Central Vermont Regional Planning Commission

REGIONAL PLAN COMMITTEE

Central Vermont Regional Planning Commission Conference Room
29 Main Street, Suite #4, Montpelier, VT 05602
April 20, 2018
1:00pm

AGENDA

1. CALL TO ORDER

The meeting will be called to order and those present will provide introductions to the group.

2. CHANGES TO THE AGENDA

The Committee should determine if the agenda should be modified or amended.

3. PUBLIC COMMENTS

Members of the public may provide comments on items not on the agenda

4. CONSIDERATION OF CHANGES TO THE 2016 CENTRAL VERMONT REGIONAL PLAN OR THE CENTRAL VERMONT REGIONAL ENERGY PLAN TO ADDRESS CONSISTENCY WITH THE STANDARDS OF ACT 174

The Committee should discuss feedback from the Department of Public Service regarding consistency of the 2016 Central Vermont Regional Plan and the Central Vermont Regional Energy Plan with the Standards of Act 174. Staff will present the Committee with information and options for review and discussion related to the feedback from the Department. The Committee should consider a recommendation to the Board of Commissioners on potential changes to address consistency with the standards.

5. ADJOURNMENT

Central Vermont Regional Planning Commission

MEMO

Date: April 20, 2018

To: Regional Plan Committee

From: Eric Vorwald, AICP, Senior Planner

Re: Regional Plan Land Use & Energy Consistency

☒ **ACTION REQUESTED:** Recommend amendments to the 2016 Central Vermont Regional Plan or the Central Vermont Regional Energy Plan for consideration by the Board of Commissioners to address consistency with the Enhanced Energy Planning Standards of Act 174.

Following the April Board of Commissioners meeting staff reached out to the Department of Public Service (the Department) to make them aware of changes that were approved to the Energy Plan. The Department indicated that the language, as drafted, may be inconsistent with Enhanced Energy Planning Standard 12 related to the identification of areas that are unsuitable for renewable energy development. Specifically, the Department noted that the proposed prohibition on wind development over 2,500 feet was inconsistent with policies outlined in the Regional Plan's Land Use Element. This creates an inconsistent prohibition on one use over another and may result in a negative determination of energy compliance.

Additionally, the Department recommended that the CVRPC consider using the definitions for wind facilities that are outlined in Enhanced Energy Planning Standard 11A, or explicitly define and include rationale for utilizing alternative language for the height of wind generation facilities.

Staff will provide an overview of the information from the Department and outline options for moving forward. This will include possible changes to ensure conformance with the Standards of Act 174. The Committee should discuss this information and determine which changes should be recommended to the Board of Commissioners for consideration.

To address the concerns raised by the Department, staff is proposing three options for moving forward which include:

Option 1. Update language in the Energy Plan to maintain consistency with the Regional Plan and include an explanation of the hub height limitation on wind energy

Option 2. Update language in the Energy Plan to maintain consistency with the Regional Plan and the Enhanced Energy Planning Standards' definition related to hub height for wind energy

Option 3. Update the Regional Plan for consistency with approved language in the Energy Plan

Options 1 and 2 will generally include additive language to more explicitly connect the goals and policies of the regional plan's land use element with the limitation on wind energy. The primary difference between Options 1 and 2 is that Option 1 would include additional discussion on why 116 feet was used for the maximum hub height; while Option 2 would include language consistent with the Departments height limits for utility scale wind. Also, with Option 2, the maximum height would be increased to 50 meters (approximately 160 feet), consistent with the Departments definitions.

Option 3 would consider amendments to the regional plan to restrict development above 2,500 feet. Due to the nature of the amendments that would be necessary, this option would require a more significant review to identify and propose the necessary amendments. The primary section that would be impacted is the land use element, however additional elements may also need to be amended.

To aid in the discussion, staff is providing several documents including:

- Proposed amendments to the Central Vermont Regional Energy Plan to address Options 1 and 2 as noted above
- The Regional Plan Future Land Use Map
- Regional Plan policies related to future land use categories
- Enhanced Energy Planning Standards 10, 11, and 12

Please note, no proposed amendments are included at this time related to Option 3. If Option 3 is recommended, staff will work with the appropriate committee(s) to develop a recommendation to the Board of Commissioners.

PROPOSED AMENDMENTS TO
THE CENTRAL VERMONT REGIONAL ENERGY PLAN

APRIL 20, 2018

The following amendments pertain to text beginning with paragraph 2 on page 14 of the Central Vermont Regional Energy Plan that was approved by the Board of Commissioners on April 10, 2018. This information relates to Options 1 and 2 as outlined in staff's memo to the Committee and includes:

Option 1. *Update language in the Energy Plan to maintain consistency with the Regional Plan and include an explanation of the hub height limitation on wind energy*

- Includes references to the Regional Plan Land Use Element
- Includes additional justification for the 116 foot hub height
- **Option 1 = Part A + Part C**

Option 2. *Update language in the Energy Plan to maintain consistency with the Regional Plan and the Enhanced Energy Planning Standards' definition related to hub height for wind energy*

- Includes references to the Regional Plan Land Use Element
- Includes consistency with the Enhanced Energy Standards' definition for hub height (including an overall increase to 50 meters or approximately 160 feet)
- **Option 2 = Part B + Part C**

Text that appears in **bold and underlined** is proposed to be added and text that appears with a ~~strikeout~~ is proposed to be deleted.

PART A – Proposed Changes related to Option 1

Central Vermont enjoys rich natural and scenic resources. This is represented by the peaks of the Worcester and Green Mountain ranges (including Camel's Hump State Park), which are characteristic of many Vermont communities. These areas are important to Central Vermont not only for their natural, scenic, and recreational value, but also for the predominance of critical plant and animal habitat that exists in the undisturbed forest blocks. In support of the protection of these areas, the 2016 Central Vermont Regional Plan identifies critical resources areas including wildlife habitat, steep slopes, and lands above 2,500 feet in elevation. These areas are specifically identified for their value as a regional resource.

With this in mind, the Central Vermont Regional Planning Commission has determined that industrial-scale wind development is not compatible with the future land use patterns of Central Vermont. For the purposes of this plan, industrial-scale wind development will include any wind turbine with a hub height greater than 116 feet (excluding the blades). Additionally, wind energy development will be ~~prohibited~~ **restricted** above 2,500 feet in elevation consistent with the 2016 Central Vermont Regional Plan's future land use plan.

For the purposes of this energy plan, a 116 foot hub height is expected to accommodate both residential and commercial wind generation. Hub heights above 116 feet will be considered industrial in scale and not fitting for Central Vermont. This height restriction is intended to reduce the visual impact of wind generation facilities while still permitting commercial and residential land uses to incorporate wind generation as appropriate. Additionally, the height restriction will limit the amount of land needed to accommodate wind generation and help maintain the sensitive natural resources throughout the region where industrial-scale wind resources have been identified.

To further support this limitation on industrial-scale wind generation, the 2016 Central Vermont Regional Plan's Future Land Use **plan** identifies two distinct categories that encompass **a** ~~an overwhelmingly~~ significant portion of the region **and includes almost all of the resource areas identified for wind generation.** These categories are Rural and Resource and are delineated on the Future Land Use Map in Appendix A of the 2016 Central Vermont Regional Plan. These categories are described as:

PART B – Proposed Changes related to Option 2

Central Vermont enjoys rich natural and scenic resources. This is represented by the peaks of the Worcester and Green Mountain ranges (including Camel's Hump State Park), which are characteristic of many Vermont communities. These areas are important to Central Vermont not only for their natural, scenic, and recreational value, but also for the predominance of critical plant and animal habitat that exists in the undisturbed forest blocks. In support of the protection of these areas, the 2016 Central Vermont Regional Plan identifies critical resources areas including wildlife habitat, steep slopes, and lands above 2,500 feet in elevation. These areas are specifically identified for their value as a regional resource.

With this in mind, the Central Vermont Regional Planning Commission has determined that ~~industrial-scale~~ **utility-scale** wind development is not compatible with the future land use patterns of Central Vermont. For the purposes of this plan, ~~industrial scale~~ **utility-scale** wind development will include any wind turbine with a hub height greater than ~~116 feet~~ **50 meters** (excluding the blades) **as defined by the Department of Public Service**. Additionally, wind energy development will be ~~prohibited~~ **restricted** above 2,500 feet in elevation consistent with the 2016 Central Vermont Regional Plan's future land use plan.

To further support this limitation on ~~industrial scale~~ **utility-scale** wind generation, the 2016 Central Vermont Regional Plan's Future Land Use **plan** identifies two distinct categories that encompass **a** ~~an overwhelmingly~~ significant portion of the region **and includes almost all of the resource areas identified for wind generation.** These categories are Rural and Resource and are delineated on the Future Land Use Map in Appendix A of the 2016 Central Vermont Regional Plan. These categories are described as:

PART C – Proposed Changes related to both Options

Rural – These areas encompass much of the Region's large forest blocks, sand/gravel/mineral deposits, and prime agricultural soils that, when in productive use, contribute to the working landscape and have significant economic value. **Rural areas also include residential, small-scale commercial and industrial, and recreational uses.**

Resource – These areas are dominated by lands requiring special protection or consideration due to their uniqueness, irreplaceable or fragile nature, or important ecological function. These include, protected lands; elevations above 2,500 feet (elevations above 1,700 feet in Waitsfield, as regulated); slopes of 25% or more; rare, threatened or endangered species and significant natural communities; wetlands; special flood hazard areas; and shoreline protection areas. As a subcategory of Resource lands, this plan recognizes critical resource areas as key sites that are particularly sensitive and should be given maximum protection.

~~Specific polices related to these two future land use districts include:~~

- ~~Development should be designed to minimize its impact on the viability of agricultural operations or its contribution to fragmentation of large contiguous tracts of woodland.~~

- ~~Identified wildlife corridors should be protected from fragmentation and uses that reduce their viability for movement of wildlife, particularly where they connect large contiguous tracts of land.~~

- ~~Conservation of the natural landscape and careful management of lands is sought for these areas. Development in these areas should be subject to extensive planning, review and conditions that ensure its protection.~~

- ~~Any development proposed within critical resource areas shall provide evidence as to why the development cannot be avoided, and shall provide mitigation for natural resources impacted by the development.~~

- ~~The extension of permanent roads, energy transmission facilities, and utilities into Resource areas is discouraged.~~

~~An analysis of wind resource mapping for the Central Vermont Region identifies approximately 1,100 acres of unconstrained prime resource area for wind that is not located within the rural or resource future land use designations as described above. This acreage would equate to approximately 843,000 megawatt hours of energy generation potential. As such, the limitation on turbine height should not adversely impact the Region's ability to support all types of renewable energy generation.~~

Based on the mapping analysis completed by the CVRPC, there are approximately 250,000 acres of wind resource area within Central Vermont that has no known constraints (but does include possible constraints). Of that land, approximately 27,000 acres of wind resource area is specifically classified for industrial/utility-scale wind generation. Of those 27,000 acres, all but approximately 15 acres of wind resource area is located within land that is designated as Rural or Resource on the Future Land Use map included in Appendix A of the 2016 Central Vermont Regional Plan.

These 15 acres of land are located in the Industrial future land use designation. The regional plan identifies industrial areas to support economic development in the region including expansion, development, or redevelopment of existing industrial uses. These 15 acres of land are located on property that is an active quarrying operation which has been in existence for over 100 years. This use is expected to continue for the life of this plan and well into the future as an on-going economic force in the region that is supported by the regional plan therefore a change of use is not expected. With this in mind, there is currently no suitable land available where industrial/utility-scale wind generation could be developed.

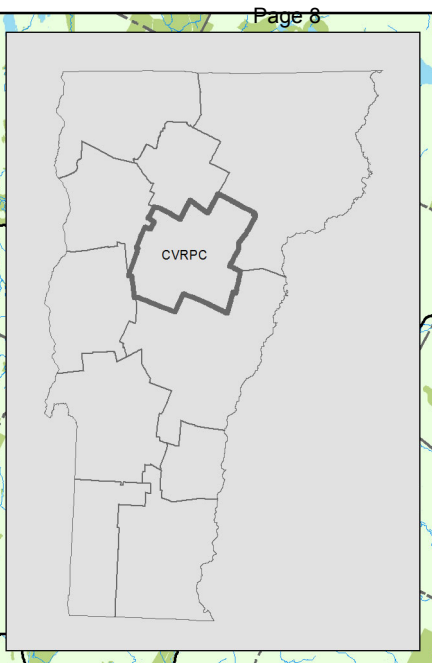
The restriction on industrial/utility-scale wind generation is also consistent with other policies outlined in the Regional Plan's Land Use element. Policies in the Rural designation support clustered development in order to protect important resources such as agricultural soils or forest blocks. The policies also support the development of small-scale business opportunities that do not adversely impact the forestry or agricultural uses or diminish the rural character of these areas. The plan notes that these uses should be established in conjunction with existing rural developments where appropriate, and not be a dominant feature.

Land use policies associated with the Resource designation propose the avoidance of development on steep slopes; fragmentation of habitat connectors and forest blocks; wetlands; and ridgelines. The Resource district also discourages the extension of permanent roads, energy transmission facilities, and utilities. The policies further state that development should be subject to extensive planning, review, and conditions to protect these areas, but does not outright prohibit development. Additional policies that support smaller scale development in the Rural or Resource areas of the region are included in the land use element and consistent with the limitation on industrial/utility-scale wind development.

Finally, the land use element notes that smaller scale or clustered development is appropriate in certain locations. Policies 1 and 2 under Resort Centers discusses support for expansion of the existing commercial ski areas including Sugarbush and Mad River Glen (in Warren and Fayston) instead of resort development at new locations. Both of these ski areas include limited development that extends above 2,500 feet in elevation. Aside from these uses, few structures exist above 2,500 feet in elevation throughout the Region further supporting the restriction on development in the area designated as Resource on the Future Land Use map.

Central Vermont Region

2008 Future Land Use Map



Future Land Use

- Resource
- Rural
- Regional Center
- Town Centers
- Industrial
- Mixed-Use Commercial
- Hamlets
- Resort Centers
- Villages

Adopted 10/13/2015

0 2 4 6 8 10 Miles

Data should be verified during permitting process per the provisions of the regulatory authority. This map is for general planning purposes only. This map may contain errors and omissions. See page 2-19 and 2-31 of the Land Use Element for a complete explanation.

CVRPC
CENTRAL VERMONT REGIONAL PLANNING COMMISSION

Document Path: M:\Regional Plan\Update 2016\Maps and Analysis\Future Land Use\Future_Land_Use.mxd

Agency ’s web site “for every acre of brownfields redeveloped, it is estimated that an average of 4.5 acres of greenfields are saved. ”

CVRPC has been very active in the area of brownfield rehabilitation since the last Regional Plan adoption. Beginning in 2004, we have received over a half million dollars in EPA grants to assist our communities in assessing and reclaiming these important properties. To date, CVRPC ’s Brownfield Program has funded an extensive environ- mental site assessment for the Salt Shed on Stone Cutters Way in Montpelier and plans are now underway to transform the former industrial site to a mixed use development. Additional sites that have benefited from the program include the Railroad Turn Table, also located along Stone Cutters Way, next to the Salt Shed (for future use as a “pocket park ”), the MWT site in Northfield Falls (for the purpose of selling the property to the current tenants of the building and to retain business in a historic mill building), and two municipally owned sites in the Town of Warren (to assess their potential for the creation of affordable housing and public recreation space).

Noise

Any undesired sound can be considered “noise.” Noise pollution is defined as “continuous and unrelenting sounds at all levels or episodic and excessively loud sounds. ” While it must be recognized that noise necessarily accompanies certain business and transportation operations, new development should make all reasonable efforts to minimize noise impacts and shall not exceed acceptable standards in residential areas. Among the techniques available are: restricting hours of operation or construction, using vegetated buffer zones to filter sound, taking advantage of topography in designing projects to provide sound barriers, the use of structural barriers (i.e. earth berms and sound walls), and architectural design and materials. Higher noise levels may be appropriate and unavoidable within assigned industrial, commercial, and mixed use zones.

FUTURE LAND USE

State Statute directs Regional Plans to include a “land use element, which shall consist of a map and statement of present and prospective land uses. ” (24 V.S.A. § 4348). The Map identifies general Planning Areas that will be used to guide land use and development in the Central Vermont Region.

The Planning Areas are not meant to be detailed representations of current conditions, nor are they intended to be distinct areas of segregated future land uses. The Planning Areas focus on the overall pattern and form of development across the rural to urban spectrum rather than on specific densities or uses, which are more properly defined at the local level.

Future Land Use Planning Areas

Regional Centers are the Region's core downtowns, plus their surrounding mixed-use neighborhoods, which accommodate high density commercial, institutional, industrial and residential uses. Regional Centers in Central Vermont include portions of the City of Montpelier, Barre City and Waterbury Village, each of which contains a state-designated Downtown district and infrastructure that includes urban road networks, sidewalks, public spaces and public water and wastewater systems. These areas pro-vide regional services and employment and are areas where efforts to reduce travel demand through ridesharing, transit and multi-modal transit options are critical.

Regional centers are not only the dominant attractors of work and personal business trips in the Region, they also attract significant numbers of trips from the outside the Region. The Region's greatest concentrations of office space, retail space, bankingservices and other generators of personal business are located in downtown Montpelier and Barre City. Relative to the other downtown areas, Montpelier and Waterbury have more office space (such as the State Office Complex). Barre City also has State Offices at the McFarland House and City Place, and has more manufacturing and industrial land uses.

Central Vermont Regional Planning Commission
Designating Future Land Uses

The following criteria and data are used when staff and Commissioners make land use area designations in the CVRPC Regional Plan. (Criteria are generally in order of priority.) Boundaries of land use area designations are for general planning purposes only and may contain errors and omissions. Data should be verified during permitting processes per the provisions of the regulatory authority.

Area Designation Criteria:

1. Is it consistent with the state land use planning goals found in 24 V.S.A., §4302 (compact centers surrounded by rural areas)?
- Proximity to villages/downtowns/growth centers designated by the Vermont Downtown Board and/or recognized hamlets, town centers or regional centers identified by CVRPC's Regional Plan
- Is the area walkable (compact configuration allowing for less than ¼ to a ½ mile round trip)?
- Is there a visual or physical break (river, steep slope, change in density or type)?

2. Proximity to existing infrastructure
- Public wastewater, water, sidewalks, highways and transit, schools, recreation parks, other town services

3. Current Conditions
- Orthophotos: development density and extent
- Road network: potential access and connections
- Resource constraints: conserved lands, steep slopes, rare threatened and endangered species and significant natural communities, wetlands, floodplains, elevations about 2500 ft, and lake shore buffers.

4. Town planning and zoning
- What does the locally adopted and regionally approved Town Plan say?
- Do the town zoning districts match current infrastructure and future land use plans?

There is one State-designated Growth Center within the Region and its boundaries are adjacent to the City of Montpelier 's Designated Downtown. Growth Center designation in Vermont recognizes municipalities that demonstrate a capacity to plan and in- vest in vital, walkable, mixed-use centers and must include and support a designated Downtown, Village Center or New Town Center. A Growth Center has clearly defined boundaries that can accommodate a majority of commercial, residential, and industrial growth anticipated by the municipality or municipalities over a 20-year period.

Town Centers are less densely populated settlements and smaller than regional centers, but similarly accommodate many of the same residential, civic, commercial and light industrial uses. Typically referred to as "Villages," factors in determining the presence and boundaries of a Town Center include: a state-designated village center, local road network and availability of public utility infrastructure, relatively dense development and smaller lot sizes (1 unit per acre or higher), a mix of land uses, and a distinct separation from surrounding rural areas.

The Region's largest Town Centers that provide water and wastewater infrastructure and also serve as sub-regional retail and employment centers include Waitsfield Village/Irasville and Northfield Village. Additional Town Centers that provide water and/ or wastewater infrastructure, or both, include Warren Village, Cabot Village, Colbyville (Waterbury), Marshfield Village, Northfield Falls, Plainfield Village, Williamstown Village, Washington Village, East Barre, Worcester Village and Waterbury Center.

East Montpelier Village, East Calais, Maple Corner, Woodbury Village, Moretown Village, Duxbury Village, Middlesex Village and Roxbury Village round out the twenty existing Town Centers recognized in this Plan.

A subcategory of Town Centers in this Plan is New Town Centers. "New Town Center," as defined by the State, means the area planned for or developing as a community's central business district, composed of compact, pedestrian-friendly, multistory, and mixed use development that is characteristic of a traditional downtown, supported by planned or existing urban infrastructure, including curbed streets and sidewalks and on-street parking, storm water treatment, sanitary sewers, and public water supply." Though there are no state-designated New Town Centers within the Region, the Town of Berlin desires to encourage the expansion of the historic town area in the vicinity of Berlin Four Corners to adjacent areas to serve as a location of a mix of small-scale commercial, high density residential and civic uses in a traditional village setting.

Policies:

1. In order to maintain the existing settlement patterns, higher density residential, commercial, and industrial development should be located in Regional Centers and Town

Centers.

2. Small-scale shopping centers, designed to complement the historic character and support the vibrancy of community centers, are most appropriate in Town Centers or Hamlets (see Rural Areas). Community and Regional Shopping Centers, however, are less appropriate in Town Centers or Rural Areas and should be located in Regional Centers as a first priority and Mixed-Use Commercial areas as a second priority.

3. Encourage infill, redevelopment, adaptive reuse of existing buildings and reuse of "brownfield" sites in Regional and Town Centers. Encourage the revitalization and reuse of viable historic structures whenever possible.

Strategy 3a: Work with municipalities to align local capital planning and public investment strategies with infill and redevelopment goals.

Strategy 3b: Support implementation of infill and redevelopment activities identified in the 2015 Vermont Downtown Action Team reports (Barre City, Northfield, Waterbury, Waitsfield and Warren).

4. Municipalities should consider use of innovative tools such as "form- based" land use regulations. These types of regulations focus less on specific uses and more on the physical form of the built environment, utilize dimensional standards to shape how buildings relate to each other, to streets, and to other public spaces.

Strategy 4a: Explore opportunities to conduct a regional workshop focused on Implementing Form-based Land Use Regulations.

5. Continue to work with municipalities and VTrans to reduce conflicts between traffic needs and human-scale functions of Regional and Town Centers through practices like traffic-calming measures, pedestrian-safety improvements and gateway treatments. Priority for the use of public funding for the maintenance or improvement of infrastructure shall be for those that support concentrated development in Regional and Town Centers.

Shopping Center Definitions
(*Source: Bennington County Regional Plan*)

A shopping center may include one or multiple stores, in single or multiple ownership, functioning together as one integrated complex. For the purposes of the Regional Plan, the following definitions apply:

Small-Scale Shopping Center: A shop- ping center with a store or stores that sell daily living needs and convenience goods such as food, medicine, clothing, and hardware, and may also include service businesses (e.g., laundry, hair salon, bank, auto or bicycle shops). These centers range in size from 10,000 to 30,000 sq. ft. of gross floor area.

Community Shopping Center: A shopping center with a store or stores that sell a broad range of goods (such as food, clothing, furniture, appliances, sporting goods) and which also may include personal and professional service establishments. Large grocery stores, department stores, and movie theaters are often found in these centers. Gross floor area in a community shopping center may range from 30,001 to 300,000 sq. ft.

Regional Shopping Center: A shopping center (or "shopping mall") including stores that sell a wide variety of merchandise and services – similar to but larger and more extensive than a community shopping center – usually built around one or more large anchor department stores. These centers exceed 300,000 sq. ft. in gross floor area.

Strategy 5a: Support identification of corridors for new roads or road segments in and around Regional and Town Centers as part of a local planning process, and support for construction of those roads and utility infrastructure to help drive growth in a way that supports compact center development.

Figure 1: Connected Streets. *The diagrams above illustrate two different traffic patterns created by new development (shown in light gray). The diagram on the left highlights several smart growth principles by integrating the new roads with the existing road and providing for a mixture of uses at a density consitent with compact development (Smart Growth Vermont).*

6. Priority for the use of public funding for the development of affordable housing and assisted living facilities shall be for those located within Regional and Town Centers in order to increase access to services.

7. The placement of municipal and other government buildings should be in established Regional and Town Centers in order to maintain and enhance the vitality of these areas.

8. Encourage the development of public places and cultural events within Regional and Town Centers.

9. Support the creation of off-road bike and pedestrian paths that connect Regional and Town centers with residential areas and neighboring centers in a hub and spoke pattern.

10. Identify key areas with flood storage capacity and encourage floodplain protection measures such as land acquisition or restrictive land use regulation in areas up- stream of Regional and Town Centers.

Industrial consists of areas where existing and future commercial and industrial activities are encouraged, including new development and redevelopment. Largely clustered in the vicinity of the Region ’s urbanized areas, these include industrial parks and active quarries in Barre City, Barre Town, Berlin, Montpelier, East Montpelier, Middlesex and Northfield. A small industrial district is also located on the border of Fayston and Waitsfield, the location of the Mad River Industrial Park.

The specification of commercial/industrial sites allows for location of these types of businesses without creating adverse impacts on adjacent land uses. Large-scale commercial/industrial uses, which are important to the region, need to be located in areas where off-site impacts such as noise, traffic and light/glare can be mitigated.

Policies

1. Industrial uses are encouraged to locate first in existing industrial areas and secondly in industrial areas assigned in municipal plans which are in accordance with the goals and policies included in this plan.

2. It is acknowledged that commercial activity and small scale, individual industrial activities will take place in other parts of the region as directed by town plans, which can address the town needs with more specificity.

Mixed-Use Commercial include areas of commercial, office and mixed-use development built in a spread out pattern and served by water and wastewater infrastructure. Typically dominated by commercial service industries, the intent of this land use cate- gory is to transform these areas into higher-density, mixed-use settlements through infill and redevelopment. These areas in the region are concentrated along US 302, Fisher Rd, VT 12 and south of Route 2 in Berlin, and also includes South Barre in Barre Town.

Planned commercial or mixed uses within existing linear commercial zoning districts along major road corridors must be developed carefully to avoid sprawl, traffic congestion, and safety hazards.

Municipalities should not encourage strip development because additional development of this type would negatively impact the economic vitality of commercial areas in nearby Regional and Town centers. Communities should give substantial consideration to the long term impacts of creating or ex- tending strip development.

"Strip Development"

Title 10: Chapter 151, the Vermont statute dictating the Act 250 land use permitting process, defines "strip development" as follows:

"Strip development" means linear commercial development along a public highway that includes three or more of the following characteristics: broad road frontage, predominance of single-story buildings, limited reliance on shared highway access, lack of connection to any existing settlement except by highway, lack of connection to surrounding land uses except by highway, lack of coordination with surrounding land uses , and limited accessibility for pedestrians. In determining whether a proposed development or subdivision constitutes strip development, the District Commission shall consider the topographic constraints in the area in which the development or subdivision is to be located."

Policies

1. Encourage the transformation of existing commercial areas into areas serving a mix of uses, including residential, and offering diversified transportation options, while also conforming to traditional historic development patterns.

Strategy 1a: Work with towns to incorporate standards such as placement of buildings near the road with parking areas to the side and rear, attractive building design, application of access management principles and provision of pedestrian facilities within the center and facilities that connect to sidewalks and public transit.

2. Large scale retail constituting a substantial regional impact should be permitted only if it includes exemplary building and site design as described above in Policy 1, and is determined to have a net beneficial impact based on an independent economic and community impact study that may be requested by the host municipality and/or CVRPC.

Resort Centers are developments that are associated with large-scale recreational facilities, which in Central Vermont are concentrated around ski area facilities in the Mad River Valley.

Downhill facilities and associated development at Lincoln Peak (Warren) and Mt. Ellen (Fayston) of Sugarbush Resort and Mad River Glen (Fayston) all provide recreational facilities, services and jobs and contribute to the Region ’s seasonal housing stock. Sugarbush Resort has been undergoing substantial expansions at Lincoln Peak for the past decade as part of a Lincoln Peak Base Area Redevelopment Master Plan to im- prove base area/guest facilities and to increase the bed base of the resort.

Access to these resort areas are provided via VT Rte 100 together with VT Rte 17, German Flats Rd., the Sugarbush Access Rd. and seasonal transit services.

Policies:

1. The Towns of Warren and Fayston have developed specific ski area planning districts and regulations in its municipal plan and zoning bylaw to ensure that development is consistent with town goals. As the impacts of these resorts extend be- yond municipal boundaries, this Plan recognizes that the Town of Waitsfield participates with the Towns of Warren and Fayston participate in the Mad River Valley Planning District (MRVPD). Also including representation from Sugarbush Resort and the Mad River Valley Chamber of Commerce, the MRVPD carries out a program of planning for the future of the Mad River Valley and conducts studies regarding key issues, such as affordable housing, recreation and trail planning and economic development that are incorporated into local plans. Future growth at Sugarbush Resort and Mad River Glen that is compliant with local plans and bylaws is consistent with this Plan.

2. The focus of alpine ski area development in the Region should remain on the expansion of existing facilities rather than development of new ones.

Rural areas encompass the majority of the Region ’s land area and are generally rural in character. Much of the Region ’s residential development in recent decades has occurred in these areas in a low-density pattern along transportation routes. These areas encompass much of the Region ’s large forest blocks, sand/gravel/mineral de- posits, and prime agricultural soils that, when in productive use, contribute to the working landscape and have significant economic value. Rural areas also include residential, small-scale commercial and industrial, and recreational uses.

New subdivisions can be planned to incorporate the positive characteristics of earlier rural settlements, such as a community identity, public open spaces, and preservation of important resources (such as agricultural soils and forest blocks). Many of these objectives can be realized by clustering lots to create a Hamlet-type character around the homes, while setting a significant percentage of the project area aside as open space reserved for agriculture, forestry, wildlife habitat or public recreation.

Hamlets are smaller than villages, and are typically concentrated residential settlements woven into the fabric of Rural Land Use Planning Areas that may or may not provide minor commercial and civic services. Hamlet areas are identified on the Future Land Use Map by center points; when making land use decisions using the policies in this Plan, Hamlet Areas must include the locally recognized extent of the hamlet as it is delineated in the appropriate town plan.

Hamlets in the Region include Riverton (West Berlin), South Village (Northfield), Cogswell, Upper Graniteville, Lower Graniteville, Upper Websterville, Lower Websterville, East Orange, Orange Village, Adamant, North Montpelier, East Montpelier Center, Putnamville (Middlesex), East Warren and South Woodbury.

Policies:

1. Development should be designed to minimize its impact on the viability of agricultural operations or its contribution to fragmentation of forest Blocks. .

Strategy 1a: Provide guidance and training on regulatory and non-regulatory tools for open space and resource protection available to towns for use in town plans and regulations. Encourage implementation of tools such as conservation subdivisions, clustered development, transfer of development rights, building envelopes and variable lot size in all subdivision development, and especially within rural residential and productive rural lands.

2. Development is encouraged to be built outside of farms and along the edges of forests, preferably with buffers between such development and agricultural uses or environmentally sensitive areas.

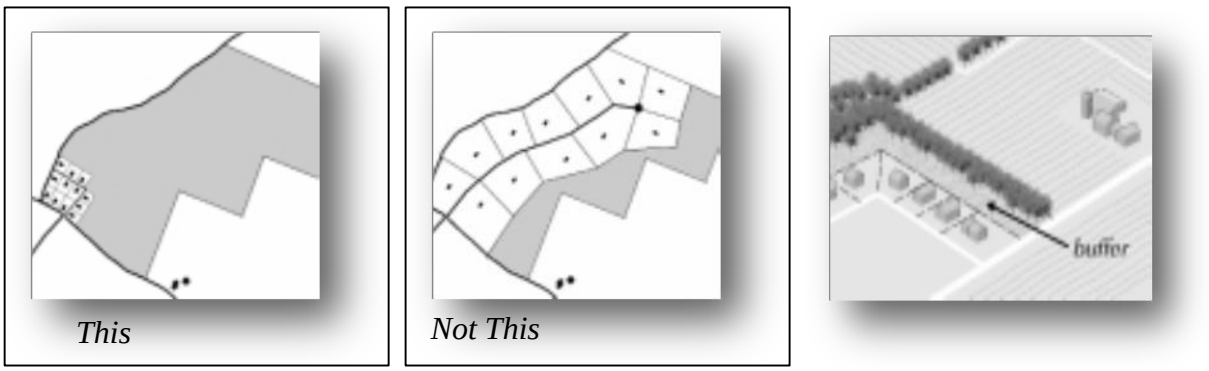


Figure 2. Avoiding Fragmentation and Minimize Use Conflicts*: Incorporate buffers between developed and resource lands to avoid conflicts between incompatible uses — maintain a well-defined edge between developed and open land. (Smart Growth Vermont).*

3. Policies that enable owners of farm and forestland to bear the financial responsibility of resource protection should be supported.

4. Development that diminishes the rural character of the area as defined by local and regional plans is discouraged. Development is encouraged to incorporate the following principles:

- Convenience and safety of vehicular and pedestrian movement, including measures such as traffic calming, within the site, and in relation to adjacent areas or roads.

- Compact development that allows for use of shorter power lines and shorter, narrower, and interconnected roads that result in lower maintenance costs.

- When new roads are being constructed, consideration should be given to burying power and phone lines, if practicable.

5. Develop and expand existing Hamlets in a form that maintains traditional density and residential settlement pattern. Encourage towns to enable this pattern of development in local land use regulations.

6. Wildlife connectivity areas should be protected from fragmentation and uses that reduce their viability for movement of wildlife, particularly where they connect forest blocks.

7. Non-residential uses, including small service businesses, small professional offices and inns are acceptable land uses for Rural Areas provided that such uses are planned as relatively small in size or scale, are not primary or dominant uses in an area, do not unduly conflict with existing or planned residential, forestry or agricultural uses, and do not unduly affect rural character. Towns should limit the number and size of such establishments to prevent a proliferation of scattered commercial development that does not serve the needs of the community.

8. Occupations that are customarily practiced in residential areas, and which do not affect the character of those areas, are another form of small-scale commercial use common in and appropriate for rural areas. Small professional offices, antique shops, and craft studios are examples of such “customary home occupations. ”

9. Cross country ski centers, mountain biking facilities and other outdoor recreational areas represent an economically viable means of maintaining rural open spaces with little secondary development; both expansion and development of new facilities are consistent with this Plan.

Resource areas are dominated by lands requiring special protection or consideration due to their uniqueness, irreplaceable or fragile nature, or important ecological function. These include:

- Protected lands;
- Elevations above 2,500 ft (elevations above 1,700 ft in Waitsfield, as regulated);
- Slopes of 25% or more;
- Rare, threatened or endangered species and significant natural communities;
- Wetlands;
- Special flood hazard areas; and
- Shoreline protection areas;

Both Highest Priority Forest Blocks and Highest Priority Connectivity Blocks are also present within the high elevations and encompass areas of steep slopes, areas with rare, threatened or endangered species, significant natural communities and wetlands. As a subcategory of Resource lands, this plan recognizes *critical resource areas (see page 2-9 for a description)* as key sites that are particularly sensitive and should be given maximum protection. Please refer to the callout box on the following page for the methodology used to determine Resource areas.

Policies:

1. Conservation of the natural landscape and careful management of lands is sought for these areas. Development in these areas should be subject to extensive planning, review and conditions that ensure its protection.

2. Any development proposed within critical resource areas shall provide evidence as to why the development cannot be avoided, and shall provide mitigation for natural resources impacted by the development.

3. The extension of permanent roads, energy transmission facilities, and utilities into Resource areas is discouraged.

4. Development on wetlands, steep slopes of 25% or more, and ridge lines should be avoided.

5. Avoid or limit development and investment in identified flood hazard areas, where feasible.

6. Avoid development that fragments forest blocks and habitat connectors.

Future Land Use Map
Resource Data and Sources

Data is for general planning purposes only and may contain errors and omissions. Data should be verified during permitting processes per the provisions of the regulatory authority. Scale limitations exist and data is only as accurate as the original source.

- Protected lands: This data consists of both private and public protected lands. These include VT State Forests, Parks, Wildlife Management Areas, Town Forests, and Land Trust Easements.
Source: Vermont Conserved Lands Database, VT Land Trust, and Towns

- Elevations above 2,500 ft (elevations above 1,700 ft in Waitsfield, as regulated): This data consists of all areas about the elevation of 2500 ft and in Waitsfield VT above 1,700 ft.
Source: USGS contours over 2500 ft and Town of Waitsfield Land Use Regulations

- Slopes of 25% or more: This data includes all areas with slopes of 25% or more.
Source: CVRPC slope analysis using 10 meter Digital Elevation Model.

- Rare, threatened or endangered species and significant natural communities: This data consists of all mapped rare, threatened or endangered species and significant natural communities as identified by the Vermont Fish and Wildlife Department, Natural Heritage Inventory.
Source: Vermont Fish and Wildlife Vermont Natural Heritage Inventory http:// www.vtfishandwildlife.com/common/pages/DisplayFile.aspx?itemId=229831

- Wetlands: This data consists of all mapped class 2 wetlands as identified in the Vermont Significant Wetlands Inventory.
Source: Vermont Department of Environmental Conservation Water Quality Division Wetlands Section

- Special flood hazard areas: This data consists of FEMA mapped Special flood hazard areas Zone A and AE.
Source: FEMA Digital Flood Insurance Rate Map data

- Shoreline protection areas: This data consists of all lakes and ponds greater than 10 acres plus a buffer of 250 feet (Lake Shore Protection areas in Calais, as regulated) .
Source: CVRPC selected Vermont Hydrologic Dataset lakes and ponds greater than 10 acres and then buffered those by 250 ft and the Town of Calais Land Use Regulations.

project review under 30 V.S.A. § 248 are clearly identifiable in the text, should a map lack sufficient clarity or granularity regarding the area in which a project is proposed.

Mapping Standard 10

Does the plan identify and map existing electric generation sources?
Maps may depict generators of all sizes or just those larger than 15 kW, as long as information on generators smaller than 15 kW is summarized and provided or referenced elsewhere. It is expected that the best available information at the time of plan creation will be used. This information is available from the Department.

The Department maintains a sortable spreadsheet of permitted generators that includes type and size; it also provides this spreadsheet to the Energy Action Network on a quarterly basis, where it is used to underpin the Energy Atlas, an online mapping tool. The Energy Atlas allows for easy visualization of different types and sizes of renewable energy generators by municipality and region. The Atlas also allows users to export the list of sites from the maps that have been created; the exported spreadsheets can then be used to sort and summarize generator information. The Department expects most regions and municipalities will want to take advantage of this tool, but they are also welcome to use the raw data from the Department's spreadsheet. If that is the case, please contact the Department.

It's important to note that the Department's spreadsheet represents permit *applications*. In most cases, at least for larger generators, it notes whether a Certificate of Public Good has been issued or not; but it does not track whether a system is online (i.e. built and producing electricity) or not. The Energy Atlas has information about whether a larger resource (> 150 kW) has been built, from the analysis of satellite photos, so it may show fewer systems than those in the Department's database. As the Public Service Board implements its electronic database system starting in 2017, and as utilities begin to track interconnected systems in a consistent fashion, new resources will emerge for regions to better understand exactly what has been built in their areas. For the time being, the Department does not expect regions to represent anything more refined than what is available through the generator spreadsheet or the Energy Atlas.

Maps may depict generators of all sizes or just those larger than 15 kW, as long as information on generators smaller than 15 kW is summarized and provided or referenced elsewhere.

Mapping Standard 11

Does the plan identify potential areas for the development and siting of renewable energy resources and the potential generation from such generators in the identified areas, taking into account factors including resource availability, environmental constraints, and the location and capacity of electric grid infrastructure?
Maps should include the following (map layers available here), and the resulting Prime and Secondary Resource Map (A, B, and C below will likely be shown on a single map) will together comprise "potential areas":

11A. Raw renewable potential analysis (wind and solar), using best available data layers (including LiDAR as appropriate).
Unlike the more comprehensive consideration of potential renewable generation sources in the Pathways standards, the Mapping standards only ask regions to consider solar and wind potential. Wind and especially solar resources tend to be more ubiquitous across the landscape, whereas hydroelectric,

combined heat and power, and biogas are much more geographically restricted (hydroelectric in terms of existing dams, combined heat and power in terms of a user for the heat and possibly biomass availability, and biogas in terms of manure, food, etc. waste availability).

Under this standard, regions are asked to look at solar and wind potential from a strict resource (solar insolation, wind speed) perspective. Later, they will be asked to look at potential natural resource and other constraints to harnessing solar radiation or blowing wind for renewable power production.

The "base layers" for wind and solar potential are available from VCGI. The solar resource layer is the same one used for the EAN Energy Atlas, and represents solar ground-mounted potential. It considers incoming solar potential (with a lower value cutoff of 1,000 kWh/m^2), slope (anything ≤ 14°), and direction (90° due east clockwise to 270° due west). It should only be used to estimate ground-mounted – not rooftop – solar resource potential. The State is currently in the process of collecting statewide high-resolution LiDAR data, which can and should be used – particularly by regions – where it is available, to look at both ground- and roof-mounted solar potential. Otherwise, roof-mounted solar potential can be separately estimated using the methodology offered in Standard 9C, above.

The wind resource layers comprise three sets:

Scale	Residential	Commercial/Community	Utility
•Hub Height •Lower Wind Speed Cutoff	•30 Meter •4.5 m/s	•50 Meter •5.5 m/s	•70 Meter •6.5 m/s

Figure 1: Wind Resources Layer Detail

Generally, wind speeds increase with elevation; however, there may be many sites at lower elevations suitable for the development of wind power projects, particularly at the residential and commercial or community scales (≤ 100 kW), but also at the utility scale (≥ 1 MW), particularly in light of recent advancements in wind turbine technologies[14]. As with solar, wind resource is only one factor in the consideration of whether a site is viable for the deployment of a particular technology. In the pyramid below, the wind and solar resource maps primarily represent "resource potential." The constraint layers that the standards ask planners to consider next help narrow the field to "technical potential." Economic and market potential are based on real-time factors and the decisions of landowners and developers based on site-specific considerations and project economics, and are therefore addressed outside of the context of the standards and the plans (although planners are encouraged to consider and discuss these limitations on deployment potential).

[14] https://www.energy.gov/sites/prod/files/2015/05/f22/Enabling-Wind-Power-Nationwide_18MAY2015_FINAL.pdf

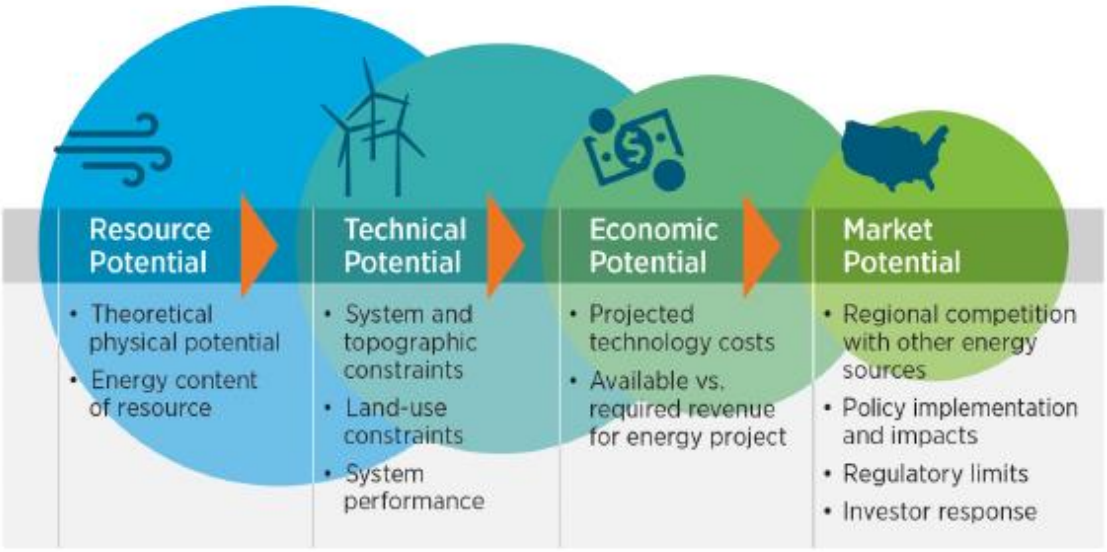


Figure 2: Types of Renewable Generation Potential
Source: National Renewable Energy Laboratory

11B. Known constraints (signals likely, though not absolute, unsuitability for development based on statewide or local regulations or designated critical resources)

"Known constraints" are high-priority constraints that limit where energy can be generated. Energy generation facilities are not very likely to be developed in these areas due to the presence of natural resources that are regulated at the federal, state, or local level. Removing these constraints from the raw resource potential layers described in Standard 11A will produce "Secondary Resource Maps," which can be used to demonstrate areas that have good renewable resource potential without high-priority constraints. Site-specific study would be required to ascertain whether one of the mapped constraints truly exists on the site; and some sites not captured by the Known constraints map layers may indeed have such high-priority constraints, again depending on the results of site-specific study. The maps are thus good indicators, but not definitive siting tools. It is important for plans to articulate their policies regarding each of the constraints below, to help guide developers and regulators in understanding the region's policies with respect to each constraint, and to help guide decision making.

To include:

- Vernal Pools (confirmed and unconfirmed layers)
  A vernal pool is a small wetland in a shallow natural depression that typically fills with water during the spring and/or fall and may dry during the summer. Vernal pools have no permanent inlet stream and no viable populations of fish. Vernal pools are typically sparsely vegetated with herbaceous plants and are shaded by trees from the surrounding upland forest. Many vernal pools provide critical breeding habitat for amphibians.

  This dataset is derived from a project by the Vermont Center for Ecostudies (VCE) and Arrowwood Environmental (AE) to map vernal pools throughout the state of Vermont. AE and VCE are mapping locations of potential vernal pools throughout Vermont, and recruiting a corps of volunteers to field-verify the presence of these potential pools. In the process, ANR will

develop a GIS layer of potential and known vernal pools, as well as a database populated with biological and physical attributes of each verified pool. With partial funding from the Vermont State Wildlife Grants Program, potential vernal pools will be identified using color infrared aerial photographs. Original data was collected remotely using color infrared aerial photo interpretation. "Potential" vernal pools were mapped and available for the purpose of confirming whether vernal pool habitat was present through site visits. The 'confirmed' dataset represents only those sites which have been verified as vernal pools; the 'unconfirmed' data set represents only those sites which have not yet been field-visited or verified as vernal pools. Field visits to confirm vernal pools continue. This statewide dataset has been collected in 2009-present.

- DEC River Corridors

  River corridors encompass an area around and adjacent to the present channel where fluvial erosion, channel evolution and down-valley meander migration are most likely to occur. River corridor widths are calculated to represent the narrowest band of valley bottom and riparian land necessary to accommodate the least erosive channel and floodplain geometry (i.e. equilibrium conditions) that would be created and maintained naturally within a given valley setting. River corridors are developed to facilitate ANR's responsibilities in providing municipalities, regional planning commissions, and Act 250 District Commissions with technical assistance and information concerning river sensitivity and fluvial erosion hazards. Vermont river corridors include areas where active, potentially hazardous river erosion and deposition process have occurred or are likely to occur. These delineations do NOT indicate that areas outside river corridors, particularly those immediately abutting the river or river corridor are free from fluvial erosion hazards. River corridors are delineated to provide for the least erosive meandering and floodplain geometry toward which a river will evolve over time. River corridor maps guide State actions to protect, restore, and maintain naturally stable meanders and riparian areas to minimize erosion hazards. Land within and immediately abutting a river corridor may be at higher risk to fluvial erosion during floods. For a thorough discussion of the purpose, design and management of the Vermont River Corridors dataset, please see the "Vermont DEC Flood Hazard Area and River Corridor Protection Procedures December 5, 2014" http://www.vtwaterquality.org/rivers/docs/FHARCP_12.5.14.pdf.

  This dataset is part of the "applicable maps" used in conjunction with other best available stream geomorphic data to implement both the Flood Hazard Area and River Corridor "Rule" and "Protection Procedure." The data will be updated over time as described in the Procedure. The date of the version posted on the Vermont Natural Resource Atlas indicates the most recent update. Users should cite the Creation Date for the version. Data processing was done using ArcGIS 10.x, Spatial Analyst, and Arc Hydro Tools 2.0. Source and digitized data included VT Meander Centerlines (MCLs), VT Reach Break points, VT Hydrography streams, VT 10-meter DEM, VTHYDRODEM, HUC 8 Basins, and VT Roads and Railroads. Major derived datasets include raster and vector valley walls, catchments per stream reach, variable-width MCL buffers, and the final River Corridor. A Frequently-Asked Questions page is available at: http://floodready.vermont.gov/rcfaq

- FEMA Floodways

The channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot at any point. Flood hazard areas and floodways may be shown on separate map panels.

The entire Vermont extent of the National Flood Hazard Layer (NFHL) as acquired 12/15/15 from the FEMA Map Service Center msc.fema.gov upon publication 12/2/2015 and converted to VSP. The FEMA DFIRM NFHL database compiles all available officially-digitized Digital Flood Insurance Rate Maps. This extract from the FEMA Map Service Center includes all of such data in Vermont including counties and a few municipalities. This data includes the most recent map update for Bennington County effective 12/2/2015. DFIRM - Letter of Map Revision (LOMR) DFIRM X-Sections DFIRM Floodways Special Flood Hazard Areas (All Available)

- State-significant Natural Communities and Rare, Threatened, and Endangered Species
  The Vermont Fish and Wildlife Department's Natural Heritage Inventory (NHI) maintains a database of rare, threatened and endangered species and natural (plant) communities in Vermont. The Department is a member of the network of Natural Heritage Programs and Conservation Data Centers network that collaborates with NatureServe, which is the umbrella organization. The Element Occurrence (EO) records that form the core of the Natural Heritage Inventory database include information on the location, status, characteristics, numbers, condition, and distribution of elements of biological diversity using established Natural Heritage Methodology developed by NatureServe and The Nature Conservancy. An Element Occurrence (EO) is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location. For species Elements, the EO often corresponds with the local population, but when appropriate may be a portion of a population or a group of nearby populations (e.g., metapopulation). For community Elements, the EO may represent a stand or patch of a natural community, or a cluster of stands or patches of a natural community. Because they are defined on the basis of biological information, EOs may cross jurisdictional boundaries. An Element Occurrence record is a data management tool that has both spatial and tabular components including a mappable feature and its supporting database. EOs are typically represented by bounded, mapped areas of land and/or water or, at small scales, the centroid point of this area. EO records are most commonly created for current or historically known occurrences of natural communities or native species of conservation interest.

- National Wilderness Areas
  Federally owned land that is preserved in its natural condition, where mechanized recreation or development is typically prohibited.

- Class 1 and Class 2 Wetlands (VSWI and advisory layers)
  This dataset represents wetlands included in Vermont's Significant Wetlands Inventory (WaterWetlands_VSWI). Questions about wetland location and use should be referred to the ANR DEC Wetlands section, 802-244-6951. NWI maps were used by the State of Vermont

Agency of Natural resources as a means of creating this data layer in conjunction with the VSWI. The NWI and VSWI were joined by a union, to create the new 2010 Vermont Significant Wetland Inventory data layer, representing Vermont's regulatory wetlands. The VSWI prior to 2010 was created by hand digitizing nearly two-thirds of Vermont's wetlands from RF 24000 scale NWI mylars. The remainder of the state was scanned from RF 24000 or RF 25000 scale mylars. These mylars were created by transferring wetland polygon boundaries from RF 62500 scale NWI mylars to RF 24000 scale base maps.

- Regionally or Locally Identified Critical Resources
  If areas are constrained for the development of renewable energy due to the desire to protect a locally designated critical resource (whether a natural resource or a community-identified resource), then the land use policies applicable to other forms of development in this area must be similarly restrictive; for this category, policies must prohibit all permanent development (and should be listed in the Notes column).
  These areas should be subtracted from raw renewable energy resource potential maps to form Secondary Resource Maps

Mitigation

Mitigation in this context means compensating for potential impacts to the natural resource located in the project area.

For example, if a proposed project contained infrastructure in the 50' wetlands buffer, and it was demonstrated by the applicant that no other location was feasible, the applicant may be able to work with the permitting agency to agree to mitigation. In this case it could include additional wetland protection elsewhere on the project site.

11C. Possible constraints (signals conditions that would likely require mitigation, and which may prove a site unsuitable after site-specific study, based on statewide or regional/local policies that are currently adopted or in effect).

"Possible constraints" are lower-priority constraints. These constraints can impact the siting process for generation facilities, and should always be considered in planning for these facilities, but do not necessarily preclude placement in corresponding areas. Site-specific solutions are often possible when one of these conditions exists. Removing these constraints from the Secondary Resource Maps developed in Standard 11B produces "Prime Resource Maps," which can be used to demonstrate areas that have good renewable resource potential without any mapped constraints whatsoever. As with the Known constraints, site-specific study would be required to ascertain whether one of the mapped constraints truly exists on the site; and some sites not captured by the possible constraints map layers may indeed have such lower-priority constraints, again depending on the results of site-specific study. As discussed above, the maps are thus good indicators, but not detailed enough to use for siting individual projects. It is therefore similarly important for plans to articulate their policies regarding each of the constraints below, to help guide developers and regulators in understanding the region's policies with respect to each constraint, and to help guide decision making.

Including but not limited to:

- Agricultural Soils
  Agricultural Soils are those Natural Resources Conservation Service (NRCS) mapped soils including Prime Farmland, Additional Farmland of Statewide Importance, and Additional

Farmland of Local Importance that are used to help identify soil map units that represent the best land for producing food, feed, fiber, forage, and oilseed crops. An Important Farmland classification of Prime, Statewide, and Local is assigned to soil map units based on the characteristics of the dominant soils in the soil map unit. Accompanying each soil unit is a Vermont Soil Fact Sheet which was developed to organize a variety of data about a particular soil map unit on one page. The purpose of this layer is to provide a pre-selected, Vermont specific, subset of the Soil Survey Geographic Database (SSURGO) soil data depicting Prime Farmland, Additional Farmland of Statewide Importance, and Additional Farmland of Local Importance and excluding water, not rated or NPSL (Not Prime, Statewide, or Local) soils.

For more information:
https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_010210.pdf

- FEMA Special Flood Hazard Areas
  The floodplain within a community subject to a one percent or greater chance of flooding in any given year. This area is usually labeled Zone A, AO, AH, AE, or A1-30 in the most current flood insurance studies and on the maps published by FEMA. Base flood elevations have not been determined in Zone A where the flood risk has been mapped by approximate methods. Base flood elevations are shown at selected intervals on maps of special flood hazard areas that are determined by detailed methods. Please note, where floodways have been determined they may be shown on separate map panels from the Flood Insurance Rate Maps. All zones with a 0.2% chance or higher of flooding annually. Only True special flood hazard areas were used.

  The entire Vermont extent of the National Flood Hazard Layer (NFHL) as acquired 12/15/15 from the FEMA Map Service Center msc.fema.gov upon publication 12/2/2015 and converted to VSP. The FEMA DFIRM NFHL database compiles all available officially-digitized Digital Flood Insurance Rate Maps. This extract from the FEMA Map Service Center includes all of such data in Vermont including counties and a few municipalities. This data includes the most recent map update for Bennington County effective 12/2/2015. DFIRM - Letter of Map Revision (LOMR) DFIRM X-Sections DFIRM Floodways Special Flood Hazard Areas (All Available)

- Protected Lands (State fee lands and private conservation lands)
  Lands owned in fee by the state for conservation or recreation purposes and lands conserved via easement or other legal encumbrance by private conservation organizations, such as land trusts. Conservation restrictions may prevent or otherwise restrict development of these lands, including for energy generation or transmission facilities.

- Act 250 Agricultural Soil Mitigation areas
  This layer shows land protected by an Act 250 permit condition for the purposes of agricultural use. The mitigation area was required due to a reduction in agricultural potential of other primary agricultural soils caused by development or subdivision. This data is for planning and informational purposes only. Contact the NRB District Office for additional information and precise mapping.

- Deer Wintering Areas
  Deer winter habitat is critical to the long term survival of white-tailed deer in Vermont. Being near the northern extreme of the white-tailed deer's range, functional winter habitats are essential to maintain stable populations of deer in many years when and where yarding conditions occur. Consequently, deer wintering areas are considered under Act 250 and other local, state, and federal regulations that require the protection of important wildlife habitats. DWAs are generally characterized by rather dense softwood (conifer) cover, such as hemlock, balsam fir, red spruce, or white pine. Occasionally DWAs are found in mixed forest with a strong softwood component or even on found west facing hardwood slopes in conjunction with softwood cover. In this mapping exercise no minimum area is defined, however, most areas less than 20 acres were not delineated, nor were areas above 2,000 feet elevation (approximate). In 2008, the boundaries of deer winter areas where refined using black and white leaf-off 1:5,000 scale orthophotography (1990-1999) and was cross referenced with 1:24,000 scale 2003 NAIP (color, leaf-on) imagery to better delineate fields and open wetlands. Some of the areas were also marked as 'not likely wintering area' based on not having softwood characteristic. The areas were reviewed by VFWD District Biologists in 2009 to 2010 for their concurrence from their knowledge of the site. The 2008 mapping project did not involve any field work, but was based on aerial photography. Potential areas were identified, but they have not been included in this map layer because they have not been field verified. The original DWA mapping was done in the 1970s and early 1980s and was based on field visits and interviews with wildlife biologists and game wardens. The DWA were mapped on mylar overlays on topographic maps and based on small scale aerial photos.

- ANR's Vermont Conservation Design Highest Priority Forest Blocks (or Habitat Blocks 9 & 10, for plans that will be submitted for adoption at the regional level by March 1, 2017)
  Highest Priority Forest Blocks are the largest and/or highest ranked forest blocks from all biophysical regions that provide the foundation for interior forest habitat and associated ecological functions. Forest blocks are areas of contiguous forest and other natural communities and habitats (such as wetlands, ponds, and cliffs) that are unfragmented by roads, development, or agriculture. Forest blocks were identified, mapped, and ranked by Sorenson and Osborne (2014). Forest blocks provide many ecological and biological functions critical for protecting native species and the integrity of natural systems. In addition, large, topographically diverse forest blocks will allow many species of plants and animals to shift to suitable habitat within a forest block in response to climate change within the next century without having to cross developed areas to other forest blocks (Beier 2012). More detailed descriptions and maps are available in the Vermont Conservation Design report http://www.vtfishandwildlife.com/UserFiles/Servers/Server_73079/File/Conserve/VT%20Conservation%20Landscape-level%20Design/Vermont-Conservation-Design%20-%20Landscapes%20(2015).pdf and on the BioFinder 2016 website (http://anrmaps.vermont.gov/websites/BioFinder2016/).

- Hydric Soils
  Areas of hydric soil have a high potential to support significant, unmapped wetlands and require field investigation to determine if significant wetlands are present. Hydric soils means soils that

are saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions in the upper part (U.S.D.A. Soil Conservation Service 1987), leading to biological conditions similar to wetlands.

- Regionally or Locally Identified Resources
  If locations are constrained for the development of renewable energy due to the desire to protect a locally designated resource (whether a natural resource or community-identified resource, like a view), then the land use policies applicable to other forms of development must be similarly restrictive (and should be listed in the Notes column).

  These areas should be subtracted from Secondary Resource Maps to form Prime Resource Maps.

11D. Transmission and distribution resources and constraints, as well as transportation infrastructure. *(Including three-phase distribution lines, known constraints from resources such as Green Mountain Power's solar map, known areas of high electric load, etc.)*

Regions may acquire maps of the electric grid from their local utility, with the assistance of the Department. (Under Act 174, utilities are required to make maps available to the Department for the assistance of towns and regions.) Green Mountain Power's solar map, available at http://gmp.maps.arcgis.com/apps/Viewer/index.html?appid=546100cc60c34e8eb659023ea8ae03f3, also includes information regarding the ease of interconnection for new solar PV on each line segment. This map will continue to be improved in the coming year, and then kept up to date as loads and generation evolve. Other utilities may develop similar resources in the future.

When identifying suitable, unsuitable, and preferred sites, regions are encouraged to take grid capacity into account. Larger generators generally require access to three-phase power lines to carry the power they generate, and generators are responsible for the costs of upgrades to interconnect to the grid, so proximity to such lines (e.g. within ¼ or ½ mile) is of significant value. Regions could include lack of proximity as a possible constraint for larger projects. In Vermont today, distribution-level (< 115 kV) lines generally interconnect projects up to 5 MW, while larger projects would interconnect to transmission or sub-transmission at a substation (either using an existing substation or building a new one).

Generation that is located near places where electricity is used (town centers, industrial facilities, etc.) is generally preferred from a purely electrical perspective, because the power generated needs to use less infrastructure reach users. This reduces losses and can reduce the size of necessary substations. Future storage resources might allow such generators to power local micro-grids and improve reliability and resilience. For this reason, planners should identify and consider known areas of high electric load when identifying suitable or preferred sites. Planners may also wish to consider areas where they would like to evaluate microgrid potential – for instance, by identifying locations of local emergency shelters and essential services such as hospitals, police and fire stations, gas stations, etc., and working with their serving electric utility to ascertain distribution grid characteristics and the potential for creating a microgrid with renewable generation and battery storage.

At the same time, Vermont's current electric grid is not built to accommodate the more than 1 GW of new generation capacity envisioned by the Comprehensive Energy Plan by 2050. Currently, the necessary grid upgrades are unknown and will depend on the evolution of controllable load technology and systems (such as storage, EVs, and other distributed resources). Future state policy will shape how the grid is upgraded to accommodate these generation and load resources. Therefore, regions should not feel constrained to identify only promising sites that are near power lines that currently have capacity for interconnection. On the flip side, sites that are far from grid infrastructure, but unsuitable for some type of generation for some other reason, should be identified as unsuitable because of the other reason, rather than the grid configuration. When reviewing maps, the Department will look for a mix of suitable or preferred sites that are accessible to the grid as it exists today, and other sites.

11E. Preferred locations (specific areas or parcels) for siting a generator or a specific size or type of generator, accompanied by any specific siting criteria for these locations

Narrative descriptions of the types of preferred areas in accompanying plan text are acceptable, though mapping of areas and especially specific parcels (to the extent they are known) is highly encouraged, to signal preferences to developers, particularly for locally preferred areas and specific parcels that do not qualify as a statewide preferred location under i. below. When identifying specific parcels, regions may choose to engage landowners in a discussion regarding their land and its suitability for energy generation.

The locations identified as preferred must not be impractical for developing a technology with regard to the presence of the renewable resource and access to transmission/distribution infrastructure.

i. Statewide preferred locations such as rooftops (and other structures), parking lots, previously developed sites, brownfields, gravel pits, quarries, and Superfund sites

ii. Other potential locally preferred locations
For example, customer on- or near-site generation, economic development areas, unranked and not currently farmed agricultural soils, unused land near already developed infrastructure, locations suitable for large-scale biomass district heat or thermal-led cogeneration, potential locations for biogas heating and digesters, etc.

These are particularly important to map if possible (with the input of municipalities), as "a specific location in a duly adopted municipal plan" is one way for a net metering project to qualify as being on a preferred site.

The figure below illustrates the concept of increasingly smaller land area as you move from raw renewable resource potential to secondary resource potential areas, primary resource potential areas, and preferred locations. Preferred locations should have the raw renewable resource potential to deploy the type or scale of technology in question, and should not have any mapped known or possible constraints (unless the region has a rationale for determining that such a constraint doesn't actually exist on the ground or the location is preferred to such an extent that the constraint in question is encouraged to be, and is able to be, mitigated).

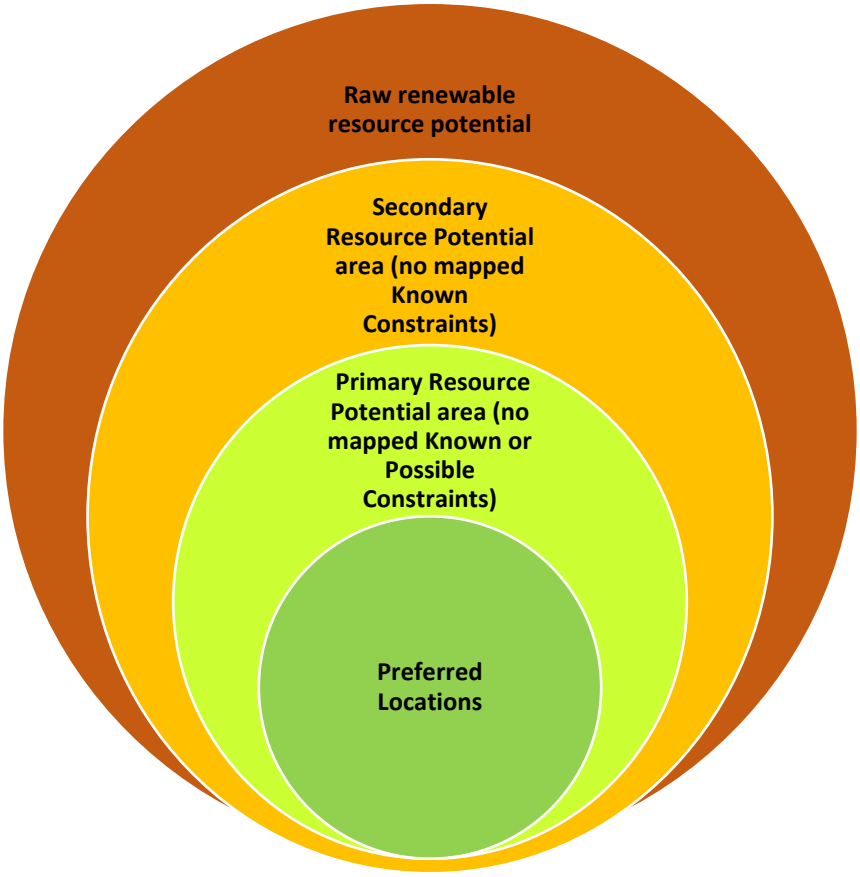


Figure 3: Moving from Raw Resource Potential to Preferred Locations

Types of locations that a region or muncipality might wish to consider as preferred can include – but are not limited to – the concepts in i and ii, above. The examples listed under i come from the Public Service Board's definitions for preferred sites in its proposed net metering rule to take effect January 1, 2017; projects in such sites would receive a financial incentive. Those definitions in turn are drawn from Act 174's definitions for preferred sites, which are specified for use in the Standard Offer program (for projects of up to 2.2 MW in size) on a pilot basis in the 2017 request for bids. Communities and developers looking to deploy projects will be seeking out such locations, which are simultaneously more cost-effective and more appealing to communities. Planners may also wish to consider other types of preferred locations or particular sites; some ideas are provided in ii above, but it is by no means an exhaustive list.

It is acceptible to simply list types of preferred locations in plans, but to the extent regions and munciipalities are able to actually identify particular locations, it will be vastly more useful in terms of directing deployment of renewables to the places that make the most sense to the community. This may require more of an effort to reach out to and involve landowners in identifying particular rooftops, parcels, etc., given that the land under municipal control is limited.

Regions also have an opportunity to signal to developers the design and other guidelines for how they wish to see renewable energy projects deployed in such locations (this applies to all potential areas, including those captured in the primary and secondary resource maps). For example, a community may

wish to encourage solar projects over a certain size to explore multiple uses and co-benefits, if conditions allow, such as grazing and recreation, or parking in conjunction with solar arrays.

At the same time, it is important to recognize that it may not be possible for renewable energy projects to be cost-effectively deployed in all preferred locations, particulary if such locations are far from adequate electric infrastructure, or if the locations require a great deal of up-front investment in remediation, stabilization, etc. Asking such projects to perform additional screening, install amenities, etc. could actually result in *discouraging* projects from seeking out or vetting such locations.

Mapping Standard 12

Does the plan identify areas that are unsuitable for siting renewable energy resources or particular categories or sizes of those resources?
Either Yes or No ("No" if the plan chooses not to designate any areas as unsuitable) is an acceptable answer here. "Resources" is synonymous with "generators."

Standard 11 was focused on identification of potential and preferred areas for siting generators, based on resource potential after a number of land use constraints and regional and local preferences were factored in. Standard 12 asks planners to consider whether there are specific areas where siting renewable generation – or particular categories or sizes of renewable generators – is unsuitable. The unsuitable areas identified by regions will be included in the constraint layers discussed above; however, it may not be possible to map all of the areas a region wishes to identify as a constraint (e.g. archeological resources). In the case of a local or regional constraint that cannot be mapped, it should be identified in the text of the plan with clearly written policies. Regions may require applicants to conduct field verification of both mapped and unmapped constraints. If plans decide not to identify any areas as unsuitable, they should check "No" and will meet the standard. If plans choose to identify areas as unsuitable, they should check "Yes," and will meet the standard if they also answer "Yes" to 12A and 12B.

Unsuitable areas are those areas that a region has designated as unsuitable for a particular type or scale of renewable development, or in some cases, all development (for the reasons listed above). It is important to bear in mind the distinction between known constraints, possible constraints, and unsuitable areas. Regions are allowed to add to the list of known and possible constraints, but also to designate unsuitable areas. It may be helpful to think of these designations in terms of a spectrum (see the figure below). Unsuitable areas are "no go" areas. Known constraints very likely represent an area where renewable development does not make sense, pending a field verification of those resources or mitigation. Possible constraints are areas that might be developable, if certain constraints can be mitigated. Prime areas have no constraints, and preferred locations are those areas that a region has identified as where they would like to see development occur.

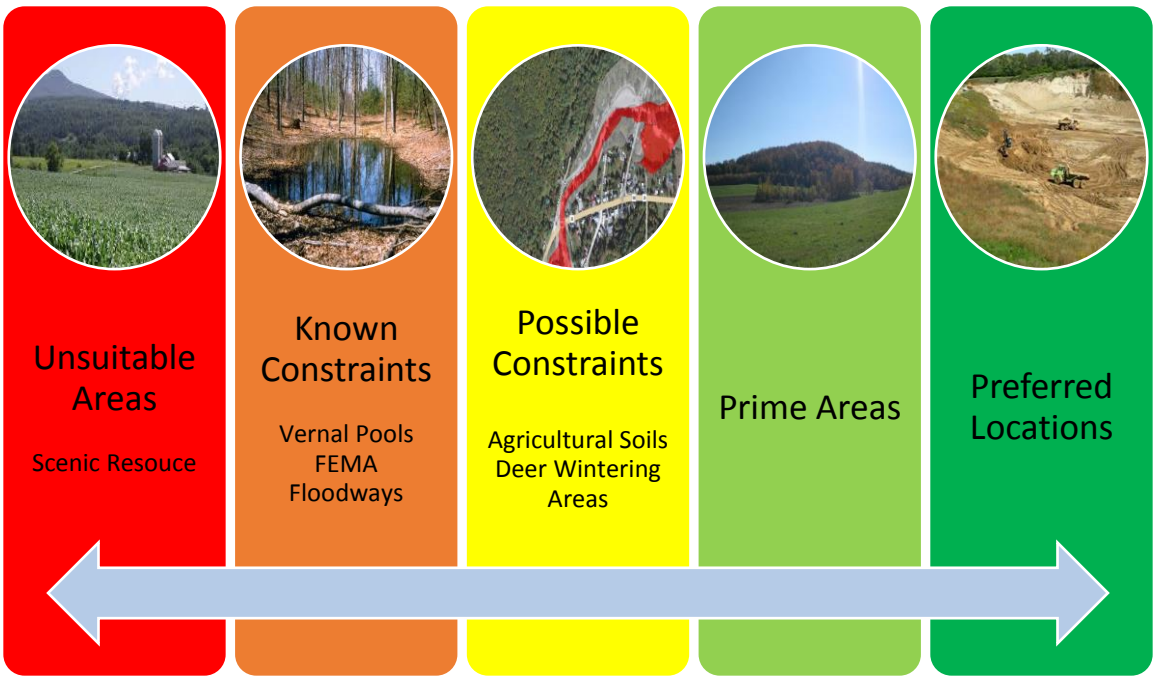


Figure 4: the Spectrum between Unsuitable Areas and Preferred Locations

When considering particular categories or sizes of resources, planners may wish to consider the technologies in these categories: solar, wind, hydropower, biomass thermal, and biomass combined heat and power; and the following scales in terms of sizes: residential, commercial, utility. See the figure below for a solar and wind size breakdown. For solar, it may be easier to think in terms of permitting categories, which tend to drive decisions about project sizes. Planners may also wish to consider solar in terms of whether it is roof-mounted or otherwise on the site of the primary offtaker (e.g., specific areas

may be designated as unsuitable for solar > 5 MW, but suitable for all roof-mounted solar systems, etc.).

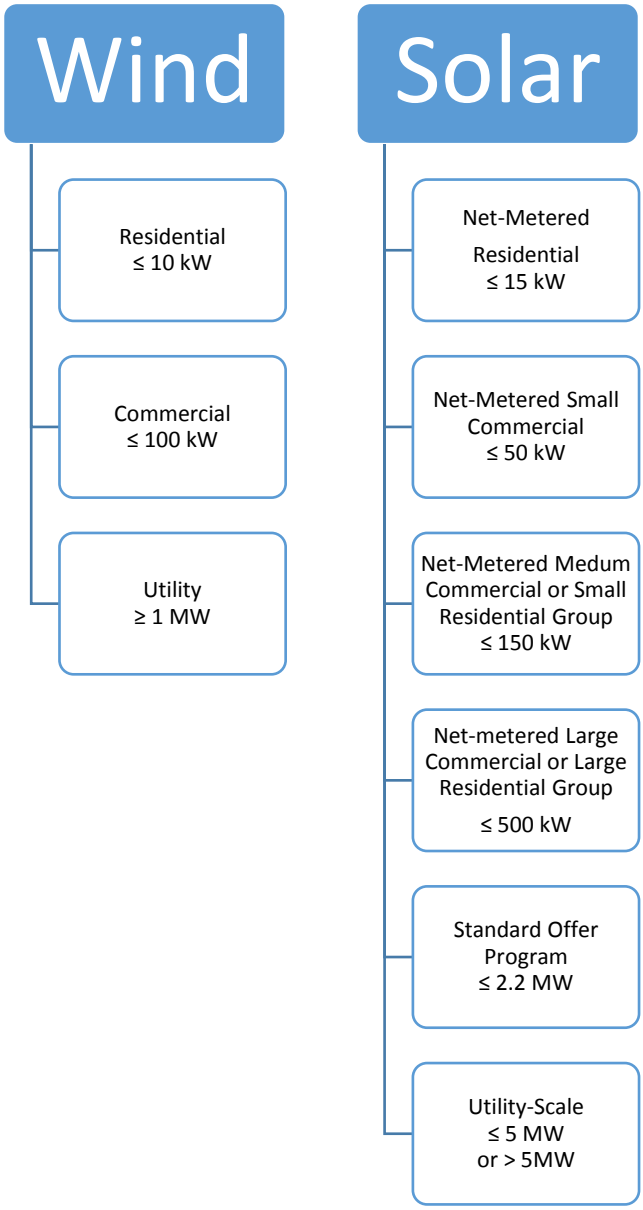


Figure 5: Wind and Solar Size Categories

12A. Are areas identified as unsuitable for particular categories or sizes of generators consistent with resource availability and/or land use policies in the regional or municipal plan applicable to other types of land development? (Answer only required if "Yes" selected above, indicating unsuitable areas have been identified)?

If areas are considered unsuitable for energy generation, then the land use policies applicable to other forms of development in this area must similarly prohibit other types of development. Please note these policies in the Notes column.

This standard is only applicable to plans that identify unsuitable areas. If no unsuitable areas are identified, regions would check "N/A" and still meet the standard. If a region chooses to identify

unsuitable areas (if "Yes" is checked for Regional Standard 12 above), then the plan must meet this standard. The standard asks, essentially, whether plans have identified areas as unsuitable from a resource availability or a land use perspective. If an area simply doesn't have resource potential due to lack of raw renewable potential (adequate wind speed, solar insolation, etc.), then it would make sense to identify it as unsuitable for the corresponding category or size of generator (wind, utility-scale wind, solar, ground-mounted solar > 500 kW, etc.). Similarly, if an area contains known or (less likely) possible constraints that render it unsuitable for a category or size of generator, plans may choose to designate that area as unsuitable. Planners may even decide to differentiate degrees of unsuitability – for example, correlating areas with known constraints as "likely unsuitable," depending on site-specific conditions, and identifying a smaller subset of specific parcels as "definitely unsuitable."

It is essential, however, that plans consider impacts of all land uses, and treat like impacts in a like manner. That is to say, if areas are identified as unsuitable, the plan should say why the areas are unsuitable, and the policies must treat all land uses in those areas in the same way, whether they are renewable energy generators or other development, like housing or commercial development, to minimize impacts on areas that are important. There is no formula for how these "like impacts, like treatment" policies should be described or applied, but planners should make an effort to explain their rationale. One example might be, if only low-density residential development is allowed in a specific area, it may be appropriate to similarly designate the same area as unsuitable for renewable generation larger than residential scale (> 15 kW, or perhaps > 150 kW or 500 kW if systems serving groups of residences are to be considered).

12B. Does the plan ensure that any regional or local constraints (regionally or locally designated resources or critical resources, from 11B-11C above) identified are supported through data or studies, are consistent with the remainder of the plan, and do not include an arbitrary prohibition or interference with the intended function of any particular renewable resource size or type?
Please explain in the Notes column.

This standard asks that when planners are adding regional or local constraints to the lists of known and possible constraints in Regional Standards 11B-11C/Municipal Standards 12B-12C, they provide a reasonable justification for those constraints and ensure they are consistent with plan policies related to other, non-energy-generation land uses. An example of a reasonable justification for a natural resource constraint such as locally identified vernal pools might be a field or other scientific survey conducted by a qualified individual or organization (e.g., a wetlands scientist). If a resource is included on a map as a constraint, there must be a justification such as this. It is important to note that a town can state in its clearly written policies that all vernal pools, even if not mapped, shall be protected; in this case, and their presence (or lack thereof) shall be field verified when projects are proposed.

An aesthetic constraint, such as a scenic viewshed, for example, might be supported through a viewshed analysis, again conducted by a qualified entity (e.g., a landscape architect). Again, any constraints related to this resource should figure into a region's plan-wide land use policies and strategies, rather than "singling out" renewable energy generation. This could be accomplished with policies restricting, for example, all development within a certain radius of locally identified vernal pools, or development over a certain scale within certain areas of the scenic viewshed. Such policies would apply not only to renewable energy development, but also to residential, commercial, industrial, and potentially even agricultural and other "working land" uses as well. Ultimately, plans that explain how their land use

constraints are based in on-the-ground facts, inform well-articulated plan policies, and treat all development on equal terms, will be capable of meeting this standard.

Mapping Standard 13

Does the plan allow for the siting in the region of all types of renewable generation technologies?

This standard, which only applies to regional plans, comes directly from Act 174's requirement that "The Commissioner shall issue an affirmative determination on finding that the regional plan meets the requirements of subsection (c) of this section and allows for the siting in the region of all types of renewable generation technologies."

Types in this case means categories of renewable generation (e.g. solar, wind, biomass, hydro), and does not require that all scales of a given technology (see Figure 5) be accommodated. For example, including only small-scale residential net metered wind would be sufficient to satisfy the requirement.

Mapping Standard 14

Has your region provided (or do you have a plan to provide) a breakout of the map product(s) above to your municipalities?
Please explain your timeline for completing this task in the Notes column.

This standard simply asks regions to ensure that they are providing maps to each of their municipalities, as supported under their training and technical assistance contracts with the Department via Northwest Regional Planning Commission.