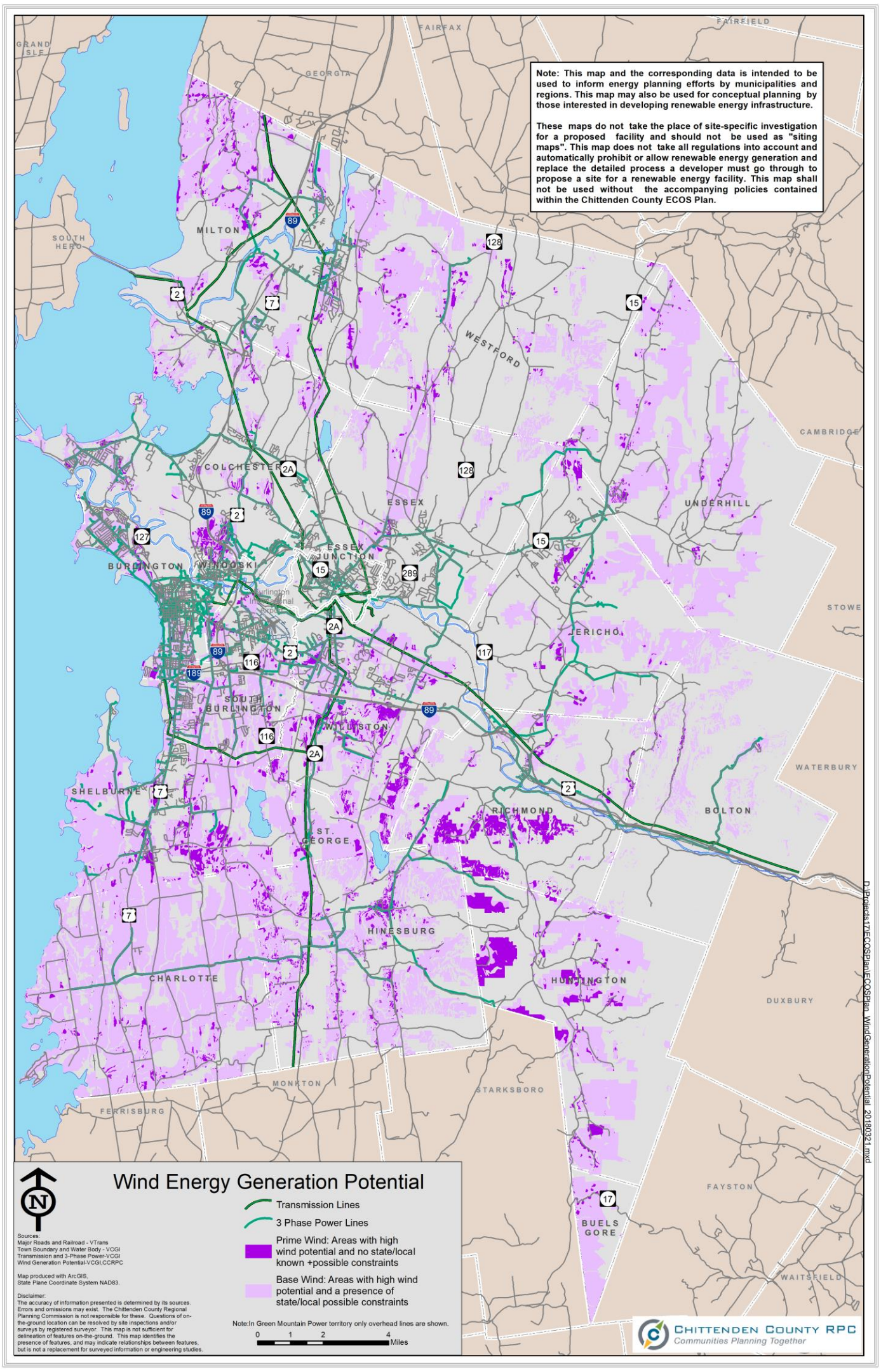
MAP 5 – STATE PREFERRED SITES FOR SOLAR GENERATION + EXISTING RENEWABLE ENERGY GENERATION SITES



MAP 6 – SOLAR GENERATION POTENTIAL



MAP 7 – WIND GENERATION POTENTIAL



~~3~~.6 IMPROVE THE SAFETY, WATER QUALITY, AND HABITAT OF OUR RIVERS, STREAMS, WETLANDS AND LAKES IN EACH WATERSHED.

While striving toward all the ECOS strategies, and particularly Strategy #2 – 90% of growth in 15% of our land area, it is essential to do so in such a way that we do not impair our essential water resources (including potable water) and that we prepare ourselves for the impacts of a changing climate.

1. River Hazard Protection – Develop and implement adaptation strategies to reduce flooding and fluvial erosion hazards. While supporting planned growth, ensure that growth is evaluated in terms of preparedness for a changing climate. Chittenden County will continue its efforts, along with the municipalities, to avoid development in particularly vulnerable areas such as floodplains, river corridors, wetlands, lakeshore and steep slopes; protect people, buildings and facilities where development already exists in vulnerable areas to reduce future flooding and erosion risk; plan for and encourage new development in areas that are less vulnerable to future flood & erosion events (see Strategy 2); and implement stormwater management techniques to slow, spread and sink floodwater (see the Non-Point Source Pollution section below).

a. Use mapping and data tools to prioritize and address erosive areas - VTrans developed the Vermont Transportation Resilience Planning Tool (TRPT: https://roadfloodresilience.vermont.gov/#/map), a web-based application that identifies bridges, culverts, and road embankments that are vulnerable to damage from floods, estimates risk based on the vulnerability, and criticality of roadway segments, and identifies potential mitigation measures based on the factors driving the vulnerability. The TRPT combines river science, hydraulics and transportation planning methods and is applied at a watershed scale. Another tool under development, to identify problem locations, is the Repeat Damage Tool for roads and bridges that needed repair after two or more Governor-declared events [note: more to come].

b. Revise bridge/culvert designs - Revise public works standards and zoning ordinances with culvert and bridge design specifications that allow for wildlife passage and movement of floodwater and debris during high intensity events. Implement culvert and bridge designs that produce stable structure in river channels (i.e. fluvial geomorphology).

c. Protect river corridors – Existing bylaws protect most River Corridor areas with stream setbacks and floodplain regulations. Work with municipalities and ANR to improve bylaws to protect the River Corridor Areas not currently protected and enforce these bylaws. Continue protection of river corridors including non-regulatory protection measures such as stream re-buffering, river corridor easements on agricultural lands, river corridor restoration and culvert and bridge improvements.

d. Support non-regulatory conservation and/or preservation of vulnerable areas through public and land trust investments, including identification of repetitively damaged structures and provide assistance to elevate, relocate or buy out structures, and identify where flood storage capacity may be restored and conserved.

e. Participate in the development and implementation of the Lamoille (Basin 7), Winooski (Basin 8) and Northern Lake Champlain Direct Drainages (Basin 5) Tactical Basin Plans. CCRPC will work with the State, municipalities, and other partners to address river hazard protection, flood resiliency and water quality through these Plans – including prioritizing projects for funding.

f. To protect water quality, development should be located to avoid state and local known constraints that have been field verified, and to minimize impacts to state and local possible constraints that have been field verified.

i. State and Local Known Constraints, as protected by municipalities and State agencies, are shown on Map 9 and include the following: DEC River Corridors, FEMA Floodways, and Municipal Water Quality Setbacks, Local Known Constraints – see constraint tables under the description of Map 9 in Supplement 3.

ii. State and Local Possible Constraints are shown on Map 9 and include the following: FEMA Special Flood Hazard Areas and hydric soils, Local Possible Constraints – see constraint tables under the description of Map 9 in Supplement 3.

2. Non-point Source Pollution - While we have addressed point sources of pollution, non-point sources are still contributing pollutants to our water bodies.

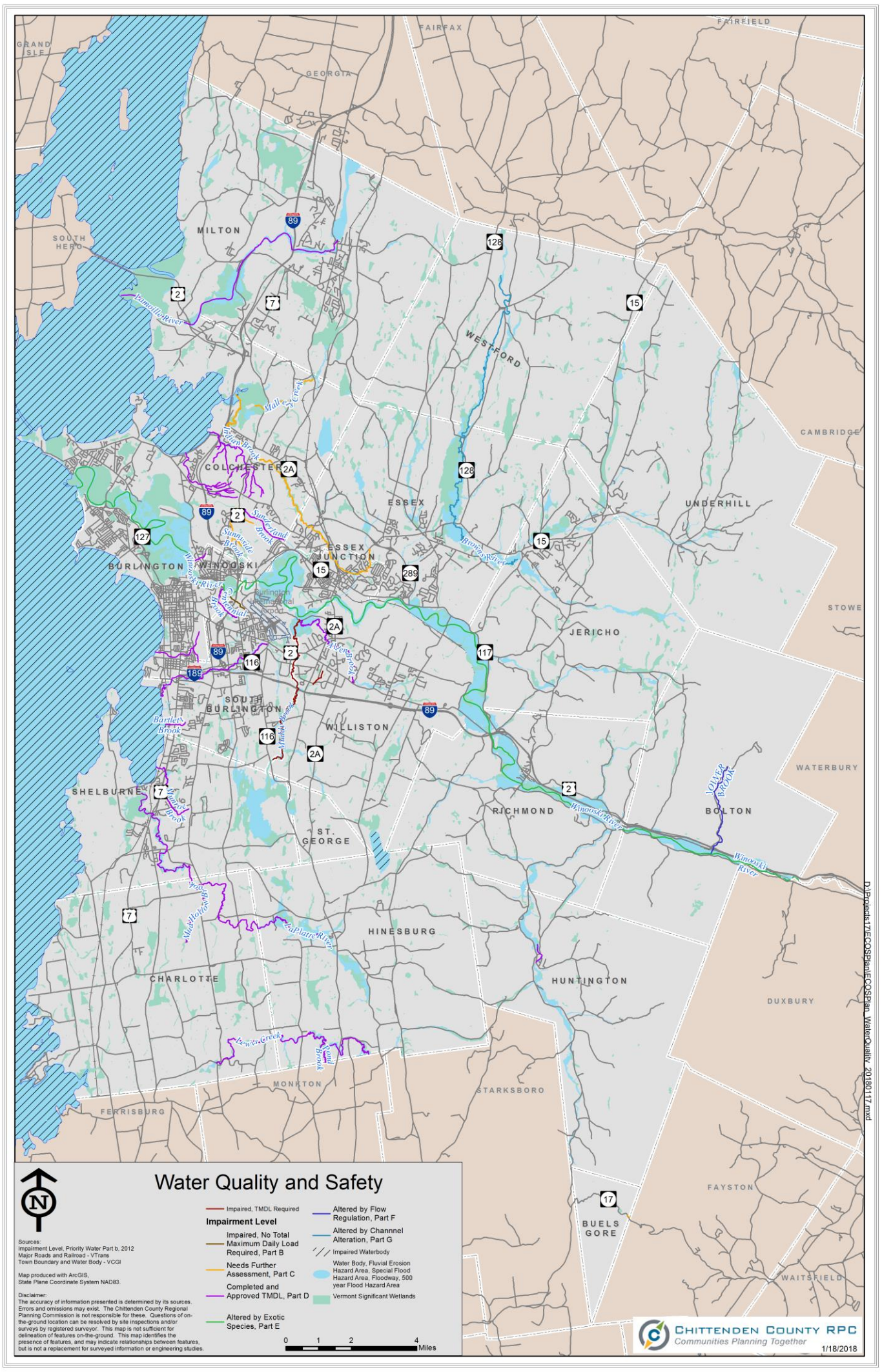
a. Assemble data – Work from existing data collected and further identify the locations that are contributing to water quality pollution such as flow, sediment, pathogen and nutrient. Where needed, conduct on-the-ground inventories of water quality and biological assessments (in-stream), wetlands, sub-watersheds, river corridors (buffered or not) and geomorphology. Map the existing and new data on one regional map.

b. Revise Plans and Bylaws and Ensure Enforcement -- Incorporate the above data into municipal plans; establish specific statements that protect these resources; develop clear standards for how to protect these resources within zoning regulations; and initiate on-going enforcement of the regulations. Encourage Low Impact Development (LID) policies and Green Stormwater Infrastructure (GSI) techniques, and shared storm water control programs to maximize land development in areas planned for growth. Incentivize best management practices for agricultural uses; and encourage the Agency of Agriculture to better enforce their required agricultural practices. In addition, EPA's Lake Champlain Total Maximum Daily Load (TMDL) for phosphorus, Vermont's Phase 1 TMDL Implementation Plan, and the Vermont Clean Water Act (2015 Act 64) have established a variety of regulatory programs to address phosphorus reduction. CCRPC will work with the municipalities and other partners to implement these programs: Municipal Roads General Permit, Phosphorus reduction integration into the existing MS4 permit, and Stormwater General Permit 3-9050 for Developed Lands (3 or more acres of impervious). See Chittenden County's Work Plan and the 2022 Chittenden County Multi-Jurisdictional Hazards Mitigation Plan (in development) for more detail on these actions.

c. Implement Non-regulatory approaches - Identify and implement non-regulatory approaches to nutrient, pathogen and sediment pollution management especially projects implemented through the Clean Water Services Provider framework authorized under Act 76.. . Support watershed organizations.

d. Implement permits - Under new MS4 permit requirements, nine Chittenden County municipalities are implementing various measures to reduce the impacts of non-source runoff and help meet the total maximum daily load requirements for impaired streams, rivers, and Lake Champlain. These include MS4 Stormwater Management Plans which include several elements namely six Minimum Control Plans, Flow Restoration Plans for impaired streams, and Phosphorus Control Plans for municipal owned roads, rights-of-ways and properties. Nine other municipalities in the County also must implement their Municipal Roads General Permit which requires improvements to municipal roads that drain to waterways. These permits require additional public investment in storm water facilities or investments.

MAP 8 – WATER QUALITY & SAFETY



4.7 INCREASE INVESTMENT IN AND DECREASE SUBDIVISION OF WORKING LANDS AND SIGNIFICANT HABITATS, AND SUPPORT LOCAL FOOD SYSTEMS.

1. **Habitat Preservation** - Protect forest blocks, wildlife connectivity resources and crossings, surface waters, riparian areas and other significant habitats (e.g. wetlands) from development and fragmentation; and promote vegetative landscaping in urban areas to maintain natural habitats, natural storm water management, water quality, air quality, carbon sequestration and cultural heritage. This work should focus on the broader concept of the pattern of forest cover versus focusing on core forest areas because forest blocks in Chittenden County are getting smaller and more isolated from other forest blocks, as well as surface water and riparian areas. Leaving isolated islands of habitat contributes to losses in biodiversity.
    a. Inventory – Map 10 provides a starting point for regionally important forest blocks and wildlife habitat and is the basis for this Plan's compliance with Act 171 of 2016 (Forest Integrity). The map includes Vermont Conservation Design's highest priority and priority resources defined as two scales: Landscape Scale (aka forest blocks and connectivity resources) and Species and Community Scale (aka rare, threatened and endangered species and other specific habitat sites). This data and the component layers are located on the State's BioFinder website. Over the coming years CCRPC will work with municipalities to be compliant with this new statutory requirement, by:
        i. assisting with on the ground surveys and inventories of forest blocks, wildlife crossings, natural communities (i.e. special features within the forest blocks and surface water and riparian areas), and other significant habitats (e.g. wetlands), scenic resources and locations of invasive species and map this information.
        ii. Prioritize these resources based on ecological information, connectivity and local information. For example, a landscape scale forest block may be more important than another if it contains multiple community species within it. Or a portion of a forest block may be more important than another if it is planned for growth. For example, the Forests, Wildlife & Communities: Science to Action project was done in the Towns of Richmond, Bolton, Jericho, and Huntington, by Vermont Natural Resources Council, Arrowwood Environmental, Vermont Fish & Wildlife Department, VT Forests, Parks & Recreation Department, and CCRPC. Hinesburg has also done some great work in this area. Also, the VT Agency of Transportation's BioFinder and *Planning: A Key Step Towards Protecting Forest and Wildlife Resources* are helpful resources for this work.
        iii. incorporate this data into municipal and regional plan text and maps and establish specific policies that address and protect these resources. This data can be added to a natural features map, and the highest priority resources can be added to the future land use map as an area to be protected in the future.

Commented [RM148]: Circle back after this legislative session.

Commented [RM149]: Be clear on what we are landing on and what we are defining.

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iv. Aggregate these locally important forest blocks, wildlife habitat and associated resources into a regionally significant map so that we can see these resources across municipal boundaries and work together to protect them.

b. Resource Protection Audit – Identify what resources are being protected and to what standard. Map this information based on tiers of resources based on scale (i.e. small scale rare species locations and wetlands versus landscape scale forest blocks) and protection standards. Small scale resources may require higher standards, where landscape scale resources may accommodate some development and require less protective standards to maintain functions and values.
c. Municipal Development Review Regulations - Develop clear definitions of the resources to be protected and establish standards to describe how to protect these resources within zoning and subdivision regulations.
d. Education - Educate engineers, developers, real estate professionals, planners and the public regarding resources and methods for restoration and protection.
e. Non-regulatory Protection - Support non-regulatory conservation and/or preservation through public and land trust investments. Establish invasive plant removal management plans, implement the plans and include long-term monitoring.
f. To protect significant habitats, development should be located to avoid state and local known constraints that have been field verified, and to minimize impacts to state and local possible constraints that have been field verified.
    - State and Local Known Constraints, as protected by municipalities and State agencies, are shown on Map 9 and include the following: State - significant natural communities and rare threatened and endangered species, vernal pools (unconfirmed and confirmed), and Class 1 and Class 2 Wetlands, Local Known Constraints: see constraint tables under the description of Map 9 in Supplement 3.
    - Possible State and Local Constraints, as protected by municipalities and State agencies, are shown on Map 9 and include the following: Protected Lands (state lands in fee simple ownership and privately conserved land), deer wintering areas, the Agency of Natural Resources Vermont Conservation Design Highest Priority Forest Blocks, Local Possible Constraints: see constraint tables under the description of Map 9 in Supplement 3.

2. **Working Lands Implementation** – To preserve the soul of Vermont, as well as move forward into the future with resiliency, Vermont needs to protect the farmland and forestland we have and support existing and new operations (including, but not limited to, un-intensive urban and suburban home gardens and mini-homesteads). ..
    a. Support implementation of the Farm to Plate Investment Program to achieve the following outcomes by 2030: 1. Increase sustainable economic development and create jobs in Vermont's food and farm sector; 2. Improve soils, water, and resiliency of the working landscape in the face of climate change. 3. Improve access to healthy local foods for all Vermonters.

b. Support implementation of the VT Working Landscape Partnership Action Plan.
c. Municipal Development Review Regulations - Develop clear definitions of working lands to be protected and establish zoning and subdivision standards to describe how to protect these areas from development so that they may be retained and accessible as "working" lands. Maintain access and scale of working lands to ensure viability after subdivision in the rural landscape (including but not limited to protection of log landings of previously logged forested parcels, zoning techniques such as fixed area ratio zoning to separate lot size from density, conservation zoning and homeowners association bylaws that allow for farming on the open space lots, etc.); while promoting urban agriculture in areas planned for growth. While farming is generally exempt from municipal zoning, some structures such as farm houses, processing facilities, the generation of energy for on-farm use, and on-farm retail and related enterprises may be regulated. The economic viability of farm enterprises can often depend on these facilities so municipal regulation should not impede reasonable farm related improvements.
d. Infrastructure & Systems – support establishment of food processing industries, value-added product markets, workforce training, etc. to help support the viability of these industries.
e. Biomass Energy Potential – support the continued sustainable harvesting of biomass in Chittenden County for uses including wood heating and electricity production, which will support the viability of the forestry industry and move the region towards the energy goals discussed in Strategy 2.
f. Support non-regulatory conservation and/or preservation through public and land trust investments (including but not limited to municipal land conservation funds).
g. Work with farmers and the Farm to Plate Initiative to balance this plan's goals of a strong local food system and increased production of renewable energy.
h. To preserve working lands, development should be located to avoid state and local known constraints that have been field-verified, and to minimize impacts to state and local possible constraints that have been field-verified.

    i. Possible State or Local Constraints, as protected by municipalities and State agencies, are shown on Map 9 and include the following: Agricultural soils and Act 250 agricultural soil mitigation areas, and local constraints listed in the constraint tables under the description of Map 9 in Supplement 4.

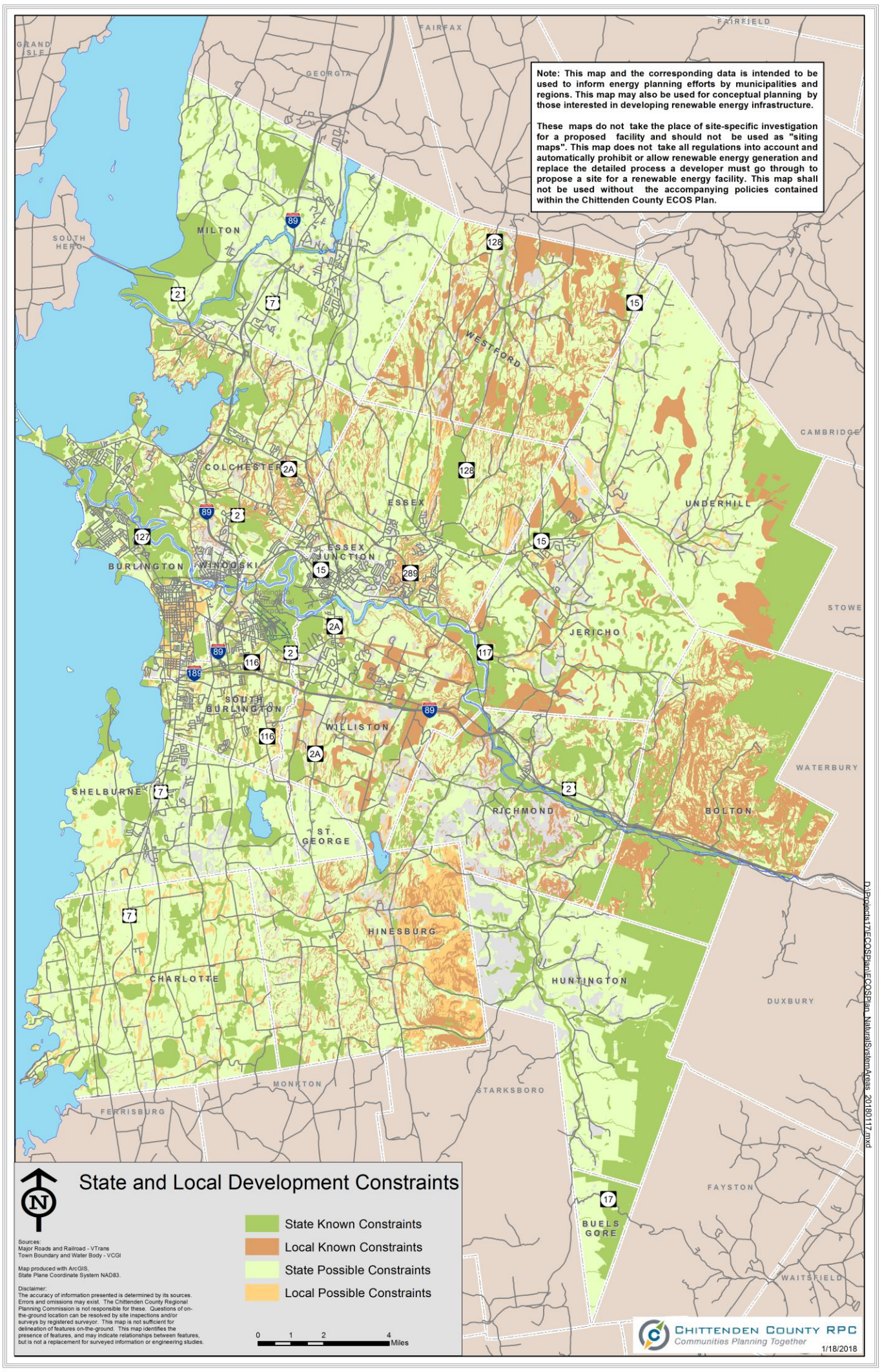
3. **Earth Resources Extraction -** Mineral extraction and processing facilities, including smaller private extraction operations existing to support agricultural operations, should be planned, constructed, and managed, in conjunction with State and local regulations, to:

a. Not place an excessive or uneconomic burden on local and state highways and bridges – including but not limited to a burden to the function and safety of existing roads and bridges serving the project site, strain from heavy loads on roadbeds and bridges, conflicts with pedestrians or bicyclists and increased heavy traffic in dense residential areas; and

Commented [RM151]: Are we still going to say this and be in compliance with the new state Comprehensive Energy Plan?

b. Minimize any adverse effects on water quality, fish and wildlife habitats, and adjacent land uses; and
c. Plan for their eventual rehabilitation so that slopes are stable, and the surface is revegetated with a variety of native species to support a wide range of biodiversity. To that end, topsoil should not be removed from sites and excavations should stop early enough so that stable slopes can be established on the property; and
d. Extraction sites should be screened to the extent practical if topography and vegetation allow.

MAP 9 – NATURAL SYSTEMS/DEVELOPMENT CONSTRAINTS



Local Known and Possible Constraints

Bolton	Burlington	Charlotte	Colchester
Known Constraints: • Surface Water Setbacks • Wetland Buffers • Slopes 25% or more **Possible Constraints:** • Conservation District • Slopes 15% to 25% • Forest District • Town Owned Land • ~~Flood Hazard Overlay II~~	**Known Constraints:** none identified **Possible Constraints:** • ~~Historic Districts, Historic Neighborhoods (Eligible for Listing)~~ • ~~Mixed Use, Institutional Core Campus and Enterprise Zoning Districts~~ • ~~Designated Downtown and Neighborhood Development Area~~ • ~~Official Map Features~~ • View Corridors • Burlington Country Club property • City-owned parks and Centennial Woods	**Known Constraints:** none identified **Possible Constraints:** • Shoreland Setback and Buffer Area • Surface Waters, Wetlands, and Buffer areas • Flood Hazard Areas • Special Natural Areas • Wildlife Habitat • Historic Districts, Site, and Structures • Slopes greater than 15% • Land in Active Agriculture • Water Supply Protection • Scenic Views	**Known Constraints:** • Slopes 20% or greater • Wetlands and Surface Water Buffers **Possible Constraints:** • Shoreland Overlay District
Essex	**Hinesburg**	**Jericho**	**Milton**
Known Constraints: • Slopes Higher than 20% **Possible Constraints:** • Scenic Resource Protection Overlay District • Resource Protection District • Slopes 15%-20% • Core Habitat • Habitat Blocks	**Known Constraints:** • Slopes Higher than 25% **Possible Constraints:** • Slopes (15-25%) • Core Habitat • ~~Village Growth Area~~ • ~~Industrial Zoning District~~	**Known Constraints:** • Well Protection Area Overlay District • Natural Resource Overlay District • Primary Conservation Areas **Possible Constraints:** • Secondary Conservation Areas • ~~Village Centers~~	**Known Constraints:** None identified **Possible Constraints**: • Town Forest and Municipal Natural and Rec Areas w/Management Plans • Habitat Blocks 8-10 • Encumbered Open Space

Commented [MN1]: Remove because of outdated layer

Richmond	Shelburne	South Burlington	Underhill
Known Constraints: • Slopes equal to or greater than 35% **Possible Constraints:** • Wetland buffers • Water supply protection area • Surface water buffers	**Known Constraints:** None identified **Possible Constraints:** • Significant View Areas • Lakeshore Buffer • Archeologically Sensitive Areas (not mapped)	**Known Constraints:** • Wetlands and buffer • River Corridor • Very Steep Slopes • Floodplain Overlay District Zones A, AE, A1-30 and B2 **Possible Constraints:** • Habitat Block Overlay District • Steep Slopes • SEQ Natural Resource Protection Area • B1- 500-year Floodplain	**Known Constraints:** • Above 1,500 ft. Elevation **Possible Constraints:** • Slopes 15% or greater • Mt. Mansfield Scenic Preservation District • Wetlands and associated buffers, • Surface Waters and buffers
Westford	**Williston**	**State**	**State**
Known Constraints: • Slopes 25% or greater • Deer Wintering Areas • Ledge Outcropping • ~~Flood Hazard Overlay~~ • Water Resources Overlay **Possible Constraints:** None identified	**Known Constraints:** • Water Protection Buffers • Primary Viewshed Areas • Slopes 30% or greater **Possible Constraints:** • Slopes 15% -30% • Conservation Areas/Natural Communities	**Known Constraints** • FEMA Floodways • DEC River Corridors • National Wilderness Areas • State-significant Natural Communities and Rare, Threatened, and Endangered Species • Vernal Pools (confirmed and unconfirmed) • Class 1 and 2 wetlands (VSWI and advisory layers)	**Possible Constraints** • Agricultural Soils + Hydric Soils • Act 250 Ag. Soil Mitigation Areas • FEMA Special Flood Hazard Areas • VT Conservation Design Highest Priority Forest Blocks (Forest Blocks – Connectivity, Forest Blocks – Interior, Forest Blocks - Physical Land Division) • Highest Priority Wildlife Crossings • Protected Lands (State fee lands and private conservation lands) • Deer Wintering Areas