MINUTES
September 17, 2015
5:30 PM
Manchester Town Offices

Present: Peter Luca (Sunderland), Walt Klinger (Pownal), Janet Hurley (Manchester Village), Rick Kelly (Manchester), Meg Cottam (Glastenbury), William Deveneau (Bennington), Bruce Lierman (Transportation), Suzy dePeyster (Sandgate), Pauline Moore (Manchester), Ken Harrington (Shaftsbury), Nancy Faesy (Dorset), John LaVecchia (Dorset) / Also submitting votes on plan approvals/confirmations: Bob Howe (North Bennington), Charlie Rockewell (Rupert), Ed Shea (Woodford), Dan Monks (Bennington), Judy Boehlert (Sandgate), Reg Jennings (Arlington), Megan Randall (Pownal), Keith Squires (Arlington), Jerald Hassett (Landgrove), Paul Myers (Peru)Phic Chapman (Rupert)

Also Present: Karen Lee, Rosalie Fox, Michael Murno, Justine Cook, Bill Laberge, Ed Morrow, Jim Hand, Tim Scoggins, Annette Smith, Rick Carroll (and several other individuals)

I. Approval of Corporate Authorization Resolution to authorize BCRC’s new financial manager, Stacey Eggware, to have access to all account information

Motion (Kelly): Approve the authorizing resolution as written for the chair’s signature. Second by Deveneau. Passed unanimously

II. Minutes of July 16, 2015 Meeting

Motion (Klinger): Approve as presented. Second by Cottam. Passed unanimously.

III. BCRC Bylaw Amendments

Sullivan summarized the amendments proposed to the BCRC’s bylaws that were first presented at the July meeting of the Commission. Motion to approve the amendments: Hurley. Second by Kelly. Passed unanimously.
IV. Public Hearing to Consider Approval of Sandgate, Sunderland, and Glastenbury Town Plans

Sullivan described the statutory process and noted that the plans had been reviewed by BCRC staff and reports are available. Each has been found to contain all required elements and to satisfactorily address statutory goals. Following the close of the hearing, commissioners voted to approve the three town plans and to confirm the planning processes of each of the towns (hard copy of ballots on file-21 votes to approve/confirm Sandgate and Sunderland and 20 for Glastenbury.

V. Regional Energy Planning

Sullivan and McGlasson presented a slide show (attached) describing the nature of the BCRC’s ongoing energy planning project that is being supported by the Vermont Public Service Department with assistance from the Vermont Energy Investment Corporation and the Energy Action Network. Two other regional planning commissions also are engaged in this planning work.

The first part of the presentation focused on the state’s energy goals and a computer scenario modeling program (Long Range Energy Applications Planning “LEAP”) that has been used to develop projections for the types of changes that will be required to meet those goals statewide and within the region. A number of questions were asked, with discussion ensuing, concerning assumptions used to develop the model, the relative feasibility and merits of different energy technologies, and the costs and efficiencies of conservation and renewable energy generation.

The second part of the presentation described how the BCRC has developed renewable energy resource maps for solar, wind, hydroelectric, and biomass resources. The maps identify good locations based on resource availability and then limit, or constrain, those areas based on the presence of certain natural resources. An important part of this meeting is to obtain input on the appropriateness of those resources and constraints and to identify other general resources or conditions that should act as either constraints or opportunities. This input will be brought back to the regional energy committee and the maps will be adjusted before being finalized. Some ideas expressed during the presentation portion of the meeting were: add a buffer zone around existing homes (at different distances) for solar and wind projects, make any forest land a constraint for solar or wind development, and include specific decibel levels in siting guidelines for wind projects. Several people also suggested that it would be good to consider new dams for additional hydroelectric generating potential (rather than the heavy reliance on wind and solar being contemplated).

Following the presentation, attendees had an opportunity to look at the resource maps at tables, discuss the maps with staff and energy committee members, and submit written comments. Those comments will be recorded, organized, and added to the mapping project files for consideration by the energy committee and the BCRC at future meetings.

Submitted by Jim Sullivan
Regional Energy Planning

Bennington County Regional Commission

September 2015
• An extension of the 2009 Bennington Regional Energy Plan and an amendment to the 2015 Bennington County Regional Plan
• Quantitative targets tied to state energy goals and development of specific strategies
• Funded by the VT Public Service Department with support from the Vermont Energy Investment Corporation and the Energy Action Network.
Vermont State Energy Goals

Some statutory, some from the State Comprehensive Energy Plan. A few examples:

- 25% of all energy consumed in the state through in-state renewables by 2025
- Reduce greenhouse gas emissions resulting from energy use in Vermont by 50% (of 1990 levels) by 2028 and 75% by 2050
- Weatherize 60,000 Vermont housing units by 2017 and 80,000 by 2025
- 90% of Vermont’s total energy needs from renewable sources by 2050.
Why are these goals important?

• **Environmental Reasons**
  
  ➢ Climate change and greenhouse gas emissions
  
  ➢ Other air and water pollution from fossil fuel combustion
  
  ➢ Impacts of coal mining
  
  ➢ Nuclear plant safety and waste storage
• **Economic Reasons**

- Reducing the amount of money exported from the state and from our region for energy purchases.

- Investment in local energy projects and services (jobs), including biomass fuel production, building weatherization, alternative heating systems, renewable energy projects,…

- Reduce uncertainty in energy supply and cost.
• Long-Term Energy Security

- Reduce reliance on uncertain contracts from large out-of-state and foreign suppliers (of liquid petroleum fuels, electricity,....)

- Improved efficiency and reduced cost

- Uncertainties in the availability and cost of nonrenewable energy sources

- Maintain quality of life and viable economic systems
• Inevitability

➢ If not renewable, then it is nonrenewable!

➢ Transition away from current energy sources is a physical and economic inevitability – just a question of time and how the transition will occur.
Long Range Energy Applications Planning (LEAP) Model

Based on data from the Vermont Public Service Department, the national Energy Information Administration, and projections from the Vermont Total Energy Study, with targets based on progression toward “90 by 50” goal.

Results for the entire state with regional outputs based demographic and economic data and projected future demand.
Vermont Energy Demand by Fuel Type

Demand: Energy Demand Final Units
Scenario: 90x50VEIC vs. Reference, Region: Statewide

Million Million ETUs

2010 2025 2035 2050

Electricity
Natural Gas
Gasoline
Jet Kerosene
Kerosene
Diesel
Residual Fuel Oil
LPG
Oil
Wood
Ethanol
Solar Thermal
Hydrogen
Coal Unspecified
BiOMass
CNG
Biodiesel
Bennington Region Energy Demand 2010 - 2050

Demand: Energy Demand Final Units
Scenario: 90x50VEIC vs. Reference, Region: Bennington

- Electricity
- Natural Gas
- Gasoline
- Jet Kerosene
- Kerosene
- Diesel
- Residual Fuel Oil
- LPG
- Oil
- Wood
- Ethanol
- Solar Thermal
- Hydrogen
- Coal Unspecified
- Biomass
- CNG
- Biodiesel

Million Million BTUs

2010 2025 2035 2050
Bennington Region Residential Energy Demand
2010 - 2050

Total Residential Energy Demand

Single-Family Heating Energy Demand
Bennington Region Commercial Energy Demand 2010 - 2050
Bennington Region Industrial Energy Demand

2010 - 2050
Bennington Region Transportation Energy Demand 2010 - 2050
How do we get there?

Strategy development will look at existing resources and programs, ideas from stakeholders and experts in the field, and input at future regional planning meetings.

- **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 (Efficiency Vermont) and opportunities for new generation in the region.
New electricity generation required statewide and by region:
2010 – 2050.

<table>
<thead>
<tr>
<th>Region</th>
<th>Year</th>
<th>Electricity Consumption (1000 GWh)</th>
<th>New Wind (MW)</th>
<th>New Hydro (MW)</th>
<th>New Solar (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statewide</td>
<td>2010</td>
<td>5,623</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>6,991</td>
<td>200</td>
<td>25</td>
<td>445</td>
</tr>
<tr>
<td></td>
<td>2035</td>
<td>8,073</td>
<td>400</td>
<td>50</td>
<td>926</td>
</tr>
<tr>
<td></td>
<td>2050</td>
<td>10,044</td>
<td>400</td>
<td>93</td>
<td>1,647</td>
</tr>
<tr>
<td>Northwest</td>
<td>2010</td>
<td>523</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>658</td>
<td>21</td>
<td>3</td>
<td>47</td>
</tr>
<tr>
<td></td>
<td>2035</td>
<td>782</td>
<td>42</td>
<td>5</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>2050</td>
<td>1,063</td>
<td>42</td>
<td>10</td>
<td>174</td>
</tr>
<tr>
<td>Two Rivers</td>
<td>2010</td>
<td>487</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>599</td>
<td>17</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>2035</td>
<td>687</td>
<td>34</td>
<td>4</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>2050</td>
<td>847</td>
<td>34</td>
<td>8</td>
<td>139</td>
</tr>
<tr>
<td>Bennington</td>
<td>2010</td>
<td>318</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>381</td>
<td>9</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>2035</td>
<td>421</td>
<td>19</td>
<td>2</td>
<td>44</td>
</tr>
<tr>
<td></td>
<td>2050</td>
<td>473</td>
<td>19</td>
<td>4</td>
<td>77</td>
</tr>
<tr>
<td>Rest of State</td>
<td>2010</td>
<td>4,281</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>2025</td>
<td>5,323</td>
<td>152</td>
<td>19</td>
<td>337</td>
</tr>
<tr>
<td></td>
<td>2035</td>
<td>6,143</td>
<td>303</td>
<td>38</td>
<td>701</td>
</tr>
<tr>
<td></td>
<td>2050</td>
<td>7,610</td>
<td>303</td>
<td>70</td>
<td>1,248</td>
</tr>
</tbody>
</table>
Energy Resource Mapping Analysis

Maps generated by VSJF for VT Renewable Energy Atlas. We explored the following resources:

- Solar
- Wind
- Hydro
- Biomass (for heating)
Purpose

The goal of this exercise is to evaluate the overall feasibility of wind, solar, hydroelectric, and biomass renewable energy development in the region and to identify preferred locations for development as well as areas that should be avoided.

• *General siting guidelines*

• *Specific sites that offer opportunities or would be problematic for reasons not included in the list of statewide constraints.*
Process

① VSJF analysis from Renewable Energy Atlas

② Determined “constraints”, classified as Level 1 or Level 2

③ Mapped “Base Resource” and “Prime Resource”
### VCGI/VSJF analysis from Renewable Energy Atlas

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solar</strong></td>
<td>Topography of land analyzed based on slope and direction (azimuth) conducted in GIS for ground-mounted solar.</td>
</tr>
<tr>
<td><strong>Wind</strong></td>
<td>Digitally modeled wind speed (based on topography) analyzed at 3 hub heights.</td>
</tr>
<tr>
<td><strong>Hydro</strong></td>
<td>Existing dams analyzed for potential capacity based on Community Hydro report. No new dams considered.</td>
</tr>
<tr>
<td><strong>Biomass (wood)</strong></td>
<td>Land coverage used to determine amount of harvestable wood.</td>
</tr>
</tbody>
</table>
Determined “constraints”, classified as Level 1 or Level 2

Level 1 Constraints
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
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
Created Energy Maps

**Base Resource**

The amount of area where resource development could be possible, i.e., where natural conditions are right, with Level 1 constraints removed.

**Prime Resource**

The amount of area where resource production is very likely feasible, i.e., where base resource exists and no Level 2 constraints interfere.
Solar Energy

Total Land Area: 367,812 acres
Base Solar Area: 49,371 acres
Prime Solar Area: 14,550 acres
THIS IS THE AMOUNT OF LAND AREA IN THE BCRC REGION
(about 370,000 acres, or 575 sq. miles)

THIS IS THE AMOUNT OF THAT AREA WHICH IS CONSIDERED “PRIME SOLAR.”
(about 14,500 acres)

AND THIS IS ABOUT THE AMOUNT OF AREA THAT WOULD BE NEEDED TO REACH OUR 2050 GOAL OF 77MW ADDITIONAL IN-REGION CAPACITY.
(about 700 acres)
Wind Energy

Total Land Area (BCRC): 367,812 acres

Base Wind Area: 130,680 acres

Prime Wind Area: 50,870 acres
WIND MAP
(WITH CONSTRAINTS)

Key
- Substations
- 3 Phase Power Lines
- Transmission Lines
- Major Roads
- Secondary Roads
- Rivers/Streams
- Lakes/Ponds
- 2,600 Ft Elevation
- Prime Wind Potential - No Level 1 or Level 2 Constraints

Level 2 Constraints
- Class 3 Wetlands
- Special Flood Hazard Areas
- Deer Wintering Areas
- Conserved Lands
- Hydric Soils
- Agricultural Soils *
- Habitat Blocks **
REGIONAL AREA

RPC BY PRIME WIND AREA

6%

4%
Wood Biomass

Total Land Area: 367,812 acres
Base Biomass Area: 184,195 acres
Prime Biomass Area: 61,934 acres
Hydroelectric Generation

Existing Dams (BCRC): 29

Total Potential Capacity: 0.9 MW

Note: This analysis is based on public GIS data, and does not include all VT dams.
HYDRO MAP
REGIONAL AREA

RPC BY POTENTIAL NEW GENERATION
(USING A LIMITED SAMPLE OF DAMS)
There are four stations—one for each resource: Solar, Wind, Hydro, and Biomass. At each station, there will be sticky notes and paper for comment.

We are looking for input on:
- General siting guidelines.
- Good/bad sites for renewable energy resource development.

THANK YOU FOR PARTICIPATING!