

Affordable Heat Act -S.5



Senate Committee Natural
Resources and Energy

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Relevant Background

- Undergraduate degree in Ethnobotany
- Studied in Northern Territory Australia -Tunivivi Aborigines
- Thesis on Sustainability- relationships between people and land
- Nourishing terrains and environmental stewardship with Indigenous wisdom as the guide
- MS- Human Nutrition
- Clinical Nutrition Practice and Vermont State Colleges



S.5-Fundamental Observations

- Solve and Serve-
- Neutrality and Ideologies
- Environmental stewardship- Present and Future
- GOALS
 - Reduce GHG emissions per GWSA
 - Reduce dependence on the volatile fossil fuel industry and market
 - Vermonters are independent and self sufficient thus full reliance on the grid inherently poses a problem for many
 - As was mentioned it is difficult to heat a home in the NE solely on heat pumps- technologies are coming. These are still supplemental systems.
 - Weatherization goals makes sense- Efficiency VT in place ³





Essential Components

- Vision/Direction/Path
- Diversification of energy sources and technologies
- Neutrality from all industries -Independent analysis
- Vermont is unique - commitment of the people
- Philosophy of stewardship and sustainability in VT to create a long term plan and map out the path.
- Implementation and reality from those on the ground doing the work is equally important in order to create constructive and functional plan that serves and solve

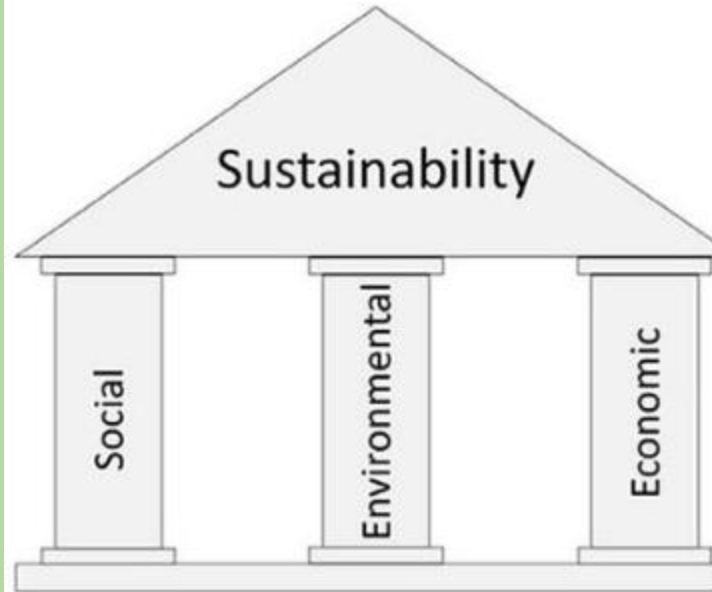
Sustainability Methods and Perspectives

- Sustainability is a complex topic.
- People with many different backgrounds and viewpoints must collaborate in order to come up with solutions to grand challenges plaguing the world today.
- Using ethics to help solve sustainability problems is one way to ensure that all of these voices are heard.....

Ethics in Sustainability – Sustainability Methods and Perspectives

When decision-makers use ethical approaches to solve sustainability problems, they consider how their actions can have effects on the environment, economy, and humankind in general – now and in the future.

Ethics in Sustainability



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Oil Tank Regulations

Efficient Oilheat Rebate

HCCV
Heating & Cooling
Contractors of Vermont

- These small fuel dealers have been doing exactly what S5 attempts to do and more. -Local heroes/keepers
- They have organically moved VT onto and down this path -innovators-
- Consumer demand, environmental consciousness, cost, competitive markets have all naturally driven this path
- Economic, efficient & environmental
- Community benefits - jobs, schools, towns



-State of Vermont now creating legislation to monitor, regulate, make rules and create a carbon credit system/tax as demanded by GWSA and the CAP. - insert state into equation

-Placing burden, full responsibility and stress on an industry that has been committed and trying to help. The pressure, unknowns and narrow options for eligible measures risks their viability as a business and their ability to provide the most affordable and effective service due to pressure for credits and avoiding a non compliance fee.

Unfair Burdens and Responsibilities

“However, this move to electrification technologies is not a government mandate and is dependent on customers **choosing** electric vehicles over traditional cars and/or choosing to install cold climate heat pumps or advanced wood heating to reduce the use of heating oil and propane. For most customers, these choices are informed not only by environmental considerations but also by economics.”

[2021 Annual Energy Report PSD](#)





Rob Stenger - Simple Energy

“You can’t heat the average home in the Northeast with electricity”

- Renewable propane, cold climate heat pumps, hybrid electric hot water heaters, biodiesel (issues)- reduce model/efficiency
- 1000 heat pump installs a year - 12 years

FQ1- Has a baseline analysis and report been done to assess current and recent actions towards goals in the thermal sector by these fuel dealers? Oversight approach - trust and faith in the people.

Dennis Percy- Fred's Energy

“My suggestion to fix the problem- instead of pushing all this money towards heat pumps, give some incentives to put more efficient heating systems in”

- Houses using $\frac{1}{2}$ the heating oil with these systems
- Impact- reductions in fossil fuel, cost, carbon footprint
- Installing heat pumps for 13 years
 - Differences in economic situations throughout state
 - NEK lower incomes than other areas of VT.

FQ2- if uptake is not adequate due to economics, why should these obligated entities carry the penalty? Supplemental systems

Reality and Baselines

- Heat pumps are supplemental options for the shoulder seasons. Consensus was current electric technology will not heat most homes alone.
- Issues with full dependency on the grid, propane generators
- Don't remove fossil fuel system
- Uptake of eligible measures optional
- Upfront costs and/or taking on a payment, even a low no interest payment is a roadblock/hard stop for many
- Massive stress to obligated entities and indirectly consumers due to unknowns
- Prior and ongoing work don't count?



Concerns-Risks-Sacrifice



Closure of Vermont Businesses

Money going out of state- buy market shares/penalties

- Keep money in communities
- RGGI- cap and trade -unsustainable model for thermal
Greenwashing issues

Inefficient and dysfunctional system installs - interferes with obligated entities ability to do best work

Advertising/marketing costs?

Economic impacts on all

S.5 -Findings -section 5

To meet the greenhouse gas emission reductions required by the GWSA, Vermont needs to transition away from its current carbon-intensive building heating practices to lower-carbon alternatives. It also needs to do this-equitably, recognizing economic effects on energy users, especially energy-burdened users; on the workforce currently providing these services; and on the overall economy.

- Cap on price increase/tax/credit requirements
- Legislative check back to review and vote versus just a committee check
- Reasonable cost threshold defined- if unreasonable impact- short circuit
- Unknowns regarding PUC design plan-

Global Warming Solutions Act

Under the GWSA and 10 V.S.A. § 578, Vermont has a legal obligation to reduce greenhouse gas emissions to specific levels by 2025, 2030, and 2050.

Natural Carbon sequestration vs. high energy intensive synthetic or man made carbon sequestration

Existing Carbon Sequestration



Existing Carbon Sequestration

- ~Approximately 75% forest- trees & fungal networks
- ~Increased levels of regenerative agriculture and grass fed farming operations
- ~Increased levels of homesteads, home gardens
- ~Many Dairy Farms sadly closing -transitioning to grassfed
- ~Increases in mushroom growing
- ~Permaculture design and biodynamic farming
- ~Trends in VT naturally heading in right direction and fostering authentic, natural carbon sequestration vs industry design with high energy inputs/bogus



Natural Carbon Sequestration

- [Four Things to Know about Fungi "Climate Warriors" | The Brink](#)
- [Fungi can help forests tackle climate change. Here's how](#)
- [Mycorrhizal fungi have a potential role in soil carbon storage under ...](#)
- [Soil Life & Carbon - Mycorrhizal Applications](#)
- [A powerful and underappreciated ally in the climate crisis? Fungi](#)
- [A powerful and underappreciated ally in the climate crisis](#)

GREEN WASHING

PUC approval of 14.5 million NY biogas/toxic landfill gas.....

How the Nature Conservancy, the world's biggest environmental group, became a dealer of meaningless carbon offsets

[JPMorgan, Disney, Blackrock Buy Nature Conservancy's Useless ...](#)

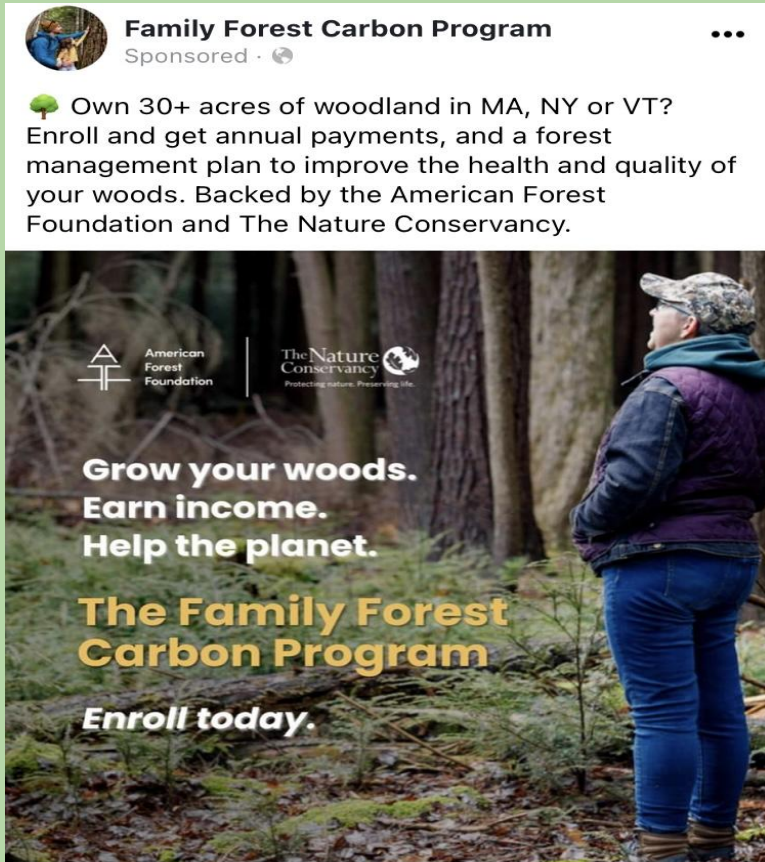
-Africa and South America situations - Environmental Colonialism, short term gain economy

-Many man-made carbon sequestration designs

Side notes- -Bill Drayton- emissions trading, carbon credit trading, ESG, impact investing, price on a desired outcome- carbon emission reductions- GHG, markets and profit if people would enter into the game.



RGGI- Cap and trade,

Corporate Carbon Game



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Does Vermont want to play the Green Washing corporate carbon game?

Vermont at a crossroads
Real environmental stewardships
or corporate?

Will local businesses be demanded
to enter the carbon emissions
game

§ 8122. CLEAN HEAT STANDARD

(b) By rule or order, the Commission shall establish or adopt a system of tradable clean heat credits earned from the delivery of clean heat measures that reduce greenhouse gas emissions.

(c) An obligated party may obtain the required amount of clean heat credits through delivery of eligible clean heat measures, through contracts for delivery of eligible clean heat measures, through the market purchase of clean heat credits, or through delivery of eligible clean heat measures by a designated statewide default delivery agent.

Polyfluoroalkylsubstances- PFAS

PFAS- National Institute of Environmental Health Sciences,
-PFAS are toxic, persistent and bioaccumulative

In July 2021, the town of Avon, NY enacted a local law to prohibit using solar panels that utilize or contain any amount of GenX chemicals or Polyfluoroalkylsubstances (PFAS)

Concerns and evidence pointing to water quality encouraged this action

[PFAS- forever chemicals in the renewable energy industry](#)

PFAS- forever chemicals

EPA scientist - Mark Strynar provided 39 records from the Scifinder database that the EPA uses to identify PFAS application of solar panels

- PFAS- used in electrical wires, backing panels, tapes, adhesives, and anti reflective coating(ARC) and anti soil coatings (ASC)
- China major supplier of polysilicone solar panels, and batteries
- In 2021, Biden administration banned import and use of certain solar energy materials and products from China due to forced labor and genocide at polysilicon mines.
- ASC- typically uses nanoparticulate titanium dioxide -concerns and evidence of risk to environmental and human health- In 2020, CA announced review of nano TiO₂ under their Safe Water Act

European Union-European Chemicals Agency- proposed ban on PFAS -2/7/23

[PFAS ban considers impact on heat pumps - Cooling Post](#)

[EU considers ban on 'forever chemicals', urges search for alternatives](#)

[Per- and polyfluoroalkyl substances \(PFASs\) - ECHA](#)

Industry Relevant Bills in VT

[VT Bill.47 - recycling solar panels](#) -proposes to require all solar panel installers to have an approved recycling plan for the solar panels. It proposes to give the Public Utility Commission authority to approve recycling plans.

[VT Bill H.50- PFAS](#) - proposes to prohibit the sale, offer for sale, or distribution of a consumer product in the State that has a total organic fluorine concentration of greater than 100 parts per million. An act relating to prohibiting the labeling of consumer products that contain PFAS as compostable

[VT Bill H.152 - Banning PFAS 2030](#)-This bill proposes to prohibit the manufacture, sale, and distribution in Vermont of apparel, cookware, paper 10 products, and pesticides containing PFAS by 2024. It also proposes to prohibit 11 the manufacture, sale, and distribution in Vermont of cosmetic products 12 containing certain chemicals and chemical classes by 2026. This bill proposes 13 to prohibit the manufacture, sale, and distribution of all products containing 14 PFAS by 2030. 15 An act relating to regulating products containing certain ch

DOWNFALLS OF BIOFUELS

High cost of production- expensive and carbon intensive

Monoculture Crops – create vacuum for pests and weeds- high use of pesticides, insecticides,

Resistance- more toxic applications- soil, water contamination with health impacts on human and environmental health

GMOs- All of the known and unknown impacts of GMOs, risks to insects, ecosystems, humans– intended to be used with glyphosates and other pesticides

Fertilizers for intensive growth -harmful effects on the surrounding environment, water pollution -Petroleum based- nitrogen and phosphorus -poisoned water and habitats and life

DOWNFALLS OF BIOFUELS

Takes up agricultural space- pressure on current growth of crops, rise in food prices

Production largely dependent on water and oil – intensive resource use, water pollutions and high emissions

Also increases nitrogen oxide

Research and future installations leads to spike in price- same volatility

Clearing native vegetation leads to ecological damage, destroying local habitat, reduce health of natural resources

Native forest better at removing CO₂ not harvested, remain trapped

Biofuels still have carbon and hydrogen- still create GHG- potentially higher in some instances

Glyphosate release

GMO Crops

Total land area in US- 2.3 billion acres

About half of the land area in US is farmland-
1.2 billion acres

333 million acres of row crop land

655 million acres of pasture & rangeland

130 million acres of grazed forestland

GMOs in 2019-

US- 71.5 million hectares

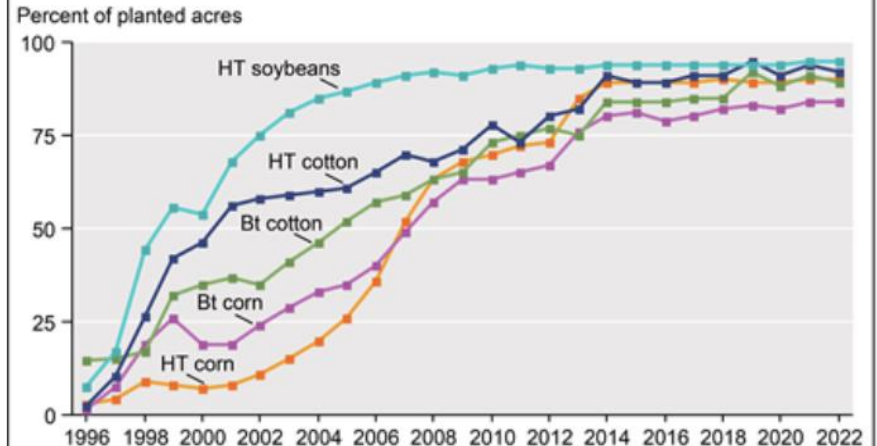
Brazil – over 52.8 million hectares

Corn grown in Nebraska dry climate required
780 gallons of irrigation water per gallon of
ethanol. -substantial amounts of groundwater-



Recent Trends in GE Adoption

Adoption of genetically engineered crops in the United States, 1996–2022



Note: HT indicates herbicide-tolerant varieties; Bt (*Bacillus thuringiensis*) indicates insect-resistant varieties (containing genes from the soil bacterium Bt). Data for HT/Bt corn and cotton are not mutually exclusive, as HT and Bt categories include those varieties with overlapping (stacked) HT and Bt traits.

Source: USDA, Economic Research Service using data from the 2002 ERS report, Adoption of Bioengineered Crops (AER-810) for 1996–99 and National Agricultural Statistics Service, (annual) June Agricultural Survey for 2000–22.

Lithium Triangle and Mining



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Brine pools at the Soquimich lithium mine on a salt flat in northern Chile. IVAN ALVARADO / REUTERS VIA ALAMY

Why the Rush to Mine
Lithium Could Dry Up the
High Andes

Environmental Colonialism



© The Carter Center / G. Dubourthoumie
Children's environmental health risks in the Democratic Republic of Congo, November 14, 2009

Gulf of Mexico Hypoxia: Past, Present, and Future - Rabalais - ASLO

A large hypoxic zone (with a five-year average area of 5,380 square miles) occurs in the Gulf of Mexico each summer. Excess nitrogen, primarily from fertilizer runoff from Midwest farms, causes algae blooms that decompose and deplete dissolved oxygen, injuring or killing aquatic life. Increasing corn ethanol acreage without changing cultivation techniques will make reducing the hypoxic zone more difficult.

Ecological and Social Impacts of Biofuels First and Second Generation Biofuels

Northern Gulf of Mexico Hypoxic Zone

Background

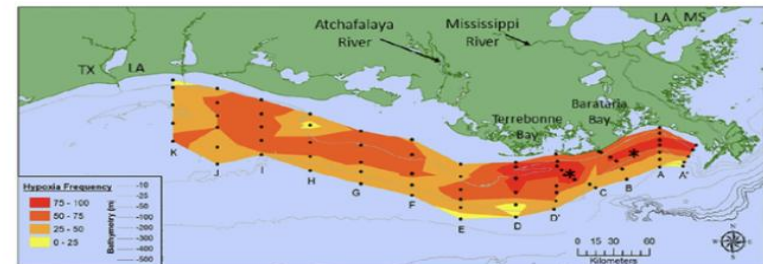


FIG. 1. The frequency of bottom-water hypoxia from shelf-wide hypoxia mapping (1985–2014) (updated from Rabalais et al. (2007b)); frequency is determined from stations for which there are data for at least half of all cruises. Asterisks (*) indicate locations of near-bottom oxygen meters; transects C and F identified. Data source: N. N. Rabalais and R. E. Turner.

Source: [Rabalais and Turner 2019](#)

Biofuels Factsheet - Center for Sustainable Systems

Studies have suggested that increased biofuel production in the U.S. will increase global GHG emissions, due to higher crop prices motivating farmers in other countries to convert non-cropland to cropland. Clearing new cropland releases carbon stored in vegetation, preventing the future storage of carbon in those plants.

Key Initial Considerations

10-year timeline

- VT will receive **\$59M** in consumer home energy rebate programs.
- Most funds have to be spent by **9/30/31**.
- Most new tax breaks through **9/30/32**.
- Some notable exceptions.

Rebate Programs thru SEOs

- DOE will send SEOs block grants to for programs—based on SEP formula.
 - Exact timing still TBD.
- LMI defined as up to 150% of AMI in most cases.
- Plans **MUST** be submitted by 8/15/24- or lose access to funds.

Climate Justice Opportunities

- Justice40- 40% of funds to LMI & underserved communities.
- GGRF- Unclear what final shape will be, VT very active-but technical assistance a must (similar to WRAP program).
- More guidance coming soon from EPA.

Solution 1- minimum

- Provide caps with a short circuit amendment
 - Prohibit and define unreasonable impacts
- True legislative check back- with a vote
- Protections for the obligated entities
 - No Business closures
 - No out of state purchase of carbon credits/CHS
- Adjust eligible measures to include efficient heating systems that reduce consumption by a certain percentage. Consult with fuel dealers for further ideas on eligible measures

Solution 2- Better than minimum

- State plays a monitoring role
- Forge stronger relationship with Efficiency VT and VT fuel dealers- they are already doing the work
- Focus efforts, time and energy on influx of IRA
- Possible historical report/analysis of eligible measures already installed- establish a baseline for comparison
- Leave out PUC - remove credit system- CHS
- Requires legislative action to prevent lawsuit
- Hold on S.5 and Clean Heat Standard design and implementation

Local and Regional Plan

- Solution 2 plus emphasis on the following:

Local Regions

- Addressing Energy Burdens
- Grid access, Output, capability, rates and infrastructure
- Considers Incomes levels
- Community and individual needs and priorities
 - Weatherization and Efficiency Focus
- Local fuel dealers and Efficiency VT collaboration



Vermont Specific Plan



~Sustainability in its true form~
Environmental stewardship
Economic support and protections
Individual and social supports

Unique, compassionate, environment
loving Vermonters want to continue to
help each other and the earth
Collaboration is Key