



Vermont's Clean Energy Economy

10,570 energy efficiency

2,164 solar

1,290 woody biomass

1,259 transportation

412 storage

345 wind

113 hydro



Majority of clean energy companies in Vermont are small businesses with 5 or fewer employees.



Meet us
workingvermonters.org

Weather Events Increasing Electricity Costs



Since 2000, VT suffered more than one federally-declared weather-related disaster every year.

GMP:

- ✘ \$34 Million dollars due to storms since 2013
- ✘ Average of \$8 Million Every Year

Washington Electric Coop:

- ✘ \$156,000 net operating loss in 2017 due to a single storm



Sources:

https://floodready.vermont.gov/flood_costs

Prefiled Testimony of Edmund F. Ryan on Behalf of Green Mountain Power (6/4/2018)

Washington Electric Coop 79th Annual Membership Meeting Annual Report (2018)

WOOD IS GOOD



Proven Reliability:

419
Residential systems
installed

173
Commercial/institutional
systems installed¹

1290 jobs² & 1
Pellet mill in the State
of Vermont

Achieving **35%** of
Vermont's thermal
heating needs through
increased advanced
wood heating by
2030:

Will displace **40** million
gallons of fossil fuel
(at \$3.00 a gallon is
\$120,000,000
saved a year).

For every **1,500** tons
of pellet mill capacity,
1 new full time job is
created
580 new jobs in
Vermont.³

ISO-NE: Regional Electricity Sources

View the real-time fuel mix at iso-ne.com



Natural Gas



Nuclear



Renewables



Hydro



Coal



Oil

2017



48%



31%



11%



8%



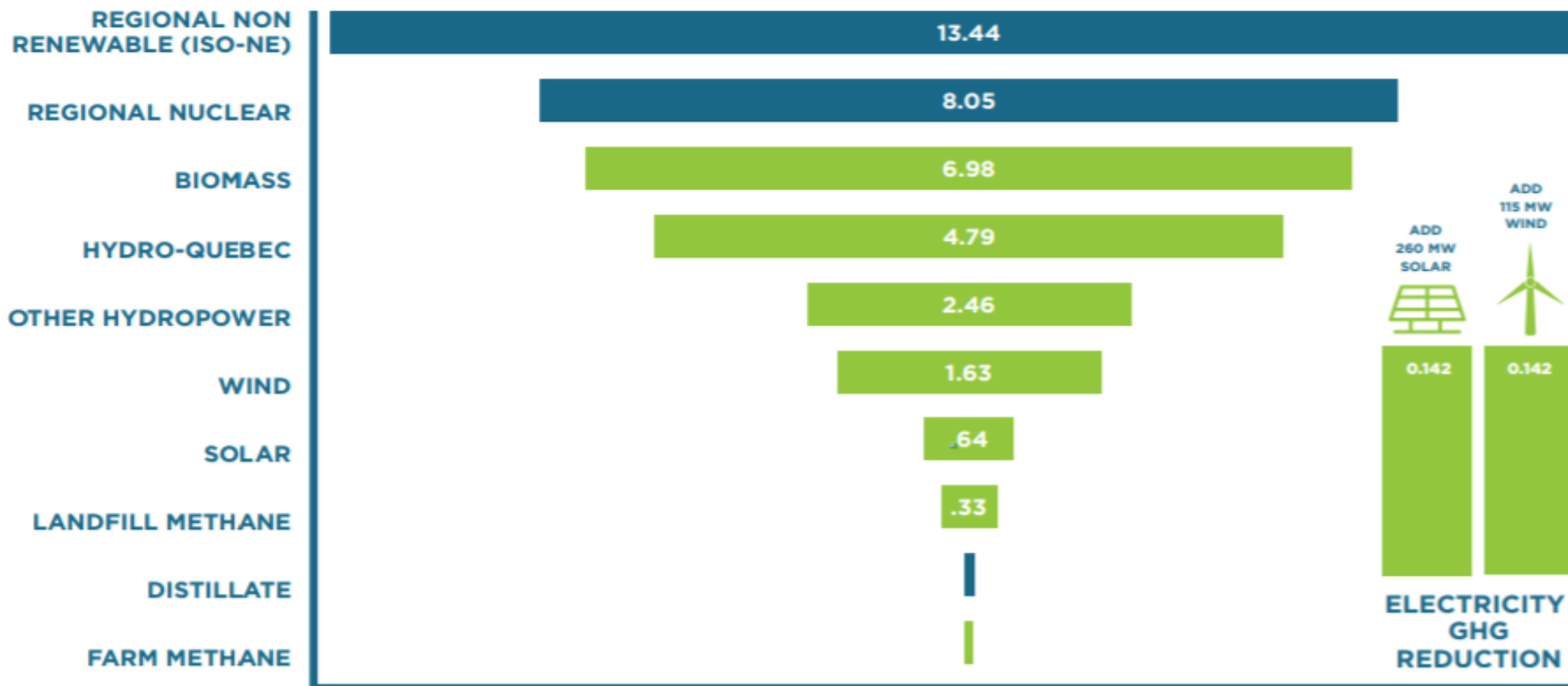
2%



1%

VT imports 60+% electricity from NE & HydroQuebec
→ inadequate local community renewables

VERMONT ELECTRICITY GENERATION SOURCES¹⁷ (in TBTU SOURCE ENERGY)



Innovations in Solar

SunCommon's Solar Canopy



- ✓ Enables solar over driveways, parking lots, patios, woodpiles, etc.
- ✓ Generates enough solar for the average Vermont home
- ✓ Glass solar panels absorb light from both the front and back to take advantage of the snow
- ✓ No upfront cost, low-interest financing

Pollinator-Friendly Solar

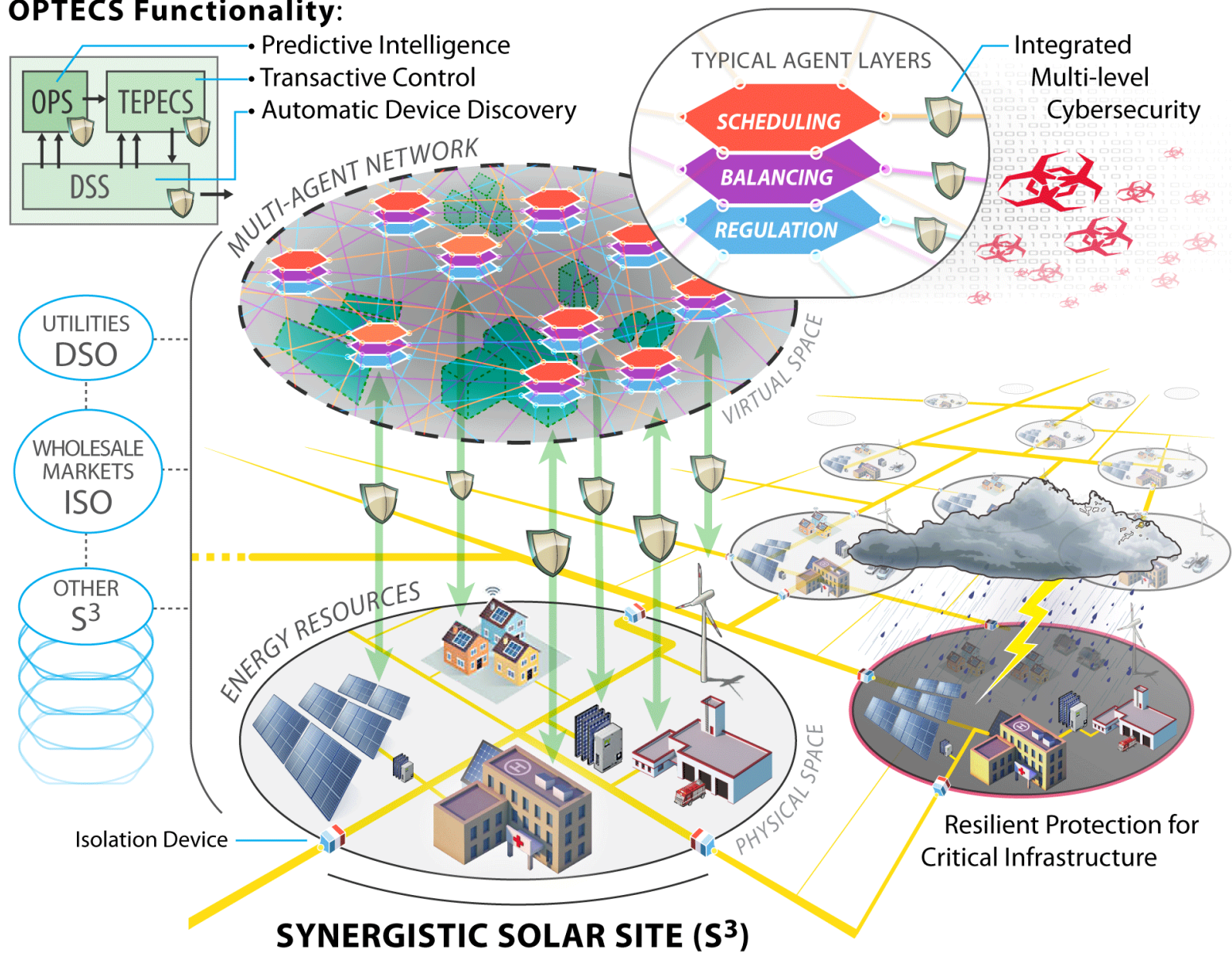
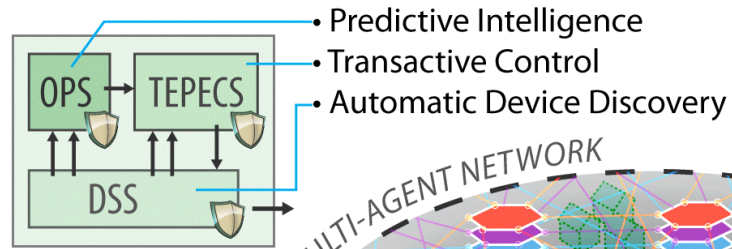
- ✓ Uses land under solar arrays to plant native plant species
- ✓ Creates habitat for bees, birds & other threatened pollinators
- ✓ Improves storm water management & soil quality
- ✓ Example in VT: South Ridge Solar Field in Middlebury
 - ❖ Collaboration between Middle Road Adventures & “Bee the Change”



Grid Modernization



OPTECS Functionality:



Renewable Energy Storage

- ✓ Increases grid reliability, resiliency, integrity, and stability
- ✓ Helps residents and businesses manage electricity use, lowering costs
- ✓ Lowers costs to ratepayers by reducing electricity demand during peak periods when additional supply is needed
- ✓ Helps avoid costly distribution and transmission infrastructure upgrades, reducing costs to ratepayers
- ✓ Provides backup power when the grid is offline
- ✓ Replaces fossil fuel powered backup generators
- ✓ Reduces greenhouse gases
- ✓ Maximizes use of VT produced renewable energy
- ✓ Supports economic growth



Vermont Energy Access Coalition

Diverse collaborative of organizations, businesses, and institutions committed to:

- ▶ lowering the energy burden for low and moderate income households to increase Vermonters' quality of life;
- ▶ increasing participation of all Vermonters in the total renewable energy innovation transformation; and
- ▶ equitably achieving 90% total renewable energy sourcing and 75% climate pollution reduction by 2050.

www.revermont.org/forall

Vermont Energy Access Coalition

3E Thermal ♦ Aegis Renewable Energy ♦ Burlington Electric Department ♦ Capstone Community Action ♦ Carshare VT ♦ Catamount Solar ♦ Cathedral Square ♦ Champlain Housing Trust ♦ Champlain Valley Office of Economic Opportunity ♦ Clean Energy Group ♦ DC Energy ♦ Vermont Department of Public Health ♦ Dunkiel Saunders ♦ Green Mountain Power ♦ Green Mountain Transit ♦ High Meadows Fund ♦ Housing Vermont ♦ VT Department of Children and Families - Low Income Home Energy Assistance Program ♦ Main Street Alliance ♦ NeighborWorks of Western Vermont ♦ Norwich Solar Technologies ♦ Renewable Energy Vermont ♦ Shires Housing ♦ SunCommon ♦ SunWood Biomass ♦ Twin Pines Housing Trust ♦ University of Vermont Medical Center ♦ Vermont Energy & Climate Action Network ♦ Vermont Energy Investment Corporation ♦ Vermont Affordable Housing Coalition ♦ Vermont Food Bank ♦ Vermont Gas ♦ Vermont Law School ♦ Vermont Low Income Advocacy Council ♦ VLITE ♦ VPIRG ♦ Vermont Public Power Supply Authority ♦ Vermont State Employees Credit Union

Values

- ▶ We believe that all Vermonters should have access to and benefit from renewable electricity, heating, and transportation, and energy efficiency. Every Vermonter should receive the health, economic, comfort, and environmental benefits of renewable energy and energy efficiency, regardless of their income, home-ownership status, or location.
- ▶ Full participation in Vermont's renewable energy transformation requires policies, resources, and program design that intentionally address the unique barriers faced by low and moderate income and marginalized Vermonters. We believe that every energy program, initiative, or policy should incorporate meaningful opportunities for low and moderate income households.
- ▶ Ensuring equitable access to affordable renewable energy solutions enables Vermonters to reduce their energy burden, strengthen communities, grow the economy, and meaningfully advance our energy and climate commitments.



Renewable Energy Vermont invites you to

SOLAR FOR ALL

Friday, January 29

1:30 pm - 3:30 pm

State House

Room 10



Join ***Vermont's Clean Energy Access Coalition***
for a panel discussion on ***Low-Income Solar Access***

Topics include:

- * Specific low-income solar project challenges and successes
- * Policy barriers and recommendations to enable greater benefits and access to solar

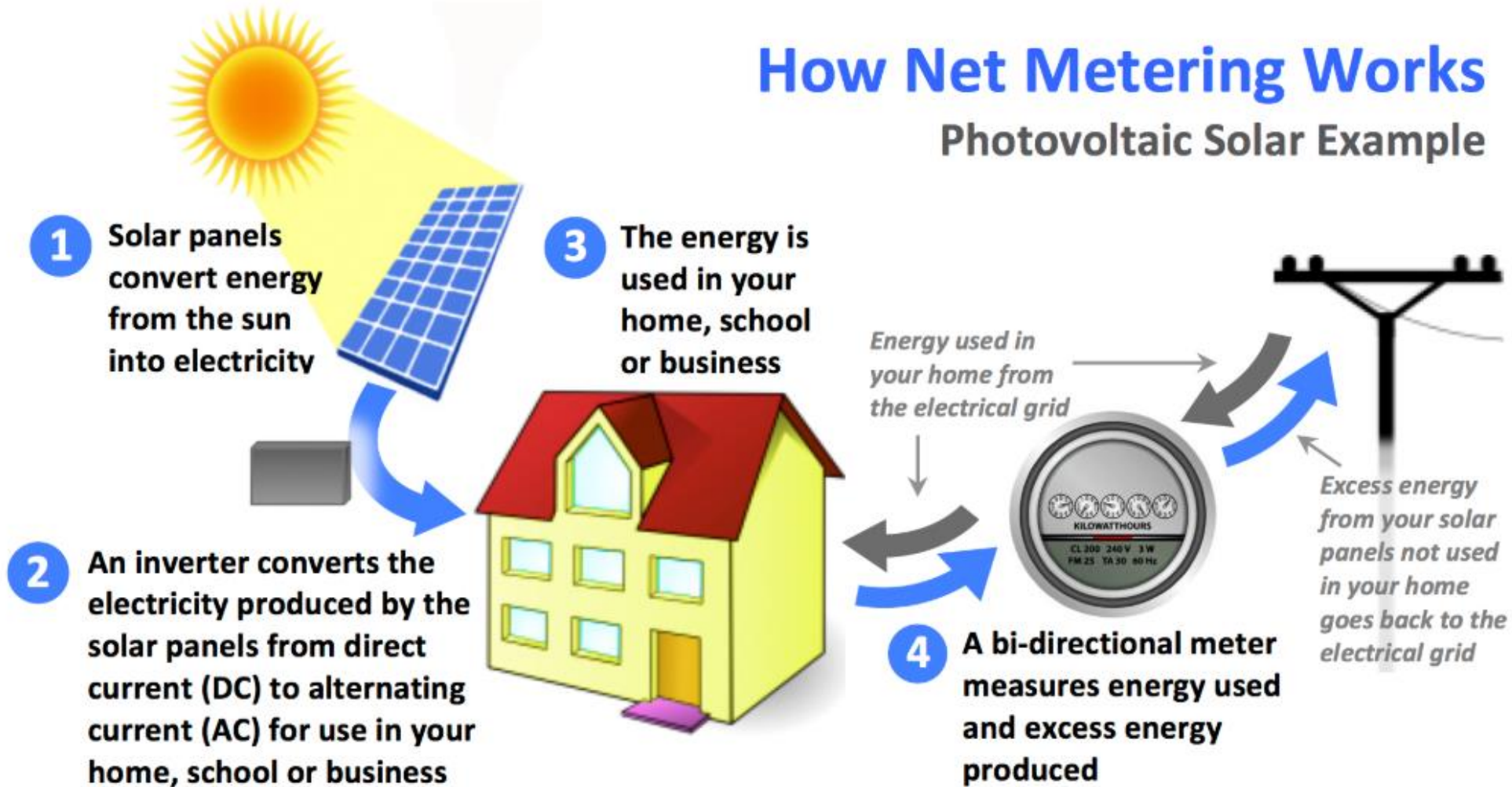
Panelists include:

Clary Franko, SunCommon
Steve Geller, SEVCA
Kevin McCollister, Catamount Solar
Nathan Phelps, Vote Solar
Christa Shute, Vermont Law School

www.revermont.org/forall

How Net Metering Works

Photovoltaic Solar Example



Net-Metering is how Vermonters can generate their own electricity and share what they don't use with their neighbors through the grid.

Why is Net-Metering So Important?

- ▶ **Local renewables via Net-Metering is the only real opportunity Vermonter's have to choose where we get our power**
- ▶ **Local renewables keep our electricity dollars in-state, creating jobs and a sustainable economy.**
- ▶ **Local renewables allows Vermonters to do our part in mitigating the climate crisis.**



PUC & DPS FINDINGS ON RATES

DPS testimony stated that purchased power is NOT a key driver in rate increases

“Over the period, Purchased Power Costs, over which GMP has some limited control, have declined by \$33.4 million. ... However, these cost reductions, which total \$49.2 million, have been more than offset by a \$60.2 million increase in rate base (capital and investment) related costs, over which GMP has significant control.”

Source: Case 18-0974-TF, DPS Direct Testimony of Brian E. Winn. August 10, 2018 at 11.

Net-Metering is a Small Fraction of the State’s Load

- In its recent rate case, GMP reported that “total [customer self-supply] production (the vast majority of which is solar PV)” was 125,000 MWh for the test year, compared to its total load of 4,400,000 MWh.
- Thus, customer self-supply through net-metering represented only 3% of the total GMP electric load.

Source: Case No. 18-0974-TF, GMP Rate Case, GMP Direct Testimony of Douglas Smith, April 13, 2018, at 7, 18.

LOCAL SOLAR POWERS Vermont's ECONOMY



- ▶ **Local Customers** - Net-Metering customers are Vermonters... our Schools, Towns, Businesses and Citizens.
- ▶ **Local Jobs & Local Returns** - a typical Net-Metered school system creates **11 FTE jobs** in Vermont and **invests \$700,000** in the local labor force. By choosing to generate its own power, a typical school **saves \$500,000** over the solar array's lifetime.
- ▶ **Local Investment** - a typical Net-Metered school system generates **\$2,000,000** in **economic activity** and brings **\$1,000,000** in **federal tax dollars** into Vermont.

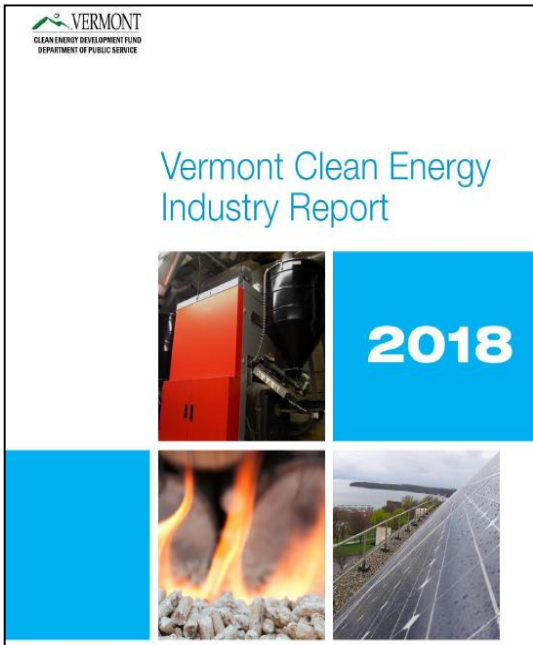


Increasing Local Solar = Tremendous Benefits

*“by 2050 Vermont would see about **\$8 billion of net benefits**, primarily from reducing the amount of gasoline and fuel oil we buy. This does not include the value of reducing carbon dioxide or other environmental benefits. Those benefits are in addition to \$8 billion in net savings.”*

www.veic.org/vermont-solar-pathways

VERMONT CLEAN ENERGY INDUSTRY REPORT



*“The state is home to approximately **18,800** clean energy workers.”*

*“Clean energy jobs in Vermont provide higher median hourly earnings—about **\$26.71**.”*

“[S]olar jobs do remain the largest segment of Vermont’s renewable electricity workforce, accounting for just over a third of total renewable energy workers”

“For the first time since the Vermont Clean Energy Industry Report’s inception in 2013, the state’s clean energy economy exhibited a decline in employment, driven largely by losses in the solar industry.

... In Vermont, the shedding of [215] solar jobs came alongside a decline in solar installations over the same period of about 9%.”

MOST ENERGY DOLLARS FLOW OUT OF VERMONT

We Are Moving in the Wrong Direction!



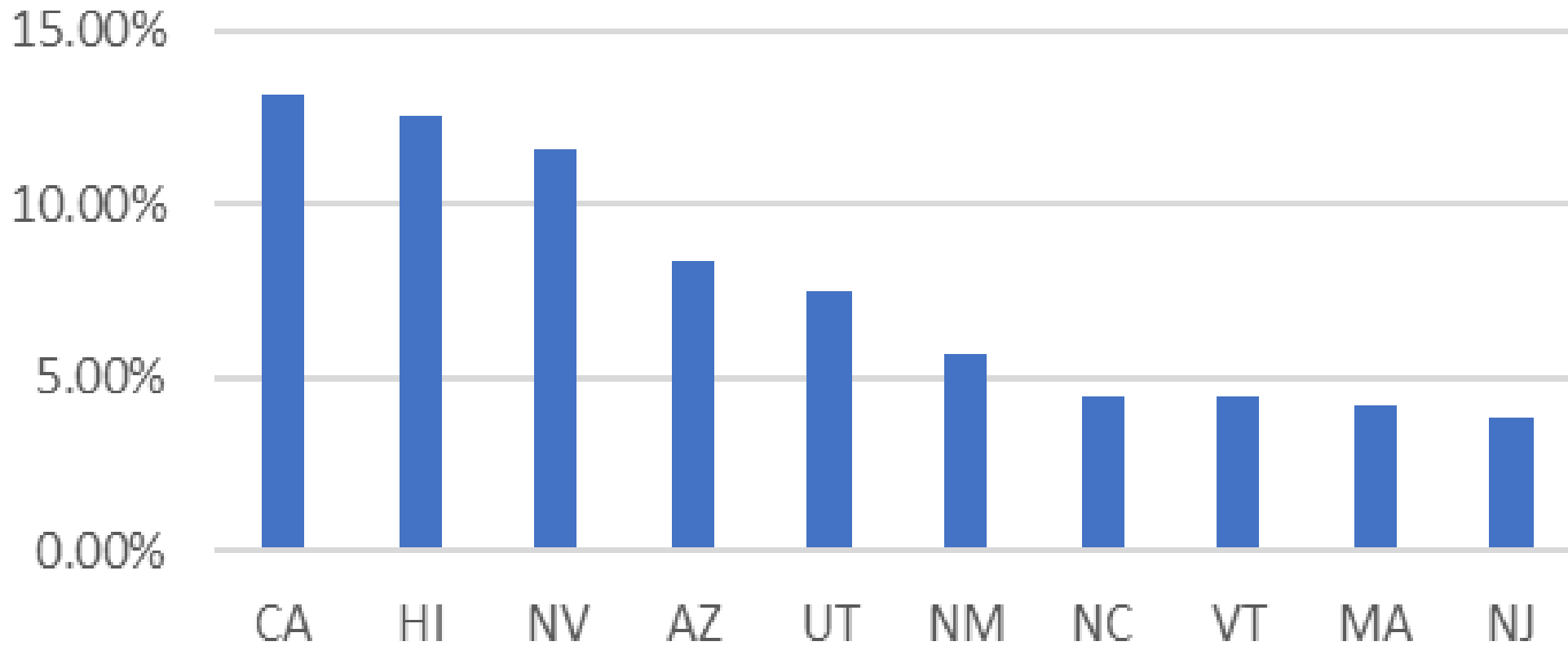
- x** *Vermont spends over \$3 Billion annually on energy.*
- x** *90% of Vermont's total energy is imported from out-of-state and out-of-country.*
- x** *Large majority of Vermont's electricity is imported from out-of-state.*

Sources: Energy Action Network Vermont Electric Generation Data for 2016; eanvt.org
Energy Information Administration; www.eia.gov/state/data.

VERMONT BEHIND OTHER STATES



Solar Penetration -2017 (EIA Data)



OTHER STATES INCREASING RENEWABLE ENERGY, JOBS, & CLIMATE ACTION



- ✓ All new California homes required to install solar starting in 2020
- ✓ D.C., Hawaii, New York, Massachusetts (AG) plan for 100% renewable electricity
- ✓ MA SMART program will double solar in Massachusetts from 1.6 Gigawatts to 3.2 GW in next several years.
- ✓ California required all new buses be carbon free within next 10 years
- ✓ CA, CT, DE, LA, MD, NY, OR, PA, TX, DC offer electric vehicle purchase incentives
- ✓ Massachusetts, New York, California, Oregon requiring energy storage procurement
- ✓ New York, Maryland, Hawaii, and California offer incentives for energy storage

Growing Vermont's Economy & Meeting Commitments



- ▶ Improve the integrity, transparency, and effectiveness of Vermont's energy laws to:
 - ✓ Create resilient communities
 - ✓ Enable choices for Vermonters
 - ▶ give people information so that they can have more tools and decisions over their energy uses and needs
 - ▶ Fair market competition leads to lower prices for all & innovation
 - ✓ Meet our climate economy commitments
- ▶ Buy local, eat/drink local, energize local
- ▶ Increasing participation & access to renewable energy solutions for ALL Vermonters, equitable opportunities for low & moderate income neighbors

Transportation & Electric Vehicles



- ▶ Clearly authorize 3rd party EV charging & per kWhs sales
- ▶ Establish an equitable point of sale electric vehicle incentive
 - ▶ Direct the \$3.6 million in consumer protection Volkswagen & all future vehicle pollution settlement dollars to the Clean Energy Development Fund to support the EV incentive
- ▶ Dedicate federal VW Settlement funds to electrification (no new diesel subsidies)
- ▶ Audit the State budget for consistency with the comprehensive energy plan & climate commitments, particularly transportation and capital investments

Challenges & Opportunities Ahead



- ▶ Maintaining & Increasing Local Renewable Electricity Access
 - ▶ Restoring residential community solar
 - ▶ Eliminating limits for schools, towns and all customers for net metered renewable electricity (currently limited to no more than 500 kW, regardless of building or solar project location)
 - ▶ Maintain & expand the Standard Offer program
 - ▶ 100% Renewable Energy Standard by 2030
- ▶ Catalyzing Renewable Energy Storage & Grid Modernization
- ▶ Replenish the Clean Energy Development Fund & maintain the Working Lands Enterprise Fund
- ▶ Ensuring local energy plans catalyze 100% total renewable energy deployment
 - ▶ All technologies: Solar, Wind, Local Small Hydro, Automated Wood Heating, Electric Vehicles, Heat Pumps
 - ▶ Encourage siting of community solar

Resources



Vermont Renewable Energy Business Listing

Show entries

Search:

Business Name	Technology Type	Type of Installer	County, State	REV Member	Former "Partnership Program Participant"	Number of years in Business	Number of systems installed	Amount of MW, kW, BTU's Installed	Business Structure (LLC, S-Corp etc.)	Credentials
Acorn Renewable Energy	Solar PV	Community	Addison, VT	Yes	No	8	2	300 kW	Co-Op	
AllEarth Renewables	Solar PV	Commercial	Chittenden, VT	Yes	Yes (Full PV)	5+	3,800+	22,800 kW	S-Corp	
Building Energy	Solar PV, Solar Hot Water	Commercial, Residential	Chittenden, VT	Yes	Yes (Full PV, Full SHW)	9	200 (PV), 60 (SHW)	1.6 MW (PV), 227 kW (SHW)	S-Corp	Solar Certified Engineer
Bourne's Energy	Wood Pellet Boilers	Commercial, Residential	Washington, VT	Yes	No					
Catamount Solar	Solar PV	Commercial, Residential	Orange, VT	Yes	Yes (Full PV)	5	400		LLC	
Cutting Edge Energy	Wood Pellet Boilers	Residential	Caledonia, VT	Yes	No	5	100		LLC	
DC Energy Innovations	Solar PV, Wind	Commercial, Community, Residential,	Chittenden, VT	Yes	Yes (Full PV, Full Wind)	14	70	1.3 MW (PV), 240 kW (Wind)	S-Corp	Master Electrician, NABCEP Certified
Encore Renewable Energy	Solar PV	Commercial	Chittenden, VT	Yes	No	9	40	15 MW	LLC	
Energy Emporium	Solar PV	Commercial, Residential	New Hampshire	Yes	Yes (Full PV)	7	>150	>860kW	LLC	NABCEP
Gary MacArthur Solar	Solar PV	Commercial, Residential	Windham, VT	Yes	Yes (Full PV)	25	100+		Small Business	NABCEP

Find a qualified renewable energy installer

www.revermont.org/vrebl

Share your climate actions, learn from others success

www.vtenergydashboard.org

LT. GOVERNOR'S 2019 MOVIE SERIES

YOU'RE INVITED TO

REINVENTING POWER

AMERICA'S RENEWABLE ENERGY BOOM

THURSDAY, JANUARY 24, 5:30 PM

FILM SHOWING & PANEL DISCUSSION

STATE HOUSE CAFETERIA

*We don't need to choose between keeping our
lights on and protecting our environment.*

REBUILD WHAT'S BROKEN

RETHINK WHAT'S POSSIBLE

REVITALIZE COMMUNITIES



Olivia Campbell Andersen, Executive Director

www.revermont.org



@RE_Vermont

info@revermont.org



802-595-5373

Net Metering 3.0

- ▶ Compensation based on whichever is lower, the utility's blended residential rate or the statewide average blended residential rate (\$0.15417/kWh)
- ▶ May not use net metering credits toward non-bypassable charges:
 - ▶ Customer Charge
 - ▶ Energy Efficiency Charge
 - ▶ Energy Assistance Program Charge
 - ▶ On-bill financing
- ▶ Four categories of Net Metering systems, plus hydro
 - ▶ Category I: 15 kW and under = +1 cent/kWh siting adjustor for 10 years
 - ▶ Category II: 15-150 kW on preferred sites = +1 cent/kWh siting adjustor for 10 years
 - ▶ Category III: 150-500 kW on preferred sites = - 2 cent/kWh siting adjustor for lifetime
 - ▶ Category IV: 15-150 kW not on preferred sites = - 3 cent/kWh siting adjustor for lifetime
- ▶ 150-500 kW projects allowed only on "preferred locations"
- ▶ REC adjustors:
 - ▶ +2 cents/kWh credit for ten years if RECs go to utility
 - ▶ drops to +1 cent/kWh for CPGs filed after July 1, 2019
 - ▶ -3 cents/kWh (debit) for the life of the system if RECs are held by the generator
- ▶ Biannual PUC proceeding to revisit adjustors





“Preferred” Priority Project Locations”

- ▶ On a pre-existing structure
- ▶ Parking lot canopies over permitted paved areas
- ▶ Previously developed land
- ▶ Brownfields
- ▶ Landfills
- ▶ Gravel pits
- ▶ Town-designated sites
- ▶ Superfund sites
- ▶ On the same parcel as an customer taking 50% or more of the output

0.1%
OF LAND

**That's about the size
of Montpelier!**

