



ENERGY ACTION
NETWORK

Vermont Energy & Climate Summit

*“Meeting Vermont’s 2025 Energy and
Climate Goals”*

Policy Pitches Report
Volume 2 – Additional Written Pitches

November 8, 2017

Vermont Energy & Climate Summit: Volume 2

Policy Pitches Continued

The Energy Action Network (EAN) organized a call for policy “pitches” to be presented at the Summit to generate substantive policies to help Vermont accelerate progress towards our energy and climate goals. The response was tremendous. Nearly 50 pitches were submitted. While all of the submissions were excellent, 13 were selected to pitch in person at the Summit (5 minutes, 5 slides).

The criteria used to select the pitches reflect those used by the Governor’s Climate Action Commission, and include:

- Impact on meeting Vermont’s energy and climate goals
- Degree to which it spurs economic activity, inspires and grows Vermont businesses, and puts Vermonters on a path to affordability
- Degree to which it leaves no group unduly burdened

Volume 1 of this report provides a compilation of the 13 written policy pitches that were selected to present in person. All of the presentations can be found at <http://eanvt.org/vt-energy-climate-summit-2017/>

This Volume 2 provides a compilation of all the additional pitches that were submitted in their original written form. The summary page that follows attempts to categorize these pitches into key sectors to assist readers with specific sectoral interests. The pitches are numbered in the order they were received by EAN. All of the additional Summit presentations and other supporting documentation can be found at eanvt.org.

The initial audience for the report is the Governor’s Climate Action Commission and the Vermont State Legislature. However, we encourage all Vermonters to dig into the ideas and substance, and help us collectively bend the curve toward our energy and climate goals.

Additional Written Policy Pitch Submissions - Summary

VT Energy & Climate Summit (Nov 8, 2017) - Additional Written Pitch Submissions				
Pitch #	Pitch Title	Submitting Individual	Submitting Organization or Business	Sector(s)
1	ECHO Energy Commons	Phelan Fretz	ECHO, Leahy Center for Lake Champlain	
2	Fairbanks Museum Renewable Energy Campus	Adam Kane	Fairbanks Museum & Planetarium	Energy Efficiency, Electricity, Heating
3	Create Transportation Alternatives	Dan Jones	Sustainable Montpelier Coalition	Energy Efficiency; Transportation
4	Regional Market-Based Strategy Assessment to Reduce Transportation Emissions in Northeast	Sara Forni	CERES	Transportation; Electricity
5	Drift Marketplace - Distributed Asset Ownership Platform	Thomas Polich	Drift Marketplace, Inc.	Energy Efficiency, Electricity
6	Preference v. Proximity	Sam Carlson	Green Lantern Group	Electric
7	Charge for Parking	Richard Watts	University of Vermont (UVM) Center for Research on Vermont	Transportation
8	Time of Sale Energy Improvements	Chuck Reiss	Building Performance Professionals Association (BPPA)	Energy Efficiency
9	Preparing Vermont Cities & Towns for the Transition to Electric Vehicles	Ben Jervey	Vermont Law School (VLS) Institute for Energy and the Environment (IEE)	Transportation; Electricity
10	Vermont Medical and Health Professionals Call for Climate Action	Dan Quinlan	Vermont Climate and Health Alliance (VTCHA)	Total Energy
11	Triple R Bundle - Replace, Reduce, and Renewable	Tom Murray	Vermont Gas Systems (VGS)	Total Energy
12	Weatherization Through Solar Contractors (EFG 15)	Russ Flanigan; Richard Faesy, Dan Mellinger	Building Performance Professionals Association (BPPA) and Energy Futures Group (EFG)	Energy Efficiency, Electricity
13	Energy Efficiency Starts at Home: HEAT Squad Expansion Proposal	Ludy Biddle	NeighborWorks of Western Vermont (NWWVT)	Energy Efficiency, Electricity; Heating
14	Replacing Car Trips with E-Bike Trips	Ross Saxton	Local Motion	Transportation
15	Vermont Global Warming Solutions Act	Sandy Levine	Conservation Law Foundation (CLF)	Total Energy
16	Heating Equipment Sales Tax Exemption	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Heating
17	Biogas Collaborative Working Group	John Osborne	Biogas Collaborative Working Group	Energy Efficiency, Transportation, Heating
18	Expanded EEC Scope	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Energy Efficiency; Electricity
19	Cold Climate Heat Pump and Heat Pump Water Heater Sales Tax Exemption	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Electric; Heating
20	EEC Self-Direct Revision & Expansion	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Total Energy

VT Energy & Climate Summit (Nov 8, 2017) - Additional Written Pitch Submissions

21	Act 250 Revisions	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Total Energy, Efficiency, Heating, Transportation
22	Delivered Fuels Tax	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Heating
23	Building Mortgage Rate Feebate	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Energy Efficiency; Heating
24	Residential Performance Contracting	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Energy Efficiency; Heating
25	City of Burlington Benchmarking and Disclosure Ordinance	Jennifer Chiodo	Vermont Green Building Network (VGBN)	Total Energy
26	Pathway Evaluation to 25% by 2025	Rick Wackernagel and Gary Dir		Total Energy
27	Vermont Registered Builder Remodeler Program	Ward Smyth		Energy Efficiency, Heating
28	Land Value Taxation in State Designated Centers: Building Efficient and Fiscally Sustainable Communities	Anonymous		Total Energy; Land Use
29	Transforming Vermont's Energy and Economy	Rebecca Foster	Vermont Energy Investment Corproation (VEIC)	Total Energy
30	Driving on Sunshine: Dynamic Rate & Electric Vehicle Charging	Olivia Campbell Anderson	Renewable Energy Vermont (REV)	Transportation; Electricity
31	Vermont Energy Code Enhancements	Richard Faesy, Dan Mellinger	Energy Futures Group (EFG)	Total Energy, Efficiency, Heating, Transportation
32	Active Transportation: Complete and Connected Transportation System	Kelly Stoddard- Poor	AARP	Transportation
33	Healthy Homes - Expanding Partnerships with Hospitals	Ludy Biddle	NeighborWorks of Western Vermont (NWWVT)	Efficiency, Heating

Note: The pitches are numbered in the order received

Written Submission 1

ECHO Energy Commons



Vermont Energy & Climate Summit **Pitch Submission Form**

1. **Pitch Submitted By (Your Name or Organization):** Phelan Fretz, Executive Director, ECHO, Leahy Center for Lake Champlain
2. **Contact Email Address:** pfretz@echovermont.org
3. **Contact Phone Number:** 802-864-1848 Ext 126
4. **Pitch Title:** Engage “all” Vermonters that visit Burlington’s Waterfront in how they can and should individually and collectively participate in achieving Vermont’s energy goals.
5. **Pitch Summary:** In fall of 2018, ECHO will install “**Energy Commons**”, an outdoor, free public space that invites the Waterfront’s nearly 1 million annual visitors to explore environmental sustainability through interactive exhibits and social connections. It will be composed of synergistic elements: a science park with interactive exhibits; green infrastructure demonstrations, including renewable energy technologies and alternative transportation linkages; interpretive panels; social spaces, including a cafe and performance space; and art installations by local artists. This \$1 million project, a partnership between ECHO and the City of Burlington, will serve as a platform for utilities, energy companies, NGO’s and government agencies to engage the public in achieving our energy goals.
6. **What energy sector(s) does this Pitch apply to? (Bold all that apply):**
 - **Energy Efficiency**
 - **Electricity**
 - **Transportation**
 - **Thermal Heating &/or Cooling**
 - **All (Total Energy)**
 - **None: Non-energy related carbon reduction proposal**
7. **Which criteria category(ies) does it address? (Bold all that apply):**
 - **Economic Activity**
 - **Affordability**
 - **Vulnerable Vermonters**

- **Other - what each of us can/should be doing to achieve our energy future**

- 8. Scale of impact on Vermont's energy and climate goals:** We can't really estimate the "conversation rate" of visitors to participating in our energy future, but hundreds of thousands of visitors convening, engaging, socializing and learning about energy through hands-on interactives has the potential to make the concept of energy and its management, real for people. We know that ECHO's guests are 40% Chittenden County residents, with 60% living outside this county. We know that ECHO's location is the nexus for multiple forms of transportation (train, boat, bike, car, walking, etc). We know that Energy Commons will include demonstrations that highlight many of Burlington's renewable energy investments. We know that folks come to the Waterfront to be inspired by the views and ECHO's guests have the expectation to be engaged and challenged.
- 9. Benefits/costs of this proposal for Vermont and Vermonters:** Getting every Vermonter to participate in our collective energy future will take reaching out to folks across the state, a very expensive and complex process. Delivering a message to nearly 1 million that visit the Waterfront and 150K annual ECHO guests offers a unique and powerful platform for building engagement and commitment. Where else can the public engage with tomorrow's technology, ask questions, take a pledge, learn what net zero really means, share their energy future with friends over a cup of coffee, and take the first steps toward their own energy independence?
- 10. Decision-makers necessary for this proposal to be adopted or move forward:** The partners are in place. Most of Vermont's utilities and renewable energy companies are already serving as content experts or have committed resources. The City of Burlington is a partner. The next step is for these partners (and others we haven't reached yet) to look beyond the opening of Energy Commons in fall 2018 to new 5-year goals to demonstrate, engage and teach about how our utilities and businesses can propel and support each Vermonter to take action - using ECHO and Energy Commons as a platform.
- 11. Strategy and key considerations:** ECHO will manage Energy Commons' daily operations - from programs, to maintenance, to the cafe. To make the Commons truly come to life, all the utilities, energy companies, energy/sustainability NGO's and government agencies need to fully embrace and help us populate the space with excitement - demonstrations, live shows, real products, point to it in their communications, and support it through ways and means yet to be thought of or created.
- 12. Timeline:** Energy Commons will open in fall 2018. It can serve as a platform for education for years to come.

Written Submission 2

Fairbanks Museum Renewable Energy Campus

Vermont Energy & Climate Summit **Pitch Submission Form**

Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. Pitch Submitted By (Your Name or Organization):

Adam Kane, Executive Director
Fairbanks Museum & Planetarium

2. Contact Email Address:

akane@fairbanksmuseum.org

3. Contact Phone Number:

(802) 748-2372

4. Pitch Title: (one line)

Fairbanks Museum’s Renewable Energy Campus

5. Pitch Summary: (one paragraph)

In 2018, the Fairbanks Museum & Planetarium, a 125 year-old institution, is moving from fossil fuels to 90% renewables. The Fairbanks Museum’s Renewable Energy Campus will strengthen the institution’s financial and environmental resilience, while leveraging its educational mission to encourage its visitors to undertake their own renewable energy projects.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- Energy Efficiency
- Electricity
- Transportation
- Thermal Heating &/or Cooling
- All (Total Energy)

- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- Economic Activity
- Affordability
- Vulnerable Vermonters
- Other (Education and Outreach)

8. Scale of impact on Vermont's energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

The Fairbanks Museum will obtain 90% of its energy from renewables and leverage the project as an educational tool and tourism driver. The Renewable Energy Campus will model a sustainable and resilient facility while leading by example in Vermont's local and distributed energy future.

The Renewable Energy Campus is a significant undertaking for which we have assembled a team of organizations to support our effort. Our partners include:

- Guidance and Support: Green Mountain Power, Efficiency Vermont, Energy Action Network
- Efficiency and Engineering Support: Commons Energy and Vermont Mechanical
- Solar Photovoltaic: Solaflect
- New Market Tax Credit Allocation and Support: Vermont Rural Ventures
- New Market Tax Credit Legal Support: Downs, Rachlin, Martin

Transitioning to renewables will require the following facilities improvements:

- Solar PV: 60kW of off-site solar to cover electrical usage through Solaflect in a solar park in St. Johnsbury
- Fairbanks Museum (15,000 sq ft): Efficiency upgrades and air source heat pump system
- McGuire Center (4800 sq ft): Efficiency upgrades and air source heat pump system
- Balch Preschool (2000 sq ft): Ground source heat pump system
- Collections Center (3500 sq ft): Air source heat pump system

The combined energy production, heat pumps, and efficiency investments will allow the Museum to secure 90% of its energy from renewable sources, and will provide a net energy savings to the Museum of \$37,000 to \$65,000 annually (fluctuation based on the cost of fuel oil).

Importantly, the improvements through the use of heat pumps will provide humidity control for our buildings. This is particularly critical in the Museum building and the Collections Center. These buildings house the Museum's collections which should be curated in a humidity controlled environment to ensure their long-term preservation. Providing a humidity controlled environment for our collections has been a goal of the Fairbanks Museum for decades.

The Renewable Energy Campus also has a significant public outreach and exhibit component. These components include a series of interactive STEM-based exhibit stations and take-home information to assist our visitors in undertaking their own renewable energy or efficiency projects. Exhibit stations include:

- Heat Pump Station: Hand-powered heat pump demonstrating the physics behind heat pumps
- Energy Tracker: Energy kiosk to show the Museum's real-time energy production and usage

- Thermal Imaging: A station using thermal imagers understand infrared light
- Take-home Information: Renewable energy information for homeowners

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

Project Goals include 1) providing an economic benefit to the Fairbanks Museum while greening its operations, 2) encouraging Museum visitors to support and undertake renewable energy projects, and 3) increase Museum visitation.

The Renewable Energy Campus is designed to provide economic benefit to the Museum, and the local and regional economy. We estimate an annual savings on heat and electricity of \$37,000 to \$65,000. The installation of hands-on, energy-related exhibits will drive increased museum admissions. Based on our previous installations, we conservatively estimate these exhibits will yield a 5% visitation increase. Using the *Benchmark Study of the Impact of Visitor Spending on the Vermont Economy: 2013* we estimate that increase adds \$80,000 to the local economy.

Indicator(s) of Success

Outcome 1: Fairbanks Museum's energy consumption meets or exceeds 90% renewables.

This goal has been established because it aligns with Vermont's 90% renewables by 2050 goal as per the Public Service Board's *Comprehensive Energy Plan 2015*. This outcome will be measured by analyzing the Museum's energy expenses between August 2018 and July 2019. Specific measures will include: 1) the number of space heating BTUs supplied from fossil fuels versus those supplied through heat pumps, and 2) solar production versus usage.

Outcome 2: Fairbanks Museum's admissions increase by 5%.

In light of the interactive, STEM-based exhibits to be installed and our internal data showing their demand, general admissions to the Museum in calendar year 2018 will be 5% above those for 2017. That data will be measured by the Museum's point-of-sale system comparing calendar years 2017 and 2018.

Outcome 3: Surveyed Fairbanks Museum visitors have an increased understanding of the steps they can undertake at their home to improve energy efficiency and employ renewable energy strategies.

Each Saturday for the 6 months following the exhibit installation, visitors will be asked to participate in a survey about how their attitudes and understanding of renewable energy and efficiency have changed after visiting the Museum. This will be an online survey accessed via a postcard handed to each adult visitor with participants receiving a free membership to the Fairbanks Museum.

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

This project is moving forward. Its scale, particularly heat pump installations in the Museum building, are dependent of additional funding. Regulatory approval will be needed from the Vermont Division for Historic Preservation.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

The project involves a four-part strategy:

- 1) Efficiency Upgrades: Under the guidance of energy efficiency contractors, Green Mountain Power and Efficiency Vermont, the Museum will undertake efficiency upgrades to decrease its electrical and heating demand.
- 2) Solar Purchase: The Fairbanks Museum currently has a 12.5kW onsite solar array, and does not have space for an additional solar installation. We will purchase 60kW of offsite solar through a third-party community solar organization (Solaflect).
- 3) Facilities Upgrades: The Museum's four buildings will have either ground or air-source heat pump systems installed in order to move their heating BTU source from heating fuel to electricity.
- 4) Installation of renewable energy exhibits and information in the Museum to provide a public outlet for the work we are doing, and how individuals can undertake similar projects at their homes or workplaces.

Project Gaps:

- 1) Funding. The project requires an \$800,000 investment of which half has been raised from private and foundation donors. The balance of the project is dependent of additional fundraising and the Fairbanks Museum executing a New Market Tax Credit.
- 2) Solar Capacity. The current project budget supports the purchase of solar PV to offset the Fairbanks Museum's current electrical usage. This amount of net-metering will be insufficient when the bulk of the Museum's heating BTUs are moved to the electric grid.
- 3) Renewable Energy Exhibits. Additional partners would be beneficial in designing the outreach and exhibit programs.

Project Barriers:

- 1) Solar Tax Credits. Not a barrier, per se, but the Museum's inability as a non-profit to reap the federal tax credit for its solar investment diminishes the amount of solar PV it can purchase.

Opportunities:

- 1) Inspiring Others. The Fairbanks Museum has four buildings, none of which are less than 100 years old. If this institution can move to 90% renewables, anyone can.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some "game changers" that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

Solar Photo-Voltaic

Purchase 60kW Offsite Solar, October 2017 (completed, installation grid-tied solar park by 12/13/17)

Energy Efficiency

Blower Door Test of All Buildings, September 22, 2017 (completed)
Order Interior Storm Windows for McGuire Center, October 2017
Order Interior Storm Windows for the Museum, May 2018

Building Upgrades

Hire Commons Energy as Energy Services Company, October 2017 (completed)
Approve plans for non-Museum buildings, January 2018
Bid Process of non-Museum buildings, February 2018
Undertake Construction on non-Museum buildings, April-August 2018
Approve Plans for Museum, April 2018
Bid Process for Museum, May 2018
Undertake Energy Improvements in Museum, August-October 2018

Energy Exhibits

Planning for Exhibits, September-October 2017
Exhibit Fabrication and Ordering, November-December 2017
Exhibit Installation, January 2018

New Market Tax Credits

Close NMTC, March 2018

Written Submission 3

Create Transportation Alternatives

Vermont Energy & Climate Summit Pitch Submission Form

Guiding Criteria: EAN's mission is to end Vermont's reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott's Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. **Pitch Submitted By (Your Name or Organization):** Sustainable Montpelier Coalition

2. **Contact Email Address:** dan@sustainablemontpelier.org

3. **Contact Phone Number:** 802-225-6377

4. **Pitch Title:** (one line) Create Transportation Alternatives

5. **Pitch Summary:** (one paragraph)

The leading source of carbon pollution and personal expense in Vermont is the total dependence on the personal car. The state can massively reduce its carbon load and make life cheaper for many Vermonters by aggressively developing alternate local transportation services which are designed to serve our rural environment. From the creation of shared use jitney services to the active rebuilding of little used railroad lines we could provide alternate means to get people to and from work and in and out of our town centers without the demands of the personal car. This solution only works if the state also increases the cost of convenience for the personal car by making in town parking capacity more expensive and inconvenient.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**

- X Energy Efficiency
- Electricity
- X Transportation
- Thermal Heating &/or Cooling
- X All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**

- X Economic Activity
- X Affordability
- X Vulnerable Vermonters
- Other

8. **Scale of impact on Vermont's energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

With 50% of Vermont's carbon load coming from transportation fuels, massive reduction in the demand or use of personal cars could have a deep and lasting reduction. If by 2050 we could reduce by half the trip demands for commuting and shopping, by half, that would comprise a reduction of almost 25% of the current carbon load. In this economic environment, expecting a massive investment in electric cars is not rational and shared alternative means of transport is both cheaper and easier to institute.

9. **Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

Since the maintaining a personal car can require up to 25% of a household budget and the maintenance of car friendly infrastructure require the majority of town budgets and much of the state's. Parking craters in our small city downtowns prevent smart growth in the towns. Reduction in the demands for all of these provisions provides obvious savings. Providing convenient transport options for our growing population of seniors is an obvious benefit, as is providing capacity to the large number of Millennials who want to live less car dependent lives, and find that such living is not possible in Vermont.

10. **Decision-makers necessary for this proposal to be adopted or move forward** (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.) This proposal needs support from the Governor and the legislature to provide both the proof of concept funding for initial demonstration projects as well as the direct support of rebuilding the failing spur railroad lines that could carry inter town local rail.

11. **Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

The overall strategy is to provide direct support for local groups who wish to push the envelope beyond current bus and car transportation modes even when most of the state is still convinced that the personal auto is the only possible rural transport option. The state has to get imaginative about the possibilities of inter city rail transport and start imagining the carrot and stick options that would allow it to develop. Intercity rail could reduce thousands of car trips a day for commuters and local shared use smart jitneys could provide the same savings in each small city's daily car traffic demand. Because the VTrans bureaucracy can only imagine continuing the current road and bus systems the state as a whole is incapable of acting. This proposal requires inviting in visionary local groups to help fashion new approaches. Already groups like All Earth Rail and the Sustainable Montpelier Coalition are attempting to provide alternative ideas but without serious consideration by the Administration and the Legislature little will be able to happen.

12. **Timeline:** To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some "game changers" that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

This approach is totally dependent on the Administration and Legislature providing the bureaucratic support and funding access for developing pilot projects. With rapid support we could have operational models up and running by 2020 which could provide all parties enough operational and financial data and public feedback to fashion a rapid response build out to achieve broad institution by 2025.

Written Submission 4

Regional Market-based Strategy Assessment to Reduce Transportation
Emissions in the Northeast

1. **Pitch Submitted by:** Sara Forni, Senior Manager of Clean Vehicles at Ceres
2. **Email:** forni@ceres.org
3. **Phone:** 617-247-0700 ext. 216
4. **Pitch Title:** Regional Market-Based Strategy Assessment to Reduce Transportation Emissions in the Northeast
5. **Pitch Summary:** Vermont's 2016 Comprehensive Energy Plan (2016 Plan) notes that the state cannot meet its energy use and emissions reduction goals without transforming how it powers its vehicles. The state's transportation fuels account for the single-largest portion of Vermont's total energy consumption, and fossil fuels are the main source of that energy. Given the size of the state, it will be difficult to make such a transformation in the absence of a regional effort. To consider how Vermont could cost-effectively reduce emissions, and continue to grow Vermont's economy, Ceres proposes to undertake a regional assessment for Governor Scott and the newly formed Vermont Climate Action Commission. This assessment would be independently funded. The assessment would be based on the 2016 Plan and would:
 - Explore the economic and environmental benefits of implementing a regional market-based strategy to reduce greenhouse gas emissions from the transportation sector, achieving rapid deployment of electric vehicles and increasing availability of advanced liquid and/or gaseous biofuels.
 - o Consider the pros and cons of a Vermont-based program versus a regional program as well as the benefits for Vermont and other participating states in a regional program.
 - Evaluate the various market-based design options, the associated environmental benefits, economic costs and benefits for all Vermonters and Vermont businesses, and opportunities to return benefits to all consumers.
 - Outline the regulatory measures in Vermont that would be necessary to support these options.
 - Take advantage of Vermont's chairmanship of the New England Governors' group to explore a regional framework for achieving these transportation goals across the region.

The completed assessment would provide the essential foundation for Vermont to support the implementation of a regional market-based program for the transportation sector.

6. **What energy sector(s) does this Pitch apply to:** Transportation, electricity
7. **Which criteria category(is) does it address:** Economic activity, affordability, and vulnerable Vermonters
8. **Scale of impact on Vermont's energy and climate goals:** This assessment would start from the conclusions of existing studies that in order to meet Vermont's climate goals, significant transformation in the transportation sector must occur. For example, the 2016 Plan sets a goal of 10% renewable energy in transportation by 2025, on the way to at least 80% by 2050. Thus, the assessment would consider the corresponding emission reduction that would be required to meet such goals and the emissions reduction opportunities of a regional program.

4. **Benefits/costs of this proposal for Vermont Businesses and Vermonters:** As noted above, the assessment would compare the emissions reduction opportunities and economic benefits of implementing a regional market-based strategy for the transportation sector, including the implications for the current gasoline tax. For each policy option, it would compare the associated environmental and economic costs and benefits for all Vermonters and Vermont businesses, and identify opportunities to return benefits to all consumers.
5. **Decision-makers necessary for this proposal to be adopted or move forward:** Based on the assessment, the Governor, legislature, state environmental regulators, and stakeholders will have the necessary information to evaluate policy opportunities that will help develop and shape a regional program to reduce emissions from the largest contributing emissions sector – transportation. The assessment will help Vermont meet its climate goals and identify opportunities for economic benefits to the state and its consumers. Given Vermont’s leadership role in the Coalition of Northeastern Governors (CONEG), Vermont can play a critical role in undertaking this assessment and convening strategic discussions to consider the potential implementation steps.
6. **Strategy and key conclusions:** In addition to the assessment strategy outlined above, it is important to note that the policy options considered would not be limited to only identifying current politically viable options. The politics of implementing a carbon reduction framework will remain challenging; however, the assessment will identify means to mitigate expected concerns surrounding the implementation and legal and regulatory requirements of a market-based program for the transportation sector.
7. **Timeline:** To achieve Vermont’s 2025 target, a policy is needed to shift emissions significantly for the transportation sector. The assessment would be completed within 12 months, with the goal of having a regional transportation framework adopted by 2020 to help establish the long-term business certainty and investment drivers needed to shift the emissions trajectory. While the transportation sector generally responds slowly to new policies, implementing a policy framework is a critical step.

Written Submission 5

Drift Marketplace – Distributed Asset Ownership Platform

Vermont Energy & Climate Summit

Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):** Drift Marketplace, Inc.
2. **Contact Email Address:** Thomas@joindrif.com
3. **Contact Phone Number:** 802-430-7114 (O) 302-561-5771 (M)
4. **Pitch Title:** (one line) Drift Marketplace and the Distributed Asset Ownership Platform: shifting production, asset ownership and revenue to the “Prosumer”.
5. **Pitch Summary:** (one paragraph) Drift Marketplace streamlines electricity purchases through a SaaS peer-to-peer network using artificial intelligence and high-frequency trading methods to balance electrical supply and demand between customers and devices of all types, in real-time removing inefficiencies from the current wholesale power market structure and passing the resulting savings on to consumers. By factoring in variables, such as the individual customers historical usage, zip code microclimate weather data estimates, real time grid operational parameters; energy is intelligently distributed, stored and dispatched from its network of peer-to-peer energy nodes to deliver power to its consumers at substantial savings over utility rates, with multiple added benefits, including participation in the value of the DER assets. Drift (a FERC Load Serving Entity) operates as a Distributed Independent System Operator (“d/ISO”) integrated within the larger wholesale market. For its supply of energy, Drift secures a multitude of independent power producers in its network that range from hydroelectric dams, solar-plus-storage projects, wind farms, PV recharging stations, residential storage devices and large commercial building management systems. Additionally, Drift is creating a Distributed Asset Ownership Platform (“DAOP”) to revolutionize the acquisition, financing and deployment of distributed energy resource assets vesting ownership and revenue from the sale of excess power through the d/ISO in those that generate the need for the asset – the *Consumer*. This economically aligns the consumer to the marketplace through asset ownership, driving prices down, fostering faster deployment of clean intelligent energy, vitalizing local communities, creating jobs, and democratizing energy.
6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal
7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other – All of the Above
8. **Scale of impact on Vermont’s energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations. Drift has neither undertaken a detailed cost benefit analysis, nor an interpretation of the Drift program in application to the specific impact on Vermont’s energy and climate goals. The acceleration of technologies, entrepreneurship, and consumer demands for choice unprecedented since the mid-1990’s with the emergence of the Internet, the vast array of hardware/software infrastructure, communication tools, bandwidth, artificial intelligence and the computing power of “big data” now available make for a complicated calculation. What we do know is that in 20 years we will have access to energy sources, products and services unimaginable today. One could not have envisioned a smart phone when the landline and dial-in modem were the way to be ‘connected’. Drift’s program anticipates those future sources, products and services.

- 9. Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental. Drift’s business model is not based on a markup of energy commodities, but rather a model that minimizes the financial, bureaucratic, and administrative overhead associated with the delivery of energy with a resulting savings to members. A modest membership fee allows the small consumer to gain price parity with a large commercial organization, and leverage the overall consumer base benefits from an aggregate energy demand and generation management. Functionally, this provides members access to tools that will allow them to participate in the wholesale power and advanced DER marketplace, both as consumer and/or producer (which we call a “Prosumer”). Therefore, there is no built-in incentive to charge more than the lowest possible cost for the energy, no matter the volume. This allows all members from small to large to have the same purchasing power and does not incentivize an increased energy demand to generate profits. Drift’s marketplace member fee provides access to the following services:
- ☐ Dashboards detailing pricing, payments, usage information and documentation.
 - ☐ Aggregate purchasing, scheduling, and settlements of wholesale energy across a wide pool of consumption types.
 - ☐ Energy management and information systems from individual to large commercial operations.
 - ☐ Access/integration to shared DER generation, including member-owned generation and storage assets.
 - ☐ Selling aggregated ancillary services to the grid through the DM Platform.
 - ☐ Invest in DER projects to modernize the grid.
 - ☐ Access to a growing number of products and services that are intergraded into the DM platform.
 - ☐ Invest in grid-tied DER generation and battery storage.
 - ☐ Behind the meter generation and storage.
- 10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)** Drift believes that its SaaS, i/DSO and DAOP Programs compliment the primary recommended strategies for electric power in the VT 2016 CEP, which include, but are not limited to: Manage electric load using active means, including new control technologies in concert with expanded access to and adoption of smart rates; Strive to lower both energy bills and electric rates; Engage actively in regional (and local) grid planning and policymaking, recognizing the significant impact that regional choices can have on Vermont; Maximize opportunities to encourage siting of renewable energy on the built environment, in already disturbed areas, or co-located with other uses in order to minimize conflicts with other land uses and users; Take advantage of opportunities to incrementally transform our utility regulations to reflect the reality of distributed energy resources and an integrated grid. The CEP explicitly welcomes innovation and entrepreneurship by utilities and their partners. Drift has gathered a team of entrepreneurs, technologist, engineers, legal, and financial experts to disrupt the status quo and deliver on the promise of the *Trusted Energy Economy*. As we have seen with other industries; transportation (Uber), accommodations (AirBnb), and merchandizing (Amazon) there is a fundamental shift in restructuring the energy sector in progress. This process will involve the Executive, Legislature, Utility, Regulators, Community, Business and Individuals (“Stakeholders”).
- 11. Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward. The new intelligent energy network will embrace every facet of life; homes, offices, factories and vehicles continuously communicating with one another sharing information and energy on a 24/7/365 basis. It is necessary to create an energy system that meets the changing expectations of consumers and society for the coming decades a high-performing, customer-focused electricity system that is efficient, flexible, resilient, reliable, affordable, safe, secure and clean. A successful transition to a 21st Century Electricity System requires careful consideration of a range of interrelated issues that will ultimately redefine the regulatory framework and utility business model while creating new opportunities for third-party providers and customers to contribute to the operation of the electricity system. The new energy paradigm will still allow big business to participate!

The opportunity; however, is counter intuitive - Utilities will have to aggressively move into a new business model managing other people's energies, helping them optimize energy usage, financing technologies, manufacturing and providing services to the various components and processes in this new energy regime.

What barriers—especially regulatory— currently prevent single energy storage systems or aggregated fleets of systems from providing multiple, stacked services to the electricity grid, and what are the implications for major stakeholder groups?

For Regulators

1. Remove barriers that prevent behind-the-meter resources such as battery energy storage from providing multiple, stacked services to the electricity grid that benefit all stakeholder groups, including customers, ISOs/RTOs, and utilities.
2. Require that distributed energy resources (including storage) be considered as alternative, potentially lower-cost solutions to problems typically addressed by traditional “wires” investments and/or centralized peaking generation investments.
3. Across all markets, require utilities to use a standardized, best-fit, least-cost benefit methodology that compares energy storage providing a full suite of stacked services with incumbent technologies.
4. NREL found that permitting and interconnection ranked among the most significant of the non-hardware cost barriers to PV+storage deployment.

For Utilities

1. Restructure utility business models and rates to reflect the value that storage can provide to the grid via temporal, locational, and attribute-based functionality, making utilities indifferent to the distinction between distributed and centralized resources.
2. Prior to considering new centralized assets, look first for opportunities to leverage existing assets, such as storage, via stacking of uses; provide education so that distribution planners, grid operators, and rate designers can work together to leverage storage's full suite of capabilities.

For the Research Community

1. Develop a widely recognized modeling tool or a consistent methodology and approach capable of comparing, on an equal basis, the net cost of stacked services provided by energy storage and other distributed energy resources as compared to incumbent technologies such as combustion turbines and traditional infrastructure upgrades.
2. Develop a detailed state-by-state roadmap that specifically identifies policy and regulatory changes that must be adapted or revised to enable widespread integration of energy storage and other distributed energy resources.

For Storage and Distributed-Energy-Resource Developers

1. Pursue business models that fully utilize storage.
2. Pursue cost reduction efforts for all power-focused elements of energy storage systems (all \$/kW components) in order to unlock more energy storage markets.
3. Collaborate with utilities and regulators to help them understand what values distributed energy storage can provide and what new utility business models will be needed to scale them.

To support this transition, **Advanced Energy Economy (AEE)** has prepared issue briefs that are intended to be a resource for regulators, policymakers and other interested parties, as they tackle the various issues arising in the rapidly evolving electric power regulatory and business landscape.

- Advanced Metering
- Access to Data
- Optimizing Capital and Service Expenditures
- DER Ownership
- Energy Efficiency as a Resource
- Performance-Based Regulation
- Rate Design for a DER Future
- Community Choice Aggregation

12. **Timeline:** To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

Goal: The creation of efficient, cost-effective, accessible grid platforms for new products, new services, and opportunities for adoption of new distributed technologies; Ensure optimal utilization of electricity grid assets and resources to minimize total system costs; Facilitate comprehensive, coordinated, transparent, integrated distribution system planning.

2018 - Phase I: Evaluation:

- A. How do VT utilities currently plan their distribution systems? Establish a baseline understanding of our utility planning processes
- B. What does each utility’s current distribution plan look like and assume? Understand the current state of plans and investments
- C. How to augment the utilities’ planning processes to advance grid modernization? Provide stakeholders an opportunity to identify potential improvements in planning processes
- D. Evaluate cost efficient non-wires alternatives to proposed investments, including DER provided services
 - Link to regulatory processes such as interconnection standards and DER valuation analysis
 - Increase transparency of utility investments and grid needs
 - Improved Integrated Resource Plan Inputs Launch and Stakeholder Workshops
- E. Proactively address the accelerating change at the distribution level: technologies, customer demands, growth in DERs through legislation, regulatory and utility adoption and participatory incentives (use carbon dividend and private business)

2018 -2019 - Phase II: Launch Implementation:

- A. Adopt Definitions and Principles. Identify specific actions, technologies, and policies that could support and enable grid modernization.
- B. Initiate Distribution investments (utility, public and private) flexible, resilient grid and meet customer needs under a range of futures
- C. Identify “Champion Community” to act as accelerated proof-of-concept/demonstration community (Pop. ~10,000 – multiple RE sites, businesses and residences available for participation – grid islanding possible)

2019-2020 – Phase III: Integrated Distribution Planning (On-Going)

- A. Establish Community Planning Requirements at multiple sites and communities (15 Communities) through Stakeholder Input on Process, possibly through Community Choice Aggregation

Tasks:

Commission - Community - Stakeholders:

Build a knowledge base of the utilities’ distribution systems and the investments being made/projected with complete transparency.

Become familiar with advanced grid technologies and various DERs

Build a framework for guiding Commission actions and for engaging stakeholders

Seek a diversity of perspectives to inform the Commission, Community and the Stakeholder

Engage outside expertise to help evaluate what we learning/missing

Distribution planning should iterate over - near, mid and long-term objectives for these plans.

Written Submission 6

Preference vs. Proximity

1. **Pitch Submitted By:** The Green Lantern Group
2. **Contact Email Address:** samc@greenlanterndevelopment.com
3. **Contact Phone Number:** 802-324-6862
4. **Pitch Title:** “Preference versus Proximity”
5. **Pitch Summary:**

Act 174 provides Town planners with the opportunity to designate certain sites as “preferred” for renewable energy development, based on environmental, aesthetics and other local criteria. But the 2017 5.100 net metering rules include a definition of a renewable energy “plant” to be one which is not sited within close proximity of another plant. This definition prevents multiple solar arrays from being located on a preferred site, which defeats both the concept of preferred siting and restricts progress on “90 by 2050”. The legislature and the Public Utility Commission should amend 5.100 to permit net metering solar arrays to be sited within close proximity, so long as they are on land designated by the Town as “preferred” for solar siting. This could also help vulnerable Vermont farmers to lease more of their land for solar, generating revenue to promote their financial sustainability and farm viability.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**

- Energy Efficiency
- Electricity**
- Transportation
- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**

- Economic Activity**
- Affordability
- Vulnerable Vermonters**
- Other

8. **Scale of impact on Vermont’s energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

This is hard to quantify, because Town plans and knowledge of available preferred sites for solar development (number and size) is not known. Under the assumption that most preferred sites for solar will be larger than 4 acres in size, given the nature of the town planning process, it is reasonable to estimate that at least twice as many 150 -500 KW solar arrays could be located in preferred site locations than will be case under current net metering rules. This would all happen before 2025.

9. **Benefits/costs of this proposal for Vermont and Vermonters**: Including, where possible, economic, financial, social, and environmental.

Benefits:

Economic: Vulnerable Vermont farmers whose land might be designated as “preferred” for solar siting would have opportunities for multiple land leases. Assuming an approximate lease payment of \$2,500/acre/year for 25 years, a farmer leasing land for two 500 KW arrays (about 8 acres) could generate \$20,000/year for 25 years, or \$500,000. Multiply this by the likely number of farms with preferred sites for solar development, and the economic benefits quickly go into the tens of millions of dollars.

Economic: increasing opportunities for net-metered solar development will increase/maintain employment in the renewable energy industry.

Environmental: if (8) above is a reasonable estimate for scale, then there could be a doubling of greenhouse gas emissions reductions than will be possible under current net metering rules.

Aesthetics: siting more solar arrays in preferred sites will reduce the negative aesthetic impact of solar arrays perceived by some Vermonters, assuming towns consider aesthetics as part of their criteria for designating sites as “preferred”. This will have an additional benefit of reducing general public opposition to solar development as antithetical to VT tourism and scenic landscapes.

Economic: siting multiple arrays in close proximity could generate the scale required to finance 3-phase line extensions, the lack of which are a significant constraining factor on expanded renewable energy generation.

Costs:

Financial: Utilities may argue that expanded net metering threatens their ability to keep electricity rates stable, given that the renewable energy attributes of solar generation (RECs) plus a preferred siting designation result in a net metering credit value that is 4 cents/kWh greater than the residential retail cost of electricity. As a potential measure to offset this, solar developers of multiple arrays in a preferred site designation could be required to include battery storage as part of their project, so that renewable energy is discharged during peak electricity demand, reducing utilities’ demand and capacity charges.

10. **Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)**

Legislature, Governor, Public Utility Commission

11. **Strategy and key considerations**: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

Barriers: utilities are likely to oppose this proposal, and argue that this promotes a “salami tactic” of dividing up a 1 MW or larger solar array into multiple <500 KW solar arrays, so as to qualify for net metering and benefit from higher net metering rates. This could be prevented by specifying minimum time intervals between project construction, separate ownership and

financing arrangements, etc. Some use of common infrastructure, such as access roads and inter-connections, should be permitted to create economies of scale, reduce land disturbance, and minimize aesthetic impacts.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

Decision-makers could make this change by June 2018, and with implementation to follow as soon as towns complete their revised town plans (with preferred siting designations) as part of Act 174.

Written Submission 7

Charge for Parking

Richard Watts: October 20, 2017

Charge for Parking

Currently transportation is the largest contributor to Vermont's GHG emissions. More than half of that is Vermonter's driving around in our personal vehicles.

In this proposal I advocate for a research-based approach to reduce the overall pie, rather than switch the fuels used in that pie.

I liken this to the nega-watt or efficiency approach in electricity. The cheapest, cleanest watt of electricity is the watt not used. In this case, the cheapest, cleanest (and safest and healthiest), is the mile not driven in a motor vehicle – the nega-mile.

Even in rural Vermont, according to an analysis by the TRC, 39 percent of all trips were less than two miles and one-quarter were less than a mile (TRC Energy Report, page 11). While most of those trips today are in a car, we can capture more of those trips by walking, cycling, public transit, car-sharing with effective public policy.

Here I propose one very narrow approach to this, based on the research. The overall idea is for employers to work with their employees to develop transportation policies that incentivize car alternatives (walking, cycling, transit, ride-sharing) and dis-incentivize the car. All of this done in a thoughtful, reasonable way that does not penalize those without options.

There is a large menu of these TDM programs to choose from, including the RE-WIRE program that looks at total carbon budget and some of those done for hill institutions with the support of CATMA.

However, these can only work if parking costs money. Take Champlain College where we are today, they have successfully moved cars off campus and to an interceptor lot. Or UVM, where I work, about 50% of faculty and staff drive to campus every day. We can do better, but that is better than most institutions in VT. Parking is a percent of your salary and all bus rides are free and employees are guaranteed free taxi ride homes if needed.

The positive impact on the transit system is an auxiliary benefit. Every additional rider on transit (free for UVM employees and students) helps transit expand options.

But it has to start with charging for parking. And making it less convenient to drive your car while providing real alternatives that work.

Written Submission 8

Time of Sale Energy Improvements

Vermont Energy & Climate Summit Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Chuck Reiss, Reiss Building and Renovation, Building Performance Professionals Association (BPPA) Board Member

2. **Contact Email Address:**
vbrreiss@gmavt.net

3. **Contact Phone Number:**
(802) 238-7802

4. **Pitch Title:** Time of Sale Energy Improvements

5. **Pitch Summary:** Build on Vermont's voluntary building energy labeling efforts (Vermont Home Energy Profile) to progressively implement requirements over time. Begin with requiring sellers to provide information on energy efficiency programs and resources at the time of listing of a property (pass S.118 from 2017). Then, if inadequate uptake within two years, a trigger mechanism could go into effect that requires a rating or audit at time of listing. If a rating or audit don't result in meeting established goals within two years, require energy upgrades within one year after the purchase of a building). Over time, as building change hands, eventually all buildings are upgraded.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

8. **Scale of impact on Vermont's energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

Vermont needs to upgrade our buildings at a rate of 12-15,000/year to meet our thermal goals. Currently, we are weatherizing less than 2,000/year. With 5-7,000 homes changing hands each year, this is a missed opportunity to inform home buyers and sellers of available programs and resources, encourage them to weatherize their homes, put energy

performance on the table as part of the buying and selling process, and take advantage of long-term (30+ year) affordable mortgage financing to leverage to upgrade homes.

- 9. Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

Significant energy savings, job creation and environmental benefits will accrue from weatherizing 5-7,000 homes a year, if made mandatory.

- 10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)**

- The Vermont Legislature should pass S.118 (just the disclosure piece of the bill requiring the handout of information at the time of signing of a Purchase and Sales Agreement;
- Efficiency Vermont will need to support these activities;
- Building Performance Professionals Association (BPPA) should support contractors and workforce development;
- Vermont Realtors are supportive of S.118, but will oppose any mandatory requirements. Reach out to the Realtors to offer to partner and provide them with an opportunity to meet the goals that set off the triggers to forestall them, if they can provide an alternative proposal.

- 11. Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

- If there is not significant uptake from this distribution of information for buyers weatherizing their homes after two years, then a trigger mechanism should go into effect that requires that energy information (a Home Energy Profile, Home Energy Rating, BPI Energy Audit, approved energy checklist or other comparable information by a certified energy professional).
- If energy information alone is not significant in motivating homeowners to weatherize their homes after three years, then a trigger mechanism should go into effect that requires some minimum level of energy improvements within one year of the purchase of a home.
- Reference similar laws in Portland, OR and Berkeley, CA.
- Reach out to the Vermont Realtors to work with them to implement.

- 12. Timeline:** To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

- The mechanisms and resources are in place to implement this in 2019.

Written Submission 9

Preparing Vermont Cities and Towns for the Transition to Electric
Vehicles

1. Pitch Submitted By (Your Name or Organization):

Ben Jervey, Clean Transportation Team leader, Institute for Energy and the Environment at Vermont Law School

2. Contact Email Address:

bjervev@vermontlaw.edu

3. Contact Phone Number:

802-282-3071

4. Pitch Title: (one line)

Preparing Vermont's cities and towns for the transition to electric vehicles.

5. Pitch Summary: (one paragraph)

The electrification of personal vehicles is underway. Municipalities must take action now to both accelerate the adoption of electric vehicles (EVs) by their citizens and to prepare for the inevitable market shift and make the transition as easy as possible for all Vermonters. There are a number of policies and incentives that cities and towns can implement to prepare for and catalyze EV adoption, however very few municipalities are integrating these policies into laws, rules, and town plans. Vermont cities and towns need clear guidance—through a policy roadmap or guide, and through coordination with regional planning commissions and local community organizations—to integrate EV-ready policies at the municipal scale.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- Energy Efficiency
- X-Electricity
- X-Transportation
- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- Economic Activity
- X-Affordability (EV ownership of currently available economy class models is cheaper over life cycle of vehicle)
- Vulnerable Vermonters
- X-Other (Provides solutions for all Vermonters to reduce their carbon impact and save money.)

- 8. Scale of impact on Vermont’s energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

Transportation is responsible for nearly half of Vermont’s greenhouse gas emissions, the vast majority of which come from personal vehicles. Meanwhile, the Comprehensive Energy Plan sets a goal of 10% of Vermont’s vehicle fleet to be powered by electricity by 2025. While the shifting market alone will help get Vermont a long way towards that goal, smart municipal policies can both help accelerate the transition and, critically, ensure that residential and commercial properties are prepared for the charging infrastructure necessary to handle such widespread electrification.

- 9. Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

The benefits of municipalities planning for the EV transition are considerable. If cities and towns aren’t prepared for their citizens to who will soon need to “plug in” their vehicles overnight, it could severely hamper the rate of EV adoption in residential areas where residents don’t have access to garages or driveways with electric outlets. According to a recent nationwide study, more than 80% of EV charging is done at home. If residences—and particularly residences that aren’t single family homes—are not prepared for this behavior, fewer Vermonters will be willing to replace a gas-powered vehicle with an EV.

There are no immediate financial costs for municipalities to consider and implement these policies. Some may generate marginal costs for property owners, landlords, or developers, such as a zoning provision that mandates a certain number of parking spots must be EV-ready in public lots, or building code that requires multi-family residential buildings are wired to be ready for EV chargers when residents want to install them. However, these costs are small compared to the costs of retroactively installing charging infrastructure—running conduit and cable—after a building has already been built or renovated.

- 10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)**

The Clean Transportation Team at the Institute for Energy and the Environment at Vermont Law School is currently working on a policy roadmap to help cities and towns become EV-ready. The report will include descriptions of various policies and incentives available, case studies and best practices from around the country, the first comprehensive catalog of municipal-level EV policies nationwide, and model codes and ordinances.

To help coordinate city and town efforts, we would ideally engage the eleven Regional Planning Commissions, as well as community organizations that work on sustainability and planning.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

This plan is carried out in two parts. First, the Clean Transportation Team at the Institute for Energy and the Environment will complete the comprehensive municipal EV policy roadmap. The lessons and models included therein can be used by Vermont cities and towns to adopt and implement the policies and incentives that make the most sense in their communities. The second part of the strategy involves engaging the Regional Planning Commissions and other regional community organizations to help coordinate with individual municipalities. Regional Planning Commissions have established relationships with town and city planners, and many community organizations (such as Vital Communities in the Upper Valley and ACORN in Addison County) already work closely with town energy committees. They established relationships can help get the critical resources into the hands of municipal policymakers.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

This plan is low cost, low commitment, and ready to implement. By the end of 2017, the municipal EV policy roadmap will be complete, and the Clean Transportation Team at the IEE will be ready to work with Regional Planning Commissions, community organizations, and cities and towns to educate and begin implementing EV-friendly policy.

Written Submission 10

Vermont Medical and Health Professionals Call for Climate Action

Vermont Energy & Climate Summit Pitch Submission Form

Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. **Pitch Submitted By (Your Name or Organization):** The Vermont Climate & Health Alliance (vtcha.org)

2. **Contact Email Address:** dan@solavida.org

3. **Contact Phone Number:** 802.760.7400

4. **Pitch Title:** Vermont medical and health professionals calling for action on climate change.

5. **Pitch Summary:**

We are physicians, nurses and other medical/health professionals who share a deep concern about climate change and its impacts on our patients, our children, and our communities. Our mission is to use our expertise to inform the public and our lawmakers about the staggering effects climate change will have on human and animal health. We would like the input of the folks at this meeting on how we can best help push a far more aggressive policy response in Vermont. We seek to move Vermonters off the sidelines and bring more people into the discussion, helping legislators to move forward.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**

All (Total Energy)

7. **Which criteria category(ies) does it address? (Check all that apply):**

Economic Activity

Vulnerable Vermonters

8. **Scale of impact on Vermont’s energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.
9. **Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

From the medical and health perspective, the two economic issues are: (1) the avoided cost of dealing with the health impacts of climate change, and (2) the economic co-benefits inherent in some of the solutions (e.g, far more people using bikes in urban areas, reduced consumption of meat, etc.)

10. **Decision-makers necessary for this proposal to be adopted or move forward (e.g.,** Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)
11. **Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

As is true with many fundamental issues Americans face, the discussion of climate change has been badly distorted by groups that have successfully undermined the trust people used to have in scientists, academics, and non-partisan think-tanks. One of the core tenets of our strategy is that medical and health professionals still hold a unique and powerful position in our communities.

The goal is to move the many, many Vermonters who believe climate change is real, but who are not making their voices heard. The discussion of climate change takes on a different hue when we talk about what is in store for our kids ... and everyone else’s kids. Furthermore, the elderly, the chronically ill, and the poor will be hit first and hardest by the impacts of climate change. By highlighting these ideas, we will bring more people into the public discourse.

12. **Timeline:** To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

Written Submission 11

Triple R Bundle – Replace, Reduce, and Renewable

Vermont Energy and Climate Summit
“Meeting Vermont’s 2025 Energy & Climate Goals”

Pitch Submission Form

1. Pitch Submitted By (Your Name or Organization):

Vermont Gas Systems, Inc.

2. Contact Email Address:

tmurray@vermontgas.com

3. Contact Phone Number:

865-1430

4. Pitch Title: (one line)

Triple R Bundle-Replace, Reduce and Renewable

5. Pitch Summary: (one paragraph)

Today, Vermont Gas (VGS) plays a vital role in reducing the state’s GHG emissions and we will play a significant role in achieving the 2025/2050 goals. VGS’ Triple “R” Pitch (Replace, Reduce and Renewable) focuses on combining our services in an innovative manner that will maximize the climate benefits. First, by REPLACING fuel oil and propane heating in roughly 900 homes/yr. with cleaner, more affordable natural gas VGS will reduce carbon emissions by over 21,000 metric tons by 2025 and save consumers over \$5m. Second, through our nationally recognized efficiency program we will REDUCE customers’ energy consumption by an additional 570,000 MMBtu through 2025, reducing GHG emissions by over 30,000* metric tons and saving consumers over \$6m. And finally with RENEWABLES and VGS’ first in the nation, renewable natural gas program (“EcoGas”) we will be utilizing VGS’ infrastructure to deliver renewable energy from local farms and reducing GHG emission by over 73,000* Metric Tons. In aggregate, these measures will reduce GHG emission by over 125,000 Metric Tons* by 2025, certainly a significant amount, and one that merits strong consideration by the Governor’s Climate Commission. The two areas where aggressive policy could accelerate the progress of the Triple R is by incenting additional renewable natural gas digesters and by assisting large vehicle fleet conversions (ex. buses, snowplow and refuse trucks) to renewable natural gas powered vehicles.*

**Accumulated Carbon Savings*

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- Energy Efficiency
- Electricity
- Transportation

- X Thermal Heating &/or Cooling
- X All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- X Economic Activity
- X Affordability
- X Vulnerable Vermonters
- Other

8. Scale of impact on Vermont’s energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

Triple R Carbon Reductions	
Replace (converting Oil/Propane to NG)	
Total Carbon Savings from Replacing Oil/Propane with NG (Metric Tons)	(21,161)
Reduce	
Total Carbon Reductions from Efficiency Savings (Metric Tons)	(30,880)
Renewable	
Total Carbon Reductions (Metric Tons) from EcoGas	(73,251)
Total Carbon Reductions (Metric Tons) 2017-2025	(125,292)

See Attached Spreadsheet for detailed calculations.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

*By 2025, VGS’ Triple R solution will result in over \$5m in savings for customers who **replace** their more costly, unregulated and volatilyly-priced fuels. An additional \$6m will be saved by customers who **reduce** usage through our efficiency program by installing more efficient equipment and insulating their homes. And customers who choose to invest in **renewable** EcoGas will be contributing directly to developing waste-to-energy projects that have enormous climate benefits.*

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

VGS’ Triple R proposal as put forth does not require any formal legislative or regulatory changes and we request the Climate Commission formally adopt our proposal as one of the key strategies toward achieving the 2025 and 2050 goals. We do believe that additional opportunities exist to develop more renewable natural gas projects and suggest that VGS work with state agencies to develop specific strategies to foster this industry; strategies could

include grant funding, financing, cost recovery and leveraging phosphorous reduction projects. While no specific enabling legislation is required to implement the bundled Triple R strategy, legislation specifically allowing the recovery of development costs related to in-state renewable natural gas facilities may accelerate the pace of development.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

The overall strategy of the Triple R campaign will be a laser-focused, eight year effort to bundle the replace, reduce and renewable themes to deliver real, measurable results by 2025. VGS' infrastructure is a vital tool for Vermont's vibrant economy, driving business retention/growth and delivering affordable energy for our homes. Combine these assets with renewable EcoGas and we can now leverage our system in new innovative ways. Today the current state policy assumes that renewable electrification is the only plausible path to achieve the state's goals, our proposal puts forth a realistic and affordable path, one that can become a national model for transitioning the use of natural gas infrastructure in a low carbon world. We believe that the concepts put forth in the Triple R pitch can complement the electrification efforts and EcoGas can maximize the environmental value of customers' existing equipment.

Policies that accelerate additional renewable natural gas digesters will drive more progress and allow for fueling of large vehicle fleets with renewable natural gas. We believe funding should be dedicated to maximizing this innovative renewable opportunity. Digesters at farms and waste treatment plants can produce energy, tackle our lake restoration challenge and address the new composting mandate. In the transportation sector, compressed natural gas vehicle, powered by renewable EcoGas can help solve the vexing carbon/NOx issues for larger trucks and buses as well as reducing fuel costs; funding sources like the VW Settlement funds could accelerate these fleet conversions.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some "game changers" that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

VGS proposed timeline for the Triple R launch is early 2018 as part of the comprehensive effort to achieve the Climate Commission's goals. We believe our EcoGas, renewable natural gas is a game changer that will grow significantly in the years to come. EcoGas is an innovative solution and another example where Vermont can lead the national. With EcoGas the carbon savings at the burner tip are significant and capturing/destroying the methane at landfills and farms will more than offset methane emission resulting from our growing customer base.

Written Submission 12

Weatherization Through Solar Contractors

Vermont Energy & Climate Summit Pitch Submission Form

1. Pitch Submitted By (Your Name or Organization):

Russ Flanigan, Building Energy & Building Performance Professionals Association Board Member

2. Contact Email Address:

rflanigan@buildingenergyus.com

3. Contact Phone Number:

(949) 422-1796

4. Pitch Title: Weatherization through Solar Contractors

5. Pitch Summary: Provide discounted home weatherization to customers who have recently completed a solar PV project. Partner with solar contractors to identify customers and promote the opportunity. Work with Efficiency Vermont to develop a set of robust incentives to drive interest and participation. Coordinate efforts with Building Performance Professionals Association (BPPA) and Renewable Energy Vermont (REV) to identify and pair interested solar and weatherization contractors.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- Energy Efficiency
- Electricity
- Transportation
- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- Economic Activity
- Affordability
- Vulnerable Vermonters
- Other

8. Scale of impact on Vermont's energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

This approach could help drive an increase in Home Performance with ENERGY STAR projects by 100-200 or more per year with robust incentives and a reasonable timeframe.

A small replicable pilot in 2017 has initially shown solar and heatpump customers who have not done efficiency work show interest in maximizing their solar/heatpump investment when suggested and offered by their solar contractor.

9. **Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

TBD

10. **Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)**

- Efficiency Vermont
- BPPA
- REV

11. **Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

This effort builds on the successful relationships developed through the EVT and CEED-funded Solar Bonus Program offered in 2017 by BPPA.

12. **Timeline:** To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

This can easily be implemented with short notice, starting in 2018.

Written Submission 13

Energy Efficiency Starts at Home: HEAT Squad Expansion Proposal

1. **Pitch Submitted By: NeighborWorks of Western Vermont**

Ludy Biddle

2. **Contact Email Address: lbiddle@nwwvt.org**

3. **Contact Phone Number: 802-438-2303 x221**

4. **Pitch Title:** Energy Efficiency Starts at HOME

5. **Pitch Summary:**

HEAT Squad, a service of NeighborWorks of Western Vermont, is a one-stop-shop for energy, home repair, health, and safety, aging-in-place assessments and improvements for homeowners. HEAT Squad provides free or low-cost energy audits and then walks homeowners through the entire rehab process, including help finding contractors, working with contractors, financing the projects, and ensuring work is high quality and homeowners are satisfied. HEAT Squad is currently in Rutland, Addison, Bennington, Windham, and Windsor counties, and proposes to expand statewide over the next few years, helping more Vermonters. In this presentation, we will share our success story and our plans for expansion of the HEAT Squad program, and let folks know how they can help, both at the community and state policy level. We respectfully ask for \$250,000/year for five years of state funding to launch our statewide expansion. Current HEAT Squad customers, the majority of whom are earning less than 120% of area median income, are collectively saving \$1.25 M a year and 7.5 M pounds of carbon. HEAT Squad has created more than 62 jobs and, with another \$1M investment, will create 16 more jobs.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**

- X Energy Efficiency
- X Electricity
- X Thermal Heating &/or Cooling

7. **Which criteria category(ies) does it address? (Check all that apply):**

- X Economic Activity
- X Affordability
- X Vulnerable Vermonters

8. **Scale of impact on Vermont's energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

HEAT Squad has completed 1500+ retrofits since 2010 in five counties, approximately a third of all residential retrofits completed in the state since we began. These retrofits are saving 7.5 million pounds of CO₂ per year. More than 60% of our customers earn less than 120% of Area

Median Income, pay as much as 10% of their disposable income on heating, and have challenges maintaining their homes. We know that low-income households are 164% more likely to install efficiency measures after working with HEAT Squad versus working directly with a contractor. In addition, because of an agreement with Efficiency Vermont, our low-income customers also benefit from free replacements for ENERGY STAR appliances and LED bulbs, and efficient heat pump hot water heaters, lowering their electrical bills. HEAT Squad has visited over 4,000 homes the past seven years and educated all of those homeowners about steps they can take to save energy, regardless of whether they complete a retrofit. Because NeighborWorks is fundamentally a low-income housing organization, all homeowners interested in energy savings also enjoy a report and access to help with home repair, health, safety and aging-in-place measures specific to their homes. These outcomes are a result of our work in five Vermont counties over the past seven years. Our hope is to scale up further and work statewide, so that we can impact more Vermont home owners to reduce energy usage, dependence on fossil fuels, and to improve the housing stock across the state. With adequate funding for labor intensive work required to encourage and enable low and moderate households to engage in complicated but valuable retrofit work, HEAT Squad could engage as many as 300 more households per year to reduce greenhouse gas emissions by 1.5 M pounds of carbon and costs of energy that is a significant burden to Vermont residents.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

Our customers who complete energy retrofits save an average of \$900/year on their energy bills, or in aggregate, about \$1.25 million each year. Our HEAT Squad program has generated over \$9 million in contractor revenue since 2010, and because of this program \$1.2 million has been invested in Vermont communities. According to the IMPLAN economic model, every \$1 million invested in home repair and maintenance results in 16 jobs created and \$615,000 in labor income for a total economic output of \$1.6 million. Our retrofits are saving seven million pounds of CO₂ each year. Efficiency measures also provide significant health benefits to residents, particularly those dealing with asthma, COPD and other respiratory ailments because mold, moisture, rodents, and other triggers to poor health conditions are arrested. Recent studies prove, for example, that asthma-related hospital visits are reduced 25% immediately upon completion of home efficiency improvements. In response to these findings NeighborWorks now has a partnership with Rutland Regional Medical Center, where doctors and medical staff refer patients to us and we assist with home repair and rehab to address health and safety issues, reduce medical costs, and improve health outcomes dramatically.

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

Our policy request is first to adapt current practices and policies to give more attention to efficiency programs aimed at individual homeowners. Individual residences are much harder to do, more labor intensive for less impact per project than the large public or commercial facilities. However, Vermont residents deserve and need to partake in the investment dollars and the potential savings from the efficiency programs. Our pitch, therefore, is a budgetary one. We are seeking \$250,000/year for five years of state funding to launch our statewide expansion. Our decision makers are the legislature and the Governor.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

Expanding into different areas of the state requires up-front investment to develop partnerships, conduct outreach to homeowners, hire staff, and train contractors. Our program has been recognized nationally and is being adopted already in nine counties in Appalachian Kentucky. We want to bring this service to all Vermonters! We have been working for the past year to educate legislators and the administration about the HEAT Squad and our plan for statewide expansion. We have met with some success and interest from all parties. The major barrier is the tight state budget. We have a campaign plan and messaging strategy, and we have been building our cadre of satisfied customers, spokespeople and community partners who will work on our behalf as well.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

We are already working on statewide expansion. HEAT Squad has boots on the ground now and can add more as soon as funding is secured.

Written Submission 14

Replacing Car Trips with E-Bike Trips

1. **Pitch Submitted By (Your Name or Organization):** Local Motion
Supporters: Old Spokes Home, V-Bikes, Skirack, Vital Communities (more signing on soon)
2. **Contact Email Address:** ross@localmotion.org
3. **Contact Phone Number:** (802) 383-8400
4. **Pitch Title: Replacing car trips with e-bike trips for thousands of Vermonters**
5. **Pitch Summary:** Vermonters can significantly reduce fossil fuel consumption by replacing trips taken by cars with trips taken with an e-bike--a game changer for transportation by bike. Considering that trips less than two miles account for 68% of all Vermonters' trips and that 87% of these trips are currently made with an automobile, the opportunity to replace short car trips with trips taken by bike or e-bike is low-hanging fruit with meaningful carbon dioxide reduction results. We propose to motivate thousands of Vermonters to use an e-bike instead of an automobile to travel short distances and to public transit.

We plan to take advantage of Vermonters' growing interest in commuting by bike (226% increase since 2000) through expanding successful existing programs to every corner of Vermont. These programs include statewide bike commuting workshops, free demo hubs for loaning e-bikes and cargo e-bikes, incentive programs that reward commuters for using their bike or e-bike to travel, rebates for purchasing an e-bike, and bike infrastructure improvements such as bike lanes and intersection markings.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**

- Energy Efficiency
- Electricity
- Transportation**
- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**

- Economic Activity**
- Affordability**
- Vulnerable Vermonters**
- Other

8. **Scale of impact on Vermont's energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

(Calculations for numbers below are here: [Note that calcs use the state's 2028 goals](#))

- **2025:** The goal of this pitch is to replace 60 million automobile miles with the same number of bike miles by 2025. We will need to motivate a total of 25,000 people to ride their bike 12 miles per day for 200 days per year across Vermont instead of driving. This will prevent more than 23,000 metric tons of carbon dioxide resulting in about 1.3% of the 2025 goal of carbon reduction within the transportation sector. 25,000 people in a decade is a reasonable goal given that this is only 5% of the number of drivers licenses in Vermont and that 13% of all Vermonters (about 81,000) currently ride a bike.
- **2050:** The goal of this pitch is to replace 120 million automobile miles with the same number of bike miles by 2050. We will need to motivate a total of 50,000 people to ride their bike 12 miles per day for 200 days per year across Vermont instead of driving. This will prevent more than 47,000 metric tons of carbon dioxide resulting in about 1.7% of the 2050 goal of carbon reduction within the transportation sector. 50,000 Vermonters is a reasonable goal given the considerations stated above for 25,000 people. Plus, the climate for riding e-bikes in Vermont is anticipated to be better (i.e. warmer) as we close in on the year 2050.

- The numbers provided account only for bike trips that replace car trips. A significant consideration is the critical role that bicycles play in transport to and from the last mile (or five+ miles) from park and rides and public transit stops. Increased bicycle ridership can facilitate increased car-pooling and transit ridership.

9. **Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

- **Where Possible:** E-bikes extend the distance the average Vermonter can travel by bike, which is an essential benefit in our rural state. Where someone might be hesitant to ride a conventional bike six miles to downtown or the bus stop, an e-bike makes it much easier and faster.
- **Financial:** Driving a car or truck is expensive between the initial cost, maintenance, and ~~pay~~ for fuel--operating an automobile in Vermont costs an average of \$3,580 per year (nearly 7% of the median household income in Vermont). The initial cost of an e-bike is between \$1,500-\$5,000 while annual maintenance costs between \$100-\$300. This is obviously an enormous cost savings for Vermonters. Since e-bikes expand the feasible distance of travel around bus stops, people will be more able to bike to public transit, which will strengthen the public transit system across the state.
- **Economic:** Increasing the prevalence of e-bikes in Vermont is an economic opportunity for the more than 60 bike retail shops across the state. The rollout of this pitch can help transform our recreationally-based bike shops into serious mobility centers. Assuming the sale of 25,000 e-bikes at an approximate average cost of \$2,000 each and 6% sales tax, we could see \$3 million in additional tax revenues. We will also see an increase in jobs at businesses that sell e-bikes. Downtowns that are well equipped for cyclists with good bike parking and safe bike lanes are shown to be more vibrant economically by increasing sales for downtown businesses.
- **Social:** Biking has a positive psychological influence on people--so much so that some psychologists use biking as a therapeutic activity for improving the health of their patients. Biking exposes people to others in their community who they would not likely see when driving an automobile--this will help bring together communities. Additionally, biking is a physically healthier choice for commuting than driving automobiles, which leads to happier people.
- **Environmental:** The amount of carbon dioxide prevented in total and relevant to Vermont's reduction goals is found in the answer for question 8 above. Beyond these results, other pollutants will be prevented by riding e-bikes instead of automobiles including gas and oil leaks, windshield wiper fluid spray, and other fluids.
- **New costs of this pitch (does not include funding already in place)**
 - E-bike Fleets: \$10,000 per demo hub at seven hubs = \$70,000
 - Rebates: \$500 per person for 1,000 e-bikes = \$500,000

10. **Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)**

- Entities involved include non-profit organizations, for-profit businesses, utilities and Government agencies. Additionally, municipalities, the state Legislature, and financial lending institutions could be involved. The majority of this pitch can be completed with limited Government commitments, which often leads to quicker implementation.
- **Program Management:** The actions outlined in this pitch are ideally managed by one organization with particular tasks delegated to partner organizations, businesses, and individuals. For example, if Local Motion is the overall program manager, Local Motion will coordinate the locations and contents of the e-bike demo fleets that are free to use. Local Motion also coordinates the entities (libraries, town rec departments, bike shops, etc.) that manage the day-

to-day operations of each e-bike demo fleet (Local Motion currently manages the day-today operations of our existing free demo fleet). Local Motion currently manages statewide workshops through the Everyday Bicycling Program, so this is another component that is managed by the overall program manager.

- **Funding:** The existing e-bike demo fleet uses Tier 3 funds from the Burlington Electric Department. Other Vermont utilities could also use Tier 3 funds to purchase e-bike fleets for locations across the state as well as for rebates to Vermonters for purchasing e-bikes. Funding to purchase the demo fleets and to provide rebates can also come from Legislative action, other state funds for climate solutions, or programs for low-income residents. VTTrans has been an important partner that provides funds to Local Motion for Everyday Bicycling Project workshops that reach more than 1,000 Vermonters each year; future years of funding will be used to continue and expand Vermonter education on bike commuting and using e-bikes for travel.
- **Bike Infrastructure:** An important factor for increasing e-bike ridership in Vermont is ensuring safe roads for bike travel. VTTrans recently began integrating proactive policies to improve bike infrastructure into projects across the state, which will result in safer roads for both cyclists and motorists. An opportunity to achieve better bike infrastructure at a faster pace is to set goals under the state's Complete Streets commitment (Act 34 of 2011). Working with VTTrans, transportation advocacy groups, municipalities, and regional planning commissions, the state legislature should set concrete goals with an associated timeline for Complete Streets. Furthermore, it is important to include bike parking at public transit locations and park & rides across the state. E-bike commuters especially will need better secure parking options such as lockers and covered racks--these parking needs can be obtained and installed by VTTrans, transit authorities, businesses, and organizations.

11. **Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

The success of replacing automobile trips with e-bike trips is contingent upon ensuring good awareness and education of e-bikes, access to purchasing e-bikes, and Vermonters feeling safe while riding their e-bikes. Each one of these contingencies is addressed in the strategy outlined in this pitch. Briefly, awareness and education of e-bikes is addressed by the free demo fleets, statewide workshops, resources made available online, and promotions run about e-bikes; access to purchase e-bikes is addressed by bike shops selling e-bikes and rebates provided to Vermont residents; people feeling safe while riding e-bikes is addressed by VTTrans policies for current and future reconstruction projects and repainting strategies and by the state's lead on setting goals for Complete Streets.

12. **Timeline:** To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some "game changers" that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

This project can begin expansion and implementation immediately. In fact, the pitch is already in motion on a smaller scale. Using Local Motion's e-bike lending fleet program as a model, other demo hubs and partners can be established within a few months of planning. Rebates can be offered within months, as well. Everyday Bicycling Project workshops will continue to happen while more workshops can be offered with greater capacity.

Improving bike infrastructure, especially along commuting corridors, is already in motion through VTTrans reconstruction projects and local projects. This work can be enhanced by establishing goals of Complete Streets at the state level and associate these goals with a timeline.

Written Submission 15

Vermont Global Warming Solutions Act

1. **Pitch Submitted By (Your Name or Organization):** CONSERVATION LAW FOUNDATION
2. **Contact Email Address:** slevine@clf.org
3. **Contact Phone Number:** 802-223-5992 x.4013
4. **Pitch Title:** (one line) Vermont Global Warming Solutions Act
5. **Pitch Summary:** (one paragraph) & **Summary Sentence:**

Summary:

We've had a good, long "engagement" with cutting carbon emissions. Now it's time for Vermont to "tie the knot" and commit to actually reducing them. Vermont can join other New England states and pass a Global Warming Solutions Act that commits us to reducing greenhouse gas emissions and making measurable progress each year. A clear commitment to reducing greenhouse gas emissions will direct all state actions, including decisions about energy supply, state spending, and transportation, and will translate Vermont's strong goals into real action.

Summary Sentence:

Passage of a Vermont Global Warming Solutions Act to join other New England states in making a firm commitment to reduce greenhouse gas emissions in line with Vermont's goals and take state action to make meaningful progress across all sectors.

6. **What energy sector(s) does this Pitch apply to?** (Check all that apply):
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal
7. **Which criteria category(ies) does it address?** (Check all that apply):
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

8. **Scale of impact on Vermont’s energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

A Vermont Global Warming Solutions Act would turn Vermont’s current greenhouse gas reduction goals, set forth in 10 V.S.A sec. 578, into clear requirements that reduce greenhouse gas emissions 50% from the 1990 baseline by 2028, and 75% by 2050, and require meaningful annual progress toward achieving these reductions. It would provide the benchmark and the yardstick that would guide state actions. This would demonstrate Vermont’s commitment to reducing greenhouse gas emissions, and set us on a clear path to do so. It would also foster innovation in renewable energy solutions, and provide an annual demonstration that Vermont is on target to achieve its carbon cutting goals.

9. **Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.
- The proposal costs nothing. It merely turns Vermont’s goals into a commitment to achieve them.
 - Economic benefits result from fostering the fastest growing sector of the economy and bringing more jobs and innovation to Vermont.
 - It helps the most vulnerable, because it will reduce climate pollution, as well as other harmful pollutants, particularly in poorer neighborhoods.
 - It will help Vermonters move away from fossil fuels by providing more and cleaner choices for energy supply.
 - It will reduce Vermont’s contribution to global warming.

10. **Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)**

The Vermont Legislature needs to pass the law, and Governor Scott needs to sign it.

11. **Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

We would aim to pass this law in 2018. We will build on the strong support for action on climate change, and work with a wide array of environmental, business, energy and public health leaders, and low income advocates. We will highlight the broad economic, environmental, and health benefits from committing to reduce greenhouse gas emissions in line with other New England states.

Barriers include overcoming inertia that the status quo is sufficient or that Vermont alone has little to contribute. Vermont has long been a leader on climate change, but our efforts have failed to achieve the greenhouse gas reductions goals we set over a decade ago.

Vermont agencies would have one year to develop regulations and incentives to facilitate the transformation to reducing greenhouse gas emissions, with the clear guidance that Vermont is committed to these reductions and the level of activity needed to achieve them.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

This proposal is ready for action in the upcoming legislative session. It will support and facilitate all other actions Vermont will take to reduce greenhouse gas emissions.

Following this plan, within two years Vermont will join other New England states in having a solid commitment in place, and the actions already in motion, in each sector to reduce greenhouse gas emissions. A Vermont Global Warming Solutions Act will enable our state to reduce our emissions in line with the goals we established over a decade ago. This is more than the first step. It is the map, the walking stick, the hiking boots and the overall fitness needed to achieve success.

Written Submission 16

Heating Equipment Sales Tax Exemption

Vermont Energy & Climate Summit Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Richard Faesy & Dan Mellinger, Energy Futures Group

2. **Contact Email Address:**
rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. **Contact Phone Number:**
(802) 482-2812

4. **Pitch Title:** Sales tax exemption for wood and efficient fuel heating equipment

5. **Pitch Summary:** Offer a 100% sales tax exemption for qualifying new residential automated biomass heating systems, pellet boilers and stoves, chunk wood boilers and stoves, and efficient fossil fuel boilers and furnaces. Pay for the tax exemption for biomass using CEDF funds and for fossil fuel equipment by applying a surcharge on the sale of any new inefficient (less than ENERGY STAR) fossil fuel based heating system. All existing and new funds are maintained and administered by the Vermont Department of Taxes.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

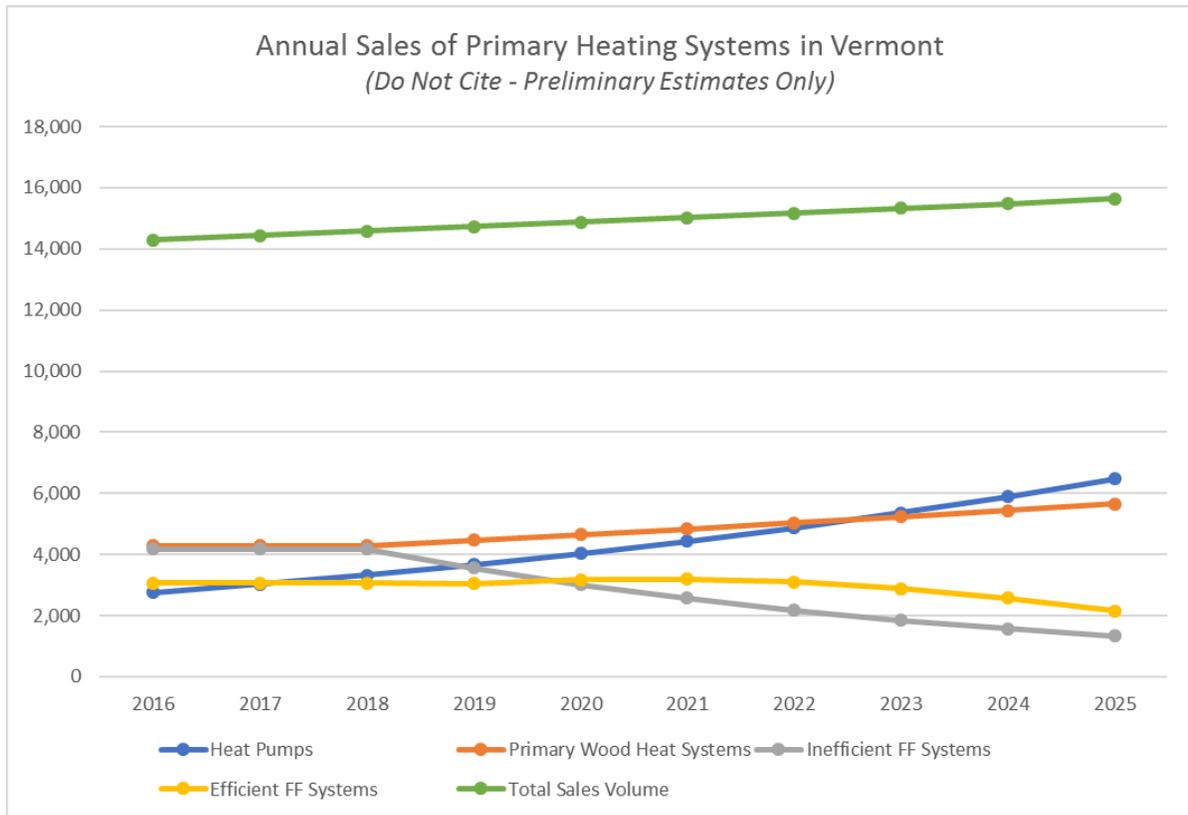
7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

8. **Scale of impact on Vermont's energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

This proposal would impact Vermont energy and climate goals in a number of ways:

1. Encourage customers to purchase wood or efficient fuel heating systems when purchasing new heating equipment, complimenting a potential Renewable Fuel Standard
2. Increase awareness and adoption of advanced wood heating systems
3. Create a disincentive for customers to select inefficient fossil fuel heating systems

As shown in the following diagram, this concept could help accelerate the adoption of wood heating systems while driving down the adoption of inefficient fossil fuel equipment. Sales of efficient fossil fuel equipment would increase slightly through 2021 before starting to decline. By 2025, nearly 80% of new heating systems sold would be biomass or electric heat pumps.



9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

- Biomass supports the local economy. According to the Biomass Energy Resource Center, 80 cents of every dollar spent on wood is retained in the local economy, but only 22 cents of every fossil fuel heating dollar is retained locally.
- Tier III has the potential to make a significant energy transformation impact, but electrification shouldn't be the only option for Vermonters. Wood heating, especially automated wood heating systems, can play a significant role in meeting Vermont's energy goals.
- Heat pumps are intentionally and explicitly omitted from this proposal since they are already being promoted by distribution utilities (in support of their Tier III goals) and Efficiency Vermont. This proposal would indirectly support heat pumps since the surcharge on inefficient fossil fuel equipment would encourage some customers to select heat pumps instead.
- Sales of inefficient fossil fuel equipment remain significant. Acknowledging that fossil fuels will continue to play a role for several years we should put an emphasis on high efficiency equipment and move away from inefficient equipment as quickly as possible.

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

- Vermont Fuel Dealers Association
- Vermont Gas
- Vermont Public Service Department
- Vermont Department of Taxes
- Efficiency Vermont

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

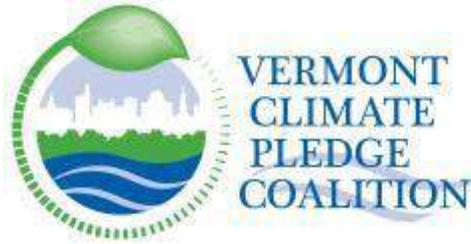
- Develop standards for “efficient” and “inefficient” equipment
- Coordinate with CEDF to determine resources available to support biomass equipment
- Develop a taxing mechanism for inefficient equipment
- Further consideration should be given to couple this with efficiency goals and avoid providing tax incentives for larger homes, such as limiting the tax exemption to equipment less than a certain size (i.e., <50,000 Btu/hour).

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

This concept could be implemented by the 2019 timeframe.

Written Submission 17

Biogas Collaborative Working Group



Vermont Energy & Climate Summit **Pitch Submission Form**

1. Pitch Submitted By (Your Name or Organization):

John B. Osborne, Glowink LLC

2. Contact Email Address:

john.osborne@glowink.biz

3. Contact Phone Number:

(802) 933-2711

4. Pitch Title: (one line)

Biogas Collaborative Working Group (BCWG)

a collaborative group between University of Vermont, St. Francis Xavier University (Nova Scotia), and Glowink (a Vermont company based in Montgomery Center)

5. Pitch Summary: (one paragraph)

BCWG has been established at UVM to focus on improving quantitative understanding of the processes governing the release of biologically-generated gases from natural and engineered systems. The working group will be established by the four founding members (Holmén, Danks, Risk, Osborne) and broadened to create an interdisciplinary technical group at UVM that is knowledgeable on gas emissions, their measurement, and the needs in diverse application areas to enable the BCWG to both advance current GHG emissions research and contribute to industry needs for biogas leak detection. Also, Sensor Capability at UVM will be developed by completing a pilot study on biogas/biomethane detection (both gas differentiation and sensor miniaturization) utilizing mobile sensing technology developed by Professor David Risk (StFX). By first developing the basic capability at UVM to deploy the StFX equipment locally in a pilot project, BCWG will strengthen the team's biogas sensing and data analysis/validation skillset for broader future application of the technology. Finally, BCWG Cross-Training/Fertilization on Biogas Research Needs will be carried out. Initial work conducted over a 2-year period will involve training and participation of various interdisciplinary groups within UVM active in biogas-related research (agriculture, animal science, community development, engineering, natural resources and sustainability) to gain technical knowledge, application area insight/perspective, and develop a broad foundation of expertise on biogas related problems and research needs/approaches. BCWG will develop a student exchange agreement between StFX and UVM for long-term research collaboration on biogas sensing technology development. Finally we will prepare for long-term research phases whereby certain equipment would be acquired by UVM to outfit a technical group to undertake mobile gas survey projects. Teams would seek additional funding from US DOE, USDA, US Forest Service and industry, continuing to work closely with StFX/Glowink to ensure scientific development of the gas sensing technology and enhanced capabilities such as additional gases and particle sensing capabilities.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- xEnergy Efficiency
- Electricity
- xTransportation
- xThermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**

- xEconomic Activity
- xAffordability
- Vulnerable Vermonters
- xOther (air quality and health)

8. **Scale of impact on Vermont's energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

Biogas converted to biomethane has the potential to represent 5% or more of natural gas consumption in Vermont, significantly reducing methane emissions. The Renewable Natural Gas (RNG) program recently issued by the Vermont PUC is a major incentive to increase the supply of biogas/biomethane in Vermont and also in other States. LincolnRNG, a project on the 3,000-acre Goodrich Farm in Salisbury, Vermont was approved in May 2015 to convert dairy farm manure, corn silage and local brewery waste to RNG using an anaerobic digester [VTDigger 2016]. Vermont Gas Systems plans to blend this biomethane with RNG from existing solid waste facilities outside Vermont (i.e. upstate New York) with the traditional fossil fuel supply in their pipeline system.

Sources of biogas are agricultural based (farm digesters), landfills, water treatment plants, etc. Uses of biomethane include substitution of pipeline gas, LNG for heavy duty trucks, ethanol, and potentially jet fuel.

*BCWG's **initial** objectives are twofold, the focus being:*

1. *differentiation of biogas from natural gas (a safety issue relating to source of a leak),*
2. *development of miniaturized gas sensors to affix to vehicles, including biomethane transporting trucks and drones, to acquire and store continuously gas data which would be uploaded to the Cloud when connected allowing a master algorithm to interpret the data autonomously.*

Once there 2 objectives have been achieved (2 years) the BCWG will expand into other methane and greenhouse gas reduction programs worldwide, expanding members internationally.

9. **Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

BCWG's R&D is aimed at helping the biogas/biomethane industry expand in Vermont, the US northeast, and worldwide. The biogas industry will have positive effects on the economy, education, investments, and environmental including health

A highly proficient scientific and technical base will be developed at UVM, collaborating with Glowink and StFX. Glowink's expertise is in international energy and all aspects of Carbon Capture, Utilization, & Storage, including introducing Cansolv Technologies (now Shell) to SaskPower which culminated in the world's largest post combustion plant capturing 3,000 t/d of CO₂ from the Boundary Dam, SK coal-fired power plant flue gas, pipelining and injecting supercritical CO₂ into the Weyburn oil field for EOR.

StFX and Glowink have worked together for over a decade. StFX is a world leader on detecting extremely small levels of gas emissions at the ppb level, much lower than an operator would be checking for and possibly a precursor to a larger event (leak). The algorithms developed by StFX allow the mobile detection systems (in a pickup truck acquiring data on the fly) to not only detect gas anomalies in real time but also provide an indication of the source since GPS and wind machines are utilized. See link below:

<http://fluxlab.ca/>

An example of a Glowink/StFX project is MSEEL, funded by the DOE, see link below:

<https://basil.stfx.ca:5001/sharing/au5i0NyqB>

StFX and Glowink intend to support technically BCWG and establish an exchange student program to transfer expertise and eventually sensor equipment so that UVM could operate independently, and remain scientifically and technically up-to-date.

10. **Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)**

BCWG believes that once the initial objectives have been met that BCWG will be able to self sustain itself and continue to expand. During the first 2 years it will be necessary to secure limited funding and so we have applied for

a Gund Institute Catalyst Award. We believe that the initial R&D will be of interest to industry in Vermont, the rest of the US, Canada (especially Quebec where biogas projects are developing), and abroad, leading to R&D funding and contract project work.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

All the elements to move this initiative forward are in place other than the funding for the initial objectives. It would help greatly if the BCWG goals are known throughout the various government agencies.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

BWCG initial objectives are ready to be implemented over the next 2 years. Limited funding has been requested from the Gund Institute Catalyst Award Program and we are investigating other government funding opportunities as well as from industry. Expansion would then take place, geographically as well as other climate change issues such as methane reduction.

Written Submission 18

Expanded Electric Efficiency Utility Scope
to Include Electrification, Storage and Renewables

Vermont Energy & Climate Summit
Pitch Submission Form

1. Pitch Submitted By (Your Name or Organization):

Richard Faesy & Dan Mellinger, Energy Futures Group
[EFG does not wish to present this topic]

2. Contact Email Address:

rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. Contact Phone Number:

(802) 482-2812

4. Pitch Title: Expand EEC scope to include electrification, storage, and renewables

5. Pitch Summary: Permit the EEU's to apply a subset of EEC funds toward electrification, storage, and renewable technologies. These expanded areas keep EEC funding within the electrical sector (thermal-only measures would remain limited to RGGI/FCM funding). EEC ratepayer benefits include: downward pressure on rates from electrification by offsetting utility revenue losses from efficiency and renewables; storage helps utilities manage duck curve and reduce expenses during peak events; renewables respond to ratepayer interest and could lead to EE opportunities once in the door. Established funding mechanism and program implementers. This concept could increase the EEU impact and counteract declining EE opportunities starting in ~ 2020.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- Energy Efficiency
- Electricity
- Transportation
- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- Economic Activity
- Affordability
- Vulnerable Vermonters
- Other

Written Submission 19

Cold Climate Heat Pump and Heat Pump Water Heater Sales Tax
Exemption

Vermont Energy & Climate Summit
Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Richard Faesy & Dan Mellinger, Energy Futures Group
[EFG does not wish to present this topic]

2. **Contact Email Address:**
rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. **Contact Phone Number:**
(802) 482-2812

4. **Pitch Title:** CCHP/HPWH sales tax exemption + fossil fuel equipment surcharge

5. **Pitch Summary:** 100% sales tax exemption for cold climate heat pumps (CCHP) and heat pump water heaters (HPWH), similar to the renewable energy systems sales tax exemption and sales tax "holidays" for ENERGY STAR equipment. Fund through a surcharge/tax on inefficient (sub-ENERGY STAR) fossil fuel based heating and hot water equipment sold in Vermont.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

Written Submission 20

Electric Efficiency Utility Self-Direct Revision and Expansion

Vermont Energy & Climate Summit Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Richard Faesy & Dan Mellinger, Energy Futures Group
[EFG does not wish to present this topic]

2. **Contact Email Address:**
rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. **Contact Phone Number:**
(802) 482-2812

4. **Pitch Title:** EEC Self-Direct Revision & Expansion

5. **Pitch Summary:** Revise the energy efficiency self-direct path as follows: (1) limit self-direct funds to 70-80% of annual EEC contribution, acknowledging benefits all customers receive through upstream programs, education, code support, contractor training, etc.; (2) allow self-direct funds to be applied to total energy projects, not just electric; (3) expand the option to larger populations of customers such as municipalities, schools, campuses, or property management companies.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

Written Submission 21

Act 250 Revisions

Vermont Energy & Climate Summit Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Richard Faesy & Dan Mellinger, Energy Futures Group
[EFG does not wish to present this topic]

2. **Contact Email Address:**
rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. **Contact Phone Number:**
(802) 482-2812

4. **Pitch Title:** Act 250 Revisions

5. **Pitch Summary:** Redefine “best available technology” beyond just building performance to possibly include location efficiency, electric vehicle charging stations, electrification, etc. Also, consider enforcement of the renovation provisions that should apply to existing buildings but aren’t enforced.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

Written Submission 22

Delivered Fuels Tax

Vermont Energy & Climate Summit
Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Richard Faesy & Dan Mellinger, Energy Futures Group
[EFG does not wish to present this topic]

2. **Contact Email Address:**
rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. **Contact Phone Number:**
(802) 482-2812

4. **Pitch Title:** Delivered Fuels Tax

5. **Pitch Summary:** Levy a tax on delivery (unregulated) fuels as a way to fund thermal efficiency programs. Give fuel dealers a say in how the funds are managed.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

Written Submission 23

Building Mortgage Rate Feebate

Vermont Energy & Climate Summit
Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Richard Faesy & Dan Mellinger, Energy Futures Group
[EFG does not wish to present this topic]

2. **Contact Email Address:**
rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. **Contact Phone Number:**
(802) 482-2812

4. **Pitch Title:** Building Mortgage Rate Feebate

5. **Pitch Summary:** Rate buildings at the time of listing for sale and adjust the mortgage interest rate based on whether the building is “efficient” or not. Without any public subsidy, a mortgage “feebate” could be implemented that would charge a higher interest rate to those who choose not to upgrade the efficiency of their building, that could in turn be used to buy-down the interest rate for those who build efficiently or upgrade an existing building to make it “efficient”. Allow the market to choose whether or not to upgrade buildings, and adjust mortgage rates accordingly.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

Written Submission 24

Residential Performance Contracting

Vermont Energy & Climate Summit
Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):**
Richard Faesy & Dan Mellinger, Energy Futures Group
[EFG does not wish to present this topic and recommends Andy Frank, CEO of Sealed]

2. **Contact Email Address:**
rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. **Contact Phone Number:**
(802) 482-2812

4. **Pitch Title:** Residential Performance Contracting

5. **Pitch Summary:** Support implementation of Sealed's program to take over customers' fuel bills and guarantee a level payment, while working with contractors to do weatherization work to bring down the energy costs and take on the risk.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**
 - Economic Activity
 - Affordability
 - Vulnerable Vermonters
 - Other

Written Submission 25

City of Burlington Benchmarking & Disclosure Ordinance

Vermont Energy & Climate Summit **Pitch Submission Form**

Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. Pitch Submitted By (Your Name or Organization):

Jennifer Chiodo, PE, L:EED AP
Managing Principal, Cx Associates; Board Chair, Vermont Green Building Network (VGBN)

Jenna Antonino DiMare
Executive Director, Vermont Green Building Network

2. Contact Email Address:

Jennifer Chiodo: jennifer@cx-assoc.com
Jenna Antonino DiMare: vermontgbn@gmail.com

3. Contact Phone Number:

Jennifer Chiodo: 802-861-2715
Jenna Antonino DiMare: 802-735-2192

4. Pitch Title: (one line)

City of Burlington Energy Benchmarking and Disclosure Ordinance

5. Pitch Summary: (one paragraph)

The Vermont Green Building Network (VGBN) seeks to reinvigorate efforts to advance legislation that would require energy benchmarking and disclosure for commercial,

institutional and multi-family buildings in the City of Burlington. Benchmarking is a measure of a building's energy efficiency, like a miles-per gallon scale for buildings. It lets building owners and tenants know whether their building is a guzzler or an efficient, green building. Disclosure requires the annual, public reporting of building energy use and intensity. Just as auto consumers expect this information, prospective building owners or tenants should have it too. Burlington has a large stock of inefficient buildings that need to be upgraded for optimal use and to address climate change. It is important for Burlington to require benchmarking and disclosure because it has been proven to leverage the market to invest in building energy efficiency. More efficient buildings can then meet a greater percentage of their load through renewable energy. This work would build on VGBN's current work as the lead organization for the Burlington 2030 District and its previous work on a benchmarking ordinance for Burlington.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- X Energy Efficiency
- X Electricity
- Transportation
- X Thermal Heating &/or Cooling
- X All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- X Economic Activity
- X Affordability
- X Vulnerable Vermonters
- Other

8. Scale of impact on Vermont's energy and climate goals:

If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

By requiring benchmarking and disclosure for buildings over 50,000 square feet in Burlington, the annual energy use of over 80% of the non-single family building square footage would be available as part of the public record. (Square footage data from Burlington Tax Assessor's office). The current energy use intensity for Burlington's commercial, institutional and multi-family buildings is 103 kBtu/sqft/year (Burlington 2030 data from utilities and tax data). The 2030 District's Goal (a project of the Vermont Green Building Network) is to reduce energy consumption in the City of Burlington by 50% by 2030. Benchmarking and disclosure ordinances have proven to increase building owner engagement with 2030 Districts across the country. Therefore, if we assume that the ordinance would help these buildings achieve the 2030 goals, then we would expect energy

savings of 1,250,000 MMBTU annually which would be significantly advanced through enactment of a benchmarking and disclosure ordinance.

9. Benefits/costs of this proposal for Vermont and Vermonters: *Including, where possible, economic, financial, social, and environmental.*

The costs associated with benchmarking and disclosure are relatively low. Building owners can expect a cost of about \$1,000 for tracking and reporting energy use in the first year and a cost of \$250/year to update data annually. The utilities that serve the City of Burlington are working to automate the benchmarking process, which would significantly reduce the first cost and likely eliminate the annual cost.

Benefits include the ability of consumers, whether they are commercial or residential tenants or even those who are buying services or goods from building owners, to factor building energy efficiency into their decision. This means renters have the opportunity to consider the energy and environmental impacts of each building and choose the property that will be fit their total budget, energy costs included.

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

Members of the Burlington City Council, the Mayor of Burlington would need to support this initiative. In addition, support by the business community would be a huge benefit to advancing such an initiative. Mayor Bloomberg brought mandatory benchmarking and disclosure to New York City by obtaining the buy-in of some of the largest real estate moguls in the country.

11. Strategy and key considerations: *Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.*

1. Engage the business community – the VGBN is already engaged through the Burlington 2030 District and our core education initiatives. However, we need to expand that engagement and building business leader support for benchmarking by increasing education and dialogue. This group has the most to gain, but also potentially the greatest risk from a benchmarking ordinance. In general, building owners prefer not to have government mandates and may resist the ordinance.
2. Engage the utilities – Burlington Electric Department and Vermont Gas have previously expressed interest in a Burlington Benchmarking Ordinance. Reconnect with the utilities to build understanding and support for the initiative.
3. Engage the City Council – VGBN met with City Councilors during our first attempt to advance Benchmark Burlington. The Councilors were in general supportive of the concept. Provide education to the City Council regarding benefits and potential challenges for the ordinance.
4. Engage the Mayor’s Office – this is the point where the prior VGBN initiative stalled. Members of the Staff at City Hall would not advance the initiative to the Mayor and

some landlords met with the Mayor to advise him of their preference to have optional benchmarking rather than mandatory after attending an informational meeting hosted by the VGBN.

5. Engage with the tenants and residents – recent successful advocacy for a cooperative telecom company in Burlington demonstrates the power of Burlington’s people. A new part of the strategy would be to educate residents and workers in Burlington about the initiative and its importance.

12. Timeline: *To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?*

General timeline: Medium-term consideration

- 2018 – Begin education activities and outreach; hold a benchmarking training
- 2019 – Build a coalition of allies who will actively support benchmarking and disclosure, educate the City Council Members and the Mayor’s office
- 2020 – City of Burlington enacts Benchmarking and Disclosure ordinance
- 2021 – First buildings benchmarked – City of Burlington and buildings over 250,000 sq ft
- 2022 – All buildings over 100,000 sq ft benchmarked
- 2023 – All buildings over 50,000 sq ft benchmarked

Energy studies and improvements as a result of benchmarking – ongoing.

Written Submission 26

Pathway Evaluation to 25% by 2025

Vermont Energy & Climate Summit **Pitch Submission Form**

Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. Pitch Submitted By (Your Name or Organization):

Rick Wackernagel and Gary Dir

2. Contact Email Address:

Rick – rick.wackernagel@gmail.com

Gary – gdir4343@gmail.com

3. Contact Phone Numbers:

Rick – 802-578-4907

Gary – 585 370 8652

4. Pitch Title: (one line)

Pathway Evaluation to Meet Vermont’s 2025 Renewable Energy Goals :s
Getting the biggest bang for our buck in climate policy and programs

5. Pitch Summary: (one paragraph)

We propose that a research team with expertise in energy efficiency, renewable energy, technological change, greenhouse -gas accounting and economics be established to do due diligence on proposed climate policies and programs. The purpose of the team will be to ensure that climate programs and policies are coordinated and will cost -effectively meet climate and economic goals. The team will:

- Identify resources and conditions needed by proposed policies and programs;
- Estimate:
 - Reductions in greenhouse -gas emissions;
 - Social and cash -flow costs and benefits of proposed actions;

- Distributions of costs and benefits among income groups;
- Develop implementation schedules so that required conditions and inputs are present when programs are started; and
- Report results of their work to the Vermont legislature, Governor, state agencies and public.

Among the possible actions that could be considered are alternative:

- Sources of renewable energy at different scales;
- Means of:
 - Reducing the costs of weatherization;
 - Accelerating electrification of transportation; and
 - Accelerating sequestration of carbon in agriculture and with other means

- Energy Efficiency
- Electricity
- Transportation
- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

6. **Which criteria category(ies) does it address? (Check all that apply):**

- Economic Activity
- Affordability
- Vulnerable Vermonters
- Other

7. **Scale of impact on Vermont’s energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

Success breeds success. Screening programs and policies for cost effectiveness and benefit -to-cost ratios will ensure that we are approaching a least -cost path in our transition to a nearly -no-carbon economy. Reducing the cost of the transition will allow us to progress through it more quickly. Seeing the cost effectiveness will make Vermonters more willing to support these programs. Knowing that proposals will be scored on cost -effectiveness and benefit -to-cost ratios will focus proposal authors’ attention on the se measures and result in proposals with higher scores . We will achieve our climate and energy goals sooner.

8. **Benefits/costs of this proposal for Vermont and Vermonters:** Including, where possible, economic, financial, social, and environmental.

The information produced will allow legislators and members of the Governor’s administration to make better choices. Cost -effectiveness will limit the financial burden of state government on Vermonters, leaving more money to recirculate through Vermont’s economy. Recognizing economic growth as a social benefit means proposals that produce it will get higher scores. Recognizing the distribution of costs and

benefits will allow programs that improve distributions to get higher scores. Using cost per ton of CO2 equivalent emissions avoided as a measure of cost-effectiveness will allow us to get the biggest climate bang for our buck, which will allow us to reduce emissions more rapidly.

9. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

While an *ad hoc* team could be formed, making it part of a nonprofit organization or government agency would make it more durable. A head of an organization or agency could decide to move the proposal into implementation.

10. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

We developed this proposal based on the lack of due diligence and measures of cost-effectiveness we have observed in many proposed pro-climate programs and policies. We have worked with several climate activists in the past few years who share an interest in the details of how programs and policies work. These activists have devoted substantial amounts of time as volunteers to promoting pro-climate policies. They have not, however, pooled their interests to focus on determining or improving program effectiveness.

We are also aware of a substantial quantity of research that could be used as a basis for designing and assessing programs. Resource people with needed expertise in Vermont, the rest of the US, Canada and Europe can be brought in to consult with the team and build local capacity.

Staffing a team with volunteers would be quick, but lead to limited capacity. As a test of concept, this could be appropriate. We also propose that state-college students and faculty members ally and partner with us in this effort. Volunteers could be augmented by agency staff, as well. Eventually, recruiting paid professionals would be needed to increase capacity.

11. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

Nov 2017	Approval of proposal concept
Dec 2017	Identification of host organization Clarification of team roles and resources with host organization
Jan 2018	Recruitment of team members
Feb 2018	Development of 3-month workplan Initiation of work, which would continue as long as new programs and policies are proposed.

Written Submission 27

Vermont Registered Builder Remodeler Program

Vermont Energy & Climate Summit **Pitch Submission Form**

Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. **Pitch Submitted By (Your Name or Organization):** Ward Smyth, Builder

2. **Contact Email Address:** wsmyth@turtlecreekbuilders.com

3. **Contact Phone Number:** 802-496-2206

4. **Pitch Title:** Registered Vermont Builder/Remodeler program

5. **Pitch Summary:**

Raise the professional “bar” for builders and remodelers in Vermont through promotion of a builder registry for contractors committed to following a strict ethical standard in business relationships with consumers and trade partners. As part of the registry requirements builders and remodelers agree to comply with state rules and regulations including Vermont’s energy code. The infrastructure for such a registry exists through the non-profit *Registered Vermont Builder/Remodeler, Inc.* This volunteer approach could be an interim step towards a future state-sponsored mandatory registry. Without statewide enforcement of the energy code not all homes are being built to the energy code baseline. The registry can serve as a resource where customers can access names of builders and remodelers committed to quality work, continuous education, and energy code compliance.

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**

- Energy Efficiency
- Electricity
- Transportation

- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- Economic Activity
- Affordability
- Vulnerable Vermonters
- Other

8. Scale of impact on Vermont's energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

A builder registry would shine a light on builders committed to quality construction, including an understanding and commitment to building energy efficient homes. By providing customers with access to a registry of quality builders it puts pressure on all builders to achieve a common threshold of construction. Current residential code compliance rates fall below 70% so there is a great deal of opportunity to increase the efficiency of all new homes built in Vermont. With the potential for new code standards over time it will be even more important to have a registry wherein builders are trained and committed to building to the relevant building code.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

Energy Futures Group created a cost-effectiveness analysis for transition to 2011 residential energy code to 2015 residential energy code.

- Average annual weighted savings = \$653/year
- Average incremental cost = \$3470
- Payback = 5.3 year
- Cash Flow (4.5% rate over 30 years)= average \$440 Annual Net Positive Savings

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

The builder registry concept could begin with support and administration from the non-profit *Registered Vermont Builder/Remodeler, Inc.* A state-sponsored mandatory builder registry would require support of the Legislature.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

The overall strategy and importance of building energy codes is called out on page 7 of the 2016 Comprehensive Energy Plan:

“Codes and standards — such as building energy codes.....serve to avoid lost efficiency opportunities in long lived products and infrastructure, using established technology. Codes and standards are appropriately applied only when cost-effective on a lifecycle basis.”

Gaps: Currently there are no statewide requirements to become a registered builder in Vermont, leading to varied levels of professionalism, service, and quality of construction.

Barriers:

Funding to support a voluntary registry- the current model would require a membership fee which could be a limiting factor for many builders.

Opportunities:

A registry, either at the voluntary level or state-mandated, would create a more level playing field for builders who could be assured they weren't being undercut by builders not meeting basic standards such as the energy code. Ensuring a higher rate of energy code compliance, among other benefits of a builder registry, results in lower energy costs for homeowners and reduced greenhouse gas emissions.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

The infrastructure is in place for a voluntary registry and increased promotion and/or financial support would allow a more robust builder registry to be launched in 2018. A state-supported registry would require action by the legislature and could be a year or more out.

Written Submission 28

Land Value Taxation in State Designated Centers: Building Efficient and
Fiscally Sustainable Communities

Vermont Energy & Climate Summit Pitch Submission Form

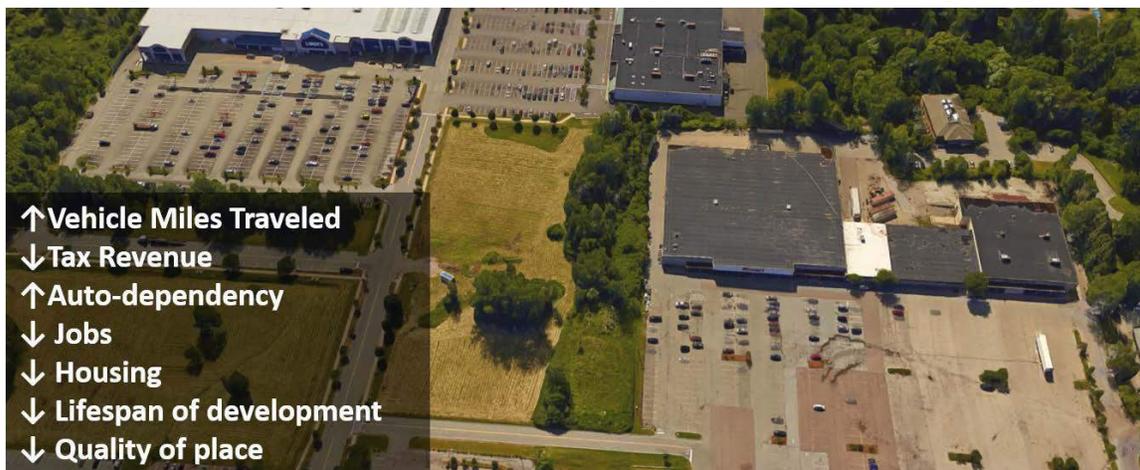
Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. **Pitch Submitted By (Your Name or Organization):**
2. **Contact Email Address:**
3. **Contact Phone Number:**
4. **Pitch Title:** Building Efficient and Fiscally Sustainable Communities with Land Value Taxation
5. **Pitch Summary:** Transition to a land value based property tax system in state designated centers. Our current property tax system incentivizes development that is of the lowest value possible (typically low-quality construction, expansive parking, single story), while requiring vast amounts of expensive public infrastructure. Private investment in our built environment is discouraged, as property taxes increase with the value of the buildings.

Fig.1 - Type of development incentivized by existing property tax system. (Image: Google 2017)



A land value tax is a type of property tax that imposes a higher rate on land than the improvements upon it, or in some instances it only applies to the land. This type of tax incentivizes building as efficiently as possible (mixed-use, multi-story) and yields a much higher return on investment for public infrastructure.

Fig. 2 - Type of development incentivized by land value tax. (Image: Google 2017)



6. What energy sector(s) does this Pitch apply to? (Check all that apply):

Energy Efficiency

- ✓ Electricity
- ✓ Transportation
- ✓ Thermal Heating &/or Cooling
- ✓ All (Total Energy)
- ✓ None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- ✓ Economic Activity
- ✓ Affordability
- ✓ Vulnerable Vermonters
- Other

8. Scale of impact on Vermont’s energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont’s energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

Implementing a land value tax could potentially lead to significant private investment in Vermont’s downtowns and walkable communities. The existing tax advantages for surface parking lots and dilapidated underused buildings are removed and property owners who invest in creating new space for businesses and new housing would no longer be faced with larger property tax bills

Quantifying the impact of a land value tax system on reducing energy demands is a complicated exercise. I would expect we would see limited impact by 2025 and potentially sizeable impacts by 2050 and beyond. To get a sense of the reduced energy demands of development incentivized by a land value tax, we can compare the median annual vehicle miles traveled for households living in state designated downtowns (10,000 miles) to a state household median of 21,000 miles.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

- Higher return on investment for public infrastructure (lower taxes.)
- Increased private sector investment in built environment.
- Increased housing opportunities (affordability.)
- Increased opportunities for successful transit programs.
- Fewer vehicle crash related deaths due to decrease in VMT.
- Decreased development pressure on working lands / wildlife habitat.
- Decrease in total impervious surface and improved water quality.

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

- Legislature

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

Still TBD. Likely should begin with pilot community and phase in overtime.

Consideration: The state would likely want to provide assistance to land owners who are 'land rich' and 'cash poor,' who could be disadvantaged if they currently own low value property (ie. surface parking lots) and lack the resources to invest in their property. A revolving loan fund could help address this issue and jumpstart the impact of the LVT.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some "game changers" that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

Start implementing in the next year. The LVT has the potential to be a game changer, but it will likely take some time.

Written Submission 29

Transforming Vermont's Energy and Economy

Vermont Energy & Climate Summit Pitch Submission Form

Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. **Pitch Submitted By (Your Name or Organization):** Rebecca Foster, VEIC
2. **Contact Email Address:** rfoster@veic.org
3. **Contact Phone Number:** (802) 540-7882
4. **Pitch Title:** Transforming Vermont’s Energy and Economy
5. **Pitch Summary:** Vermont has the tools, foundation, and resources already in place to jumpstart our economy and transform our energy system. The key is to repurpose Efficiency Vermont, such that it is no longer focused primarily on the delivery of energy savings – but also on building the infrastructure (trained workers, leading edge technologies, and a statewide network, all while supporting middle and low income Vermonters) to spur increased private market investment, and create new business opportunities across the energy sector. This proposal relies on regulatory and statutory changes, but requires no new funding, and will create opportunities to leverage additional capital into the state – helping further progress toward energy and climate goals, and solidifying Vermont’s national reputation as an energy innovator.
6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

7. **Which criteria category(ies) does it address? (Check all that apply):**

- Economic Activity
- Affordability
- Vulnerable Vermonters
- Other

8. **Scale of impact on Vermont's energy and climate goals:** If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

Efficiency Vermont (EVT) has already made an impressive impact in helping address Vermont's energy and climate action goals. A few key highlights:

- Accounts for 15.5% of the state's electric needs, which has helped reduce the environmental impact of our electric supply, and has created more capacity for beneficial electrification
- Is Vermont's single largest in-state resource bidding into the ISO-NE Forward Capacity Market – so far returning more than \$30 million for investment into thermal efficiency efforts
- Has supported the creation of 11,000 jobs in energy efficiency and conservation

Seventeen years after its creation, EVT has demonstrated that it is an ideal engine for spurring and supporting energy transformation. There is now more interest and activity taking place to advance Vermont's climate and energy goals than ever before, and EVT is in the ideal position to serve as a catalyst and foundation, helping support and advance private sector and utility efforts.

We will not meet our bold goals unless we can get to scale rapidly – leveraging EVT's proven strengths. This means:

- Seeking out transformative technologies by engaging with manufacturers, researchers, and product developers – and bringing the best products to Vermont first
- Training and certifying contractors and installers, ensuring they are available to serve customers throughout the state in completing energy transformation projects
- Making it easy for Vermonters of all income levels to take action by directly lowering the cost of technologies and creating new financing opportunities
- Leveraging a supply chain and distribution network that includes more than 300 local businesses in every corner of the state

The current regulatory construct creates unnecessary competition for energy savings, and requires EVT to place its focus on delivering MWH and MMBtu, rather than doing foundational work to help increase the impact of utility and private sector efforts. By removing statutory limitations and changing performance requirements, EVT could increase its focus on building the clean electricity, thermal, transportation, and renewable energy markets. Part of building these markets would include encouraging

private sector investment, and ensuring a skilled workforce is in place to meet increased demand for energy transformation services.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

This proposal has no additional cost, since it would simply leverage and repurpose existing EVT resources for investment where they can have greater impact.

Benefits:

- Spurs an increase in economic activity – from a higher volume and increased scale (EVT’s upstream distribution model has been shown to drive 10x the purchasing and installation activity of direct consumer rebates alone)
- Improves affordability by making energy transformation easier, cheaper, and more accessible for all Vermonters. This is particularly true for the most challenging activities, such as weatherization and services to low income Vermonters, which can never be fully served through pure market activities – but where the need is great and is not being fully met. Under a new performance model across total energy, EVT can even put its infrastructure and resources to work supporting electric vehicles and renewable energy for moderate, low income and the most vulnerable Vermonters.
- This proposal also supports the rapid scale that is required to meet Vermont’s goals – removing the barriers that are currently causing unnecessary competition so the full potential of energy transformation can be unleashed.

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

Legislature (for change in EVT guiding statute); Governor (through PSD, ANR, VTrans, and ACCD engagement to help shape energy transformation new goals and requirements for EVT); and PUC (to create new regulatory construct, oversee progress on new goals, and ensure EVT is deployed to create an energy transformation market – and not to compete with other entities for savings)

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

Analogous energy transformation efforts are underway in other jurisdictions – but there are key differences – and there will need to be research to investigate potential new regulatory models and assess their potential impact. It will be important to evaluate the full impact of EVT’s current efforts as well as the risks and consequences of the contemplated change. This would also help ensure that EVT is able to fill any gaps not currently being served by utilities or the private sector, in addition to its new charge of helping lay groundwork for advancing energy transformation at scale.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

It will take time for the legislature to effectively examine and adjust the guiding statute for EVT, followed by a 1-2 year PUC process to create a new regulatory and operational framework. Once in place the new EVT will be a game changer for rapidly advancing Vermont’s energy transformation efforts and meeting climate goals.

Written Submission 30

Driving on Sunshine: Dynamic Rate & Electric Vehicle Charging

Vermont Energy & Climate Summit
2017 Pitch Submission Form

1. Pitch Submitted By (Your Name or Organization):

Renewable Energy Vermont

2. Contact Email Address:

olivia@revermont.org

3. Contact Phone Number:

802-595-5373

4. Pitch Title: Driving on Sunshine: Dynamic Rates & Electric Vehicle Charging

5. Pitch Summary:

Specialized, dynamic, competitive, clear, and strategically located electric vehicle charging rates and infrastructure will encourage new private investment and increase use of electric vehicles in Vermont. Smart and consistent rate design can accelerate widespread transportation electrification, achieve ratepayer benefits, reduce dependence on fossil fuels, and reduce climate pollution. Rates should be stable and understandable and provide customer choice.

Vermont should implement a strategic transportation electrification effort by:

- Authorizing and encouraging electric utilities to offer special reduced electricity rates for electric vehicle charging.
- Eliminating statutory and regulatory barriers to competitive or non-utility electric vehicle charging.
- Locating fast chargers in downtown areas in addition to other places where vehicles are parked for long periods of time (workplaces, home, etc.) rather than primarily along interstate transit routes encourage and enable Vermonters and visitors to charge their vehicles while enjoying mainstreet leisure, shopping, dining, and business opportunities, encouraging smart growth and thriving downtown communities.
- Phasing in a small per kWh charge on electric vehicle charging after a certain number of electric vehicles are deployed to fund road maintenance and repairs (state transportation fund) to offset revenue losses from reduce fuel sales.
- Establishing consumer protections, consistent communications, and education for electric vehicle charging.
- Utilizing the full amount allowed of the incoming VW settlement funds for strategically located electric vehicle charging infrastructure.
- Adopt open-source charging / data protocol to support interoperable information exchange for transactions and charger operations

Consumers won't buy an EV if they can't charge it quickly and cheaply.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- Energy Efficiency
- **Electricity**
- **Transportation**
- Thermal Heating &/or Cooling
- All (Total Energy)
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- **Economic Activity**
- **Affordability**
- **Vulnerable Vermonters**
- **Other**

8. Scale of impact on Vermont's energy and climate goals:

Transportation emissions represent approximately 47% (CEP, p. 135) percent of the state's GHG emissions, ## percent of its oxides of nitrogen (NOx) emissions, and ## percent of its diesel emissions. Reducing emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050 will require widespread transportation electrification.

The average Vermonter drives ## miles per day, well within the range of available ZEV models. Because ZEVs require longer charge times, range anxiety caused by the lack of infrastructure continues to impede the adoption of ZEVs in rural areas or for drivers seeking to make longer trips.

The average Vermonter spends \$\$\$\$ on gas annually. If someone switches to an EV and has access to affordable carbon free electricity for charging.....

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

By authorizing and encouraging utilities to set special rates for electric vehicle charging and authorizing non-utility energy service providers to sell electricity for electric vehicle charging, the financial risk of necessary new infrastructure is reduced (addressing issue of rate based stranded and/or under- or unutilized assets for utility's).

Deploying electric vehicles can assist in grid management, integrating generation from eligible renewable energy resources, and reducing fuel costs for vehicle drivers who charge in a manner consistent with electrical grid conditions.

Deploying electric vehicle charging infrastructure should facilitate increased sales of electric vehicles by making charging easily accessible and should provide the opportunity to access electricity as a fuel that is cleaner and less costly than gasoline or other fossil fuels in public and private locations.

Smart policies to expand charging access can help sales ramp up while expanding grid flexibility, reducing power costs, and integrating cleaner electricity. If we plan and implement strategies to manage charging before there is widespread EV adoption, we can shift the electricity demand of EVs into the valleys – the off-peak hours – of the grid load profile. Smart EV charging rates optimize our electricity system, reduce the cost of electricity for all consumers in the long run, and allow us to integrate a larger share of wind and solar than might have been possible otherwise, by using EVs to soak it up.

10. Decision-makers necessary for this proposal to be adopted or move forward

Vermont Legislature

Governor

Public Utility Commission

Department of Public Service

Electric Utility's

11. Strategy and key considerations:

States that move forward on policies facilitating EV growth will reduce consumer costs, lower emissions, and help shared energy infrastructure and energy service providers remain economically viable. Those that don't could face a sudden need to build expensive generation and infrastructure to maintain grid reliability and keep customer costs low. Applying performance-based regulation to utility charging infrastructure projects to incentivize investments by rewarding social benefits without exposing ratepayers to undue risk, and recommends regulations rewarding utilities for benefits like ancillary services or demand shaving. Despite the benefits of managed charging, getting consumer buy-in requires utilities and charging service providers to develop a range of outreach and engagement strategies.

12. Timeline: 1 to 3 years

Written Submission 31

Vermont Energy Code Enhancements

Vermont Energy & Climate Summit Pitch Submission Form

Guiding Criteria: EAN’s mission is to end Vermont’s reliance on fossil fuels *and* to create efficient, clean, affordable, and secure electric, heating, and transportation systems for the 21st Century. The VT Climate Pledge Coalition is seeking pledges to reduce GHG reductions that will help Vermont meet Paris climate commitments. Together, we support the criteria outlined in Gov. Scott’s Executive Order creating the **Vermont Climate Action Commission**, specifically that solutions must:

- Spur economic activity, inspire and grow Vermont businesses, and put Vermonters on a path to affordability;
- Engage all Vermonters, so no individual or group of Vermonters is unduly burdened; and
- Collectively provide solutions for all Vermonters to reduce their carbon impact and save money.

With these goals and criteria in mind, please answer the questions below. Questions 8-12 can be answered individually or in one comprehensive narrative. (Total pitch submission **no more than 3 pages**).

1. Pitch Submitted By (Your Name or Organization):

Richard Faesy & Dan Mellinger, Energy Futures Group

2. Contact Email Address:

rfaesy@energyfuturesgroup.com; dmellinger@energyfuturesgroup.com

3. Contact Phone Number:

(802) 482-2812

4. Pitch Title: Vermont Energy Code Enhancements

5. Pitch Summary: As Vermont updates the Residential Building Energy Standards (RBES) and Commercial Building Energy Standards (CBES), incorporate standards for newly constructed buildings that support Vermont’s Comprehensive Energy Plan. Phase in the base energy code to require fossil-fuel-free (i.e., all-electric or biomass-heated) new residential buildings by 2025 and commercial buildings by 2030. Provide electric vehicle (EV) charging facilities in each new residence and all commercial parking spaces. In the interim, with the next update of RBES and CBES, require:

- “PV-Ready” construction elements for all buildings (i.e. solar assessment, conduit from basement to attic, breaker panel space, and roof framing sized to support PV array);
- Fossil-Fuel-Free buildings for the Stretch Code five year earlier than the base energy code; and
- Phased in EV charging facilities.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- Energy Efficiency X
- Electricity X
- Transportation X
- Thermal Heating &/or Cooling X
- All (Total Energy) X
- None: Non-energy related carbon reduction proposal

7. Which criteria category(ies) does it address? (Check all that apply):

- Economic Activity X
- Affordability
- Vulnerable Vermonters
- Other

8. Scale of impact on Vermont's energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

There are approximately 1,000 – 1,500 new homes constructed each year and square feet of commercial space. Homes and commercial buildings built today will last up to 100 years, so we should ensure that they are supporting meeting the state's climate goals in order to avoid having to retrofit them down the road.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.

Incorporating energy efficiency and fossil-fuel-free technologies is much more cost-effective to incorporate at the new construction timeframe rather than making upgrades at a later point in the building's life.

Energy Futures Group created a cost-effectiveness analysis for transition to 2011 residential energy code to 2015 residential energy code.

- Average annual weighted savings = \$653/year
- Average incremental cost = \$3470
- Payback = 5.3 year
- Cash Flow (4.5% rate over 30 years)= average \$440 Annual Net Positive Savings

An analysis that includes the benefits and costs of a fossil-fuel-free approach could be developed.

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

As the 2018 RBES/CBES energy cost update process is launched by the Vermont Public Service Department (PSD), these recommendations would need to be incorporated into the stakeholder review and PSD approval process, then ultimately approved through the Legislative Committee on Administrative Rules (LCAR) process.

- 11. Strategy and key considerations:** Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

Incorporate in the 2018 RBES and CBES update process.

- 12. Timeline:** To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

Since the PSD should be starting the 2018 RBES/CBES process in the next few months, this proposal could be included in that process.

Written Submission 32

Active Transportation: Complete and Connected Transportation System



Vermont Energy & Climate Summit
“Meeting Vermont’s 2025 Energy & Climate Goals”
Pitch Submission Form

1. **Pitch Submitted By (Your Name or Organization):** Transportation for Vermonters Coalition; Kelly Stoddard Poor (AARP VT) Coalition Member

2. **Contact Email Address:** kstoddardpoor@aarp.org

3. **Contact Phone Number:** 802-951-1313

4. **Pitch Title:** (one line): Invest in active transportation to create a complete and connected transportation system that ties in our land use policies to improve public health, quality of life, mobility and access while reducing emissions.

5. **Pitch Summary:** Today’s streets are designed to prioritize one mode of transportation – the motor vehicle. As a result, our streets, which were once avenues of commerce and places of connection, have become about moving cars rather than connecting people to places. Vermont has the opportunity to realize a multitude of benefits by enhancing our active transportation network and investing intentionally in the implementation of complete streets and compact development.
¹Complete Streets policies not only make it possible for residents to take shorter trips and utilize public transit, but to drive less, saving money and reducing harmful emissions pollution. In addition to investing in Complete Streets, Vermont has the opportunity to lead the way in collecting and analyzing their performance. While we know initial data suggests Complete Streets projects were related to broader economic gains like increased employment and higher property valuesⁱ, creating and using new performance measures for transportation projects and the transportation system is essential. This would will help agencies ensure they are on the right track — and celebrate when our investments successfully help Vermonters age in place, live affordable and healthy lives, and attract and retain young Vermonters. **To fully benefit all Vermonters, we believe the State needs to establish benchmarks and goals for active transportation to ensure accountability and greater adoption of Complete Streets law.**

6. **What energy sector(s) does this Pitch apply to? (Check all that apply):**
 - Energy Efficiency
 - Electricity
 - Transportation
 - Thermal Heating &/or Cooling
 - All (Total Energy)
 - None: Non-energy related carbon reduction proposal

¹ Complete Streets is a set of transportation policy and design approaches that allow Vermont to plan, design, operate, and maintain roadways to enable safe access for all road users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities.

7. **Which criteria category(ies) does it address? (Check all that apply):**

- X Economic Activity
- X Affordability
- X Vulnerable Vermonters
- X Other – Health, Isolation & Quality of Life

8. **Scale of impact on Vermont's energy and climate goals:**

Complete streets are a vital part of livable, attractive communities. Everyone, regardless of age, ability, income, race, or ethnicity, ought to have safe, comfortable, and convenient access to community destinations and public places—whether walking, driving, bicycling, or taking public transportation. By making these investments the following benefits will be achieved:

Environmental:

- Greenhouse gas pollution reduction (the transportation sector accounts for 47% of greenhouse gas emissions in VT – the single largest contributor).
- Energy and transportation efficiency.

Public Health:

- Supports healthy active lifestyles and physical exercise.
- Access to public health services.
- Reduction of deadly particulate matter air pollution from combustion engines.
- Smart Growth America found that complete streets saved \$18.1 million in collision and injury costs in one year.

Economic Development:

- Reduces transportation costs.
- Improves access to markets and local businesses.
- Bolsters tourism opportunities as being a destination for active recreation – including road and mountain biking.
- Compact communities consistently increases property values by more than 15 percent for office, residential, and retail use.
- According to a study by Smart Growth America, “complete streets projects were related to broader economic gains like increased employment and higher property values.”

Social Equity:

- Access for disadvantaged groups and vulnerable Vermonters.
- Access to cultural and recreational opportunities for all.

9. **Benefits/costs of this proposal for Vermont and Vermonters:** Both land use and transportation planning are community processes that significantly affect how people and goods move from place to place, as well as how well a community functions for the people who live there. Transportation infrastructure and land use decisions not only shape how communities grow, but also influence other types of development, economic prosperity, environmental quality, and social equity. Planning for transit-, bicycle- and pedestrian- friendly communities can reduce demand for automobile transportation and improve environmental quality.

Health Benefits & Social Equity: The Center for Disease Control (CDC) recommends Complete Streets due to the direct link between the built environment and physical activity.

- A quarter of kids and teens, and 60% of adults, in Vermont are overweight or obese. Unfortunately, many children do not have safe places to play and recreate outside.

- Unhealthy weight gain brings higher risk for pre-diabetes, high cholesterol, high blood pressure, sleep apnea, and joint problems.
- Studies show that people in walkable neighborhoods generally get about 35 to 45 more minutes of moderate intensity physical activity a week and are less likely to be overweight or obese than those in low-walkability neighborhoods.

Older adults are one of the most vulnerable population when it comes to pedestrian safety. By 2030, nearly one in four Vermonters will be 65 or older. More and more Vermonters want to age in place and contribute to the vitality of their surrounding communities, and about half of all non-drivers over the age of 65 would like to get out more often. What’s more, almost one in five Americans live with some type of disability.

Economic benefits:

- Walkability is marketability – homes located in walking distance to amenities and services associated with higher property values.
- Projects that include bicycle and pedestrian facilities create more jobs.
- **Transportation is the second largest expense for families: 18% of their household budget and for low income households they spend up to 55% of their budget.**
- According to research conducted by Harvard University in 2015 commuting time is the single biggest barrier to economic mobility.

10. Decision-makers necessary for this proposal to be adopted or move forward

Advance the practical impact of complete streets on the ground through the following:

1. Legislatively advance the changes to the State Highway Design Standards by updating them to reflect current national standards that advance multimodal networks that discourage exemptions from Complete Streets.
2. Through regulation establish performance measures, benchmarks and goals for active transportation projects. Current statute allows for broad exemption from implementing complete streets, *“outside the scope of a project because of its very nature,”* which provides an expansive opportunity to exempt projects from complete streets requirements without any limitation.

11. Strategy and key considerations: Vermont’s Complete Streets statute (passed in 2011) does not require VTrans to establish benchmarks or the collection, monitoring, and reporting of data on implementation. Furthermore, the policies do not indicate the extent to which meeting the complete streets requirements impact the availability of funding for projects (funding is not tied directly to the implementation of complete streets projects). There is no review arm or senior-level official designated within VTrans to approve an exception to the complete streets policy, and no tracking of Complete Streets implementation at the local level beyond having a project manager provide written documentation if a project does not incorporate the principles.

12. Timeline: Timeline for implementation and changes to VTrans’s procedures could be accomplished within the medium term, 2-3 years. Rollout of updated state highway design standards and requirements may take time given that even once the changes are passed, road projects don’t happen overnight. To achieve the full benefit of complete streets on the majority of Vermont’s roads will take time as projects are designed, funded, and built over several years, but with updated standards and performance measures transportation projects will be better suited to incorporate all modes of transportation generating multiple benefits.

¹ These findings are based on data collected directly by local transportation and economic development agencies as reported to Smart Growth America’s National Complete Streets Coalition

Written Submission 33

Healthy Homes - Expanding Partnerships with Hospitals

1. Pitch Submitted By: NeighborWorks of Western Vermont

Ludy Biddle

2. Contact Email Address: lbiddle@nwwvt.org

3. Contact Phone Number: 802-438-2303 x221

4. Pitch Title: Efficient and Healthy Homes in Rutland County

5. Pitch Summary:

NeighborWorks of Western Vermont (NWWVT) and the Rutland Regional Medical Center (RRMC) have recently formed a pilot program to provide home repairs and energy efficiency measures on a 'doctor prescribed' basis to patients of the RRMC. The HEAT Squad, a service of NeighborWorks of Western Vermont, is a one-stop-shop for energy, home repair, health, and safety, aging-in-place assessments and improvements for homeowners. HEAT Squad provides free home assessments and low-cost energy audits and then walks with the homeowners through the entire rehab process, including help finding contractors, working with contractors, financing the projects, and ensuring work is high quality and homeowners are satisfied. The Medical Center RRMC, in its efforts to promote healthy communities, recognizes that attention to patients' housing, one of the social determinants of health, can reduce demand for medical services and therefore, the health care costs of an entire community. For example, multiple studies have proven that energy efficiency measures such as air sealing and insulation, applied to the homes of patients with asthma or COPD, thus eliminating mold, moisture, rodents and poor air circulation, significantly reduces the triggers for respiratory illnesses. Other HEAT Squad services such as new porch steps or a new roof, handicapped bathroom facilities, ramps and improved lighting make recovery at home possible in many cases and aging in place a safer and more feasible proposition. Medical personnel and distressed or elderly patients are simply not able to take on these tasks in the midst of what is often an emergency.

NeighborWorks HEAT Squad, with funds provided by RRMC, is able to grant and/or loan funds to patients and immediately carry out the construction work in the home to make it a healthier place to live. Other current HEAT Squad customers, the majority of whom are earning less than 120% of area median income, are collectively saving \$1.25 M a year and 7.5 M pounds of carbon. HEAT Squad has created more than 62 jobs and, with another \$1M investment, will create 16 more jobs. In this presentation, we will share our success story and our plans for expansion of the HEAT Squad program, and let folks know how they can help, both at the community and state policy level. We respectfully ask for \$250,000/year for five years of state funding to launch our statewide expansion and replicate our Healthy Homes project with other medical institutions interested in learning from our experience.

6. What energy sector(s) does this Pitch apply to? (Check all that apply):

- X Energy Efficiency
- X Electricity
- X Thermal Heating &/or Cooling

7. Which criteria category(ies) does it address? (Check all that apply):

- X Economic Activity
- X Affordability
- X Vulnerable Vermonters

8. Scale of impact on Vermont's energy and climate goals: If this proposal came to fruition, how might it move the needle in helping to meet Vermont's energy and climate goals by 2025 and/or 2050? Please outline assumptions and, if available, provide calculations.

HEAT Squad has completed 1500+ retrofits since 2010 in five counties, approximately a third of all residential retrofits completed in the state since we began. These retrofits are saving 7.5 million pounds of CO₂ per year. More than 60% of our customers earn less than 120% of Area Median Income, pay as much as 10% of their disposable income on heating, and have challenges maintaining their homes. We know that low-income households are 164% more likely to install efficiency measures after working with HEAT Squad versus working directly with a contractor. In addition, because of an agreement with Efficiency Vermont, our low-income customers also benefit from free replacements for ENERGY STAR appliances and LED bulbs, and efficient heat pump hot water heaters, lowering their electrical bills. HEAT Squad has visited over 4,000 homes the past seven years and educated all of those homeowners about steps they can take to save energy, regardless of whether they complete a retrofit. Because NeighborWorks is fundamentally a low-income housing organization, all homeowners interested in energy savings also enjoy a report and access to help with home repair, health, safety and aging-in-place measures specific to their homes. These outcomes are a result of our work in five Vermont counties over the past seven years. Our hope is to scale up further and work statewide, so that we can impact more Vermont home owners to reduce energy usage, dependence on fossil fuels, and to improve the housing stock across the state. With adequate funding for labor intensive work required to encourage and enable low and moderate households to engage in complicated but valuable retrofit work, HEAT Squad could engage as many as 300 more households per year to reduce greenhouse gas emissions by 1.5 M pounds of carbon and costs of energy that is a significant burden to Vermont residents.

9. Benefits/costs of this proposal for Vermont and Vermonters: Including, where possible, economic, financial, social, and environmental.



Healthy Homes, Healthy Lives

According to a recent *nationwide* evaluation completed by the Weatherization Assistance Program, once homes were weatherized, residents reported:

- **24% fewer asthma symptoms**
- **59% fewer asthma related ER visits**
- **43% fewer persistent cold symptoms**
- **47% fewer days residents reported poor mental health**



Our customers who complete energy retrofits save an average of \$900/year on their energy bills, or in aggregate, about \$1.25 million each year. Our HEAT Squad program has generated over \$9 million in contractor revenue since 2010, and because of this program \$1.2 million has been invested in Vermont communities. According to the IMPLAN economic model, every \$1 million invested in home repair and maintenance results in 16 jobs created and \$615,000 in labor income for a total economic output of \$1.6 million. Our retrofits are saving seven million pounds of CO₂ each year. Efficiency measures also provide significant health benefits to residents, particularly those dealing with asthma, COPD and other respiratory ailments because mold, moisture, rodents, and other triggers to poor health conditions are arrested. Recent studies prove, for example, that asthma-related hospital visits are reduced 25% immediately upon completion of home efficiency improvements. In response to these findings

10. Decision-makers necessary for this proposal to be adopted or move forward (e.g., Legislature, Governor, a regulatory agency, a business, organization, media outlet, or financing institution, etc.)

Our policy request is first to adapt current practices and policies to give more attention to efficiency programs aimed at individual homeowners. Individual residences are much harder to do, more labor intensive for less impact per project than the large public or commercial facilities. However, Vermont residents deserve and need to partake in the investment dollars and the potential savings from the efficiency programs. Our pitch, therefore, is a budgetary one. We are seeking \$250,000/year for five years of state funding to launch our statewide expansion. Our decision makers are the legislature and the Governor.

11. Strategy and key considerations: Outline the overall strategy, including gaps, barriers and opportunities for moving this proposal forward.

While the RRMC has provided funds to grant or loan to patients who need work in their homes, they are not providing funds for operating costs for the NWWVT rehab and HEAT Squad staff. Expanding into different areas of the state requires up-front investment to develop partnerships, conduct outreach to homeowners, hire staff, and train contractors. Our program has been recognized nationally and is being adopted already in nine counties in Appalachian Kentucky. We want to bring this service to all Vermonters! We have been working for the past year to educate legislators and the administration about the HEAT Squad and our plan for statewide expansion. We have met with some success and interest from all parties. The major barrier is the tight state budget. We have a campaign plan and messaging strategy, and we have been building our cadre of satisfied customers, spokespeople and community partners who will work on our behalf as well.

12. Timeline: To meet our 2025 goals, we need some proposals that can be implemented in the next couple of years as well as some “game changers” that will bend the curve even further out. What timeline do you foresee for your proposal to be developed and implemented?

We are already working on statewide expansion. HEAT Squad has boots on the ground now and can add more as soon as funding is secured. We have already spoken to the presidents, several hospital administrators and medical staff at the Southern Vermont Medical Center and the Northeastern Vermont Regional Hospital about replicating our pilot program in their regions. We are ready to share our experience and implement similar programs throughout Vermont when we have adequate staff to begin.