

Rutland Town Enhanced Energy Plan

DRAFT June 21, 2018

Vermont Energy Goals

- By 2050, 90% of energy comes from renewable sources
- Reduce greenhouse gas emissions to:
 - 50% below 1990 levels by 2028;
 - 75% below 1990 levels by 2050

Rutland Town Energy Goals & Policies

- Decrease overall energy consumption through conservation and efficiency
- Reduce reliance on fossil fuels and imported energy sources
- Develop renewable energy resources locally

In other words...

- Conservation & efficiency
- Fuel switching
- Generation of energy

Energy 101

Energy can be grouped into three major sectors:

- Transportation
- Heating & Cooling
- Electricity

What control does one town have on overall energy use and meeting the state's goals?

- This plan lays out how towns can have an impact by concentrating on light-duty transportation, residential and commercial heating and electricity use.

LEAP modeling

- Rutland Town will need to reduce overall energy use by half *and* nearly eliminate use of fossil fuels.
- By 2050, electric vehicles will need to comprise more than 90% of the light-duty fleet.
- More than 90% of heating energy use will need to come from renewables.
- Continued commitment to conservation

Rutland Town's Renewable Energy Potential

- Currently, Rutland Town has about 3.1 MW of total renewable energy generation.
- The town's total renewable energy generation potential is 1,1016 MW.

Rutland Town's Renewable Energy Target

- 1,016 MW equals approximately 1,586,820 MWh.

- The town's target of **14,369** MWh by 2050 is a fraction of the town's renewable generation potential of 1,586,820 MWh.

Renewable Energy Mapping

Known Constraints (State)

- Vernal Pools
- DEC River Corridors
- FEMA Floodways
- State–significant Natural Communities and Rare, Threatened, and Endangered Species
- National Wilderness Areas
- Class 1 and Class 2 Wetlands

Renewable Energy Mapping

Possible Constraints (State)

- Important Ag Soils
- FEMA Special Flood Hazard Areas
- Protected Lands
- Act 250 Ag Soil Mitigation Areas
- Deer Wintering Areas
- ANR's VT Conservation Highest Priority Forest Blocks
- Hydric Soils

Renewable Energy Mapping

Prime Resource Areas

- High resource potential; no state Known Constraints

Secondary Resource Areas

- High resource potential; at least one state Possible Constraint

Resources mapped

- Wind*
- Solar
- Biomass
- Hydro

* Utility scale wind is unsuitable for Rutland Town

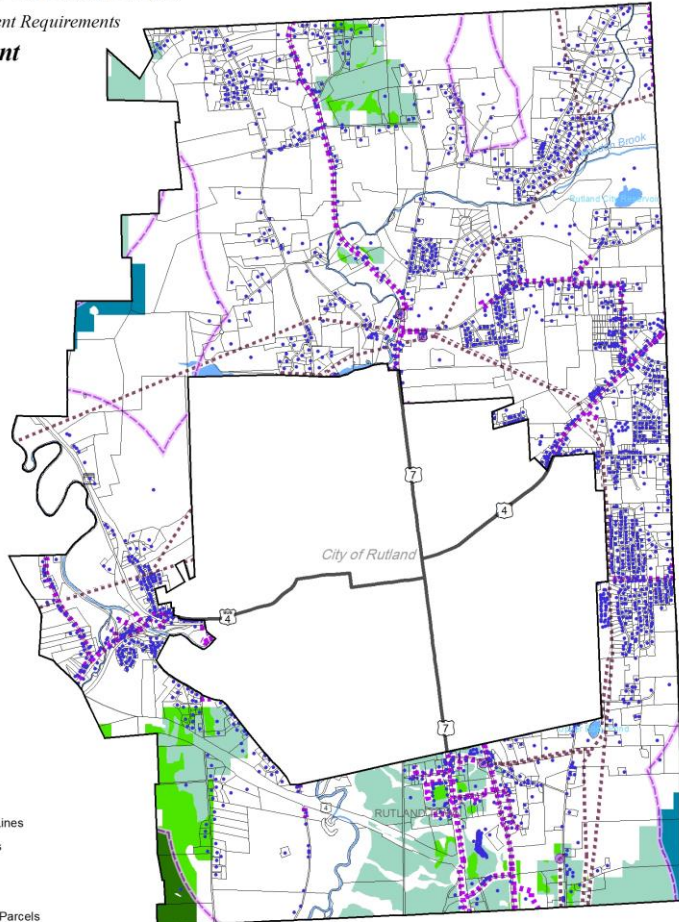
WIND ENERGY POTENTIAL

Based on Public Service Department Requirements
Town of Rutland, Vermont

June 21, 2018

Legend

- Structures
- ⊗ Substations
- ⋯ 3 Phase Power Lines
- ⋯ Distribution Lines
- Lakes/Ponds
- Rivers/Streams
- Town of Rutland Parcels
- 1 Mile Buffer of 3 Phase Power Lines



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Methodology

This map shows areas of potential electricity generation from wind, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime wind potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

Known Constraints

Areas with conditions that are likely to be hazardous or encounter significant obstacles to development, and therefore are very likely to make renewable energy generation development unfeasible, are considered Known constraints. These areas have been removed and are not shown in any way on this map.

Known constraints include:
 FEMA floodways,
 DEC River Corridors,
 Federal Wilderness Areas,
 Rare and Irreplaceable Natural Areas (RINAs),
 Vernal Pools,
 Wetlands Class 1 and 2.

Possible Constraints

Areas that may pose some obstacle to development, but where development is still likely to be feasible, are considered Possible Constraints. These areas ARE shown on the Map, wherever they overlap an area that has potential for solar development. The map only shows where these conditions overlap an area that otherwise has potential for renewable energy development.

Possible Constraint include:
 Deer Wintering Areas
 Public water sources, a 200 foot buffer added around the well head.
 FEMA Special Flood Hazard Areas
 Hydric Soils
 VT Agriculturally Important Soils (prime, statewide and local classifications).
 Act 250 Agricultural Soil Mitigation areas
 Protected Lands (State fee lands and private conservation lands)
 Habitat Blocks only includes areas of 2,000 acres or greater of contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture.
 ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10).
 Regionally or Locally Identified Critical Resources

Legend

- Prime Wind, w/in 1 mile of 3 Phase power lines.
- Prime Wind
- Areas with high wind potential and no identified constraints (known or possible).
- Secondary Wind, w/in 1 mile of 3 Phase power lines.
- Secondary Wind
- Areas with high wind potential and no known constraints, but where at least one possible constraint exists.

SOLAR ENERGY POTENTIAL

Based on Public Service Department Requirements

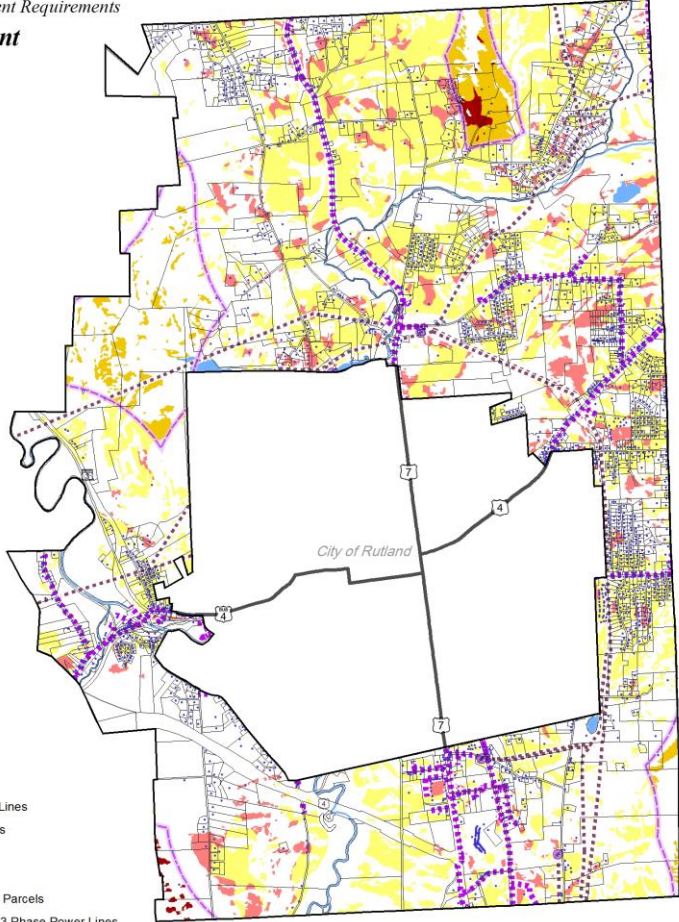
Town of Rutland, Vermont

June 21, 2018

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Legend

- Structures
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Setbacks

Under H.40, passed in 2015, minimum setback requirements for in-state, ground mounted solar generation facilities approved under Section 248 are:
 From a state or municipal highway - 100 feet for a facility with a plant capacity exceeding 150 kilowatts and 40 feet for a plant capacity between 15 and 150 kilowatts.
 From each property boundary that is not a state or municipal highway - 50 feet for a facility with a plant capacity exceeding 150 kilowatts and 25 feet for a facility with a capacity between 15 and 150 kilowatts.

Methodology

This map shows areas of potential electricity generation from solar, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime solar potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

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 Vernal Pools
 Wetlands Class 1 and 2.

Possible Constraints

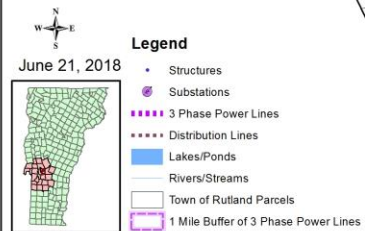
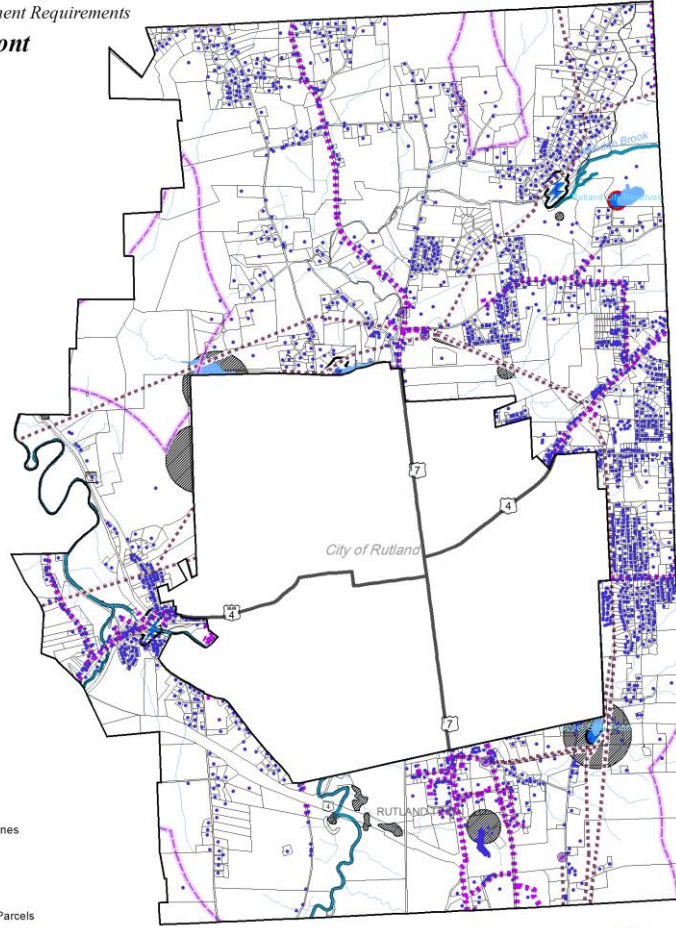
Areas that may pose some obstacle to development, but where development is still likely to be feasible, are considered Possible Constraints. These areas ARE shown on the Map, wherever they overlap an area that has potential for solar development. The map only shows where these conditions overlap an area that otherwise has potential for renewable energy development.
 Possible Constraint include:
 Deer Wintering Areas
 Public water sources, a 200 foot buffer added around the well head.
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 Hydric Soils
 VT Agriculturally Important Soils (prime, statewide and local classifications)
 Act 250 Agricultural Soil Mitigation areas
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 Habitat Blocks only includes areas of 2,000 acres or greater of contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture.
 ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10)
 Regionally or Locally Identified Critical Resources

Legend

- Prime Solar, w/in 1 mile of 3 Phase power lines.
- Prime Solar
- Areas with high solar potential and no identified constraints (known or possible).
- Secondary Solar, w/in 1 mile of 3 Phase power lines.
- Secondary Solar
- Areas with high solar potential and no known constraints, but where at least one possible constraint exists.

HYDRO ENERGY POTENTIAL

Based on Public Service Department Requirements
Town of Rutland, Vermont



June 21, 2018

Legend

- Structures
- ⊗ Substations
- 3 Phase Power Lines
- ⋯ Distribution Lines
- Lakes/Ponds
- Rivers/Streams
- Town of Rutland Parcels
- 1 Mile Buffer of 3 Phase Power Lines

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Methodology

This map shows areas of potential electricity generation from hydro, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of hydro potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

Known Constraints

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- Known constraints include:
- FEMA floodways,
 - DEC River Corridors,
 - Federal Wilderness Areas,
 - Rare and Irreplaceable Natural Areas (RINAs),
 - Vernal Pools,
 - Wetlands Class 1 and 2.

Possible Constraints

Areas that may pose some obstacle to development, but where development is still likely to be feasible, are considered Possible Constraints. These areas ARE shown on the Map, wherever they overlap an area that has potential for solar development. The map only shows where these conditions overlap an area that otherwise has potential for renewable energy development.

- Possible Constraint include:
- Deer Wintering Areas
 - Public water sources, a 200 foot buffer added around the well head.
 - FEMA Special Flood Hazard Areas
 - Hydric Soils
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 - Act 250 Agricultural Soil Mitigation areas
 - Protected Lands (State fee lands and private conservation lands)
 - Habitat Blocks only includes areas of 2,000 acres or greater of contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture.
 - ANR's Vermont Conservation Design Highest Priority Forest Blocks (Habitat Blocks 9 & 10),
 - Regionally or Locally Identified Critical Resources

Legend

- RT4 and RT7
- Designated Outstanding Resource Waters
- ⚡ Dams not on National Wild and Scenic Rivers

Potential Hydroelectric Facilities

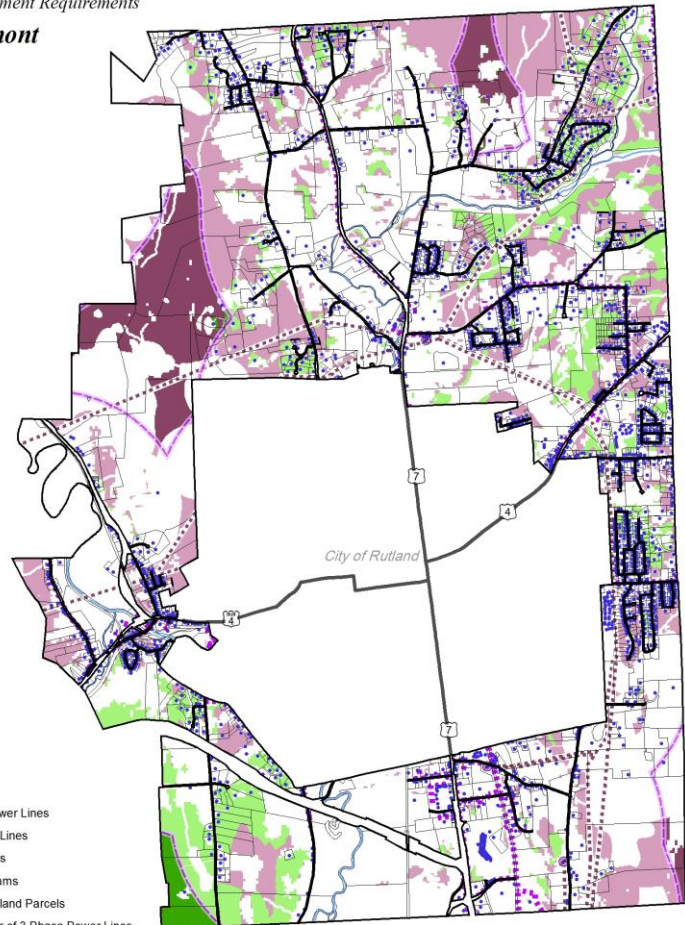
- < 50 kW Capacity
- > 50 kW Capacity
- High Hazard with < 50 kW Capacity
- High Hazard with > 50 kW Capacity
- Impaired Waters
- Stressed Waters
- Rivers/Streams
- Rare and Irreplaceable Natural Areas (RINAs)



BIOMASS ENERGY POTENTIAL

Based on Public Service Department Requirements

Town of Rutland, Vermont



June 21, 2018

- Legend**
- Structures
 - Substations
 - 3 Phase Power Lines
 - ... Distribution Lines
 - Lakes/Ponds
 - Rivers/Streams
 - Town of Rutland Parcels
 - 1 Mile Buffer of 3 Phase Power Lines

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Methodology

This map shows areas of potential electricity generation from biomass, i.e. locations where renewable energy generation would likely be most feasible according to the natural conditions of an area. This map also considers various other conditions, such as ecological zones, that may impact the feasibility of renewable energy development. These conditions are referred to as constraints. Areas of prime biomass potential exist where the natural conditions make development feasible and no Known or Possible constraints exist, as determined by the Vermont Public Service Board.

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 Federal Wilderness Areas,
 Rare and Irreplaceable Natural Areas (RINAs),
 Vernal Pools,
 Wetlands Class 1 and 2.

Possible Constraints

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 Hydric Soils
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 Act 250 Agricultural Soil Mitigation areas
 Protected Lands (State fee lands and private conservation lands)
 Habitat Blocks only includes areas of 2,000 acres or greater of contiguous forest and other natural habitats that are unfragmented by roads, development, or agriculture.
 ANR's Vermont Conservation Design Highest Priority Forest Blocks (+ Habitat Blocks 9 & 10).
 Regionality or Locally Identified Critical Resources

Legend

- Prime Woody Biomass, w/in 1 mile of 3 Phase power lines.
- Prime Woody Biomass
- Areas with high woody biomass potential and no identified constraints (known or possible).
- Secondary Woody Biomass, w/in 1 mile of 3 Phase power lines
- Secondary Woody Biomass
- Areas with high woody biomass potential and no known constraints, but where at least one possible constraint exists.

Renewable Energy Mapping

Local Unsuitable Areas: Utility Scale Wind

Few of the prime areas identified could accommodate utility scale wind. Most are secondary resource areas and may not be suitable for energy development.

Renewable Energy Mapping

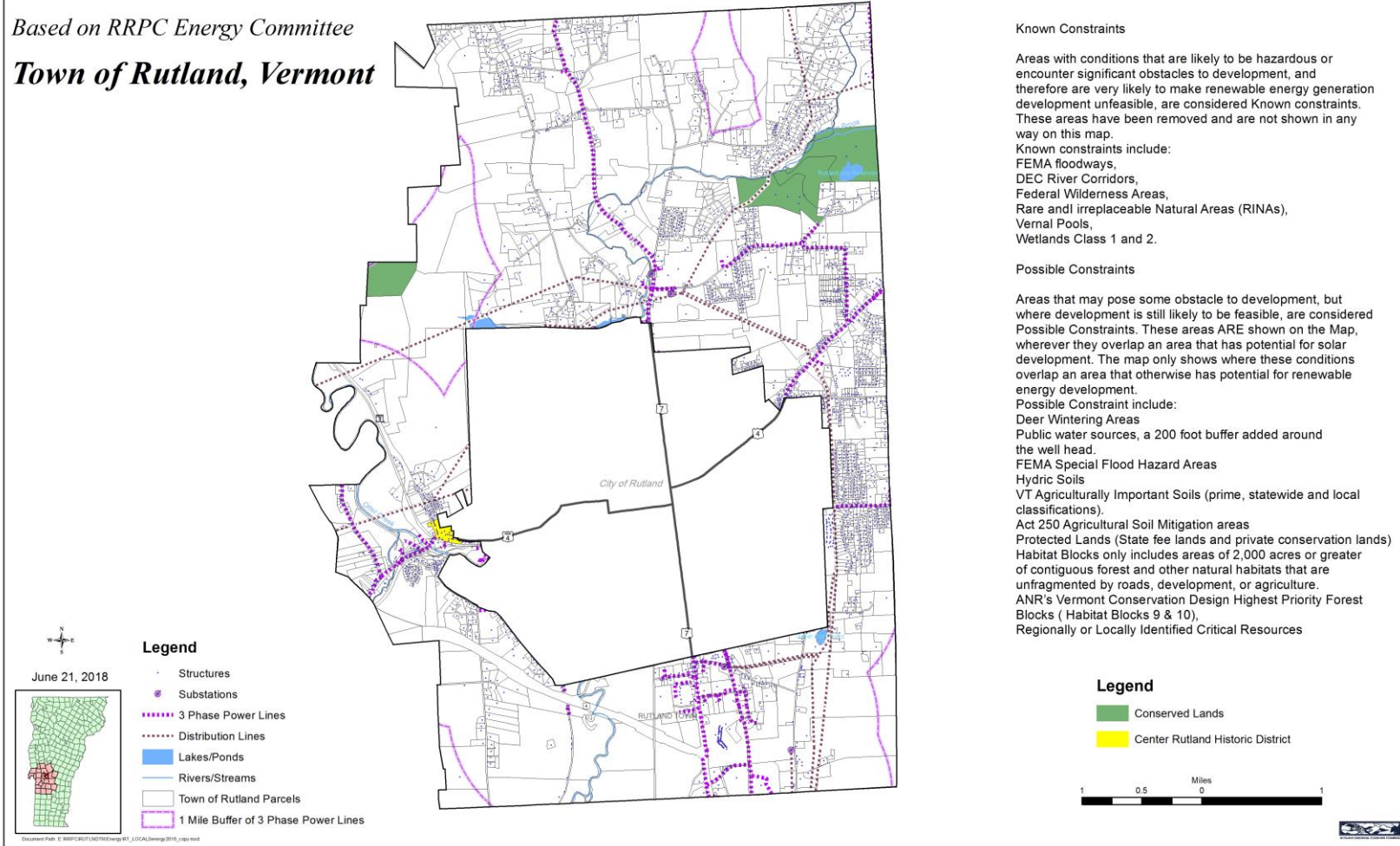
Local Possible Constraints

- Scenic Resources (pp 74-75)
- Conservation District (ecological and/or aesthetic importance)
- Designated Rutland Town Historic Sites

LOCAL POSSIBLE CONSTRAINTS

Based on RRPC Energy Committee

Town of Rutland, Vermont



Known Constraints

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- Rare and irreplaceable Natural Areas (RINAs),
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- Regionally or Locally Identified Critical Resources

Legend

- Conserved Lands
- Center Rutland Historic District



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Renewable Energy Mapping

Local Preferred Areas

<150 kw – Residential and commercial rooftops (not mapped)

>500 kw – Commercial scale

- Foley/Baker parcels – 50 acres
- Municipal land at Northwood Park (capped former landfill) – 4 acres
- Route 7 Industrial Commercial District parcels – 181 acres

Renewable Energy Mapping

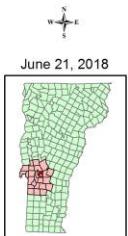
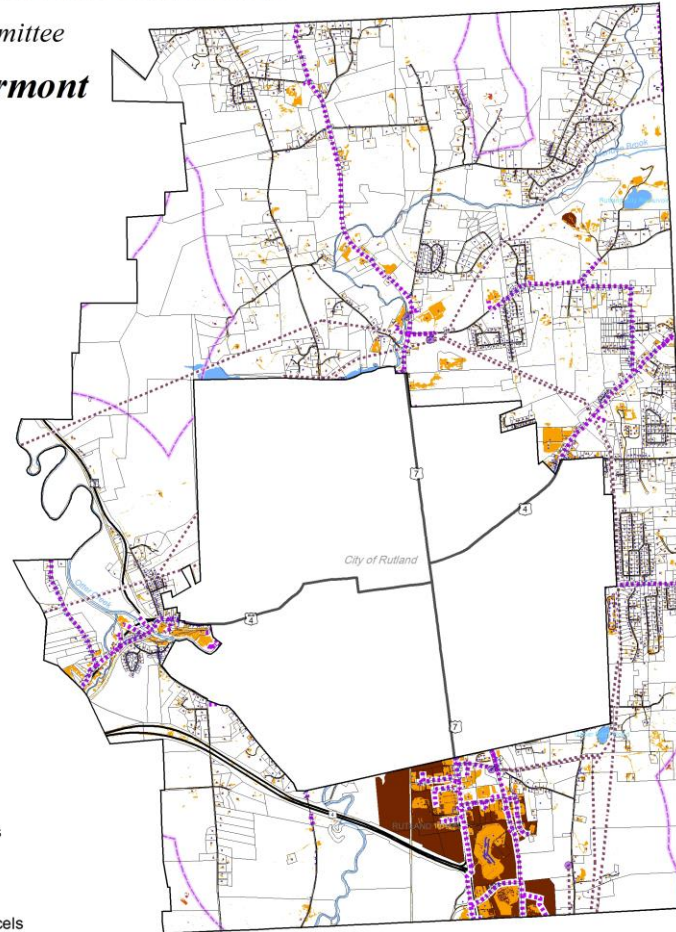
Department of Public Service Preferred Areas

- Roof-mounted systems
- Former brownfield sites
- Disturbed areas (gravel/sand pits)
- Sanitary landfills
- Junkyards
- Parking lots

LOCAL PREFERRED LOCATIONS

Based on RRPC Energy Committee

Town of Rutland, Vermont



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Legend

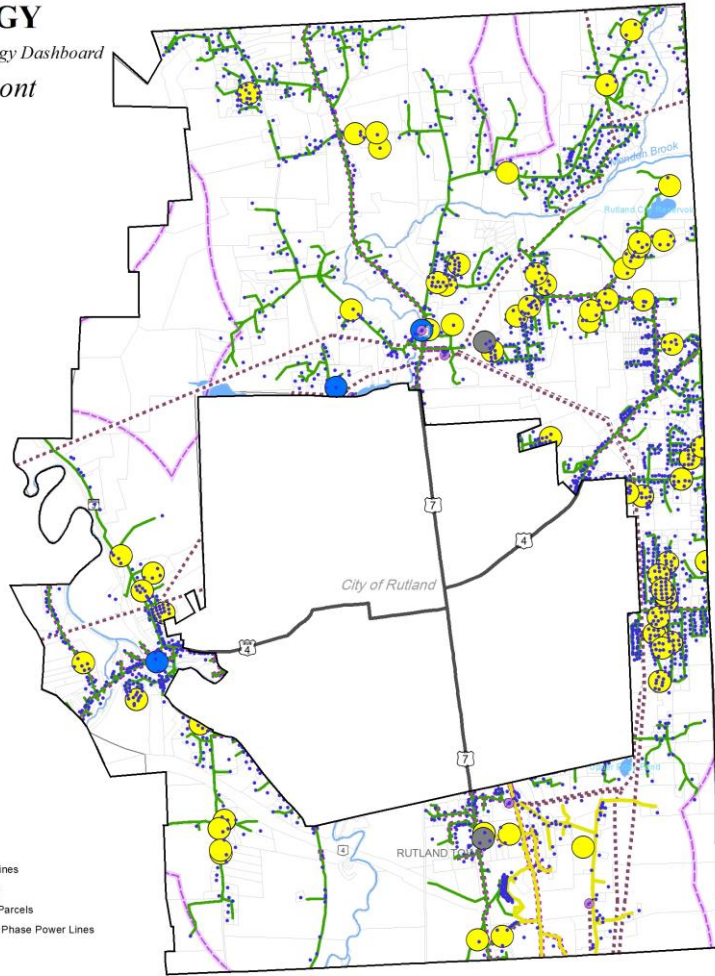
- Impervious Surface (preferred locations for solar only)
- Impervious Surface (preferred locations for solar only, within 1 mile of 3 Phase Power)
- Town of Rutland Preferred Sites



EXISTING ENERGY

Based on Vermont Community Energy Dashboard

Town of Rutland, Vermont



Legend

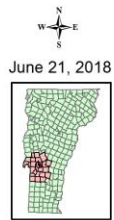
- Efficiency (Crowdsourced)
- Hydro
- Solar
- RT4 and RT7

GMP Distribution Circuits

DG Rating

- Unrated
- Good
- Fair
- Poor

Green Mountain Power data is from:
<https://maps.gmpvt.com/arcgis/rest/services>.
Existing data is from the Vermont Community Energy Dashboard.



June 21, 2018

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Mapping Summary

Rutland Town Renewable Energy Potential Summary	
Town Target (by 2050) (in MWh)	14,369
Total Acres in Rutland Town	12,292
Acres Suitable for Renewables (Solar, Wind, Biomass – Prime and Secondary)	10,301
Local Possible Constraints – Conservation District, Historic District (in acres)	376
Scenic Resources Areas	*
Acres Suitable for Renewables (minus Constraints - in acres)	9,925
Local Preferred Areas (in acres)	94
Total Acres Suitable for Renewables (minus Constraints plus Preferred Areas - in acres)	10,019
Acres Needed to Make Target	84.8

**Rutland Town Planning Commission Criteria for Net Metering Preferred Sites
and Renewable Energy Siting Preferred Sites**

How Town Plans influence state regulatory proceedings:

- Act 250 applications must conform to the municipal plan.
- Applications for a Section 248 Certificate of Public Good must give due consideration to the municipal plan; with an enhanced energy plan considered compliant, it is substantial deference.

Criteria:

1. Renewable energy generation potential is present on site (as indicated by the state's data layers for prime and secondary resources).
2. Each proposed project is considered in a transparent and non-arbitrary manner and that each proposal is consistent with other land uses in that district as specified in the Municipal Plan and Future Land Use map.
3. If located in the AGR40 (Agricultural & Forestry Working Lands) District: The proposed project meets the definition of "lands presently used for or suitable to support agriculture, forestry, and related commercial, recreation and tourist related enterprises."
4. If located in the AGR40 (Agricultural & Forestry Working Lands) District: The proposed project is considered small-scale commercial that "preserves the setting, natural features and contours of the land".
5. If located in one of the town's Scenic Resources (viewsheds) as specified in its Municipal Plan: The project does not have an "undue impact on the visual or scenic resources of other locations within the town from which it can be seen" using what's known as the "Quechee Analysis" legal precedent.
6. The site avoids environmentally-sensitive areas (wetlands, flood hazard areas, wildlife habitat).
7. The Town of Rutland has notified all abutting property owners and requested the developer to take all generally available and reasonable steps to mitigate the project's visibility.
8. Access must be available to firefighters and other emergency responders as defined in the town's Driveway Installations Ordinance, Article 1, § 181/20-24 (adopted in 1980).

Rutland Town Enhanced Energy Plan

Strategies & Policies to
Achieve Town Targets

- Appointment of an Energy Coordinator and/or Energy Committee to be responsible for the implementation of strategies and policies for:
 - Conservation and Efficient Use of Energy
 - Transportation
 - Land Use

RUTLAND TOWN ENERGY PLAN FLOW CHART

