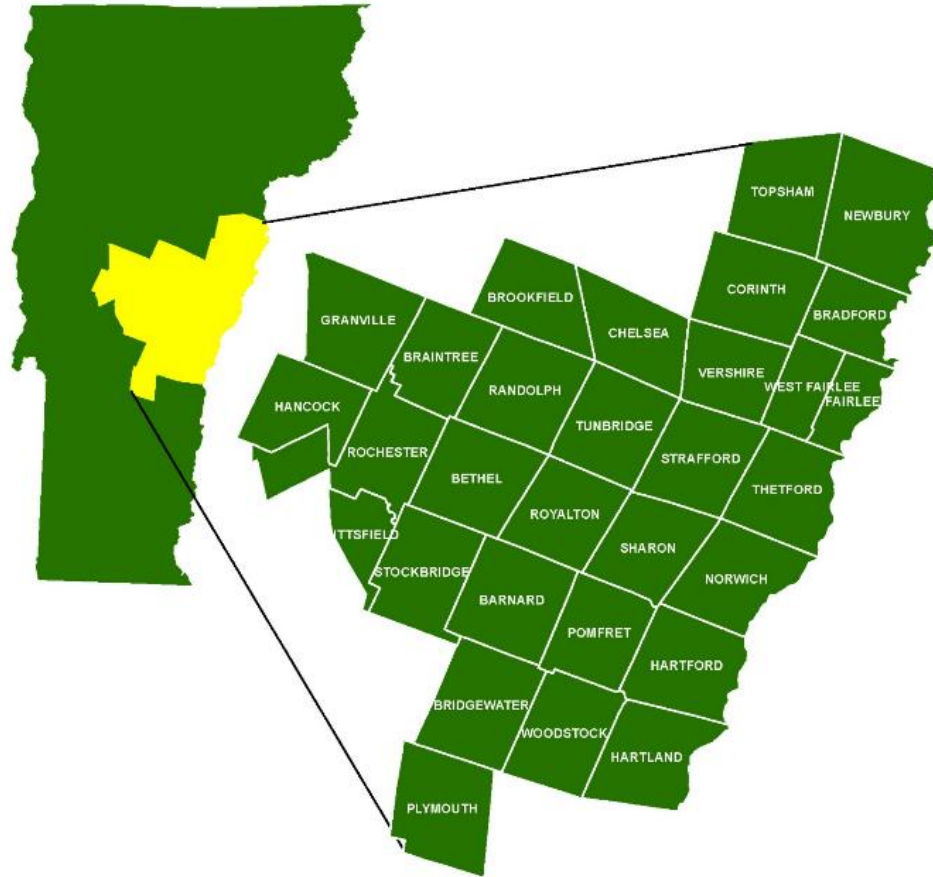


# ENERGY PLANNING & ACT 174

Overview of  
Municipal  
Standards for  
Determination of  
Energy  
Compliance



# THE TRO REGION



# REASONING FOR SEEKING THE DETERMINATION

- TRORC originally received a Determination for Energy Compliance in 2017.
- New updates in the Regional Plan were needed, and TRORC incorporated the previously separate Energy Implementation Plan into the 2020 Regional Plan.
- This requires TRORC to seek the Determination again.

# HISTORY OF ENERGY PLANNING IN VT

- Driven primarily by a desire **to reduce greenhouse gasses\***, Vermont established a comprehensive energy plan in 2011 (updated in 2016). The plan included some very lofty goals:
  - Reduce total energy consumption per capita by 15% by 2025 & > 1/3 by 2050
  - Meet 25% of remaining energy need from renewables by 2025, 40% by 2035 and **90% by 2050**
  - Renewable end use sector goals for 2025: 10% transportation, 30% buildings, 67% electric power

\*V.S.A. Title 10, § 578(a)

# INTEGRATING ENERGY AND PLANNING

- Energy Generation Siting Policy Commission (2013) & the Solar Siting Task Force (2015) called for energy planning to be integrated with land use planning.
- Many of the components of municipal and regional planning are intertwined with energy issues, such as:
  - Transportation
  - Housing
  - Natural Resources
  - Land Use
  - Economic Development

# ACT 174 - SUMMARY

- Act 174 (24 VSA 4352) establishes a set of municipal and regional energy planning standards.
- Enhanced Energy Planning is a **volunteer** process. Participation is not required.
- Plans in communities and regions that opt in will be reviewed using the standards developed as part of Act 174.
- Those communities and regions that meet the standards will receive a determination of energy compliance (DEC).
- The Municipal Plans of communities and Regional Plans of RPCs with a DEC will receive “substantial deference” under Section 248.

## Due Consideration

Statute Does not define what “due consideration is” or assign whether the PSB or the Courts are the ultimate arbiter.

Case law indicates that the PUC “need only give “due consideration” to the recommendations of the municipal and regional planning commissions in deciding [if] the project will not unduly interfere with the orderly development of the region.” \*

## Substantial Deference

Defined in Statute:

*“that a land conservation measure or specific policy shall be applied in accordance with its terms unless there is a clear and convincing demonstration that other factors affecting the general good of the State outweigh the application of the measure or policy.”*

# VEIC AND THE LEAP MODEL

- Modeling for the project was done by the Vermont Energy Investment Corp (VEIC)
- Their model was informed by the 2013 Total Energy Study, which proposed three possible models for reaching the 90% renewable by 2050 target:
  - Business as usual
  - Carbon tax shift
  - Total Renewable and Energy Efficiency Standards (TREES)
- VEIC adapted the TREES scenario for this project



# DATA AND ASSUMPTIONS

- Historic information was primarily drawn from the Public Service Department's Utility Facts 2013 and Energy Information Administration (EIA) data.
- Projections came from the Total Energy Study (TES), the utilities' Committed Supply, and stakeholder input.
- Assumptions include:
  - The population is assumed to grow at 0.35% per year. People per house are assumed to decrease from 2.4 in 2010 to 2.17 in 2050.

# DATA AND ASSUMPTIONS

## ■ Assumptions (continued):

- The commercial demand driver was area of commercial buildings. Commercial building data and projections were extracted from inputs in the TES.
- Industrial energy use was entered as the actual totals for each energy type, without a driver specified in the model.
- Transportation energy use is based on projections of vehicle miles traveled (VMT). VMT peaked in 2006 and has since declined slightly. VMT is assumed in the model to remain flat while population and economic activity grow slightly.
- There will be reductions in energy use due to changes in technology, including building shell and device efficiency improvements.

# MODEL RESULTS

- Based on the LEAP model provided:
  - The TRORC Region will go from consuming 10.874 mmbtu of energy to 6.537 (a nearly 40% decrease in total energy consumption) by 2050.
  - Use of fossil fuels will dramatically decrease, while use of electricity and renewable energy sources will increase. The overall increase in electricity use will be primarily due to the utilization of electric vehicles (EVs) and heat pumps

| Energy Demand by Fuel TRORC Region  |               |              |              |              |
|-------------------------------------|---------------|--------------|--------------|--------------|
| TRORC Fuel Consumption Change 90/50 |               |              |              |              |
| Units: Million Million BTUs         |               |              |              |              |
| Fuels                               | 2010          | 2025         | 2035         | 2050         |
| Electricity                         | 1.712         | 2.093        | 2.393        | 2.939        |
| Natural Gas                         | 0.075         | 0.195        | 0.135        | 0.109        |
| Gasoline                            | 2.971         | 2.231        | 1.573        | 0.077        |
| Jet Kerosene                        | -             | -            | -            | -            |
| Kerosene                            | 0.089         | 0.054        | 0.032        | -            |
| Diesel                              | 0.929         | 0.651        | 0.438        | 0.020        |
| Residual Fuel Oil                   | 0.431         | 0.331        | 0.262        | 0.158        |
| LPG                                 | 1.147         | 0.719        | 0.533        | 0.258        |
| Oil                                 | 1.337         | 0.842        | 0.515        | 0.004        |
| Wood                                | 1.649         | 1.476        | 1.385        | 1.319        |
| Ethanol                             | 0.403         | 0.424        | 0.447        | 0.479        |
| Solar Thermal                       | 0.001         | 0.005        | 0.008        | 0.013        |
| Hydrogen                            | -             | -            | -            | -            |
| Coal Unspecified                    | 0.094         | 0.059        | 0.035        | -            |
| Biomass                             | 0.007         | 0.013        | 0.017        | 0.023        |
| CNG                                 | 0.020         | 0.022        | 0.023        | 0.026        |
| Biodiesel                           | 0.010         | 0.350        | 0.615        | 1.110        |
| <b>Total</b>                        | <b>10.874</b> | <b>9.464</b> | <b>8.413</b> | <b>6.537</b> |
|                                     |               |              |              |              |

# HOW TO ACHIEVE THE GOALS?

- The TRORC Regional Plan focuses on the following as part of this pathway\* to implementing the goals:
  - **Thermal:** Improving building stock, changing and improving heating systems and fuels.
  - **Transportation:** Reducing the amount of driving and transforming the vehicle fleet.
  - **Electricity:** Continuing efforts at conservation and opportunities for new generation in the region.

\* The Plan represents **ONE** possible pathway to achieving the goals of the CEP



| Year | Electricity Consumption (1000 GWh) | New Wind (MW) | New Hydro (MW) | New Solar (MW) |
|------|------------------------------------|---------------|----------------|----------------|
| 2010 | 487                                | -             | -              | -              |
| 2025 | 599                                | 4             | 2              | 38             |
| 2035 | 687                                | 16            | 4              | 78             |
| 2050 | 847                                | 16            | 8              | 139            |

## TARGETS

New Renewable Energy Generation Capacity

The LEAP model provided TRORC with targets for renewable energy generation capacity.

**These targets represent new renewable capacity (after 2015) if the path developed through the LEAP model is chosen.**

TRORC chose to go with the LEAP model.

# IDENTIFYING RENEWABLE POTENTIAL



## Solar

Topography of land analyzed based on slope and direction (azimuth) conducted in GIS for ground-mounted solar.



## Wind

Digitally modeled wind speed (based on topography) analyzed at 3 hub heights.



## Hydro

Existing dams analyzed for potential capacity based on Community Hydro report. No new dams considered.



## Biomass (wood)

Land coverage used to determine amount of harvestable wood.

# IDENTIFIED CONSTRAINTS

## Level 1 Constraints

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Conditions which would likely make development unfeasible. These were removed entirely.

- Floodways & River Corridors
- Federal Wilderness
- Rare and Irreplaceable natural areas
- Vernal Pools
- Class 1 and 2 Wetlands

## Level 2 Constraints

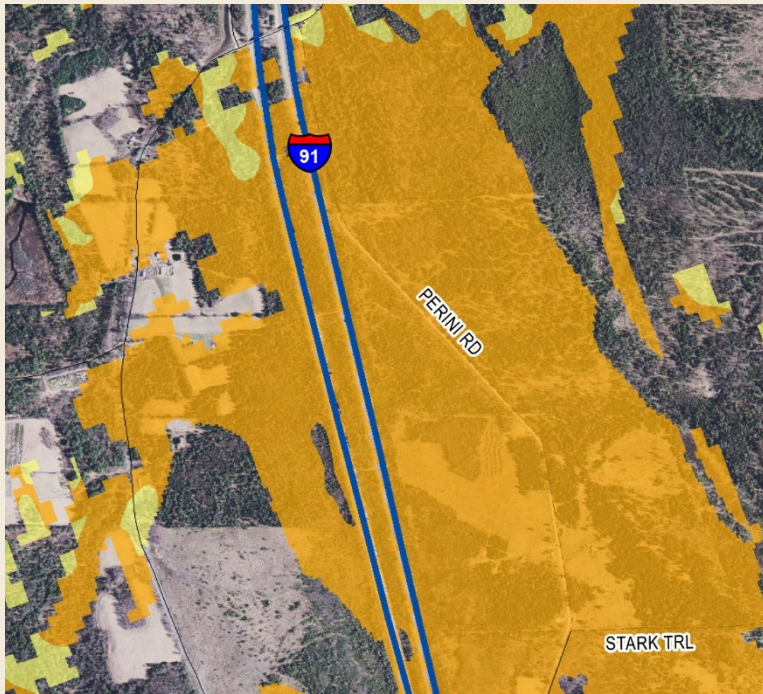
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Conditions which could impact development, but which would not necessarily prevent it. *These are shown on maps in color (where they overlap).*

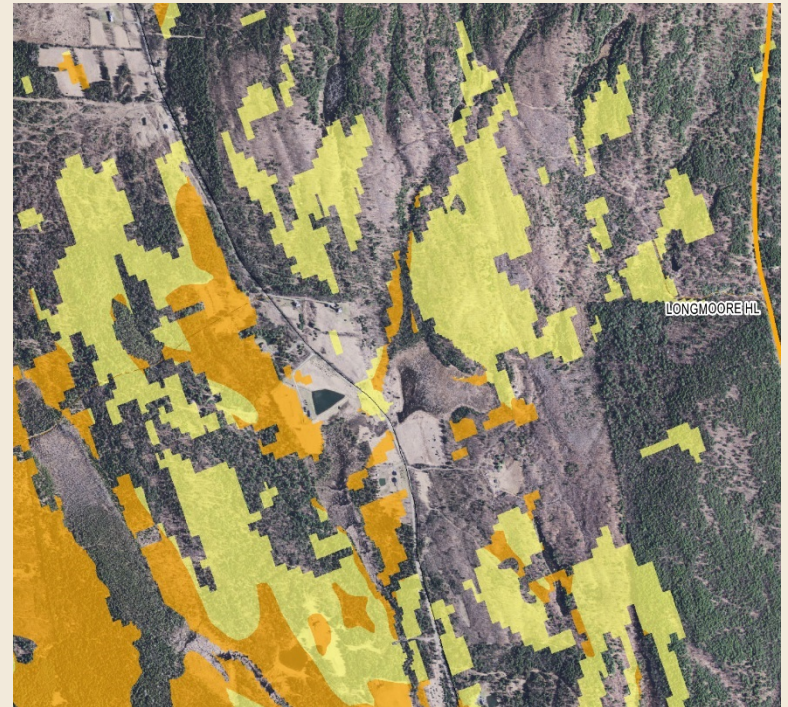
- Agricultural Soils (all ag-rated soils)
- Habitat Blocks (ANR class 9 and 10)
- Hydric Soils
- Conserved Lands
- Special Flood Hazard Areas
- Deer Wintering Areas
- Class 3 Wetlands

# MAPPED POTENTIAL AREAS

Potential  
(with Level 2 Constraints)



Prime Potential  
(No Level 2 Constraints)



*This example shows solar potential.*



# REGIONAL ACTION

- Many of TRORC's actions focus on things like:
  - Providing outreach and education.
  - Encouraging continued development of state policy that will help reach the targets.
  - Modifying the Regional Plan.
  - Supporting existing initiatives through outreach or policy.
  - Work with stakeholders and municipalities to communicate with those who need energy related services.
  - Participating in Act 250 and Section 248 proceedings.
  - Helping communities draft strong energy plans.

# WHAT WILL WE DO WITH THE PLAN?

- It will serve as a guide for the Regional Commission as we move forward toward the state's energy goals.
- Once we received a Determination of Energy Compliance, the TRORC Board will be able to grant the same status to Town Plans that meet the standards.
- It will serve as a tool and a starting point for municipalities drafting their own energy plans.
- The Regional Plan also serves as a tool in Section 248 proceedings and in Act 250 applications

# WHAT WILL WE DO WITH THE MAPS?

- **As a Tool for Municipalities:** The primary purpose of the maps in this plan are to provide communities with a tool that will help them identify potential areas for the siting of renewable energy resources.
- **As a Component of Enhanced Energy Planning:** Under Act 174, if a Regional Commission seeks a determination of energy compliance for the Regional Plan, the Plan will need to include the *“identification of potential areas for the development and siting of renewable energy resources and areas that are unsuitable for siting of those resources or particular categories or sizes of those resources.”*

# COMPONENTS ADDED BY ACT 174 (2016) TO ENERGY CHAPTER (FOR REGIONAL PLANS)\*

- Sec. 5. 24 V.S.A. § 4348a(a)(3) is amended to read:

(3) An energy element, which may include an analysis of resources, needs, scarcities, costs, and problems within the region, **across all energy sectors, including electric, thermal, and transportation**; a statement of policy on the conservation **and efficient use** of energy and the development **and siting** of renewable energy resources, a statement of policy on patterns and densities of land use likely to result in conservation of energy; **and an identification of potential areas for the development and siting of renewable energy resources and areas that are unsuitable for siting those resources or particular categories or sizes of those resources.**

# CONSISTENCY WITH STATE GOALS

- Plans\* must be consistent with:
  - Vermont's greenhouse gas reduction goals under 10 V.S.A. § 578(a);
  - Vermont's 25 by 25 goal for renewable energy under 10 V.S.A. § 580;
  - Vermont's building efficiency goals under 10 V.S.A. § 581;
  - State energy policy under 30 V.S.A. § 202a and the recommendations for regional and municipal energy planning pertaining to the efficient use of energy and the siting and development of renewable energy resources contained in the State energy plans adopted pursuant to 30 V.S.A. §§ 202 and 202b (State energy plans); and
  - The distributed renewable generation and energy transformation categories of resources to meet the requirements of the Renewable Energy Standard under 30 V.S.A. §§ 8004 and 8005; and
  - Meet the standards for issuing a determination of energy compliance included in the State energy plans.

\*Those plans seeking Enhanced Energy Planning Certification