Vermont Comprehensive Energy Plan

Initial Stakeholders Meetings:

- Energy Efficiency
- Elec. Grid & Utility Issues
- Energy Supply Resources
- Transportation

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Comprehensive Energy Plan

Team Effort

State Government
• Public Service Dept.
• Dept. of Buildings & General Services
• Agency of Agriculture, Food, & Markets
• Agency of Commerce & Community Dev.
• Agency of Human Services
• Agency of Natural Resources
• Agency of Transportation

Community & Business Partners
All of you!
• Utilities
• Energy Services Companies and Consultants
• Public Interest Organizations and Community Groups
• Business Community
• Town Energy Committees
Comprehensive Energy Plan

What is it?

Title 30, Section 202b-the CEP must include:

Comprehensive Analysis and Projections
  • Usage
  • Supply
  • Cost
  • Environmental Effects

Recommendations for State Implementation
  • Actions – Public and Private
  • Regulation
  • Legislation

Title 30, Section 202 - Electric Plan
Comprehensive Energy Plan

Why create it?

Title 30, Section 202a:

To assure, to the greatest extent practicable, that Vermont can meet its energy service needs:

- In a manner that is **adequate, reliable, secure** and **sustainable**
- Assuring **affordability** and encouraging the state’s **economic vitality**
- Using energy resources **efficiently** and managing demands cost effectively
- Employing **environmentally sound** practices

Recommendations based upon all state law on the subject: e.g., GHG reduction goals, renewable energy goals
Overarching goals of CEP

✧ Address all energy sectors, not just electricity ✧

★ Strive for lower GHG footprint, toward state targets ★

★ Support in-state energy solutions & economic growth ★

★ Keep Vermont's costs regionally competitive ★
Progress since the 2011 Plan

List of examples:

- H.40 (Ren. Energy Standard & Energy Transformation)
- Standard Offer
- Updated building energy codes
- Multi-state ZEV MOU and action plan
- Smart Growth and Downtown programs
- Net metering expansion and redesign
- Building Energy Disclosure Working Groups & Reports
- VT Energy Generation Siting Commission
- Thermal Efficiency Task Force
- Total Energy Study
2015 CEP Timeline

- Stakeholder meetings – 6/24 & 6/30
- Regional public forums:
  - July 9 – Woodstock
  - July 16 – Middlebury
  - July 20 – Manchester
  - July 23 – St. Albans
- Initial comment period – through 7/24/15
- Draft CEP – September
- Public hearings, further written comments – Fall 2015
- CEP published – December
Stakeholder Meeting Objectives

• Update stakeholders about the current energy picture in VT (including state goals)

• Obtain input and recommendations from stakeholders regarding future energy options to inform the 2015 CEP

• Share the timeline and objective for updating the CEP, including public engagement
Format for today’s meeting

8:50 a.m.: Energy supply resources topic overview
9:20 a.m.: Breakout discussion #1
10:20-10:30 a.m.: Break
10:30 a.m.: Breakout discussion #2
11:45 a.m.: Wrap-up

... Help us set the path for Vermont’s energy future.
Meeting Working Agreement

- ✌ Start and stop on time
- ➡ Focus on the topic of discussion
- ➤ Keep comments brief to allow time for others
- ☝ One person speaks at a time
For more information on the energy plan and to submit comments go to:

www.energyplan.vt.gov
Comprehensive Energy Plan 2015
Comprehensive Energy Plan: Energy Supply Resources

Stakeholder Meeting
June 30, 2015
Energy Use Reduction and Renewable Energy goals
  ◦ Informed by Total Energy Study modeling
Energy supply portfolios, present and future
The 2015 CEP could establish a goal of reducing total energy consumption by ~33% or more by 2050, from our current level.

Accomplished through increased efficiency in energy production and use.

For context, Vermont’s total energy consumption has declined about 7% from a peak in 2004.
Two Types of Energy Efficiency

- Expend less energy to perform the same end use services
  - Also includes switching to new fuels/technologies that are fundamentally more efficient (e.g. EVs, heat pumps)

- More efficient production
  - Avoid the lost heat that comes from combustion and conversion to electricity
TES-based Renewable % and GHG

[Line graph showing Trend of Overall % RE, GHG relative to 2015, and Total energy demand from 2015 to 2050]
TES-based total primary energy

- Transport nonelec FF
- Transport nonelec RE
- Transport elec
- Building non-heat elec
- Industry elec
- Industry heat nonelec FF
- Industry heat nonelec RE
- Building heat elec
- Building heat nonelec FF
- Building heat nonelec RE
Known electric sources
TES-based electric site energy

**Electric site energy uses based on TES modeling**

- **Site energy in TWh**
- **2015**
- **2025**
- **2035**
- **2050**

Legend:
- Transportation
- Industrial
- Building heat
- Building non-heat

**Vermont Department of Public Service**
Commissioner
Recchia
Secretary Markowitz
#1: The “Energy Pie”
- Breakout into small groups based on the color of your question sheet. Everyone will be discussing the same set of questions.

**Break**

#2: Technology-specific discussions
- Breakout into small groups based on your interests. Large groups may be broken into smaller groups, and tiny groups may be disbanded

Facilitated discussions, note takers recording key points; you can also submit written comments on the question sheets
Assume that the use of solid and liquid bioenergy somewhat more than doubles, with the largest changes in heavy duty transportation and industrial heat.

Assume achievement of very aggressive efficiency goals.

To meet remaining expected energy demand and the 90% goal, electric end use energy would still need to grow by about 75% while supplies become virtually 100% renewable.
Expected/identified resources (owned, under long term contract, or expected from H.40) add up to:

- Solar: 9%
- Wind: 6%
- Hydro: 31%
- Biomass: 6%
- Methane: 2%

where the %s are calculated from the assumed 2050 energy need.

This leaves 46% of the electric portfolio undetermined.
1. Approximately 46% of the electric portfolio in 2050 is undetermined. Of this, how much should come from in-state vs. out of state, and why?

- 1% of energy from solar is 65 MW
- 1% of energy from wind is 37 MW
- 1% of energy from large hydro is 11 MW
- 1% of energy from small hydro is 25 MW
- 1% of energy from biomass is 12 MW
- 1% of energy from methane is 12 MW
Wrap-Up

Thank you!

For more information on the energy plan and to submit comments, go to:

www.energyplan.vt.gov
Supplemental Slides
2. Of the total amount of energy to be supplied by in-state renewables, how should the pie be sliced:

- By technology…?
- By size…?
- By cost…?
- By……?
3. We’re already assuming a doubling of solid and liquid bioenergy, with the largest changes in heavy duty transportation and industrial heat. Going even further would reduce the pressure on electricity expansion.

- Is that possible?
- What sectors will be the hardest to move to renewables?

4. What should be the state’s #1 priority in achieving 90% by 2050?
Breakout #2: By Technology

- Wind, solar, woody biomass, biofuels, methane, hydro, natural gas & petroleum

1. What is the state of the national and Vermont market for _______?
2. What are the potential available _____ resources within and importable to VT?
3. What are the benefits of adding more _____ to the VT portfolio?
4. What are the challenges to developing more ________?
5. Are there pitfalls to developing too much _____?

6. What strategies should Vermont pursue with respect to the development of ______?

7. What opportunities and recommendations with respect to ______ would you suggest?
Wind, solar, woody biomass, biofuels, methane, hydro, natural gas & petroleum

1. What is the state of the national and Vermont market for _______?
2. What are the potential available _____ resources within and importable to VT?
3. What are the benefits of adding more _____ to the VT portfolio?
4. What are the challenges to developing more ________?
5. 5. Are there pitfalls to developing too much _____?
6. 6. What strategies should Vermont pursue with respect to the development of _______?
7. 7. What opportunities and recommendations with respect to _______ would you suggest?
Additional Break Out #1 Question #1 Materials
Assume that the use of solid and liquid bioenergy somewhat more than doubles, with the largest changes in heavy duty transportation and industrial heat.

Assume achievement of very aggressive efficiency goals.

To meet remaining expected energy demand and the 90% goal, electric end use energy would still need to grow by about 75% while supplies become virtually 100% renewable.

In order to meet this demand, and in addition to resources owned by utilities or under contract or expected under H.40, Vermont will need 4.5 TWh of renewable electricity each year.

Known resources (owned, under long term contract, or expected from H.40) add up to:

- Solar: 9%
- Wind: 6%
- Hydro: 31%
- Biomass: 6%
- Methane: 2%

where the %s are calculated from the assumed 2050 energy need.

This leaves 46% of the electric portfolio undetermined.
Two examples, choosing extremes between baseload and variable generators:

1,830 MW of generation capacity (heavy on baseload):
- Solar: 600 MW 9%
- Wind: 210 MW 6%
- Hydro: 900 MW 75%
- Biomass: 80 MW 7%
- Methane: 40 MW 3%

3,500 MW of generation capacity (heavy on variable):
- Solar: 2000 MW 31%
- Wind: 1000 MW 28%
- Hydro: 420 MW 31%
- Biomass: 80 MW 7%
- Methane: 40 MW 3%