

Reaching 90% by 2050

*Policy to Action:
What does that really look like?*

Linda McGinnis, EAN Program Director

Presentation to CVRPC
February 2016



ENERGY ACTION NETWORK



ENERGY ACTION NETWORK

Common Goal - Collective Impact

Business
Leaders

Utilities

Policy
Makers

Non-
Profit
Leaders

Educators

90% by 2050

Capital
Mobilization

Public
Engagement



Regulatory
Reform

Technology
Innovation

90% by 2050 – Based on Statute

Statutes

- 25% of all energy consumed through in-state renewables by 2025 (now 16%)
- 50% reduction in GHGs from energy by 2028 (now 2% increase)
- Weatherize 80,000 Vermont homes by 2025 (now 19,000)

State

- **Comprehensive Energy Plan – 90% by 2050**

RPC

- **RPC Energy Planning – 3 pilot regions**

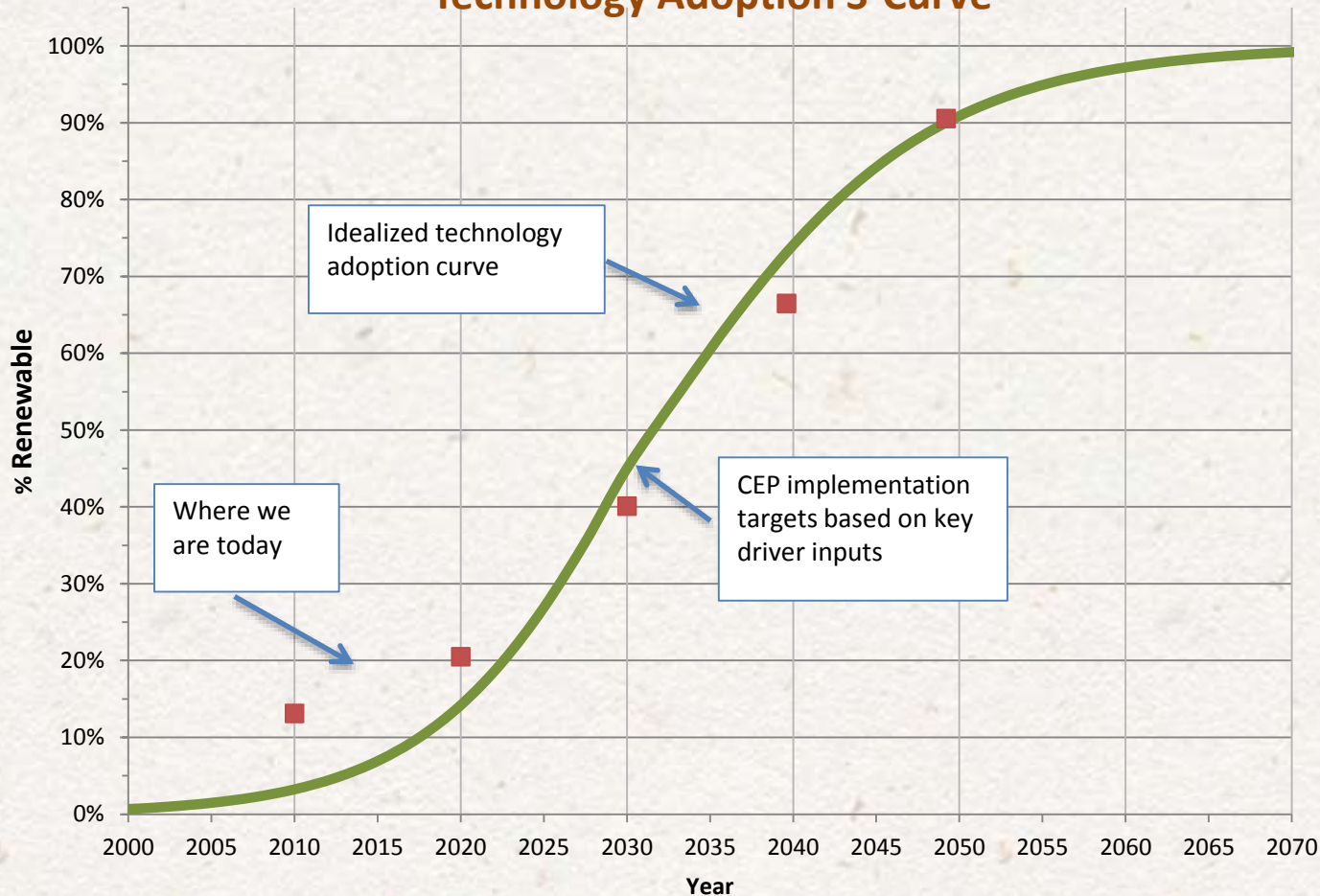
Community

- **Community Energy Dashboard – 255 towns**

Energy Pathways

Policy and Technology Pathways to Achieve 90% by 2050

Technology Adoption S-Curve



Total Energy = Three Sectors

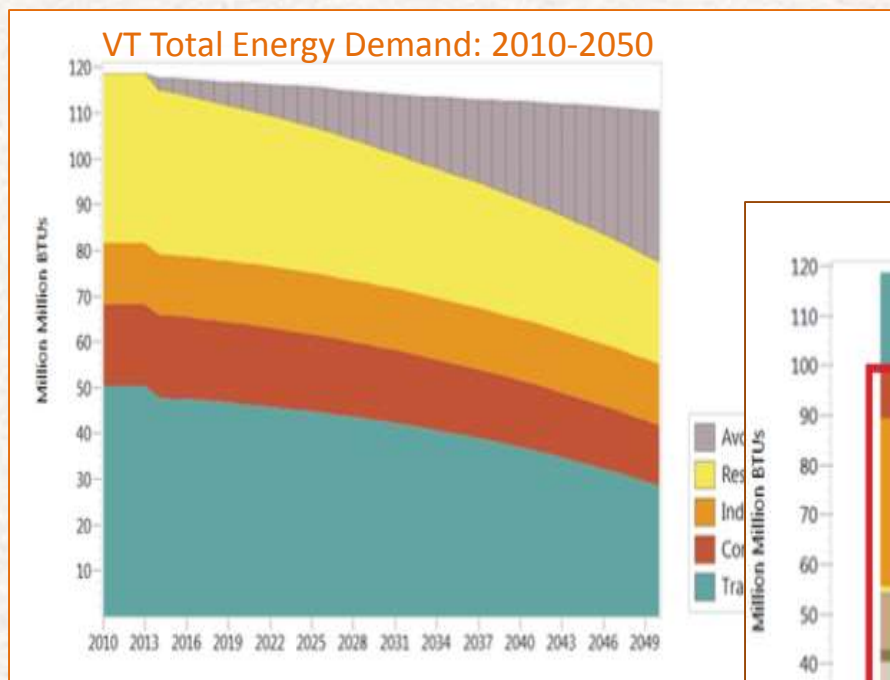
- Heat
- Transportation
- Electricity

Decade Milestones

- Now = 16%
- 20% by 2020
- 40% by 2030
- 70% by 2040
- 90% by 2050

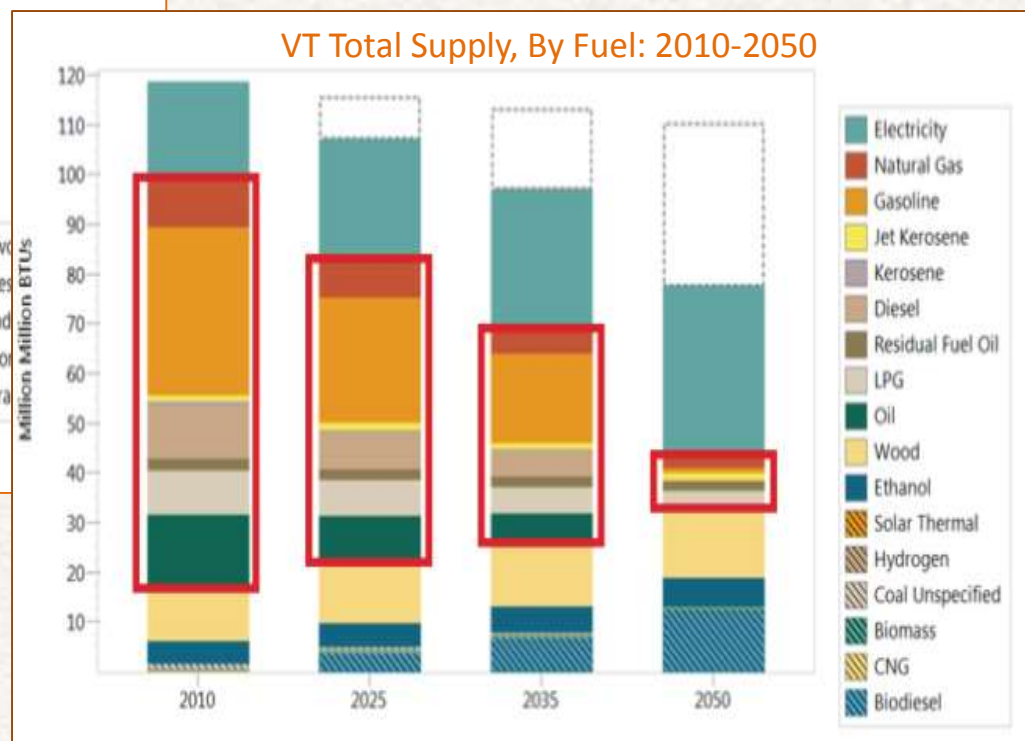
90 x 2050: What does it mean?

Reducing our energy use...



Source: LEAP Energy Modeling and VEIC (Long Range Energy Alternatives Planning)

...and making our supply renewable



RED = Non-electric Fossil Fuels

What does that really mean?

Use Less

Remainder =
90%
Renewable



Build. Efficiency

Fewer VMTs

Efficient Equip

Heat Pumps

Public Transpo

Solar

Efficient Biomass

More EVs

Wind

Biomass

Biofuels - Heavy

Hydro



90% by 2050

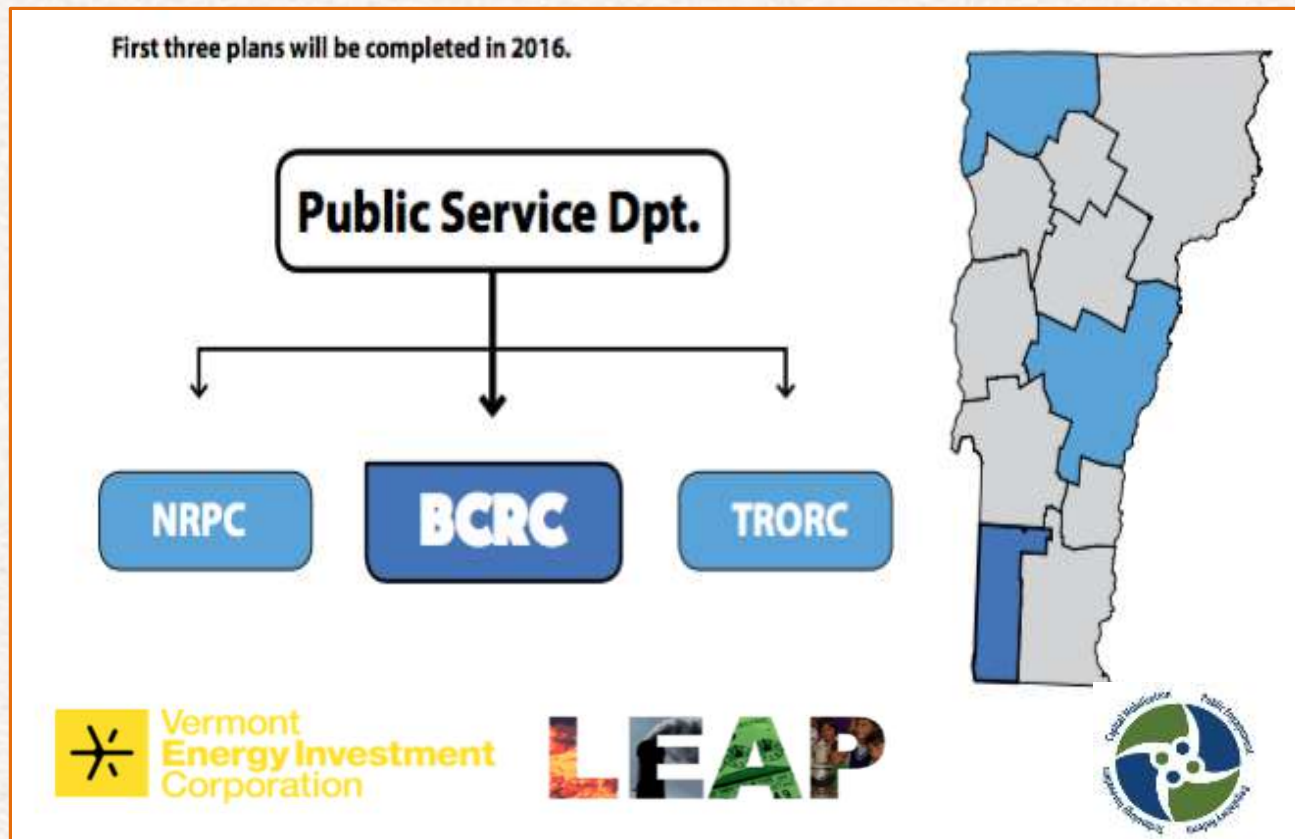
What does it look like?

At the REGIONAL level?

At the LOCAL level?

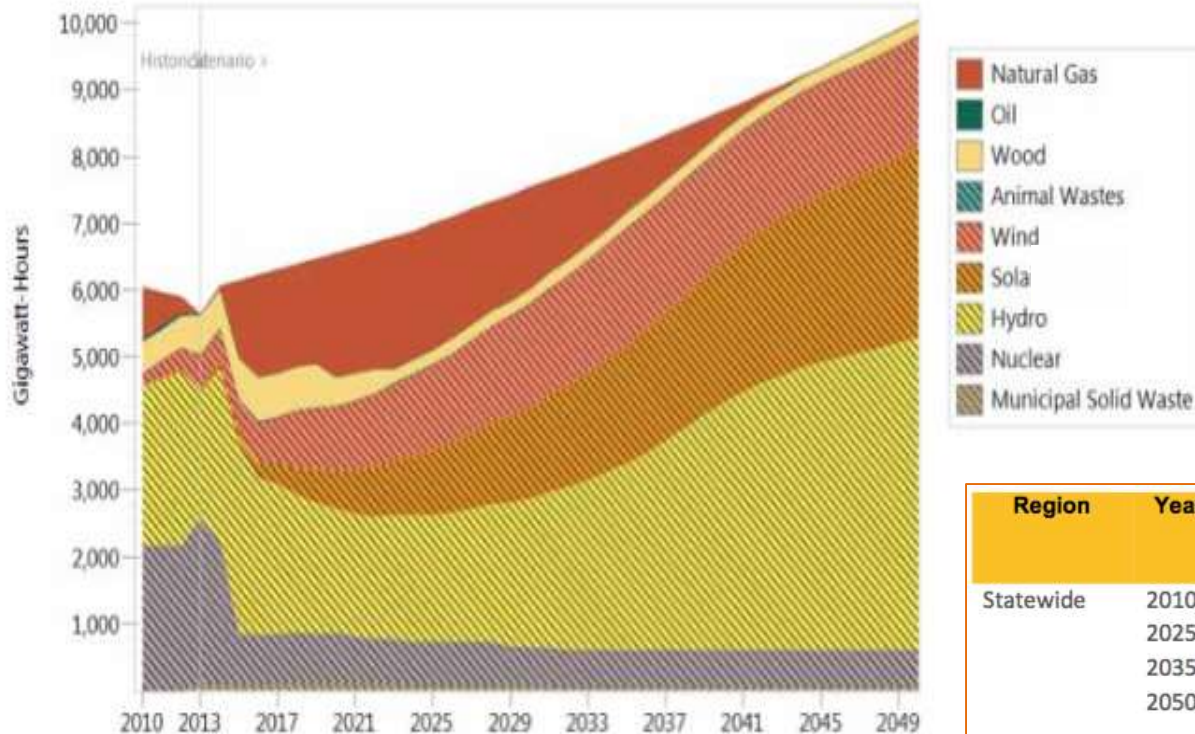
RPC Energy Planning Initiative

Goal: Create region specific energy plans that help achieve state goals



Where does more electricity come from?

New VT Electric Generation Goals (2010-2050)



About half from in-state sources

Bennington Region

Region	Year	Electricity Consumption (1000 GWh)	New Wind (MW)	New Hydro (MW)	New Solar (MW)
Statewide	2010	5,623	-	-	-
	2025	6,991	200	25	445
	2035	8,073	400	50	926
	2050	10,044	400	93	1,647
Bennington	2010	318	-	-	-
	2025	381	9	1	21
	2035	421	19	2	44
	2050	473	19	4	77

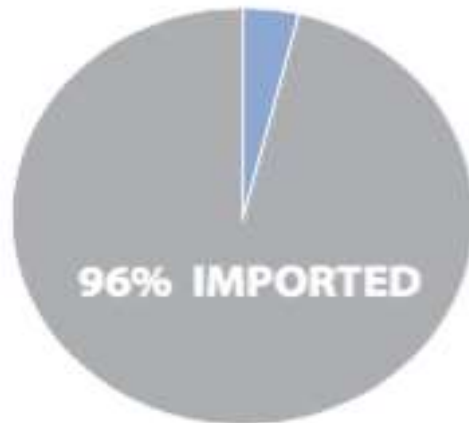
What does that mean for a region?

Let's look at BCRC

2015

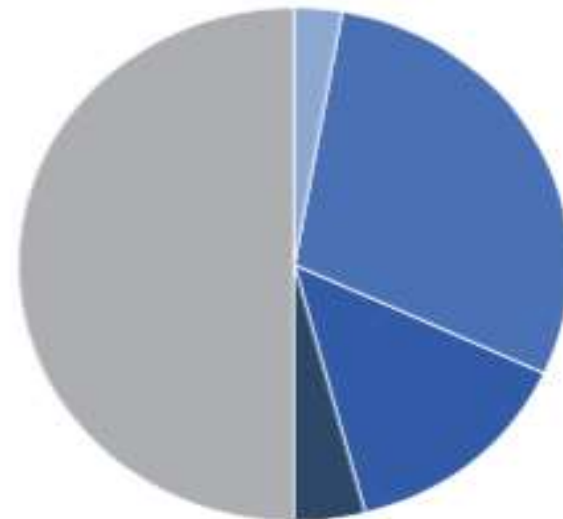
ANNUAL CONSUMPTION: 318 GWh

4% FROM IN-REGION
(INCLUDING EXISTING AND PERMITTED)



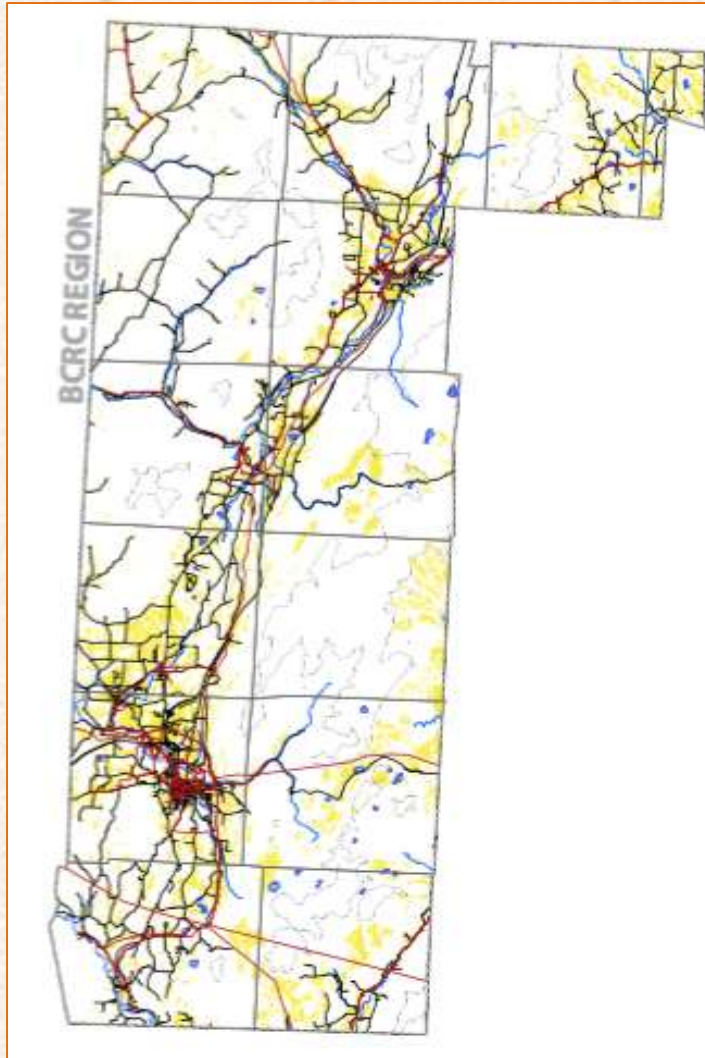
2050: GOAL

ANNUAL CONSUMPTION: 473 GWh



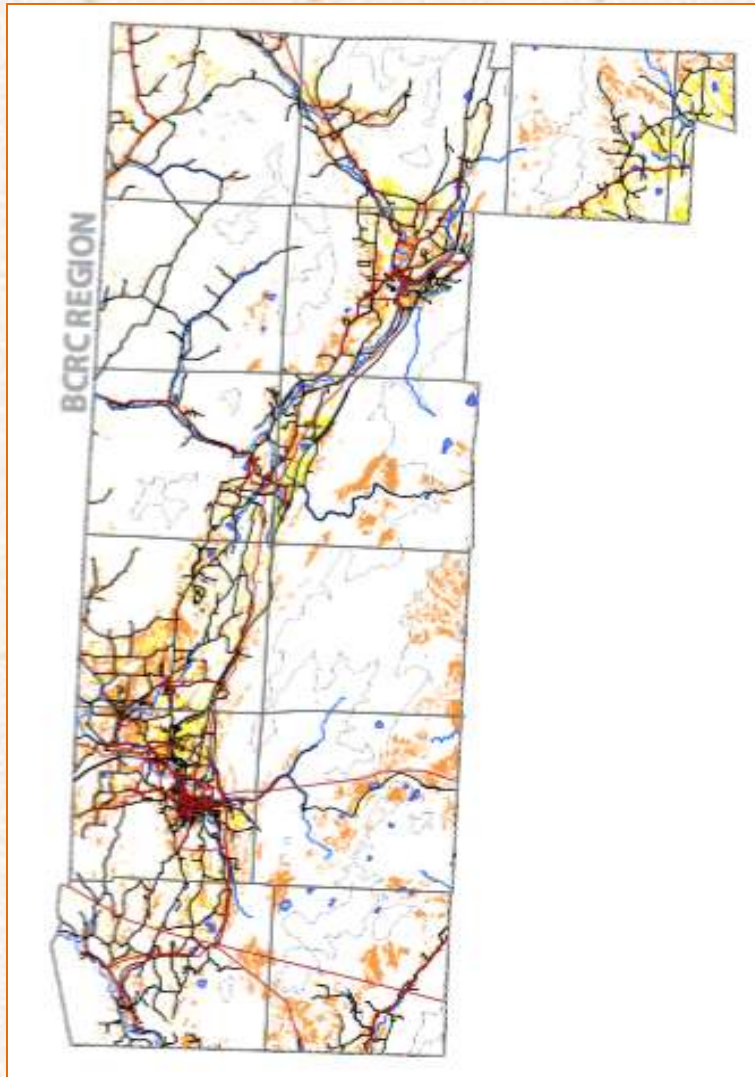
- 50% IMPORTED
- 3% EXISTING IN-REGION
- 29% BCRC SOLAR
- 14% BCRC WIND
- 4% BCRC HYDRO

Let's just look at solar potential...



- **BCRC Solar Goal = 77MW by 2050 (or 29% of consumption)**
- **Mapping Solar Potential:**
 - South facing access
 - gently sloping (<10%)
- **Doesn't interfere with:**
 - Floodways
 - rivers
 - federal wilderness
 - rare natural areas
 - vernal pools
 - Class 1& 2 Wetlands

Mapping BCRC Solar Potential Cont'd



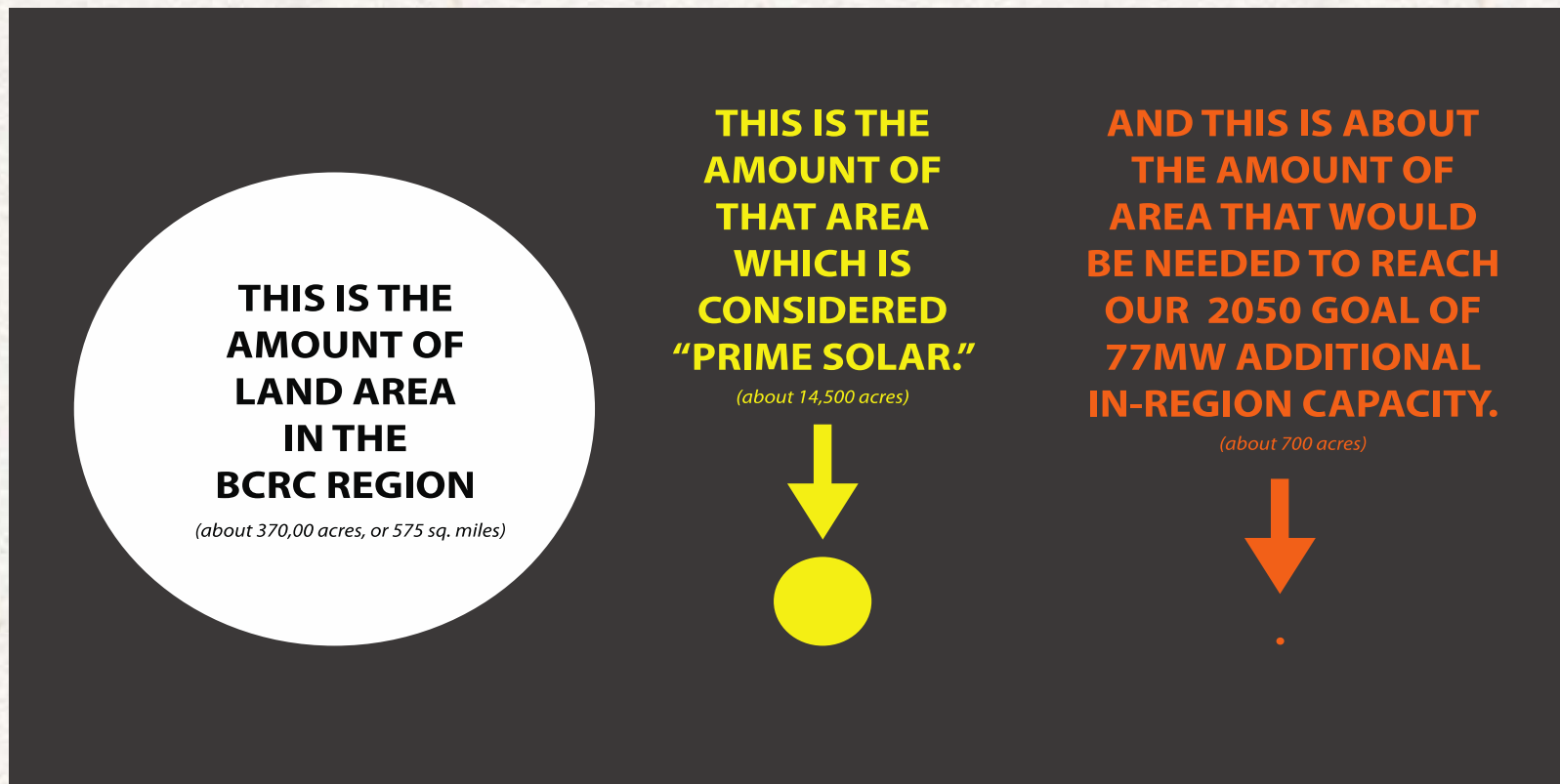
Add Further Natural Resource Constraints:

- Ag Soils
- Habitat Blocks
- Hydric Soils
- Conserved Lands
- Special Flood Hazard Areas
- Deer Wintering Areas
- Class 3 Wetlands

Consider 3-Phase Lines

Yellow = “Prime Solar”

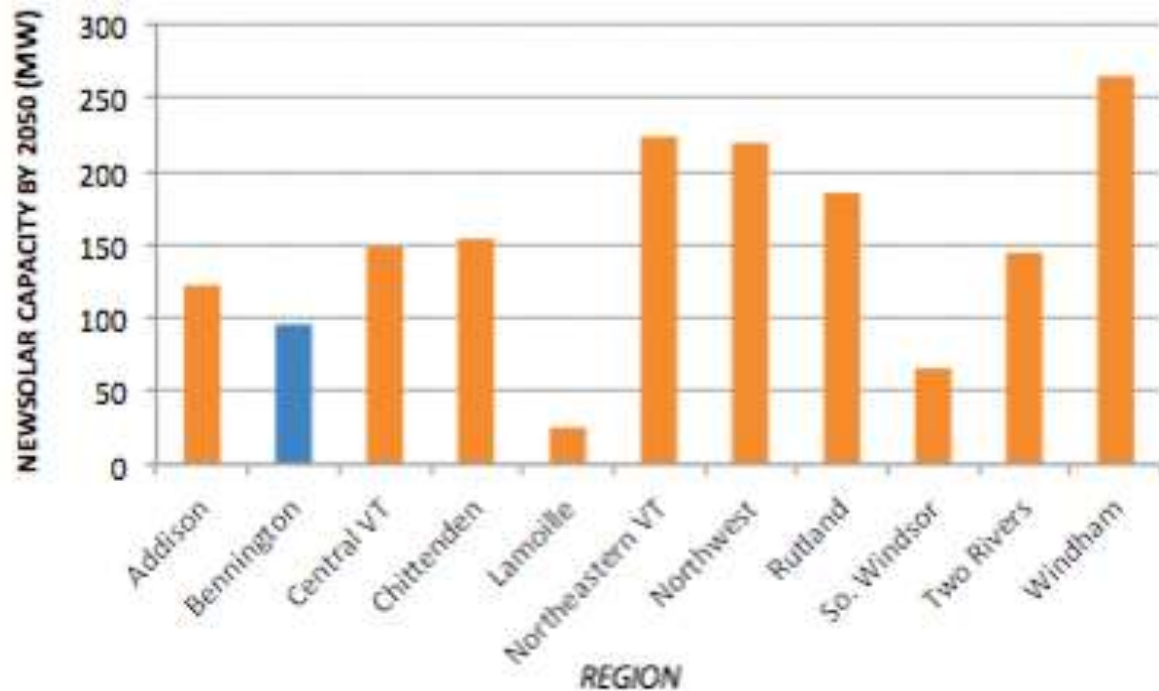
BCRC – Reaching Regional 90 X 2050



...And about 44% of total solar goal could potentially be met through rooftop solar

How do other regions compare?

This is what the distribution would look like if the 2050 goal of 1,647 MW of in-state generation were allocated regionally based on “Prime Solar”



***How do we translate statewide
90 by 2050 goals to local
action?***

A Collaborative Project of the



ENERGY ACTION NETWORK



Vermont Sustainable Jobs Fund



Vermont
Energy Investment
Corporation

**Vermont Energy &
Climate Action Network**
Energizing Vermont Communities

....and many other partners

With funding support from

VLITE

Building An Energy Secure Vermont



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ENERGY



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Community Energy Stories



Neighborhood Net Metering Solar Project in Underhill

In an effort to be more sustainable, Steve Webster and his wife Barbara Yerrick, decided to install solar panels on their barn roof, and to share the annual 12,000kWh of electricity generated with another neighbor and a small business. This project was so successful that Steve and Barbara decided to expand the project, adding five solar trackers for a total of 52,000kWh/year and another 5 households.

How much energy does your community use?

Find out what your community is doing to transition to renewables and become more efficient.

Find Your Community!

Are you working toward a renewable future?

Help Vermont reach its goal of meeting 90% of its energy needs by efficiency and renewables 2050.

Take Action!

Recent Energy Actions

[View All Actions](#)

Community Action	Individual Action	Individual Action	Individual Action
 <p>City of Montpelier Montpelier, VT January 10, 2015</p> <p>Montpelier installed ground-mounted solar PV on a pole and is Making Electricity.</p> <p>Visit Site</p> 	 <p>Christopher Sylvester Johnson, VT January 10, 2015</p> <p>Christopher performed a building audit and is Saving Electricity.</p> 	 <p>Amanda Blake Burlington, VT January 1, 2015</p> <p>Amanda installed efficient indoor lighting and is Saving Electricity.</p> 	 <p>Todd Leonard Essex, VT January 1, 2015</p> <p>Todd installed a roof-mounted solar PV and is Making Electricity.</p> 

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Without website design, graphic design, and web hosting provided by Vermont Design Works.

What is the Community Energy Dashboard?

A powerful website to help your community understand and analyze energy at the local level:

- > *Where you are now*
- > *Where you need to go*
- > *How you can get there*

TAKE ACTION ON BEHALF
OF YOUR COMMUNITY —
MOTIVATE, INSPIRE!

How does it help communities?

The Dashboard provides simple online tools to set goals, track progress, map current and future actions, share stories and learn from neighbors and other communities across ALL energy sectors (efficiency, electricity, heat, transportation).

Why was the Dashboard developed?

Towns across Vermont are asking for concrete ways to make clean energy and efficiency choices at the **local level**, to accelerate actions neighbor-to-neighbor, and to measure their impact.

Who should use the Dashboard?

Anyone who thinks about energy in Vermont! Municipalities, energy committees, businesses, farms, schools, institutions, individuals....The Dashboard will be available to all 255 Vermont towns in 2016.

What is the timeline for the Dashboard?

- 5-6 towns will pilot the tool by first quarter of 2016
- Available to the rest of Vermont Spring 2016

Dashboard Tools: Seven ways to

- Make energy visible
- Support clean energy choices
- Build community-scale awareness + change behaviors

Timeline

Statistics

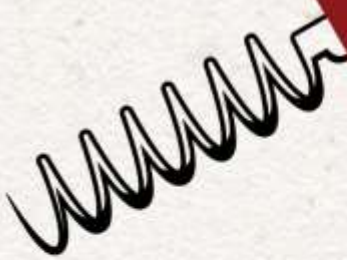
Actions

Analysis

Stories

Mapping

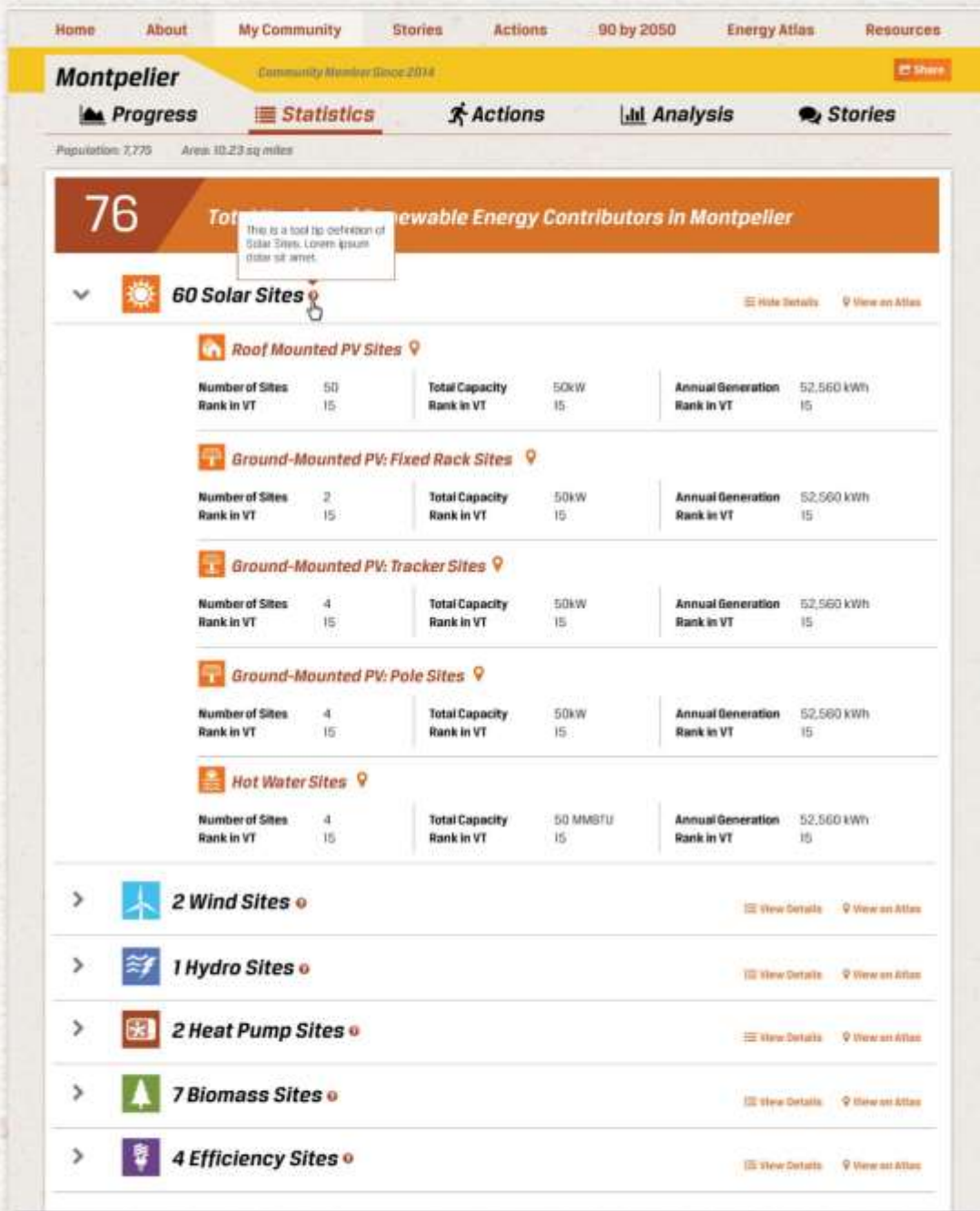
Resources





Communities can utilize pre-loaded data or customize their Dashboard to track local progress toward reaching 90 by 2050

TRACK: ANALYZE PROGRESS OVER
TIME TO PREPARE YOUR TOWN
ENERGY PLAN AND DEMONSTRATE
IMPACT



Statistics

Communities can easily access information on all local renewable energy generation, and add their own data on efficiency.

- > How many sites?
- > How much energy is generated?
- > How does our town compare with others?

INFORM: STATISTICS AND ACTIONS TAKEN BY YOUR COMMUNITY PROVIDE ADDITIONAL CONTENT FOR DECISION-MAKING

Here is a collection of the actions that have been entered into our database from Montpelier. Please note, that this only represents the actions that committed community members have entered and does not represent every action that has been made to increase the use of renewable energy. If you'd like this data to be more accurate, please add your own actions [here](#) and encourage your friends to do the same!

[Add New Action](#)

71

Actions Entered in Montpelier



25 Heat Actions Taken

[View Actions](#)


29 Electric Actions Taken

[View Actions](#)


17 Transportation Actions Taken

[View Actions](#)


17 Planning Actions Taken

[View Actions](#)


Performed a building audit

9 Actions Performed



Use an efficient computer

8 Actions Performed



Installed an efficient electric hot water heater

3 Actions Performed



Installed ground-mounted solar PV tracker

2 Actions Performed



Installed ground-mounted solar PV on a pole

2 Actions Performed



Installed an efficient refrigerator

1 Actions Performed



Installed cook-mounted cook top

1 Actions Performed



Installed wind turbine

1 Actions Performed



Installed indoor lighting

1 Actions Performed



Installed combined heat and power project

1 Actions Performed



Installed hydropower project

1 Actions Performed



Installed Community Solar PV project

0 Actions Performed



Installed fixed rack ground-mounted solar PV

0 Actions Performed



Installed efficient indoor lighting

0 Actions Performed



Installed efficient outdoor or street lighting

0 Actions Performed

Categories

All Actions

Heat

Electrical

Transportation

Planning

Individual

All Actions

< PREV

1 2 3 4 5 6 7 8

NEXT >

Community Action



City of Montpelier
Montpelier, VT
January 12, 2015

Montpelier installed ground-mounted solar PV on a pole and is generating electricity.
[View Site](#)



Farm Action



Name of Farm
Burlington, VT
January 1, 2015

Name of Farm installed efficient indoor lighting and is saving electricity.



Actions

Action Tiles provide easy & fun way to track progress.

> Check off specific energy actions related to Heat, Electricity, Transportation or Planning.

> Include actions from town, businesses, schools, farms, residences

ENGAGE: ADD UP THE RESULTS AND VISUALIZE YOUR COLLECTIVE IMPACT!

Add Your Own Analysis: Use this section to upload analyses, maps, data, surveys and descriptions that are relevant to your community.

+ Add New Analysis



Montpelier District Energy
CHP Feasibility Study



Community Solar Off-peak,
Connecticut Adapting Off



Community Solar Off-peak,
Connecticut Adapting Off

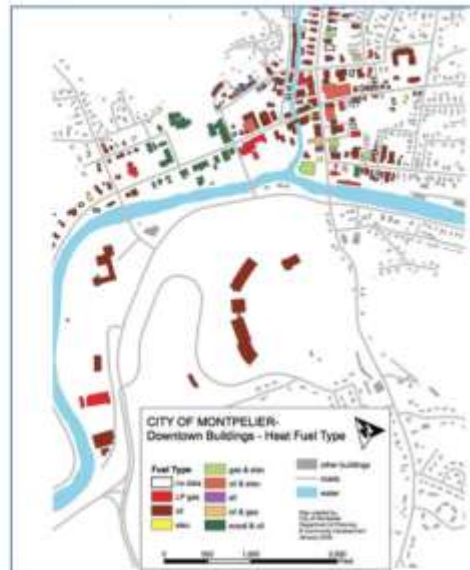


Community Solar Off-peak,
Connecticut Adapting Off



Community Solar Off-peak,
Connecticut Adapting Off

Montpelier District Energy CHP Feasibility Study – Mapping Heat Fuel Use



Download image

The City of Montpelier contracted the Biomass Energy Resource Center (BERC) in October 2008 to carry out a feasibility study to assess the potential for a combined heat and power (CHP) system for a wood-fired district energy system. The system would link a central CHP to a network of buried heat distribution pipes connected to all the larger buildings in and around Montpelier's downtown. As part of this study, BERC developed a map of the heat fuel types of existing downtown buildings in order to assess the cost-effectiveness and carbon reduction of switching to a CHP system for the city.

[Visit the City of Montpelier Website](#)

[Montpelier-Feasibility-Study.pdf](#)

Uploaded by David Abbott

Analysis

Communities can upload their own local energy analyses.

- Provide local context to energy decisions
- Help other communities to learn from best practices, and avoid reinventing the wheel

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Stories

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Electric

Transportation


Planning

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[Read More](#)

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[Read More](#)

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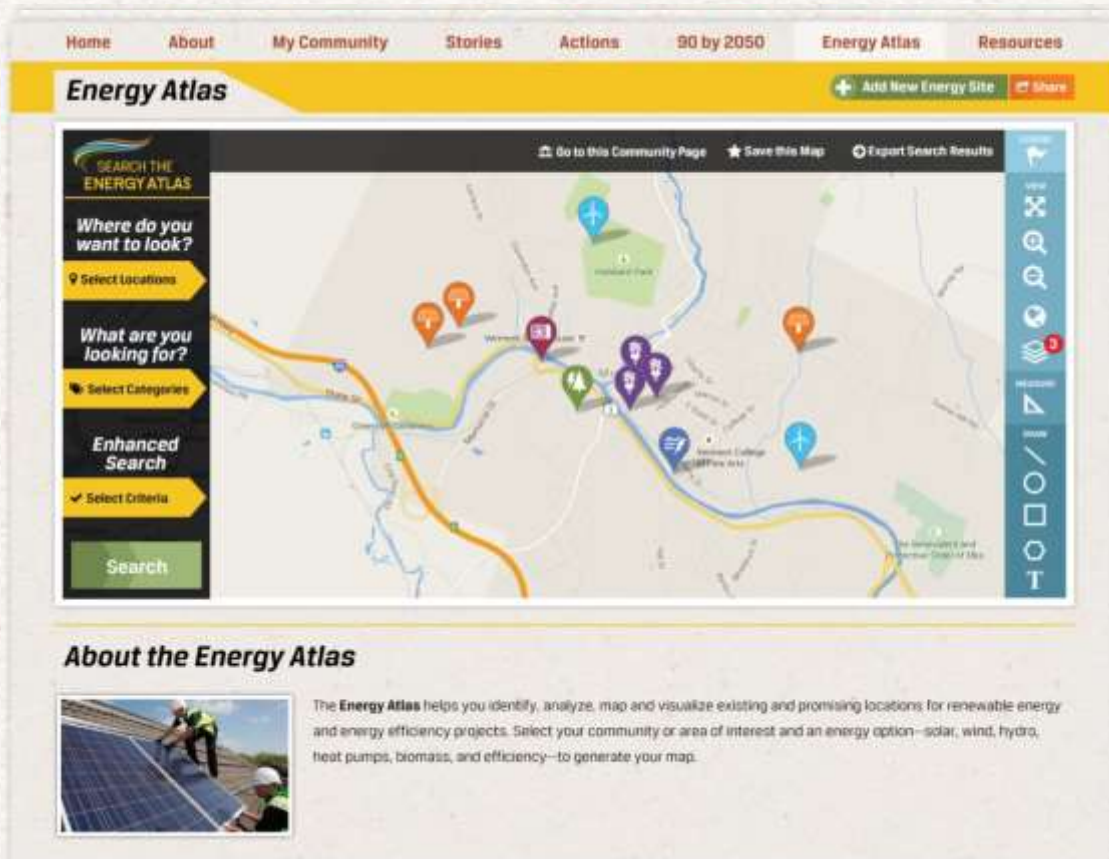
[Read More](#)

Stories

Stories are a way to highlight the energy action happening in *your* community with *your* neighbors

- Help others understand how easy it is to save money and energy
- Celebrate local energy heroes
- Link stories to social media and spread the word

EDUCATE: SHARE YOUR TOWN'S
ENERGY STORIES AND ACTIONS
AND LEARN FROM OTHER
COMMUNITIES.



Mapping

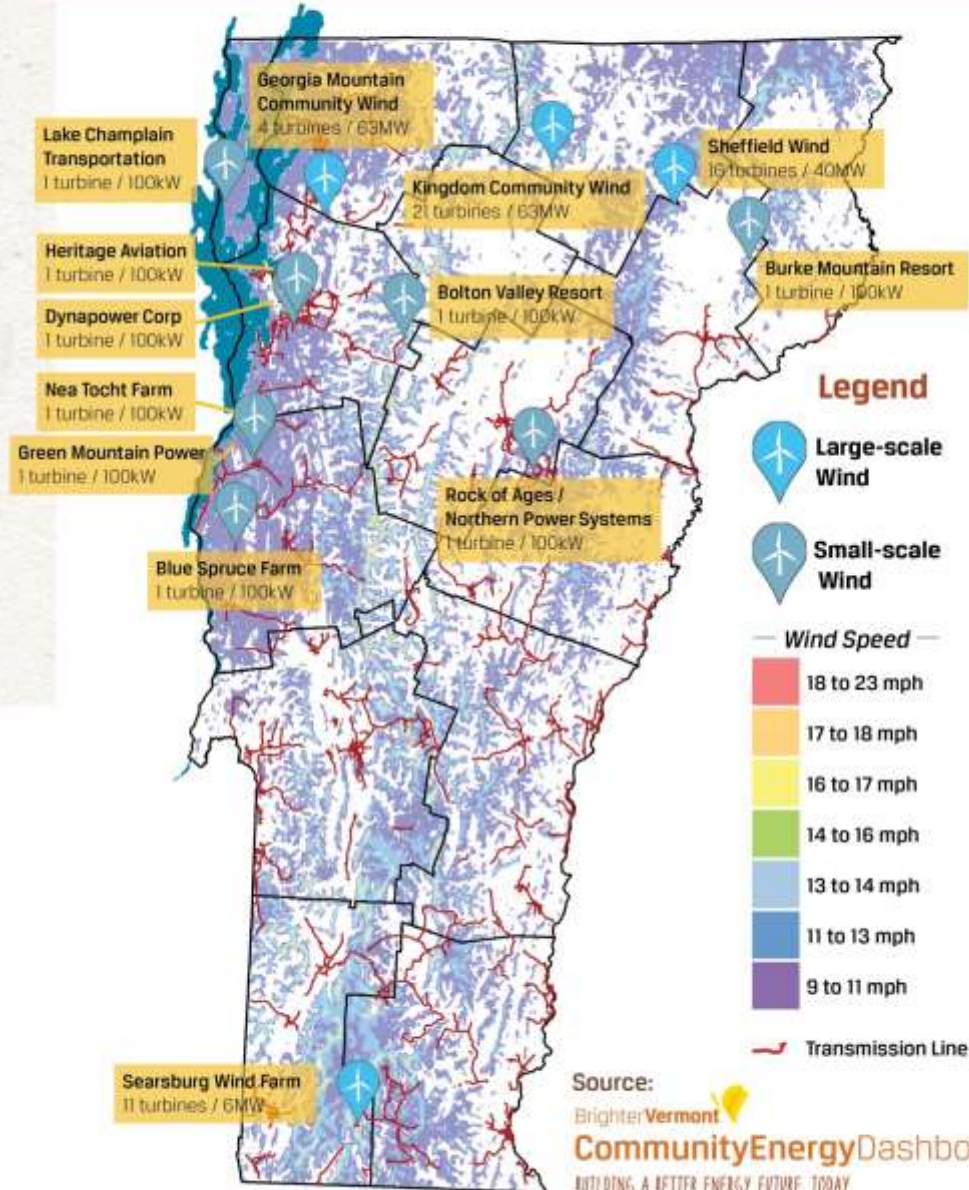
The Energy Atlas makes it possible to:

- ✓ Map every renewable energy site in your community
- ✓ Add new energy and efficiency sites
- ✓ Use tools to determine potential sites based on environmental, utility, and other key data
- ✓ Create community maps by technology, town, utility, site type, system size.

Where does the data come from?

Atlas data comes from the Vermont Public Service Department, Vermont Center for Geographic Information, Renewable Energy Vermont, and you!

Wind Projects Over 100 KW



VISUALIZE: MAKE ENERGY VISIBLE
 THROUGH UNDERSTANDING
 WHERE IT EXISTS IN YOUR
 COMMUNITY.

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Share

The Energy Action Network created a one-stop shop called **Brighter Vermont** to make it easier for you to access information about energy so you can make the wisest choices and investments for your community, business or home. The links below will take you to the specific information, organizations and businesses that fit your needs.

Heat

Learn how to lower your heating costs and increase your comfort.

Resources for your home

Resources for your business

Resources for your school

Electric

Simple steps to be more efficient and lower your electric bills.

Resources for your home

Resources for your business

Resources for your school

Transportation

Options for reducing your dependence on fossil fuels.

Resources for your home

Resources for your business

Resources for your school

Financing Options

Money is the most common reason cited by Vermonters who have not yet invested in renewables or efficiency. But it doesn't have to be! Learn about a host of rebates, incentives and low interest loan programs that make investing in renewables and efficiency more affordable than ever.

Resources for loans, rebates, incentives, and financing

Planning

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Suspendisse vitae porttitor ipsum.

Resources for understanding energy

Resources for energy planning

Resources

Link to important resources and partners:

- > Heat
- > Electricity
- > Transportation
- > Financing Options
- > Local Energy Planning

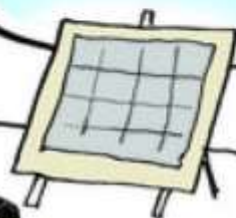
For your home, school, business, farm, community



CLIMATE SUMMIT

WHAT IF IT'S
A BIG HOAX AND
WE CREATE A BETTER
WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.



12/19 USA TODAY

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