

Spring 2017 Environmental Studies Senior Seminar Project Statements
ENVS 0401A
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Seminar Theme: Energy Equity

Projects will focus on inequality, energy burden, housing and associated programmatic and policy questions as part of Vermont's evolving energy landscape and transition to a low carbon future

Background: Historically, low-income homeowners have not been actively included in efficiency and renewable energy initiatives in the state. This is particularly problematic given that the low-income population faces a disproportionate burden with regard to the cost of energy. Households below median income spend up to 12% of their annual income on electricity and thermal energy (heating), while those above median income spend 5% or less. These percentages also do not include the high cost of transportation energy, which is actually the largest component of "total energy" spending for Vermonters. Taken together, Efficiency Vermont notes that "a substantial number of Vermont households live in fuel poverty, or are in danger of falling into such poverty" (Mapping Total Energy Burden, 2016).

Key considerations/framing:

- Current political moment in Vermont and beyond: Vermont's new governor Phil Scott (R) has stressed that economic growth and affordability are his two primary areas of focus. One challenge is to think about how energy issues are intimately tied to both of these and demonstrate what can be done on a bipartisan platform.
- Non-subsidized rental market housing: This is one of the hardest sectors to reach, so keep an eye out for successful models from elsewhere for engaging landlords.
- Vermont Community Energy Dashboard: A powerful new community energy tool with a range of functions. Another consideration is to think about how products from all projects might be featured on the Dashboard (<http://www.vtenergydashboard.org/>).

Starting Resources / References:

Mapping Total Energy Burden in Vermont:

<https://www.encyvermont.com/news-blog/whitepapers/mapping-total-energy-burden-vermont>

Energy Costs and Burdens in Vermont: Burdensome for Whom?:

<http://www-assets.vermontlaw.edu/Assets/iee/VLS%20IEE%20Energy%20Burden%20Report.pdf>

Note: This report is in our required reading list for week, as reading 4B.

Project #1: Leveraging Policies and Programs to Support Low-Income Vermonters

Project Partner: Linda McGinnis, Program Director and interim Executive Director, Energy Action Network

Energy Action Network (EAN) will be focusing in 2017 on identifying those mechanisms and programs (either in Vermont or in comparable states) that can effectively target those who spend the greatest share of their income on energy, generally low-middle income residents. The goal is to enable them to access to the same types of energy efficiency and renewable investments/actions as the early adopter/higher income segments of the population.

- Issue: There are several new tools for financing Total Energy projects (addressing heat, electricity and transportation), yet most low to middle income Vermonters are not aware of these options.
 - Outcome 1: to achieve a better understanding of what is available, develop case study summaries of available programs.
 - First priorities for programs to research are 1) On-bill financing programs (e.g. pilot Green Mountain Power Program in Panton, Vermont), 2) The Upper Valley's Solarize and Weatherize campaigns and how these might be expanded to the Northeast Kingdom of Vermont, and 3) programs that address transportation as part of total energy (e.g. California EV program for low-income residents).
 - Other programs if time allows: Burlington's Landlord Efficiency "Champ" Program, Vermods, McKnight Lane Modular Housing Innovation Project in Waltham, and Neighborworks Heat Squad projects
 - Outcome 2: go beyond highlighting programs/tools, *but also make suggestions of how to improve these tools/programs/policies*
 - What are the limitations to existing programs?
 - What are barriers to adoption / utilizing programs and are these real or perceived?
 - Address barriers specific to renters/leasers
 - Research models from elsewhere to address gaps or recommend improvements to what is available in VT (e.g. California EV program for low-income residents)

Project #2: Total Energy Visualization and Calculation

Project Partner: Linda McGinnis, Program Director and interim Executive Director, Energy Action Network

- Issue: Need for a better conceptualization / understanding of total energy spending and smart infographics that help people understand the savings that can be generated over time by investing in efficiency and/or renewable electricity/heat/transportation. Transportation is a particular area of need, because many people do not track transportation expenditures the way they track / are aware of utility bill spending.
 - Outcome 1: An detailed portrait (perhaps an infographic) of what an average low-middle income Vermonter spends on total energy including:

- Current total energy spending (through interviews & case studies using consistent metrics)
- Calculation of what they could spend if they made a change or took advantage of an available tool/program
- Outcome 2: Research existing “Total Energy Financial Calculators” (or develop your own) that would enable households to plug in specific actions across all key energy sectors (efficiency, electricity, heat, transportation) and calculate potential savings (including best available financing). EAN would like to add this type of calculator to its [Community Energy Dashboard](#), so keep in mind which tools would be adaptable to this platform.
 - What models are out there (e.g. DOE, HUD)? Which ones are *simple and provide outputs of potential savings*
 - Test as many models as possible, detail the pros and cons of these models and suggest improvements
 - Our partners at Efficiency Vermont can provide some example inputs from a range of housing scenarios for your tool testing

Project #3: Energy Arrearage Programs in Vermont

Project Partners: PEAS Team from Efficiency Vermont—Liz Curry, Elizabeth Palchak, Stephanie Morse and Elizabeth Chant

Paying Energy Arrearage through Savings (PEAS) is a concept to prevent utility shut-offs and lower the energy burden for low-income households. The idea is to work with utilities (and assess the feasibility of working with fuel dealers) to engage customers with arrearages (overdue payments on electricity and/or fuel bills) to participate in energy savings and cost reduction efforts. This is a priority research and development area for our partners at [Efficiency Vermont](#).

Efficiency Vermont is interested in the elements that make these programs successful for the purpose of assessing opportunities to improve arrearage management approaches in Vermont. Additionally, Efficiency Vermont (EVT) would like to explore the concept of combining an Arrearage Management Program (AMP) with installing higher efficiency electrical products in the homes of AMP participants in order to lower their electrical use and costs, and deliver education about saving energy. EVT will explore this program component after the initial research is complete.

Key Questions:

- What is an arrearage management program and how does it work?
- What are the best practices in other states with AMPs in place?
- What is currently in place to support low-income Vermonters with overdue metered (electric, natural gas) and bulk (oil, propane) bills?
- How can Vermont integrate lessons from AMPs in other states?

Project Outcomes:

- An understanding of the intersection between poverty, energy costs and utility bills in arrears and the consequences of this type of debt for low-income households

- Ideas on what comprises successful AMPs, in both investor-owned (IOUs) and non-investor owned utilities (municipal and cooperatives) found in other states like Maine and Massachusetts
- An understanding of how programs in other states could contribute to programs in Vermont that effectively support low-income residents

Project Deliverables

- Background research to identify common elements, key design components/program features, and best practices in AMPs across the country, including Maine and Massachusetts. EVT has detailed a list of programs that they would like you to start with to ensure that these get covered. You will consider these programs from a range of perspectives, e.g. advocates, regulatory entities, and municipal utilities.
- Develop interview guide and interview select members from utilities and advocacy community organizations (e.g. LIHEAP, AARP, CVOEO) in and outside of Vermont to assess strengths and weaknesses of AMPs as a mechanism for increasing the economic security of low-income customers. Again, EVT has developed a starting list of organizations that they would like you to interview.

Starting Resources (in Classes Share folder):

Efficiency Vermont PEAS 2016 R&D Project Plan

[Helping Low-Income Utility Customers Manage Overdue Bills through Arrearage Management Programs \(AMP\)](#)

Massachusetts Arrearage Management Plans (AMPs) 2010 Attributes and Outcomes

Payment Arrangements & Arrearage Management (Austin, TX)

Finding Methods to Estimate Social Benefits of Low-Income Energy Efficiency Programs

Project #4: Storytelling for Zero-Energy Modular Homes

Project Partner: Phoebe Howe '15, Homeownership Advisor, Efficiency Vermont's Mobile Home Replacement Program

Efficiency Vermont's Mobile Home Replacement Program seeks to help all low-income Vermonters, with an emphasis on current mobile home residents, access high quality, net-zero energy housing. The program operates in collaboration with the Vermont Housing and Conservation Board, local affordable housing organizations, and VERMOD Homes, a local builder of zero-energy modular (ZEM) homes. In addition to providing high quality, energy efficient housing, ZEM homes also enable low-income homeowners to reap the benefits of renewable energy: resiliency against severe weather events (when paired with battery storage), protection from fluctuating energy costs, the satisfaction of self-sufficiency, and a means to put environmental values into action. Although typically viewed by stakeholders and prospective homebuyers through an affordable housing lens, Efficiency Vermont's ZEM approach is also one of the state's most comprehensive, cost-effective, and targeted efforts to reduce the energy burden on low-income residents.

Need: There is no question that energy costs disproportionately burden low-income Vermonters; plenty of data and analysis exists to prove that point. However, we are missing the stories and voices that would serve to humanize and contextualize that data. It remains surprisingly easy for policy makers, community stakeholders, and even homeowners themselves to ignore or reject the scientific evidence— but much harder to discount an individual and their lived experience, particularly when presented in a compelling format.

Deliverables: Storytelling project with low-income homeowners (to include mobile home residents and ZEM homeowners) in Addison County (can expand to Chittenden and Rutland Counties as well) – to include visual art, film, sound, written narratives, photographs, etc. that are suitable for sharing with the public. Efficiency Vermont can provide contacts for low-income homeowners to interview.

- Potential interview questions for homeowners are up to the students and should be informed by their policy research, but here are a few ideas:
- What is the perspective of low-income homeowners on the place of energy within a household budget? Is it high priority? Low priority? Is energy seen as a flexible or fixed expense? Is it seen as a necessity or luxury? Do people calculate their energy costs on a monthly, seasonal, or annual basis? (ask ZEM homeowners about their past vs. present experience)
- How do homeowners save electricity and heating fuel in their homes? What significant efficiency measures have they undertaken, either on their own or through established initiatives?
- What indoor conditions do homeowners consider comfortable?
- What are the main barriers to participation in existing efficiency and renewable energy programs? Lack of awareness? Expense (perceived or real)? Sense of exclusion? Burden of research, paperwork, and application process?
- If new efficiency and/or renewable energy programs were created for low-income homeowners, what topics should they address? What would motivate people to participate?
- How do homeowners think Addison County should pursue efficiency measures and renewable energy? How about the country as a whole?

Further reading:

VERMOD Homes website: <http://vermodhomes.com/>

Voices of Home storytelling project: <http://www.vtaffordablehousing.org/voices/>

Other Resources for All Project Teams:

- [One Touch](#) is an e-referral program that connects health, energy, and housing home visiting and repair programs to cost-effectively improve health outcomes and reduce home energy use.
- Dept. of Housing and Urban Development's [Location Affordability Portal](#). Geared towards understanding the combined cost of housing and transportation
- [Act 56 Renewable Energy Standard](#)
 - “Tier 3” – the energy innovation tier – requires utilities to help Vermonters reduce their use of fossil fuels for heating and transportation. By 2032, the Public Service Department estimates that these requirements will result in [over 85,000 Vermonters receiving assistance on energy upgrades](#) ranging from home weatherization to cold climate heat pumps to biomass and biofuel systems to electric vehicle charging stations.
- [Vermont Comprehensive Energy Plan](#)
- [The Rise of the Energy Efficiency Utility](#) (to help students get a sense of what energy efficiency utilities are)