Exploring the Feasibility of a Residential Energy Efficiency Carbon Offset Project at Colgate University

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EXECUTIVE SUMMARY

To reach climate neutrality by 2019, Colgate University must complement on-campus carbon reduction initiatives with off-campus carbon offset programs. There are a variety of different carbon offset projects that Colgate University can employ, and this paper investigates the feasibility of one of these projects: a program that provides energy efficiency upgrades for residential households in the local community. Residential energy efficiency programs have grown in popularity as of recent given the many ecological, economic, and social benefits. By implementing this type of carbon offset project, Colgate University could once again demonstrate its position at the forefront of the sustainability in higher education movement.

In order to quantify the benefits associated with this type of program and evaluate their impacts in the greater Hamilton community, our group contacted various local energy contractors and interviewed individuals working on similar carbon offset projects at Duke University and Yale University. Through these conversations and further research we learned that weatherization work, which includes insulation, duct sealing, and air sealing, is the most cost-effective project that can generate the most energy savings. Our calculations indicate that if Colgate University financed weatherization projects in approximately 475 local households, the associated carbon savings would be about 5,000 mtCO2e given that carbon savings typically accrue for 10 years. We estimated the cost of carbon per ton to be $247 and the cost to finance these projects to be $1,235,000. We also found that investing in weatherization projects of middle-income households could be an additional and viable way to produce carbon offsets given the many state funded energy efficiency programs targeted at low-income households.

This report really only scratches the surface of the possible implementation of a home energy efficiency carbon offset project- much more research is needed to evaluate financing options, explore the possibility of community partnerships, gauge household interest level, and decide the most effective way to account for carbon savings. In directing future research, we recommend that a home energy efficiency project focus on weatherization work and target middle-income households in the surrounding area. We also recommend that Colgate University collaborate with other organizations, such as the Clinton Climate Initiative- Home Energy Affordability Loan Program, to develop a pilot program for Colgate’s employees and evaluate the program’s feasibility.
Table of Contents

INTRODUCTION ............................................................................................................. 4

BACKGROUND .............................................................................................................. 6
Initial On-Campus Reduction of Emissions....................................................... Error! Bookmark not defined.
Choosing Types of Offsets....................................................................................... 7
Analysis of Home Energy Efficiency Projects ....................................................... 8
Research into Existing Strategies............................................................................ 9
Assessment of Goals and Potential Obstacles....................................................... 12

METHODS ..................................................................................................................... Error! Bookmark not defined.
A Direct Approach through Interviews................................................................. 13
Reviewing the Literature to Inform our Research Design ........................................ 14

FINDINGS/RESULTS .................................................................................................. 16

ANALYSIS/DISCUSSION ............................................................................................ 22
Ecological Analysis................................................................................................... 22
Economic Analysis ................................................................................................... 23
Social Analysis.......................................................................................................... 24

RECOMMENDATIONS AND CONCLUSION ................................................................ 25
Insulation Projects...................................................................................................... Error! Bookmark not defined.
Third Party Verification............................................................................................. 26
Target Middle-Income Households ............................................................................ Error! Bookmark not defined.
Implementation Recommendations........................................................................... Error! Bookmark not defined.

REFERENCES .............................................................................................................. 28

APPENDICES .............................................................................................................. 30
INTRODUCTION

Colgate University has been a forefront leader in higher education by advancing the practice and teachings of sustainability. In January of 2009, Colgate University became a signatory of the American College and University Presidents’ Climate Commitment (ACUPCC), which mandates that all signatory parties establish and achieve climate neutrality during an institution’s decided time frame (ACUPCC, 2008a). The commitment was a highly visible public pledge for the university to advertise its ambitious goal of climate neutrality by 2019. To reach this goal, Colgate needs to develop plans to minimize current greenhouse gas emissions, eliminate them from as many future operations as possible, and mitigate the residual emissions through investment in renewable energy programs or carbon offset projects (Sharp, 2009, p. 2).

Sustainability, and sustainable development for that matter, both implore parties to consider the social and economic ramifications in addition to the more obvious environmental ones when developing a project (Kates et al., 2005, p. 12). As authors within the sustainability discourse often mention, these three pillars of sustainability, are highly interdependent, and a project must addresses each pillar in order to be considered sustainable (Zilahy, 2006; McNamara, 2010; Bostrom, 2012; Theis & Tomkin, 2012). Therefore, while it is essential that Colgate reach its neutrality goal by 2019, the project chosen to offset the remaining emissions should not solely focus on the emission reductions, but also the social and economic repercussions of the project.

Considering this information, the following paper will investigate the feasibility of one particular carbon offset initiative that Colgate could potentially pursue: a residential energy efficiency program. According to the Department of Energy, residential energy usage makes up 32% of total energy consumption in the United States, accounting for 1.27 billion CO2e annually. However, studies suggest that cost-effective energy efficiency programs could unlock savings of around 27% of US residential energy consumption by 2020 (Energy.gov, 2010). Thus, our group developed the following research questions:

If Colgate University established a fund to which community members could apply to receive funding for home energy-efficiency upgrades:

(1) What types of energy efficiency projects would it finance?
(2) How many carbon dioxide equivalents would these upgrades save?
(3) Which community members would be eligible to participate?

To answer these questions, we conducted interviews with various local energy contractors and individuals working on similar carbon offset programs at other institutions. From these interviews, we were able to gather enough data to estimate average energy and cost savings associated with certain energy efficiency projects and determine an approximate number of households in Madison County needed to offset 5,000 mtCO2e. In this paper, we will 1) evaluate the literature on carbon offsets and home energy efficiency programs, 2) review the methods
used to reach our conclusions, 3) analyze our findings, 4) and provide future recommendations. We hope that the Colgate senior administration will utilize the following report to weigh the benefits and drawbacks of this project and to ultimately decide whether this is a carbon offset project worth pursuing in the future.

BACKGROUND

**Carbon Offsets**

According to the ACUPCC, climate neutrality is achieved by reducing on-campus emissions and then supplementing any unavoidable emissions with off-campus carbon offsets (Dautremont-Smith et al., 2007, p. 21). Since 2009, Colgate has implemented many on-campus projects to reduce its gross emissions. However, despite our best efforts, Colgate cannot reduce its emissions to zero through mitigation measures alone given certain activities like employee air travel and commuting, which produce emissions that cannot be eliminated without major changes to our operations or academic mission. Thus, Colgate must invest in carbon offsets, defined as, “a reduction or removal of carbon dioxide equivalent greenhouse gas emissions that is used to counterbalance or compensate for (“offset”) emissions from other activities” (Hales et al., 2008, p. 11). By investing in off-campus projects that effectively mitigate atmospheric greenhouse gases, Colgate can neutralize the emissions we cannot immediately eliminate and accept responsibility for the harmful effects its operations contribute to global climate change.

In 2012, Colgate partnered with the Patagonia Sur Nature Reserve in southern Chile to create an innovative forestry-based carbon offset program. Over the course of 15 years, approximately 225,000 native trees will be planted on roughly 420 acres of land, which will sequester 5,000 mtCO$_2$e annually.

In order to ensure the legitimacy of offsets, some institutions choose to have their offsets verified by an outside company. One particular standard of interest is the Verified Carbon Standard (VCS), which is the world’s leading voluntary greenhouse gas program. VCS quality assurance principles ensure all verified carbon units represent greenhouse gas emission reductions or removals that abide by ACUPCC’s 13 requirements for offset projects. In order to develop a project with VCS, the first step is to select a methodology applicable to the proposed project by either using existing VCS methodology or one developed under an approved greenhouse gas program such as the Clean Development Mechanism, which allows a country that has committed to the Kyoto Protocol to create a carbon offsetting project in a developing country. Moreover, if an applicable methodology does not exist, project developers are welcome to propose their own. The second step is to select an approved verification organization to validate the project and determine whether a project meets all VCS rules and requirements. Once a project starts, the
greenhouse gas emission reductions or removals must be monitored using a monitoring report provided by VCS. Lastly, the project must submit all required documents to a VCS registry operator in order to be registered on the VCS Project Database and request issuance of verified carbon units. Although this process ensures that offsets are following the correct protocol, it is also very time consuming and expensive, which can limit the success of the project.

Analysis of Home Energy Efficiency Projects:

The process of improving home energy efficiency can be simple once offset calculations and financing are complete. The process begins with a home energy audit conducted by trained contractors in order to collect information on how a specific home is using its energy and how it can be upgraded to be more energy efficient. The Residential Energy Consumption Survey (RECS) gathered data from energy usage in 2009 and found that 48% of energy consumption in US homes was attributed to space heating and cooling. For houses in the cold climate to which Madison County belongs, the average was even higher and accounted for nearly 60% of total energy consumption. Given that houses are using the most energy for space heating and cooling, local energy contractors and other stakeholders focus most of their efforts on weatherization projects, which include air sealing, duct sealing, and insulation.

Research into Existing Strategies:

Since many colleges and universities have either developed carbon offsets programs or are in the process of designing one, it is helpful to research existing strategies in order to learn more about the many different available options. Research into the successes and pitfalls of other institutions can help a college or university save time and money when designing its own carbon offset program. In assessing the feasibility of an offsets program at Colgate, we looked at similar programs at Yale University and Duke University as well as housing studies in Maine and New York State.

At Yale University, the Office of Sustainability collaborated with the Center for Business and Environment at Yale to create the Yale Community Carbon Fund to help support local community members that live in the neighborhoods surrounding Yale. Unfortunately, due to lack of funding, Yale was unable to support this project and it does not contribute to Yale’s goal of carbon neutrality. Although it is not directly involved with Yale’s neutrality goals, the program still exists in order to generate offsets and foster sustainable practices in the local community. Since low-income communities are often ignored when trying to increase energy efficiency in the United States, Yale’s program focuses on the social benefits of offsets and works to right environmental injustices that may exist in household energy production. In creating its program, Yale experienced multiple difficulties, especially concerning data collection and funding for energy efficiency updates. One of the obstacles that Yale faced was that in many cases, homes
needed health and safety improvements before energy efficiency programs could begin. This presented both time and cost obstacles. In order to fund the project, Yale created a carbon calculator that allows anyone with Internet access to donate to the program based on personal carbon emissions. This fund does not generate a significant amount of money and is very unreliable in producing consistent income (A. Harper, Personal Communication, April 2, 2014).

Duke University signed the ACUPCC in June 2007 and since then has accomplished a 53,000 mtCO₂e reduction in its emissions (Duke University, 2009, p. 2). Now, Duke is looking to use carbon offsets to bring them closer to reaching their goals of carbon neutrality. Duke created the Duke Carbon Offsets Initiative (DCOI) in June 2009, which works to design carbon offset programs (Chauhan, Chen, & Lu, 2013, p. 7). While this initiative focuses on generating offsets to reduce Duke’s carbon footprint, it is also dedicated to organizing offset programs that include “educational, social and environmental co-benefits” (Polk & Potes, 2008, p. 1). One offset program which is of particular interest to Colgate is Duke’s energy efficiency project, which provides Duke employees with the opportunity to renovate their homes and make them more energy efficient at a discounted price. This project is designed to simplify the household energy efficiency process by teaching users about energy efficiency and by offering financial aid for renovations (C. Adair, Personal Communication, April 4, 2014). After conducting feasibility assessments to evaluate, “cost, community and environmental co-benefits, educational opportunities, research opportunities, and achieving credible and measurable offsets” (Duke University, 2009, p. 8), Duke designed an energy efficiency offset pilot project that is to be implemented this summer (C. Adair, Personal Communication, April 4, 2014).

The Maine State Housing Authority or MaineHousing conducted a study to evaluate the effectiveness of energy efficiency in households for creating offsets. This program focused on weatherization, in which households are renovated in order to reduce the amount of energy needed to heat a home. MaineHousing found that even though there are significant obstacles involved with household energy efficiency, it has the potential to be a very successful carbon offset project. From their findings, they discovered that 32% of the United States’ total energy consumption comes from residential energy usage, making this kind of offset program an excellent opportunity to generate offsets (Erario et al., 2012, p. 9). One drawback to this type of project is the amount of time it takes to organize in order to make sure it is successful in the long run. Feasibility assessments and creating reports for offset verification can take over a year or longer to complete, which can prevent projects from being implemented and can be costly for organizations (Erario et al., 2012, p. 23). A report from MaineHousing reveals that in order for an offset to be a financially sound investment, at least 1,000-2,000 households must be renovated. Thus, collecting participants can also be a significant obstacle (Erario et al., 2012, p. 12). Overall, the MaineHousing report was hopeful about the potential for household energy efficiency projects to generate offsets, reduce one’s carbon footprint, and benefit the local community.
In recent years, Madison County representatives have dedicated themselves to increase energy efficiency in Upstate New York. Public parks in many Madison County communities now produce energy using solar panels as well as hydroelectric power systems in streams and rivers. Madison County representatives have also been involved in researching and executing the development of wind farms in appropriate areas (Hart, 2013, p. 8). With their sustainability initiatives, Madison County seeks to achieve, “economic benefits, energy security, and public health” (Hart, 2013, p. 5) while also reducing its carbon footprint and benefiting the environment. Currently, many offset programs and energy efficiency benefit programs exist in the Madison County area, so additionality tests are a very important aspect of creating new offset programs. Figure 1 and Figure 2 below provide data on households in the Village of Hamilton, the town of Hamilton, and Madison County.

**Madison County Housing, Demographic, and Greenhouse Gas Emissions Data**

*Figure 1*

<table>
<thead>
<tr>
<th>2008-12 American Community Survey Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population</td>
</tr>
<tr>
<td>Mean household income</td>
</tr>
<tr>
<td>Occupied housing units</td>
</tr>
<tr>
<td>1 unit, detached homes</td>
</tr>
<tr>
<td>Owner Occupied (% of total occupied)</td>
</tr>
<tr>
<td>Target Homes (1 unit, detached homes* % owned)</td>
</tr>
<tr>
<td>Average household size of owner occupied</td>
</tr>
<tr>
<td>Houses built Pre-1939</td>
</tr>
<tr>
<td>Houses Built 1940-1989</td>
</tr>
<tr>
<td>Houses Built Post 1990</td>
</tr>
<tr>
<td>Median Owner occupied value</td>
</tr>
<tr>
<td>Utility Gas</td>
</tr>
<tr>
<td>Bottled, tank, or LP gas</td>
</tr>
<tr>
<td>Electricity</td>
</tr>
<tr>
<td>Fuel oil, kerosene</td>
</tr>
<tr>
<td>Coal or coke</td>
</tr>
<tr>
<td>Wood</td>
</tr>
<tr>
<td>Solar energy</td>
</tr>
<tr>
<td>Other fuel</td>
</tr>
<tr>
<td>No fuel used</td>
</tr>
</tbody>
</table>

**Madison County 2010 GHG Inventory Results**

| Total residential emissions | 140,562 mtCO2e |
| % Total GHG emissions from residential | 18% |
### Emissions per occupied housing unit

<table>
<thead>
<tr>
<th>Emissions per occupied housing unit</th>
<th>5.23 mtCO₂e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions from target homes</td>
<td>90,948 mtCO₂e</td>
</tr>
</tbody>
</table>

**Figure 2**

<table>
<thead>
<tr>
<th>House Characteristics</th>
<th>Village of Hamilton</th>
<th>Town of Hamilton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median Home Value</td>
<td>$196,000</td>
<td>$126,900</td>
</tr>
<tr>
<td>Average sale price/sqft 2010-12</td>
<td>$87</td>
<td>$94</td>
</tr>
<tr>
<td>Average square footage</td>
<td>2,253 sqft</td>
<td>1,350 sqft</td>
</tr>
<tr>
<td>Houses Built Pre-1939</td>
<td>68.50%</td>
<td>59.80%</td>
</tr>
<tr>
<td>Houses Built 1940-1989</td>
<td>25.70%</td>
<td>31%</td>
</tr>
<tr>
<td>Houses Built Post 1990</td>
<td>5.80%</td>
<td>9.20%</td>
</tr>
<tr>
<td># of one unit, detached homes</td>
<td>455</td>
<td>-</td>
</tr>
<tr>
<td>New permits issued between 2007-12</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Change in housing stock 2000-2010</td>
<td>-22%</td>
<td>14%</td>
</tr>
</tbody>
</table>

**Existing Programs**

There are currently four programs—Empower New York, the Assisted Home Performance with ENERGY STAR, the Assisted New York ENERGY STAR Homes Program, and the Home Performance with ENERGY STAR program that are financed by NYSERDA and two other state programs called the Weatherization Assistance Program and the Low-Income Home Energy Assistance Program.

Empower New York, the Weatherization Assistance Program (WAP), and the Low-Income Home Energy Assistance Program (HEAP) are programs only available to New York household’s that have annual incomes at or below 60% of the state median income. The income requirements vary based on the number of residents in each household; for example, a household with two residents must have an annual income equivalent to or below $34,128 and a household with three residents must have an annual income of $42,156. EmPower New York Program targets low-income households and provides free energy efficiency upgrades that include insulation, draft reduction, upgraded lighting, and replacement of inefficient refrigerators and freezers. Once a household is accepted to the program, a participating accredited contractor will schedule an energy audit and identify where energy efficiency, comfort, and safety upgrades can be made. The Weatherization Assistance Program (WAP), administered by the New York State Homes and Community Renewal, assists income-eligible families and individuals by reducing their heating and cooling costs and addressing health and safety issues in their homes. Priority is given to senior citizens, families with children, and people with disabilities. Lastly, The Low-Income Home Energy Assistance Program (HEAP) is administered by the New York State Office of Temporary and Disability Assistance and focuses on heating and cooling services.

The Assisted Home Performance with ENERGY STAR targets households that have an annual income at or below 80% of the area median income. The program provides income-eligible New Yorkers with an assisted subsidy, which represents up to 50% of the total cost of an approved energy efficient project and maxes out at $5,000 for a single family home and $10,000
for a 2- to 4- family home (link 1). To qualify for this program in Madison County, a household with two residents must have an annual income equal or less than $44,736; a household with three residents must earn $55,248.

The Assisted New York ENERGY STAR Homes Program targets this same income bracket group and provides $500 cash incentives to energy efficiency projects. In order to qualify, households must meet certain income requirements. For example, a two-person household’s annual income must be equal to or less than $44,545; for a 3-person household the income must be equal or less than $55,027.

The Home Performance with ENERGY STAR program is eligible to anyone that owns a single-family home or two-to four-unit multifamily building. The program provides free or reduced-cost comprehensive home energy assessments. If a household decides to implement a recommended energy efficiency improvement after the home assessment, that house is eligible to receive 10% of the cost of eligible upgrades back (up to a maximum of $3,000) depending on the project.

When devising a carbon offset program, it is essential to consider these programs that already exist to ensure that the homes we target are additional.

**Assessment of Goals and Potential Obstacles:**

The goals of an institution are important in determining the procedure of a project and the specific types of offsets to pursue. At Yale, the main goal of the Yale Community Carbon Fund (YCCF) is to assist low-income residents in lowering their household emissions and improving their living situations by investing in health and safety renovations. YCCF faced many challenges with the funding of their project and due to the high expense and unpredictable nature of energy efficiency renovations, Yale was unable to support the fund and include it in their carbon neutrality mission. In this situation, the Community Carbon Fund focuses more on the social benefits that can accompany carbon offset projects (A. Harper, Personal Communication, April 2, 2014).

Although Duke experienced less of an economic barrier than Yale, they found that project organization and data collection can be complex and time consuming. With regards to verification, Duke’s offsets are not verified by an outside party due to the associated expenses. However, this is not to say that Duke’s offsets lack the high standard of verified offsets, but Duke conducted intensive research into the qualification process of offsets and verified their offsets internally. One of the goals of Duke’s offset project is to produce offsets that can be counted towards its goal of carbon neutrality. In addition to this main goal, Duke wants its project to achieve social and educational benefits for employees, students, and the local community. (C. Adair, Personal Communication, April 4, 2014).

In creating a carbon offsetting project with a focus on household energy efficiency in the communities surrounding Colgate, the main goal of the project is to generate a significant amount of offsets that can help Colgate reduce its carbon footprint. A second goal of the project
is to improve community relations, or the town-gown relationship, and thus achieve social benefits on top of the creation of offsets. With that being said, these two goals must also be accomplished while taking cost into careful consideration.

METHODS

Interviews

Our methodology consisted predominantly of interviews. To learn which energy efficiency upgrades were the most common, cost-effective, and able to generate substantial energy reductions, we interviewed various local energy contractors. We maintained email correspondence with Bruce McClean, the President of Energy Savers and Norm Farwell, the Principal of Energy, and met in person with Zach Williams, Julie Miller, and Ryan Riddle from BlueOx Energy. Furthermore, we visited Al McMahon in East Syracuse at the New York State Weatherization Directors Association (NYSWDA) to learn about the importance and effective of home weatherization projects. We asked all of these stakeholders similar questions to assess the market for residential energy efficiency projects in upstate New York, particularly Madison County. Estimates provided by Norm Farwell were used to conduct our analysis on the scope, energy emissions, and cost effectiveness of a project financed by Colgate.

To learn how to organize a carbon offset program within the institution and determine the feasibility of setting up such a program, we conducted phone interviews with Annie Harper, the Coordinator of the Yale Community Carbon Fund, and Charles Adair, the Program Manager of the Duke Carbon Offsets Initiative. From these phone interviews that lasted approximately an hour each, we heard about the barriers and benefits of each program. Our correspondence with Charles Adair led us to Ryan Canfield and Keith Canfield of the Clinton Climate Initiative-Home Energy Affordability Loan (HEAL) Program. Since Duke’s home energy efficiency project utilized the HEAL Program as a consulting service to organize their program, we thought it would be interesting to learn how a potential partnership between Colgate and the HEAL Program could function.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Types of Questions Asked</th>
</tr>
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<tbody>
<tr>
<td>Charles Adair</td>
<td><em>Program Manager of the Duke Carbon Offsets Initiative, Duke University</em></td>
<td>Why does the Duke home energy efficiency carbon offset program focus exclusively on employee households? How are the offsets certified? How do you monitor the energy savings associated with each project?</td>
</tr>
</tbody>
</table>
Annie Harper
Coordinator of the Yale Community Carbon Fund, Yale University

Why does the Yale home energy efficiency program focus exclusively on insulation projects? Why did you decide not to go through third party certification? Why did this initiative fail as a carbon offset project?

Zach Williams, Julie Miller, and Ryan Riddle
Representatives of BlueOx Energy

What energy efficiency projects have the greatest energy savings? How do you monitor and calculate energy/cost savings over time? What are the most common projects?

David Hales
President of Second Nature

What constitutes a local carbon offset? Should we count carbon upfront or incrementally? How important is third party certification?

Al McMahon
Energy Contractor from the New York State Weatherization Directors Association (NYSWDA)

What energy efficiency projects have the greatest energy savings? What are the most common upgrades? How do you calculate cost savings over time?

Ryan Boswell and Keith Canfield
Representatives from the Clinton Climate Initiative (CCI) Home Energy Affordability Loan (HEAL) Program

How does the CCI-HEAL Program work? Why did you organize it as an employee benefit program? How important is third party certification? What issues with additionality have you encountered?

RESULTS

Based on our interviews and calculations, we have four main results:

1. Conversations with stakeholders indicate that weatherization projects, which include air sealing, duct sealing, and insulation, have the greatest cost and energy savings.
2. Calculations indicate that weatherization projects could generate 5,000 mtCO_2e per year by weatherizing approximately 475 homes per year at a cost of $1,235,000 per year.
3. Conversations with stakeholders and existing NY energy efficiency program eligibility requirements indicate that there are barriers and benefits to target our program at each income group.
4. Our results indicate that third party certification is an extensive and costly process.

1) Home Energy Efficiency Project Evaluations

With regards to our first research question, “What types of home upgrades would this project finance?” we found that the most common projects that could generate the greatest monetary and
energy savings (“lowest hanging fruit”) were weatherization projects, which include air sealing, duct sealing, and insulation. Email correspondence with three local energy contractors and one interview with Zach Williams, Julie Miller, and Ryan Riddle from BlueOx Energy supported this fact.

Julie Miller mentioned that almost everyone that goes through the NYSERDA program does insulation work, which is usually followed by heating system upgrades (Personal Communication, April 11, 2014). However, insulation work must be completed in conjunction with air sealing. As Julie said, “when you talk about insulation it is important to compound that with air sealing because you are trying to both stop the air from coming in and stop the air from coming out” (Personal Communication, April 11, 2014).

There are many places to insulate in a home including the rim joist, attic, and walls. However, according to Julie, “Insulating the rim joist is the project that has the biggest payback. Usually that would cost no more than $1,000 depending on the size of the house” (Personal Communication, April 11, 2014). Zach Williams agreed and expanded on this point when he stated, “If you can spray foam and insulate that, you can reduce air infiltration by 30%” (Personal Communication, April 11, 2014).

After the rim joist, Julie recommended looking at insulation in the attic. She mentioned, “If you were to go from 3-6 inches of insulation to 15 inches, I feel comfortable saying that will probably save you about 40% on energy bills” (Personal Communication, April 11, 2014). BlueOx Energy updates insulation to 15 inches (R-49) given that it is the code for houses in our climate region.

Julie further described the benefits of weatherization work when she noted, “When you increase the insulation in the house, you slow that air change, meaning that you can put in smaller equipment that works more efficiently. After doing weatherization work, a lot of times we will take out a 150,000 Btu boiler and put in a 75,000 Btu boiler that can still heat the home” (Personal Communication, April 11, 2014). Furthermore, Julie noted that insulation work has a lifespan of 40 years, much longer than other energy efficiency projects.

Three other contractors also agreed that insulation and air-sealing work are the most popular and effective project that can reduce energy costs. Email correspondence with Bruce McClean, the President of Energy Savers wrote, “The most popular upgrades are attic insulation and air sealing. 95% of the homes I test have blower door test numbers that are above their standard and probably half are 2-3 times higher than what would be optimum” (Personal Communication, April 4, 2014). He also wrote, “For a home of about 1500 sq. ft., adding insulation would cost anywhere from $1000 - 2000 and air sealing would be about $700 - 1500. In terms of energy reductions, NYSERDA claims that weatherization can reduce energy bills by 40%. I think for most homeowners this is a little optimistic and that 20-25% savings are more accurate” (Personal
Communication, Norm Farwell, the Principal of Energy Equity, added, “Insulation and air sealing are our most common intervention. After that, I would say upgrades to heating systems, and maybe appliance upgrades.” (Personal Communication, April 8, 2014).

Similar to Norm’s conclusion, the BlueOx team stated that upgrades to heating systems were the second most common upgrade. Zach indicated that, “Most oil fired boilers, furnaces, and hot water heaters are anywhere between 75-85% efficient, propane and natural gas systems are anywhere between 90-96% efficient, and electric is consider 100% efficient because there is no combustion. However, 96-97% is about as efficient as you can get with very minimal waste” (Personal Communication, April 11, 2014). Zach explained that a simple way to evaluate what this indicates economically is that if you spend $1 on energy and you have an 80% efficient heating system, 80 cents goes into making heat and 20 cents is wasted going up your chimney” (Personal Communication, April 11, 2014). Moreover, the BlueOx team emphasized that the two biggest factors to evaluate with combustion appliances are age and efficiency. Additionally, furnaces have a lifespan of 20 years whereas a boiler has a lifespan of about 25 years. This feedback directed our calculations to focus solely on weatherization projects.

2) Calculations for Weatherization Projects

Data used for Calculations

Size of household: 1500 square feet
A 1,500 square foot house was chosen for the analysis given that Tom Urtz based the utility bill savings off of this size. Additionally, Zach Williams from BlueOx energy informed us that the average size of a house in our area is 1,500 square feet (Personal Communication, April 11, 2014).

Average cost of weatherization work: $2,600
The average cost of weatherization work, $2,600 was taken from Bruce McClean’s estimates. Tom mentioned that insulation would cost anywhere from $1,000-2,000 and that air sealing would cost $700-$1500. By adding the average estimates of $1,500 and $1,100 from each project we utilized the estimate of $2,600.

Average energy and utility bill percent reduction from weatherization work: 20%
We obtained average estimates for energy reductions from Bruce McClean, who mentioned that weatherization work could save 20-25% in energy utility bills. We used the 20% estimate in the analysis to be conservative.

Average annual utility bill cost: $1,755
The 2009 Residential Energy Consumption Survey (RECS) provides data on energy usage in homes across the United States. The summary statistics from the Consumption and Expenditures
portion of the survey, specifically for homes in the Northeast located in cold/very cold regions indicate that energy expenditures per square foot are $1.17. We multiplied this amount by the 1500 square feet.

**Average annual energy usage: 5.28 mtCO$_2$e**

This estimate was obtained by dividing the total emissions from the residential sector as denoted in the 2010 Madison County Greenhouse Gas Inventory, 140,562 mtCO$_2$e. (table I) by the total number of total occupied housing units (26,613) from the 2008-12 American Community Survey (Table 1).

**Lifespan used for offsets: 10 years**

We chose to count carbon and utility bill savings for a 10-year period. Although insulation has an estimated life span of 40 years, the DCOI program and CCI-HEAL both recommend not counting anything over 10 years (PC).

**Calculations:**

Over a 10-year period, if an average house in Madison County emits 5.28 mtCO$_2$e per year and weatherization work can reduce 20% of emissions per year, we calculate:

5.28 × 0.2 = 1.056 mtCO$_2$e avoided per year

1.056 mtCO$_2$e × 10 years = 10.56 mtCO$_2$e avoided per house over 10 year lifespan

Colgate can either count these carbon credits upfront or incrementally. This analysis will count the credits upfront, which indicates that after weatherizing one house, Colgate would obtain 10.56 mtCO$_2$e credits immediately.

Thus, to offset 5,000 mtCO$_2$e per year, Colgate would have to weatherize approximately 475 houses per year.

Furthermore, these homes would save 20% of their annual utility bills over a 10-year period.

$1,755 × 0.2 = $351 saved per year in utility bill costs

$351 × 10 years = $3,510 saved per house in utility bill costs over 10 years

**What does this mean for Colgate University?**

Average cost of weatherization work × number of houses to insulate:

$2,600 × 475 houses = $1,235,000 per year

Cost of carbon per ton = $247 ($1,235,000/ 5,000 mtCO$_2$e)
Note:
1. Administrative, labor, and energy audit costs are not included in the analysis.
2. This analysis does not consider the differences in fuel type and estimates will vary based on the home fuel source.
3. It is essential to note that it is very difficult to generalize about cost and savings of weatherization work. Each house varies in its age, structure, fuel source, efficiency of appliances, and the number of household residents, which is why contactors need to conduct energy audits to obtain and analyze real data.
4. There are benefits and drawbacks to counting carbon upfront versus incrementally. Charles Adair highlighted that the decision to count one way or the other is up to the university and what administrators are comfortable with. He mentioned that claiming offsets upfront could be risky if the program is not transparent about how it is done. The DCOI decided to count their offsets incrementally; as Charles mentioned, “it is easier to claim offsets are real and additional if the program uses real time data” (C. Adair, Personal Communication, April 4, 2014).

3. Target Households

Conversations with Charles Adair and Annie Harper exemplified the difficulties and advantages in addressing certain income groups.

As discussed in the literature review section, numerous New York programs exist to finance energy efficiency upgrades for low-income residents. The Yale Community Carbon Fund (YCCF) encountered issues with energy efficiency programs in Connecticut since they could not prove that if they did not spend money on a house that the residents wouldn't have simply signed up for the utility program. For a period of time the utility program was not paying for oil-heated homes, which gave them an opportunity to pay for those homes, but funding for oil was later reinstated. As initially conceived, the project sought to focus on low-income households since Yale is located in a low-income area and the homes are generally not as well insulated. Ultimately they were able to be additional by spending money on things other than insulation. Annie mentioned, “there are typically 3-5 health issues that need to be resolved before you can do weatherization work in low-income homes” (A. Harper, Personal Communication, April 2, 2014). Thus, the YCCF quickly realized that an effective and additional way to invest their money was not to spend money on insulation, but rather on health and safety remediation measures. For example, conducting outreach to 'difficult-to-reach' customers, people who wouldn't participate without special, focused outreach, and helping case-manage them through the program or by paying to remediate health and safety problems (mold, asbestos, CO) so that weatherization can proceed. As Zach Williams mentioned, “70-80% of natural gas homes have gas leaks since there is really no regulation of that industry” (Personal Communication, April 11, 2014). When asked what income group could benefit from an energy efficiency program, Julie Miller remarked,
The hardest households are the ones that make too much to get the free program [Empower New York] and can qualify for the grant, but don’t have any money to pay for the other half of the grant. If you don’t qualify for the low-income program, you are between a rock and a hard place because you know you’ll get energy savings by doing this, but you don’t have the money upfront to get there. (Z. Williams, Personal Communication, April 11, 2014)

Charles Adair and Annie Harper both discovered additional issues with targeting general community members, regardless of their income. Annie Harper underscored that monitoring and verifying energy savings can be very difficult. She wrote,

The only way to accurately measure it is by looking at a year of pre-weatherization energy bills and a year of post-weatherization bills. This is i) a complicated thing to do, which requires particular expertise and ii) requires energy bill data. We found it extremely difficult to get hold of that data. The utility was very reluctant to share electric data. We did initially get some such data using waivers, but it was difficult and labor intensive. We were most interested in heating fuel, so we needed gas or oil data. We got some waivers for gas data, but even with the waivers were never able to get the gas bills from the utility. Getting oil data was even more difficult. Residents often don't keep their bills, or don't want to share them. If residents move, it's even more difficult to get the data. (Personal Communication, April 2, 2014)

The DCOI initially explored the feasibility of encouraging energy efficiency upgrades in Durham, and after administering a survey to Duke employees, two main barriers were established. First, many individuals were concerned about putting down large upfront costs and seeing the investment pay back over time. Secondly, there were informational trust issues with the contractors and people doing the weatherization work. Thus, to removes these barriers, the program was organized as an employee benefit program. The DCOI partnered with the Clinton Climate Initiative Home Energy Affordability Loan, which developed the program and customized it specific to Duke University. Charles also speculated that working with Duke employees would make it much easier to obtain utility data and reduce concerns about large upfront costs.

4. Third-Party Certification

Our contact with stakeholders revealed mixed reviews with the decision to obtain third party certification. On one hand, David Hales, the president of Second Nature, strongly supported third party certification via outside auditors who can set clear standards. He quoted, “It is cheaper to get it right than think that you did” (Personal Communication, March 26, 2014).
On the other hand, the DCOI decided against third party certification for their program given the high cost and the large amount of time needed to implement it. According to Ryan Boswell, VCS Certification can easily take two years (Personal Communication, April 22, 2014). However, Charles Adair based the internal protocol for Duke’s program off of the VCS Weatherization of Single Family and Multi-Family Buildings methodology discussed in the literature review section. He followed the protocol closely, but tweaked it to make it applicable to Duke’s program and the policies in North Carolina. Thus, Charles created a standard that was transparent and addressed the core needs of an offset project, but it was also easier to implement than pursuing third party certification (Personal Communication, April 4, 2014). Similarly, Annie Harper from the YCCF said, “to set something new up and then have it certified is expensive and unrealistic; it would only make sense if you do something on a large scale. Otherwise Colgate should try to organize a program through an already existing program” (Personal Communication, April 2, 2014).

Ecological Analysis

Following the transportation sector, the residential energy sector accounts for the greatest source of greenhouse gas emissions in Madison County. The Madison County 2020 Community Greenhouse Gas Emissions Forecast expects emissions in the residential sector to decrease by 6.83% from 2010 to 2020, primarily due to anticipated efficiencies. Colgate can help to reduce this number even more by providing additional incentives for homeowners to invest in energy efficiency projects. As noted above, weatherization projects are the most common, cost-effective, and generate the greatest energy savings. Thus, the project may want to focus exclusively on weatherization projects. Furthermore, although the average Madison County household emits 5.28 mtCO$_2$e per year, it is difficult to generalize about the amount of energy reduced from specific energy efficiency projects. If weatherization work can reduce 1.056 mtCO$_2$e per year over a 10-year period, this project seems to reduce a substantial percentage of residential energy emissions.

Furthermore, the fact that 70% of homes in the Village of Hamilton were built before 1939, the number of new housing permits issued between 2007-2012 was a mere 8, and that the housing stock in the Village of Hamilton decreased by 22% between the year 2000 and 2010 all indicate that the Village of Hamilton could be a town in which weatherization can generate a considerable amount of energy reductions (Table 2). Furthermore, the Village of Hamilton has 455 one unit, detached homes, which could cover the majority of the 475 homes needed to obtain 5,000 mtCO$_2$e in one year.

If the university wants to obtain 5,000 mtCO$_2$e per year, Colgate will need to look to other towns to obtain carbon credits. Madison County has a total of 17,225 homes that are one, unit detached and owned that generate a total of 90,948 mtCO$_2$e per year (Table 1). Thus, if all of these households were to participate in the program, the program could extend for about 18 years to
offset the 90,948 mtCO$_2$e. In order to capture the social benefits associated with the program, it would seem prudent to offer the program to towns closest to Colgate University in Madison County and later expand to other towns and counties.

However, providing weatherization services to 475 homes per year seems unrealistic. Thus, this program may be more feasible if it is scaled down and the carbon credits are counted incrementally. Specifically, if Colgate insulates 475 homes, approximately 500 mtCO$_2$e would be counted annually and culminate to 5,000 mtCO$_2$e 10 years later. The program could also be organized in a way so that Colgate provides weatherization services to 4,734 homes in one year and additionally, counting the offsets incrementally would make it easier to claim offsets. Colgate could utilize a similar methodology to the Duke program in which the DCOI collects three years of utility data after the retrofit, takes an average, and applies that average to the following seven years.

It is also important that the project consider the different fuel sources across the county. When spaces are heated by natural gas, the associated CO emissions are less than other fuel sources like propane and heating oil; one million Btu of natural gas emit 117 pounds of CO$_2$, as compared to propane and heating oil, which emit 139 and 161 lbs of CO$_2$ per one million Btu respectively (numbers). To demonstrate this fact, 42% of housing units use natural gas in Madison County, which account for 35% of total residential greenhouse gas emissions. However, while only 28% of housing units use fuel oil, the total residential greenhouse gas emissions account for nearly the same as natural gas (32%) (GHG Inventory). Nevertheless, natural gas is the most prevalent heating fuel source in the area. In Oneida County, natural gas accounts for 60% of energy consumption and in Onondaga County it accounts for 75% of energy consumption. However, in other counties such as Chenango County, the majority of residential energy consumption (38%) comes from fuel oil consumption (ACS survey). Thus, the Colgate administration must weigh the different aspects of the project- Are they more interested in weatherizing more homes closer to the university in order to have a greater social impacts, or would they rather focus on homes that use fuel sources other than natural gas that emit more carbon per million Btu of energy? This is an important question to consider, particularly because natural gas will arrive in the Village of Hamilton in the near future.

With regards to certifying these offsets, Charles Adair, Ryan Boswell, Keith Canfield, and Annie Harper all agreed that stakeholders at Colgate University must decide for themselves what level of assurance is desired for carbon credits. It really comes down to what administrators at the decision-making level feel comfortable counting as carbon offset credits. Colgate can either pursue third party certification or can create an internal protocol. To create an internal protocol, Colgate could tweak the VCS Weatherization of Single Family and Multi-Family Buildings methodology in a similar way that the DCOI did. The decision is up to the administration and they must consider the advantages and drawbacks of third party certified carbon offsets. After
weighing the options, Colgate could develop an appropriate methodology to advance this project forward.

**Economic Analysis**

If Colgate wants to offset 5,000 mtCO$_2$e per year, an investment of about $1,235,000 per year would be required. Furthermore, the approximate cost of carbon per ton is $247. Although this seems large, it is important to factor in the social benefits that do not have a monetary value. Although the capital required for this project may seem exorbitant, it is important to remember that each house would reduce utility bill costs by approximately $3,510. Thus, the total utility bill savings from 475 homes would be about $1,667,250 over the ten-year lifespan, an amount larger than the capital required to initially finance the weatherization work. Given that Colgate would provide the upfront $2,600 for the weatherization projects, it seems fair that the university redeem some of the utility bill savings. This money could then potentially be re-invested in other home weatherization projects. By establishing a sort of green revolving fund, Colgate could replenish its capital stock to continue to weatherize 475 per year. The university may want to develop partnerships with other organizations, such as utility companies, to engage other sources of capital.

Moreover, this project would require various personnel to ensure its successful implementation and organization. The program would require local energy contractors to administer energy audits, assess the appropriate weatherization projects for each house, and weatherize the homes. By paying for weatherization projects, the university would be supporting and investing in the overall local economy, particularly the local energy contractor organizations.

**Social Analysis**

If the Colgate administration was solely interested in claiming carbon offset credits, they could easily buy carbon credits from the voluntary market. However, the social benefits associated with each weatherization project are what make this project unique. The project serves as a valuable way for Colgate to give back to the surrounding community in a mutually beneficial manner and improve the overall town and gown relations.

Catering a program to low-income residents may be the best way to achieve energy reductions and make an impact, but as previously noted there tend to be many health and safety issues associated with these homes. Although Yale decided to focus their project on health and remediation measures, it is important to remember that their program is not organized as a carbon offset project. Health and safety remediation projects result in few energy reductions and thus this type of program would not be relevant in the context of Colgate’s Climate Action Plan. With three state energy efficiency programs already targeted at low-income household, it seems
that it would be difficult for a project targeting households with incomes below 60% the state median to claim additionality.

Another income group that Colgate can target with this program are individuals whose income is just above 60% of the state median income. As noted above, Julie mentioned that these households many times have difficulty paying for the other half of the Assisted Home Performance with ENERGY STAR program grant. Thus, this seems to be an area that the program could potentially claim additionality. As Keith Canfield noted, “In working with utilities, we found that you can prove a program is additional by looking at existing program participation rates and then looking at your rates and be able to say that anything in addition to normal regular participation is brought about because of the new program” (Personal Communication, April 22, 2014). Thus, the program could potentially use a similar additionality test to evaluate increased participation rates in the Assisted Home Performance with ENERGY STAR program.

Colgate can also pursue an employee benefit program similar to Duke’s program structure. While the social benefits may not be as great as those obtained working with low-income households, the above results indicate that the project implementation could be more efficient. However, it is important to note that Colgate employees live in various locations—while some live in the Village of Hamilton, others live as far as Syracuse. According to Human Resources, Colgate has approximately 1,300 employees, all who have varying salaries. Thus, the program could be offered to employees with the lowest salaries since they would be expected to have the greatest need for weatherization projects. Colgate employees would not be able to continually offset 5,000 mtCO₂e per year, but targeting an initial program at this group and further expanding is one way to approach the project.

RECOMMENDATIONS AND CONCLUSION

Based on our research, data, and calculations we can offer the following four recommendations. Firstly, a fund that focuses on weatherization projects will be the most feasible option for Colgate, because it generates the most carbon offsets, especially in Central New York’s climate. Secondly, there is an opportunity for this project to benefit middle-income households, because several state programs already offer loans and grants to low-income households. Thirdly, we recommend that Colgate does not go through the third party verification process because it is expensive and prohibitive. Finally, we recommend that Colgate explore potential partnerships with non-profits, or consulting services like the CCI-HEAL Program.

Insulation Projects:

Through interviews with contractors, our collected data, and our calculations, we recommend that this project proceed with a focus on financing weatherization projects for three reasons.
Firstly, the contractors that we contacted unanimously agreed that insulation projects are the most effective way to make a home more efficient and therefore offer the cheapest offsets. Our calculations confirm that investing $2,600 for the weatherization of one house can offset over one ton of carbon per year, making each ton of carbon $247. While the price of weatherization work is expensive compared to the carbon market price, much of the return goes to the homeowners in the form of reduced utility bills. Therefore, Colgate is not only generating its own offsets, but it is also simultaneously giving back to the community. We believe that by educating local residents about energy efficiency, providing financial aid for projects, and lowering utility bills, Colgate can be assured that their investment results in social capital as well as carbon offsets. Secondly, the average house in Madison County was built in 1920, meaning that there is ample opportunity to improve energy efficiency in the local area. We believe that Colgate will easily find many houses in the Hamilton area that are in need of weatherization upgrades. Finally, after speaking with Charles Adair and Annie Harper, they both conclude that weatherization has the greatest impact on a homeowners’ energy usage and was able to generate the most carbon offsets, which was confirmed by the data from their respective home energy efficiency programs.

(Target Middle-Income Households:

During our research, we discovered several programs run by the state of New York that provide loans and grants for home energy efficiency projects. In our investigation, we found that energy efficiency projects in low-income households are very well financed by these programs. However, we still believe there is an opportunity for Colgate to invest in a home energy efficiency project. High-income households can usually afford their own upgrades and already have efficient households, making for few potential offsets. However, our research has shown that middle-income households find themselves in a gap for they cannot qualify for programs like NYSERDA and EmPower, but also have a hard time affording energy efficiency upgrades (Zach Williams, Personal Communication, April 11, 2014). We found that these households could potentially be an excellent group to participate in this project. Again, because the average house in Central New York is so old, there is a good chance many of these middle-income residents are in need of a weatherization upgrade.

(Third-Party Verification:

Our final recommendation has to do with the verification of these offsets. Our findings show that while verification can offer the school legal viability for these offsets, it can be a very costly and prohibitive process. It is our opinion that because Colgate will not sell these offsets on the market, it is not necessary to be hindered with third-party verification. Instead, we recommend that Colgate create its own verification checklist, which can be modeled off the VCS process as Charles Adair did for his Duke University project.)
Implementation Recommendations:

Based on our findings, we recommend that the school continue to consider this project by first conducting an interest-based survey and secondly implementing a pilot program. A survey would be able to provide the school with valuable information such as interest level, number of people who cannot afford an upgrade, and number of homes that need an upgrade according to the resident. With this information, Colgate can make a much more accurate assessment of how much the project would cost, how much carbon would be offset, and therefore how much each ton of carbon will cost. Price per ton will make it easier for the school to compare this project with other offset projects such as a methane digester and solar-thermal, and judge its overall feasibility. Secondly, we recommend that the school consider running a pilot program through Colgate employees. Collaborating with the HEAL program would give Colgate detailed instructions on how to organize a pilot program as an employee benefit program.

In conclusion, we recommend that Colgate strongly consider this project, but not as a stand-alone project. While our calculations show it can be very feasible, they do not take into consideration the costs of the administration, labor, and audit work necessary to run this project. We believe that this project is an excellent idea, and can be paired nicely with another home-energy project, such as the solar-thermal program. However, the social benefits of this project are tremendous and make this a wonderful opportunity to improve the town and gown relations.

REFERENCES


APPENDICES

Questions sent to local contractors:

1. How do you monitor and calculate the energy savings associated with each upgrade?
2. How do the energy savings translate into carbon savings for the various energy efficiency projects? (Carbon intensity/ emissions factor for fuel oil #2, kerosene, propane, natural gas, etc)
3. What energy efficiency projects produce the most energy savings on average?
4. What are the “average” energy savings for each type of upgrade that your company offers? (Ex: average savings per foot of insulation, switching to an energy efficient combustion appliance, etc)
5. Is there a total average energy savings per home that you can provide us with?
6. What are the average fuel and electricity prices in the Madison County area?
7. How do you calculate the cost savings over time? Is there a specific economic/mathematical analysis technique that you use such as the net present value analysis?
8. What are the upfront costs/ ongoing maintenance costs of each project?
9. What are the “average” cost savings for each type of upgrade that your company offers? (Ex: average savings per foot of insulation, switching to an energy efficient combustion appliance, etc)
10. Is there a total average cost savings per home that you can provide us with?
11. What are the most common projects that your customers tend to invest in?
12. How much does an audit cost per household? How much are the associated taxes?
13. Are there customer data/energy bills that you would be willing to share with us to assess some house-specific energy and cost savings of your projects?
14. Are most of your customers participating/ aware of the NYSERDA Home Performance with Energy Star program?
15. How does your company encourage households to follow through with the installations/upgrades after the energy audit given the large upfront cost and other barriers?
16. What is the average size and age of the houses that you service?
17. What is the average income level of the individuals you service?

Questions for Annie Harper

1. What factors did you take into consideration when choosing insulation as the main way to reduce energy consumption for the low-income home insulation project?
2. How do you monitor the energy savings associated with each project?
3. What informed your decision to focus only on low-income housing for the home insulation project? Did you look at any other community groups such as Yale faculty and administration or communities closest to Yale?
4. Could you talk about why you chose not to officially verify and if you have run into any obstacles because of the lack of official verification?
5. Does Yale consider this a carbon-offset project and deduct emissions from its total GHG emissions? What percentage of emissions does it take?
6. How would you recommend that we finance our project? What are some resources you found to be useful?
7. Did you work with a local contractor?
8. Which project did you initially anticipate to have the greatest impact? Has this projection proved accurate thus far and, if not, why?
9. Would you recommend this program?

Questions for Charles Adair
1. Can you tell us a bit about how you set up your program and the pilot program you plan on conducting this summer?
2. On the website, it says that your program is supported by The Duke Endowment and Piedmont Natural Gas. How did you gain support from the Duke Endowment and why did you decide to partner with Piedmont Natural Gas?
3. What upgrades are included in your program? How did you decide which projects to include?
4. How do you monitor the energy savings associated with each project?
5. What percentage of emissions does the carbon offset take? Are they upfront or incremental?
6. Why did you decide to have the offsets verified? Why did you choose the Verified Carbon Standard? How did you decide on the specific methodology?
7. Did you find the verification process prohibitive and/or expensive to your project?
8. How do you engage community members and encourage them to participate in the project?
9. Why are Duke students aiding in the audit and installation process instead of just the energy contractor? How did you establish your relationship with the local contractor?
10. Why did you decide to pursue this carbon offset project for Duke as opposed to other initiatives?

Question for David Hales
1. What do local offsets mean to you and how important is it from your point of view to pursue local offset projects?
2. Are you aware of other schools investing in local offset projects? ...any that you consider a model program? ...how are they developed (i.e., in-house, partner with developer, other)?
3. How important is third-party certification? What if pursuing certification becomes prohibitive?
4. Any insight as to when we account for the offsets? One-time upfront (take the carbon reductions from the implementation of the project multiplied by the life of the project, then take the total carbon emissions avoided upfront) or incremental (take the carbon reductions each year over the life of the project)?

5. What if our local offset project is supported by state or federal funding/grants? Should we still take credit for 100 percent of the offsets or some incremental percentage? How do you recommend we approach this?

6. In-house or partner with project developer?