What we will be discussing:
- Overview of VT Energy Planning
- Review of Municipal Energy Planning Standards

What we will not be discussing:
- State energy policy as a whole.
- Predicting what will happen under the Scott administration.
Why and how are we here?
WHY PLAN?

- Environmental Reasons
- Economic Reasons
- Long-term Energy Security Reasons

- Driven primarily by a desire to reduce greenhouse gases*

- Reduce total energy consumption per capita
  - 15% by 2025, and more than 1/3 by 2050

- Meet energy need from renewables:
  - 40% by 2035, and 90% by 2050

- Renewable end use sector goals for 2025:
  - 10% transportation, 30% buildings, and 67% electric power

*V.S.A. Title 10, § 578(a)
INTEGRATING ENERGY AND PLANNING


- Energy intertwined with other planning issues:
  - Transportation
  - Housing
  - Natural Resources
  - Land Use
  - Economic Development
Pilot Project in 2015
  - Implement the CEP

Set regional targets for:
  - Energy conservation
  - Energy generation

Develop specific strategies for:
  - Conservation
  - Energy efficiency
  - Reduced fossil fuel use.

Identify energy resources and areas with the potential for renewable energy projects.
Act 174 establishes a set of **optional** municipal and regional energy planning standards.

- (Plans are still required to have an energy element!)

- Standards developed by DPS in November 2016

- Communities that meet the standards will receive a determination of energy compliance (DOEC).
  - “Substantial deference” under Section 248
THREE DEADLINES

- Regional plans seek designation of energy compliance from Dept. of Public Service.

- If the regional plan is NOT certified, municipal plans may seek compliance from Department of Public Service UNTIL July 1, 2018.

- After July 1, 2018 municipalities must seek designation from the regional planning commission.
Due Consideration
Statute calls for “due consideration.” Does not define what “due consideration is” or assign whether the PSB or the Courts are the ultimate arbiter.

The SCOV indicated that the PSB only has to 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.”
STANDARD OF REVIEW

- “determination standards for energy compliance”

- Standard of review
  - Same as for “Regional Approval”
  - Outlined in §4302(f) - requires “substantial progress toward attainment of the goals.”

- All sections of plan will be considered

- Policies can’t be conflicting policy between chapters.
BASIC REQUIREMENTS

- Locally adopted and regionally approved Plan
- Energy Plan as defined in 24 V.S.A. §4348a(a)(3)
- Analysis and Targets
- Pathways (Implementation Actions)
- Mapping
ANALYSIS AND TARGET STANDARDS
Plan must contain an analysis the following across all energy sectors (electric, thermal, transportation*):

- Resources
- Needs
- Scarcities
- Costs
- Problems

DPS and other guidance available

*note that the “across all energy sectors” component is new, the other components are not.
ANALYSIS AND TARGETS

- Estimate current energy use:
  - Transportation, heating and electric

- Establish targets:
  - Thermal and electric conservation and efficiency
  - Use of renewable energy for transportation, heating and electricity.
  - Electric generation

- Evaluate needs:
  - Conversion of heating sources
  - Transportation/land use changes
  - Electric-sector conservation and efficiency
Communities can opt to collect and analyze data themselves, or they can utilize data provided by their RPC. Those that use the RPC data will be presumed to have met the standards in this section.
Data and targets should be aligned with state energy policy.

- If not, must explain how the plan otherwise achieves the intent of the state goal or policy

DPS will be providing guidance to communities

Other resources

- EAN Community Energy Dashboard
Ex. Glover, VT

- 784 household vehicles (ACS) * 15,000 average miles per vehicle (DPS Guidance) = 11.8 million miles/year

- 11.8 million miles/year / 25 MPG (DPS Guidance)= 472,000 gallons

- 472,000 gallons * $2.25/gallon = $1,062,000 in gasoline expenditures per year

- Gas v. Ethanol (DPS = 10%)
  - 472,000 gallons * .1 = 47,200 gallons of ethanol

- EVs
Ex. Anytown, VT

**Step 1**: Home heating fuel by household (ACS)
- Divide by total households for % of households

**Step 2**: Total square feet of housing
- Owner: (Mean people per household (ACS) * median sq. ft. per person (American Housing Survey) * owner households (ACS)) = Total Square Footage
- Renter: (Mean people per household (ACS) * median sq. ft. per person (American Housing Survey) * owner households (ACS)) = Total Square Footage
## STEP 1 EXAMPLE

### Glover, VT (Home heating fuel by household):

<table>
<thead>
<tr>
<th>Home heating fuel by household</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Owner-Occupied Housing Units</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottled tank or LP gas</td>
<td>41</td>
<td>10.6%</td>
</tr>
<tr>
<td>Electricity</td>
<td>10</td>
<td>2.6%</td>
</tr>
<tr>
<td>Fuel oil, kerosene, etc.</td>
<td>126</td>
<td>32.6%</td>
</tr>
<tr>
<td>Coal or coke</td>
<td>3</td>
<td>0.8%</td>
</tr>
<tr>
<td>Wood</td>
<td>207</td>
<td>53.5%</td>
</tr>
<tr>
<td><strong>Renter-Occupied Housing Units</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bottled tank or LP gas</td>
<td>2</td>
<td>2.7%</td>
</tr>
<tr>
<td>Fuel oil, kerosene, etc.</td>
<td>43</td>
<td>57.3%</td>
</tr>
<tr>
<td>Wood</td>
<td>30</td>
<td>40.0%</td>
</tr>
</tbody>
</table>

Source: American Community Survey, 2011-2014
### Glover, VT (Total square feet of housing):

<table>
<thead>
<tr>
<th></th>
<th>Owner Occupied:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ppl per household</td>
<td>2.36</td>
<td></td>
</tr>
<tr>
<td>Median sq. ft. per person**</td>
<td>772</td>
<td></td>
</tr>
<tr>
<td>Owner occupied households</td>
<td>387</td>
<td></td>
</tr>
<tr>
<td><strong>Total sf., owner occupied</strong></td>
<td><strong>705,083</strong></td>
<td></td>
</tr>
<tr>
<td>Renter Occupied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ppl per household*</td>
<td>1.35</td>
<td></td>
</tr>
<tr>
<td>Median sq. ft. per person**</td>
<td>495</td>
<td></td>
</tr>
<tr>
<td>Renter occupied households</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td><strong>Total sf., renter occupied</strong></td>
<td><strong>50,119</strong></td>
<td></td>
</tr>
</tbody>
</table>

* American Community Survey; ** American Housing Survey, NE Div. 2015
Ex. Anytown, VT

**Step 3:** Square ft. by fuel type = % home heating fuel households * total square footage

**Step 4:** Determine energy required for heating
- avg. is about 60,000 BTU/sq. ft.
- Older housing stock can be “leaky” – about 80,000 BTU/sq. ft.
### Glovers, VT (Total square footage by heating fuel):

<table>
<thead>
<tr>
<th></th>
<th>Owner-Occupied Housing Units</th>
<th>Renter-Occupied Housing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sq. ft</td>
<td>387</td>
<td>75</td>
</tr>
<tr>
<td>Bottled tank or LP gas</td>
<td>41 10.6% 74,698.72</td>
<td>2 2.7% 1,336.50</td>
</tr>
<tr>
<td>Electricity</td>
<td>10 2.6% 18,219.20</td>
<td></td>
</tr>
<tr>
<td>Fuel oil, kerosene, etc.</td>
<td>126 32.6% 229,561.92</td>
<td>43 57.3% 28,734.75</td>
</tr>
<tr>
<td>Coal or coke</td>
<td>3 0.8% 5,465.76</td>
<td></td>
</tr>
<tr>
<td>Wood</td>
<td>207 53.5% 377,137.44</td>
<td>30 40.0% 20,047.50</td>
</tr>
</tbody>
</table>
**Glover, VT (Determine energy requirements according to age of housing stock)**

<table>
<thead>
<tr>
<th>Age of Housing Stock</th>
<th>Owner-Occupied</th>
<th>Renter-Occupied</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Prior to 1940</td>
<td>28.9%</td>
<td>42.7%</td>
</tr>
<tr>
<td>% Built after 1940</td>
<td>71.1%</td>
<td>57.3%</td>
</tr>
</tbody>
</table>
Glover, VT:

<table>
<thead>
<tr>
<th></th>
<th>Owner-Occupied Housing Units</th>
<th>Renter-Occupied Housing Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTUs pre 1940**</td>
<td>BTU/sq. ft. all other</td>
<td></td>
</tr>
<tr>
<td>Bottled tank or LP gas</td>
<td>1,729,458,736.95</td>
<td>45,619,200.00</td>
</tr>
<tr>
<td>Electricity</td>
<td>421,819,204.13</td>
<td>45,975,600.00</td>
</tr>
<tr>
<td>Fuel oil, kerosene, etc.</td>
<td>5,314,921,972.09</td>
<td>980,812,800.00</td>
</tr>
<tr>
<td>Coal or coke</td>
<td>126,545,761.24</td>
<td>988,475,400.00</td>
</tr>
<tr>
<td>Wood</td>
<td>8,731,657,525.58</td>
<td>684,288,000.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IDENTIFY COST

- Fuel units used = energy required for heating/BTUs per unit
  - Converting BTUs to units (gallons, cords, pounds, kWh)
  - Ex. 1 gallon of heating oil = 140K BTUs

- Cost = Fuel units used * cost per unit (US EIA)
Based on Vt. Labor Market Information
Supplemented by
- Energy audits of Public Buildings
- Local Knowledge

More difficult to define.

<table>
<thead>
<tr>
<th>Assumptions</th>
<th>MMBtus per year, per establishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>400</td>
</tr>
<tr>
<td>Med</td>
<td>700</td>
</tr>
<tr>
<td>High</td>
<td>1000</td>
</tr>
</tbody>
</table>
IMPLEMENTATION ACTIONS
Enhanced Energy Plans must:

- Include “pathways” and recommended actions to achieve energy targets
- Statements of policy
  - Conservation
  - Transportation
  - Land Use
  - Development and Siting of Renewables

Some actions may not be applicable or relevant
- Provide reasonable justification
EXAMPLES:

- Promote “efficient” buildings
- “Stretch codes” for energy efficiency
- Building audits & weatherization projects
- Encourage public transit use
- Park-and-rides
- Village Center/Downtown designations
- Water/wastewater planning
- EV charging stations
Questions?

POLICY AND IMPLEMENTATION
MAPPING STANDARDS
Mapping is required
  - Regional Maps; OR
  - Municipalities may choose to undertake their own mapping.

Municipalities expected to work collaboratively with their regions and with neighboring municipalities to ensure compatibility
Identify potential areas for renewable energy development:

- **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.
**Known Constraints**
Conditions which would likely make development unfeasible.

**Possible Constraints**
Conditions which could impact development, but which would not necessarily prevent it.
This example shows solar potential.
Preferred locations:
- Locally preferred locations
- Statewide preferred locations
- Have policies about specific sizes or type of generator

Unsuitable Areas:
- Areas (or criteria) where Town does not want a generator or a specific size/type of generator.
  - *Must have similar policies for other types of land development.*
- Any regional or local constraints identified:
  - Supported through data or studies
  - Consistent with the remainder of the plan (and regional plan),
  - No arbitrary prohibition or interference
EX. LOCAL MAPPING
A CLOSER LOOK
Questions?

MAPPING
NEXT STEPS

- Regional Energy Plan

- Municipal Determination of Energy Compliance directly from DPS.
  - Submit to: PSD.PlanningStandards@vermont.gov

- RPCs will provide map and analysis data by the end of April, 2017.

- Municipal assistance
ADDITIONAL RESOURCES

- Department of Public Service
  - http://publicservice.vermont.gov/
  - PSD.PlanningStandards@vermont.gov

- NVDA (Act 174 Resource page)
  - http://www.nvda.net/land-use-planning.php

- EAN Community Energy Dashboard
  - http://www.vtenergydashboard.org/

- Vermont League of Cities and Towns
  - www.vlct.org
COMMENTS & QUESTIONS

Thank You

Contact?