
# Final Report

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**EXECUTIVE SUMMARY:**

The Carrboro WISE program was created upon award of the SEEA grant based on a proposal submitted in conjunction with the Town of Chapel Hill. The intent was to create a pilot energy efficiency incentive program that could use the initial impact and lessons learned to create a sustainable regional energy alliance to promote market transformation throughout the home performance contracting industry and greater energy efficiency in the built environment throughout the region. The WISE program originally targeted small commercial buildings through a revolving loan fund, modeled on their existing revolving loan fund which focuses on economic development. Over the course of the grant period and based on lessons learned from the Chapel Hill WISE program, Carrboro created a single-family and multifamily residential pilot program which offered incentives for projects that met an estimated 15% energy savings. The program incorporated a unique set of program elements that included: a MOU with the Town of Chapel Hill to work together through shared experience and program administration; implementation of a pilot program through a municipal government; expert third party quality assurance; contractor management and training utilizing Home Performance with Energy Star standards; vertically integrated home performance contractors; grassroots marketing and outreach; continuous program improvement; and program evaluation and reporting. The program discovered the need for additional contractor standards and oversight; the importance of 3rd party quality assurance for motivating projects to move forward and the power of word of mouth to drive demand for energy efficiency upgrades.

While the energy alliance is still in the exploratory stage, the Carrboro WISE program was successful in driving energy efficiency projects for 113 single-family and multifamily units and providing 5 small commercial loans for projects in 3 separate commercial buildings, surpassing the goal of 100 residential units and 4 commercial loans. The projects are estimated to save 21% or more in energy savings and almost $40,000 a year at current utility rates.

## INTRODUCTION

Carrboro, in collaboration with Chapel Hill, received an award for American Recovery and Reinvestment Act funds from the US Department of Energy (DOE), through SEEA, to pursue community scale improvements in the energy efficiency of buildings in 2010. The overarching goal of this grant-funded initiative has been to establish a building energy efficiency retrofit program. More specific goals have been to:

- reduce energy consumption and greenhouse gas emissions;
- lower utility bills;
- create jobs;
- assist in the development of a local home and building retrofit market; and
- create a sustainable program that lasts beyond grant funding.

Carrboro received an initial allocation of $75k, and chose to focus this allocation on initiating an Energy Efficiency Revolving Loan Fund (EERLF) for small businesses in Carrboro. Carrboro received three additional allocations of funding totaling $236k (for a total grant award of $311k), and used these subsequent allocations to pursue: 1) single and multifamily residential initiatives focusing on "deep" (at least 15% improvement in energy efficiency) residential retrofits; 2) a residential outreach and education program, with support from Clean Energy Durham; and 3) additional commercial projects using the EERLF program. The grant funds were leveraged with Town funds for program administration, private investment from the property owners, and incorporation of all utility incentives currently offered. The collective initiative utilized the SEEA branded Worthwhile Investments Save Energy (WISE) program, and has been administered by Clean Energy Solutions, Inc. (CESI) staff. Contract support has also been provided by prequalified contractors and quality assurance providers (see Table 1). Town staffing support has been provided by Planning, Management Services, and Economic and Community Development staff, who have collaborated closely with Chapel Hill staff through a Memorandum of Agreement.

The purpose of this report is to provide an overview of the program design and process including workforce development, marketing and outreach channels, financing, incentive structure and highlight improvements made throughout the course of the grant. Additionally analysis of the program impacts, accomplishments and challenges and the sustainability plan are discussed.

## INSTITUTIONAL DESIGN AND BUSINESS MODEL

**Table 1:** Institutional Design and Business Model

| | |
|---|---|
| Organization | Operated out of Town of Carrboro municipal government |
| Program management | 3rd party contractor: Clean Energy Solutions (1.5 FTE) between both Chapel Hill and Carrboro; approximately .5 FTE for Carrboro |
| HPwES Program | Advanced Energy (sponsor) |
| Building type served | Single-family (owner-occupied and rental); multifamily; small commercial |

| | |
|---|---|
| Eligibility | Located in the Carrboro Town limits or the Extra Territorial Jurisdiction (ETJ) |
| Financing | PowerSaver loan through Sunwest |
| Contractors | Vertically integrated, BPI certified, HPwES certified |
| Incentives | Incentive for assessment and completion of eligible work (see below for details); low interest loan for small commercial |
| Quality Assurance | 3rd party administered by Advanced Energy and BigWoods Energy Engineering |

**Program Design and Customer Experience**: The Single Family, Program Process is explained below. The process was created based on the original incentive design and the Chapel Hill WISE experience. The multifamily program process was created based on experience from the single-family program and basically follows the same process. The customer was very involved in the process in terms of selecting the contractor, determining the scope of work with the contractor and overseeing the work. The program forms basically are in place for the homeowner or property owner to give authority to the Town to pay the WISE contractor on their behalf. Examples of the forms can be found in the Appendix A: Program Forms: application/owner participation agreement, assessment complete form, assessment subsidy invoice, intent to proceed, utility data release form, energy efficiency improvement invoice, summary certificate.

Below is a step-by-step single-family, Carrboro WISE program process.

1. **Property owner joins WISE program** | Either through a marketing channel or contractor referral, a property owner completed the Owner Participation Agreement (OPA) and submitted it to the Program along with the most recent 12 months of utility data, containing consumption and cost of electric and gas (if applicable) data. (**NOTE:** if a contractor referred a property owner to the program, that property owner was assigned to the referring contractor.)

2. **Program verifies property owner eligibility:** After receipt of the OPA and utility data, the WISE program verified the property owner eligibility. Orange County Tax Records were used to verify property ownership and Orange County GIS mapping was used to verify property location within the Town's corporate limits.

3. **Property Owner selects a prequalified contractor:** Upon acceptance into the WISE program, the property owner received an email with the list of WISE prequalified contractors. The property owner then selected a prequalified contractor to conduct the energy assessment. The assessment provides a report of the existing conditions in the home and makes recommendations for energy efficiency improvement measures which helped homeowners reach at least an estimated 15% energy savings off their current energy baseline. (NOTE: Carrboro WISE moved to a "portfolio" method which was based on energy savings across eligible projects. As long as the cumulative energy savings remained at or above 15%, individual homes could have estimated savings as low as 10% with approval from the program.)

4. **Contractor completes assessment:** The selected contractor completed the assessment utilizing BPI protocol and modeling the estimated energy savings using an energy modeling software approved by Advanced Energy. (Eligibility for a WISE job incentive entailed meeting at least a 15% estimated energy savings through installed measures or the property owner receiving individual project approval from the program.) The contractor then submitted the *Carrboro Assessment Complete Form* to WISE program staff and uploaded the assessment report and modeling data to the Advanced Energy House Characterization website http://www.advancedenergy.org/buildings/nchomeperformance/contractors.php. The contractor sent the property owner the *Assessment Subsidy Invoice.* The property owner completed this form and mailed it to the WISE program for processing.

5. **Program submits WISE assessment for payment:** Once the completed *Assessment Subsidy Invoice* was submitted to the WISE program, this form and the assessment invoice from the contractor were submitted to the Town of Carrboro for payment of the WISE assessment incentive to the Contractor. The *Assessment Subsidy Invoice* signed by the homeowner authorized the Town to release the assessment incentive (up to $150) directly to the contractor on behalf of the homeowner.

6. **Property Owner and contractor agree on a Scope of Work:** A scope of work was created based on information gathered during the energy assessment. Once a scope of work was agreed upon between the property owner and the contractor, it was sent to the Program and an *Intent to Proceed Form* was created and emailed to the property owner. The property owner signed the form and mailed it back to the Program to indicate their commitment to completing the work.

7. **Program submits *Intent to Proceed Form* to Town to encumber the funds and receive an account number:** Upon receipt of the *Intent to Proceed Form,* the Program sent information to the Town for appropriate Town signatures, grant fund encumbrance and assignation of account number. Once the project had an account number/ PO, work could begin.

8. **Contractor completes work**: Work was completed based on the agreed upon Scope of Work. (**NOTE:** if there was an increase in the cost of the job based on change orders or expanded scope of work, the Program had to be notified. Additionally, if measures were removed from the scope of work, the Program had to be notified to ensure that the project still qualified for a WISE incentive.)

9. **Contractor sends FINAL invoice to Program:** Upon completion of the work or when all costs were known, the Contractor sent the FINAL invoice to the Program. The final invoice MUST indicate a credit for the WISE incentive that was subtracted from the TOTAL cost of the job charged to the property owner.

10. **Property owner submits final paperwork:** When the Program received the FINAL invoice from the contractor; an *Energy Efficiency Improvement Invoice* was created and sent to the homeowner. The *Energy Efficiency Improvement Invoice* contained the measures installed, the

WISE incentive amount and was the property owner's authorization for the Town to release the WISE incentive funds to the contractor. At this time the *Utility Data Release* form was also sent to the property owner. Both forms were completed by the Property owner and returned to the program.

The *Utility Data Release* form gives the Program the authority to receive utility data from both the electric and gas utility for two years after the project has been completed. The form was originally approved by Duke Energy with the agreement that it could be submitted once a year by the Program to receive the past years consumption and cost data for each month.

However, when the first batch of project forms was sent to Duke Energy they would not release the information and informed us of the cost of $5 per project for the utility data. However the program was also informed that Duke did not have a payment process at this time and have seemingly been unsuccessful in establishing one to date. At this time the program is still unable to receive any of the post retrofit data from Duke Energy.

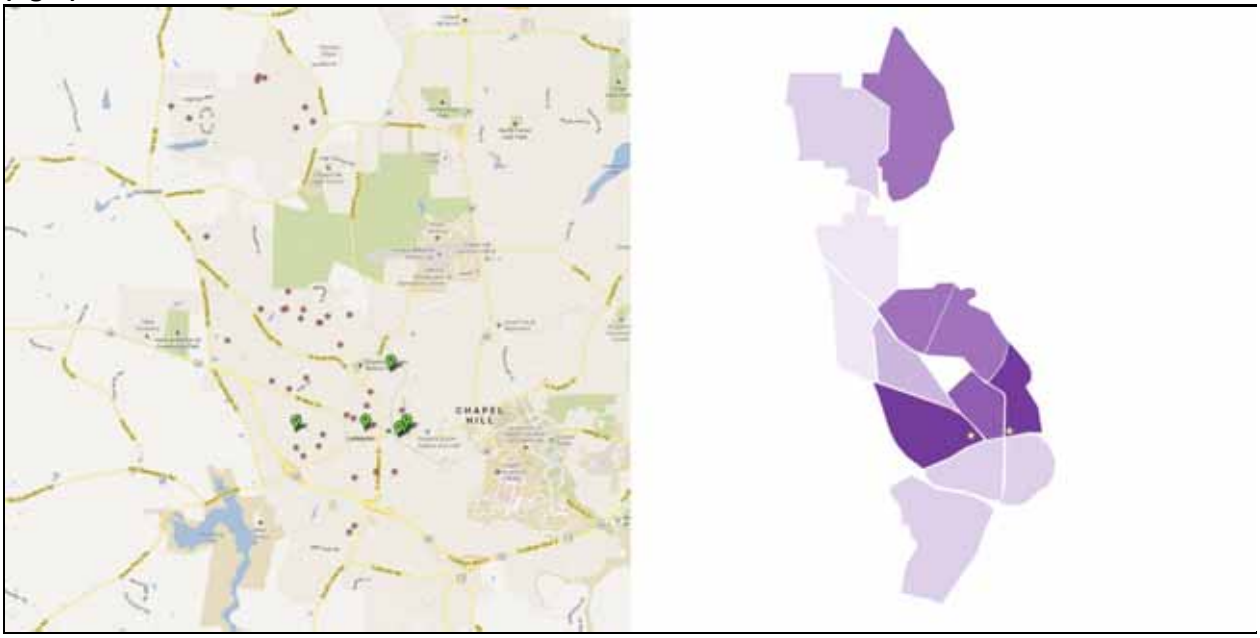
PSNC, the gas provider, agreed to honor the form and sent some post retrofit consumption and cost data. They will continue to send on an annual basis upon receipt of the utility data release forms. The forms must be scanned and emailed to PSNC and they will in turn send the data. They are not allowed to compile the data into a spreadsheet so the information must be manually entered into Excel.

11. **Program submits WISE job for payment:** Once the final paperwork was submitted and Advanced Energy completed the Quality Assurance (site visit and/or file review) the job was submitted to the Town of Carrboro for payment of the WISE incentive to the Contractor. In order for the Town to release the incentive funds to the contractor, the program must have received a complete Close Out Packet. A complete Close Out Packet included: *Energy Efficiency Improvement Invoice,* contractor invoice that showed WISE incentive amount, test-out document signed by homeowner, historic preservation review (if applicable), and the HPwES summary certificate from Advanced Energy.

**DRIVING DEMAND**

Figure 1 is a map of the program projects for the Carrboro WISE program. Projects were completed throughout the municipal limits. The program participants heard about the program through multiple marketing channels and outreach methods.

**Figure 1: Location of Carrboro WISE program participants (left); concentration of program participants (right).**

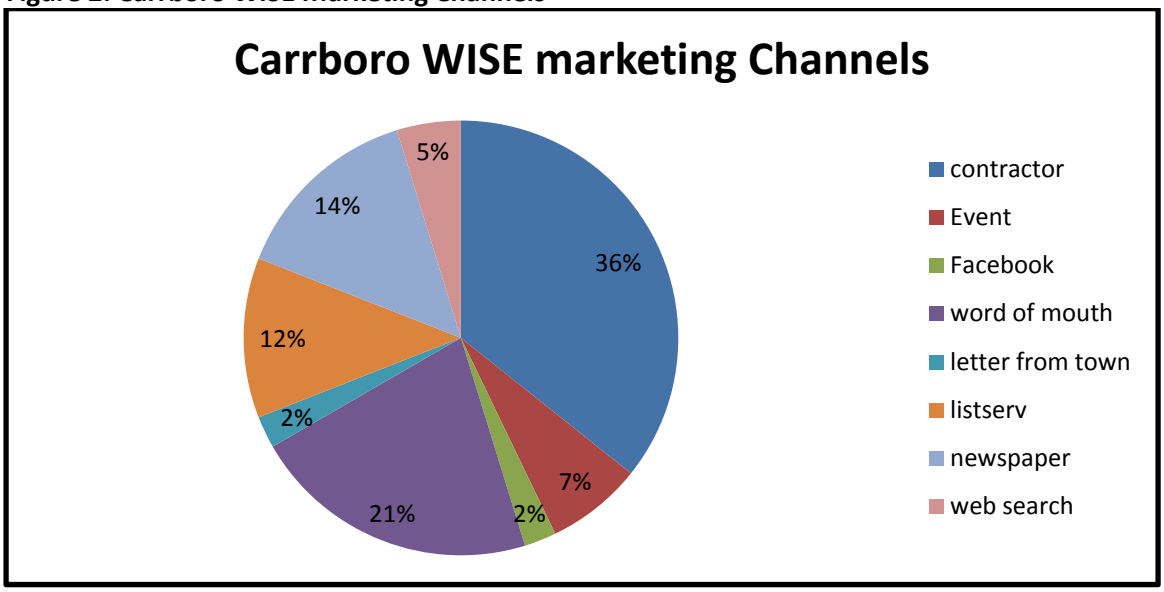


*Key: green markers = multifamily, commercial; red markers = single family*

The map illustrates the clusters of projects in different areas of the town. It is likely that clustering is due to the fact that contractor promotion and word of mouth accounted for almost 60% of the program participants (see chart and discussion below).

The different methods of driving demand were tracked through the homeowner application. When a homeowner applied to the program they were asked how they heard about the program. The chart below illustrates the effectiveness of the most successful methods utilized. Each method is explained in more detail below.

**Figure 2: Carrboro WISE Marketing Channels**




- **Contractor** – Contractor "word-of-mouth" or promotion was the most effective method of driving demand to the program. The contractors that were the most successful in the program actively promoted the program. For example, Home Performance NC sent out postcards about the Carrboro WISE program and the benefits.

- **Word of Mouth** (friend and/or neighbor) –After contractors had completed a significant number of assessments and projects the "word-of-mouth" between neighbors and friends seemed to perpetuate their success. If the contractor promotion is combined with the friend or neighbor word of mouth, these free methods of program promotion produced almost 60% of the participants. Word-of-mouth or program promotion between friends and neighbors was the second most effective mode of driving homeowners to the program. Over 20% of the program participants came to the program based on the recommendation of a friend or neighbor.

- **Newspaper** – The multiple press releases which were picked up by local media outlets generated 14% of the program participants. For the cost and the effort this was an effective method to drive demand to the program. However this was hard to predict as not all events and press releases were covered by the local media outlets. Additionally, there was risk of the program being portrayed incorrectly or facts being incorrect which could ultimately damage the interest in the program.

- **Listservs** – 12% of the program participants came to the program through listservs. These were both the Town's listserv that provides updates around Town news and Carrboro neighborhood listservs. The program staff would periodically submit emails about the program to the neighborhood listservs to drive demand.

- **Events** (Energy Fair and WISE Mob) – Only 7% of the WISE program participants applied based on information received at events. Both the Chapel Hill WISE and Carrboro WISE programs were kicked off with an energy fair held in the Carrboro Century Center. The fair lasted most of the day, took a couple of weeks to plan and had around 60 attendees. The agenda and outreach

material for the Energy Fair is attached as Appendix B. Additionally, the WISE program held a WISE Mob at Surplus Sids, the first local business to complete a WISE EERLF Loan project. The WISE mob was based on the Carrot MOB model of attracting business and awareness for local businesses that take measures to reduce their carbon footprint and increase their sustainability. Marketing collateral for the WISE Mob is included in Appendix B. For the time and amount of work and time devoted to planning or tabling at events, it did not appear to be the most effective investment of time. However, the benefit of the events was greater overall program visibility and an opportunity to provide education and outreach around energy efficiency and the benefits.

- **Websearch/ website** – The program received 5% of the program participants from website traffic. Specifically, Carrboro residents found the program through a web search for energy efficiency or how to improve the comfort of their homes. Program information was provided on the Town of Carrboro website, the Town of Chapel Hill website and the DSIRE website listing all available incentives in NC. The specific website where the information was found is unknown.

- **Town of Carrboro Facebook page –** 2% of the participants (1 applicant) heard about the program through the Town of Carrboro Facebook page. Based on this information, social media was not a strong component of the Carrboro WISE marketing plan.

- **Letter from the Town –** The Town sent a letter out to elderly residents that fell under the Homesteader legislation in hopes of attracting low income homeowners. The letter attracted several inquiries about the program and one individual applied. However, once the homeowners learned of the cost share portion of the program, they were not interested in moving forward.

**Other methods** (not represented on the chart above): The impacts of the methods to drive demand to the WISE program listed below are unknown. In some cases the method was ineffective and has been noted.

- **Market characterization study** – A graduate DELTA intern created a market characterization study of both Chapel Hill and Carrboro. The housing stock and demographics of each town were analyzed and recommendations for neighborhoods to target based on both need and potential interest (ability to participate) were highlighted. The study is attached as Appendix C for reference.

- **Bus ads** – The bus ads were not effective. The ads were placed on 3 Chapel Hill Transit buses in September 2012. The program received only a couple of calls from the ads that are still on buses as of July 2013. The buses run throughout Carrboro and Chapel Hill so potentially this could have been a driver to the Carrboro WISE program as well.

- **Public presentations**- The program gave several public presentations over the course of the performance period. The benefit of these presentations was not directly driving demand but education of the attendees on the benefits of energy efficiency.

- **Brochures** –Several program brochures were created over the course of the program, however the benefit was for supporting tabling events therefore the direct impact is unknown.

- **Video** – A video was created featuring the prequalified contractors, program staff and satisfied homeowners but it was never released.

- **Limited time promotion with increased incentives** – In order to increase demand towards the end of the program and to increase participation after a 6 month lull due to contracting issues, the program offered a limited time increased incentive. This seemed to be very effective. Some of the uptake could have simply been from more outreach and utilizing additional marketing channels around this time. The incentive levels are discussed in more detail later in the report.

- **Grassroots outreach through Clean Energy Durham** – The impact of the outreach provided by Clean Energy Durham is discussed later in the report. This initiative was started in February 2013 so there was limited time to gain momentum and analyze the impact. Additionally, the outreach had some focus on low-to-moderate income homeowners to teach them about low to no-cost measures they could implement to make their homes more energy efficient. Driving them to the WISE program was a secondary objective.

**WORKFORCE DEVELOPMENT**

The workforce development in the Carrboro WISE program came largely from the partnership with Chapel Hill and Advanced Energy. Advanced Energy is a nonprofit that was established in 1980 with a mission to create economic, environmental and societal benefits through innovative and market-based approaches to energy issues. Advanced Energy is the Home Performance with Energy Star (HPwES) sponsor in the state of North Carolina. Advanced Energy and the Chapel Hill WISE program worked together to develop a contractor training/mentoring program, contractor management system, and quality assurance protocol, which all contributed to the success of the program. Carrboro adopted the process, utilized Chapel Hill WISE prequalified contractors and created their own contractor agreement as well to meet the Town's needs.

- *Contractor training and mentoring:* The WISE program required all contractors be vertically integrated and able to offer both BPI assessments and act as general contractor to complete the energy efficiency improvements. The program, through the partnership with Advanced Energy was also a HPwES program. Advanced Energy provided the HPwES training and mentoring of the WISE prequalified contractors. Each contractor was provided training around HPwES and the process. Additionally, for the first 5 jobs of each contractor, Advanced Energy acted as a mentor to provide the contractors with a resource for questions and to ensure their quality of work met the HPwES standards. The first couple of jobs were not graded and allowed the contractors to ask questions and learn from the Advanced Energy experience. The next 3 jobs were graded and determined if the contractor could become a full-fledged HPwES contractor.

- *Contractor management system:* In addition to the HPwES training and mentoring through Advanced Energy, the WISE program developed a management system to address any challenges that arose. The program held individual meetings with each contractor upon being accepted into the program. Additionally there would be periodic phone meetings or face to face meetings with each contractor to receive updates and give the contractors a chance to give the program feedback about the process and any challenges they were facing. If any conflicts arose, the program developed, in conjunction with Advanced Energy, a contractor rating and

evaluation system, a debarment policy and a corrective action plan to help contractors meet the program standards or be removed from the program if unable to meet the standards.

- *Contractor rating and evaluation system:* On both the assessment subsidy invoice and the energy efficiency improvement invoice the property owner had an opportunity to rate the contractor on work, cleanliness, and professionalism (see Appendix A). Additionally any property owner complaints outside of the rating and feedback provided on the final survey were taken into account to provide the contractors with feedback on an annual basis.

- *Debarment policy:* (created and utilized by Chapel Hill WISE but impacted the Carrboro WISE program since Carrboro used Chapel Hill WISE prequalified contractors) The debarment policy or probationary policy helped set the contractor expectations and gave the program support if any problems arose.

- *Corrective Action Plan:* If the contractor received sub-par scores on the graded projects from Advanced Energy, they were requested to submit a corrective action plan to Advanced Energy to ensure that they could meet the standards on future WISE and HPwES projects. The corrective action plan provided a step-by-step document on how the contractor would improve their work in the future and how they would manage the quality of all of their work.

**INCENTIVES**

The initial emphasis in Carrboro's WISE program was on establishment of a commercial loan fund program, The Carrboro WISE EERLF (Energy Efficiency Revolving Loan Fund), in recognition of Carrboro's established and successful business revolving loan fund and Town priorities to support businesses. This structure and focus also was chosen to create a sustainable financing mechanism. CESI and Town staff worked to create the program design and reach out to small businesses, with a goal of completing four loans during the grant period. The program has been able to complete five loans with a total value of over $100k. Over the course of the grant the Carrboro WISE program expanded into single-family residential and multi-family projects. The program structure for each building type is outlined below.

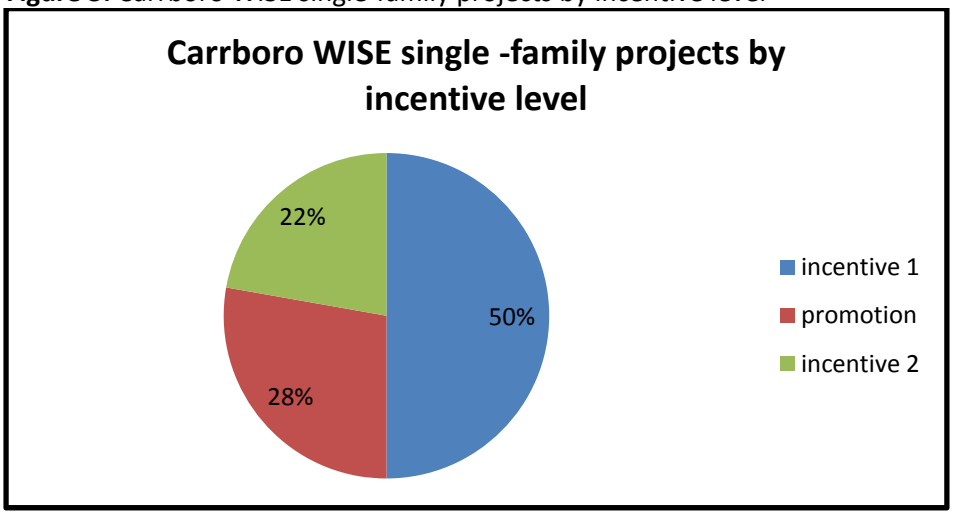
*Commercial Loan Structure:* The EERLF provides loans for small commercial buildings (defined as 50 or fewer employees) within the Carrboro town limits. The loans are currently provided at 3% interest for up to a 10 year term. Interested properties must receive an energy assessment from a qualified provider and agree to a project that will meet at least a 15% estimated energy savings. Once an application is submitted, after an assessment has been completed and project designed, the application is reviewed by the Economic Sustainability Commission (ESC) and finally the Board of Alderman (BOA). The EERLF Loan Application is attached as Appendix E.

*Residential Incentives:* In 2012, Carrboro started the single family residential program with the same incentive structure as Chapel Hill WISE phase II in an attempt to reduce confusion between Chapel Hill and Carrboro residents and the contractors. The exact incentive structures are listed below.

**Table 2:** Residential Incentive Structure

| | | |
|---|---|---|
| **1st Single Family Incentive Structure** | **Maximum amount** | **$1650** |
| | Assessment | 75% of assessment cost up to $150 (contractors charged $350 to stay in line with Chapel Hill) |
| | Improvement | Up to $1500 |
| | Calculation | 40% of envelope measures; 20% of lighting and equipment measures |
| **Single Family Promotional Incentive** | **Maximum amount** | **$2350** |
| | Assessment | 75% of assessment cost up to $150; full compensation of assessment cost IF complete a WISE eligible project (contractors charged $350 to stay in line with Chapel Hill) |
| | Improvement | Up to $2000 |
| | Calculation | 40% of envelope incentives; 20% of lighting and equipment measures |
| **3rd Single Family Incentive Structure** | **Maximum amount** | **$2000** |
| | Assessment | 75% of assessment cost up to $150; full compensation of assessment cost IF complete a WISE eligible project |
| | Improvement | Up to $1650 |
| | calculation | 40% of envelope incentives; 20% of lighting and equipment measures |
| **Multifamily Incentive Structure** | **Maximum** | **Incentivized assessment and up to $1500 per unit** |
| | Assessment | Assessment cost covered by program up to $3500 if a WISE qualified project is completed |
| | Improvement | Up to $1500 per unit |
| | calculation | 50% of energy efficiency measures |
| | | |

**Figure 3:** Carrboro WISE single-family projects by incentive level




The projects were divided by which incentive structure was used to calculate the WISE incentive. 50% of the projects moved forward under the original incentive structure of up to $1650 for an eligible project. The promotion, which lasted approximately 5 months attracted an additional 28% of the projects. The final incentive structure, which was active for approximately 3 months attracted 22% of the projects. Based on this data it appears that the promotion of a maximum incentive of $2350 was only marginally more effective than a maximum incentive of $2000. However, the uptick in projects at the end of the program could also have been from the sense of urgency that the end of the program created. With the program winding down homeowners did not want to miss the opportunity to receive an incentive for work, regardless of the amount.

**FINANCING**

*EERLF Small Commercial Revolving Loan:* The Carrboro WISE EERLF is operated out of the Town of Carrboro's Economic and Community Development office. During the grant period, the EERLF completed 5 loans and as the loans are repaid will be able to continue to provide financing to additional projects. Currently there are various recommendations that the Town is considering to ensure the sustainability of the loan fund. To continue to support the EERLF, the Town is considering in future budgets a small budget for contract support for administering the EERLF. The administration of this program during the grant was time intensive and specialized. While some of the requirements in terms of reporting and oversight have been reduced as the grant ends, there is still significant need for administrative assistance. Additionally, the Town will explore options for providing outreach and technical assistance to business owners. Each project was and will be different and the property owners and the contractors need guidance to move through the process. The small commercial sector can be a difficult market segment to reach and without some dedicated outreach, it will be more difficult to fully utilize the EERLF.

*Carrboro WISE residential program:* From the beginning, the program worked with Harrington Bank to develop a loan product specifically for energy efficiency improvement work through the WISE program. Harrington bank does not offer unsecured loans and was not interested in creating a new product. The program worked with them to promote their revolving equity line of credit (RELOC) that had a 3.75%

interest rate for Harrington Bank account holders. The interest rate was slightly higher if opening a new Harrington account.

In the fall of last year the program began offering the PowerSaver loan through Sunwest bank in California. The loan was set up through SEEA. Additional SEEA funds were utilized to buy down the PowerSaver interest rate to around 4% based on the rate at the time of application. The loan was promoted through the contractors that were pre-qualified through a Sunwest partner. Regardless of Sunwest prequalification, only WISE prequalified contractors could offer the loan with the reduced interest rate.

The Program little if any interest in the PowerSaver loan and did not make any residential loans. There were a couple of challenges in promoting the loan to Carrboro property owners:

- Sunwest is a west coast bank (California) that Carrboro homeowners had never heard of. The application was completed on-line, over the phone.
- The contractors had already gone through a rigorous process to become WISE contractors and were reluctant to go through the prequalification process again without understanding the benefits.
- Throughout the program, very few homeowners were interested in financing their projects, choosing to pay for them outright or put them on a credit card.

**DATA AND EVALUTION**

The program data was largely tracked in LongJump. LongJump is an online data management software. It costs $99 a month. Chapel Hill absorbed the cost of the software for both programs. The data tracked in the system were:

- Leads
- Program participants
- Project information including energy savings, project cost, measures installed and removed and the progress of each project

Upon completion of the program, all of the data from LongJump was downloaded into an Excel spreadsheet to be accessed in the future.

*Carrboro Demographic Data*

The Town of Carrboro covers approximately 4.48 square miles and is adjacent to the Town of Chapel Hill and the University of North Carolina. Table 3 outlines Carrboro's basic demographic information compared to the state of North Carolina and the United States.

**Table 3:** Basic Carrboro Demographic Data

| | Carrboro | North Carolina | United States |
|---|---|---|---|
| **Population** | | | |
| Population 2012 estimate | 20,433 | | |
| White | 71% | 68.50% | 77.90% |
| Black | 10% | 21.50% | 13.10% |

| | | | |
|---|---|---|---|
| other | 19% | 10% | 9% |
| **Education & Income** | | | |
| Bachelor's degree or higher | 62.40% | 26.50% | 28.20% |
| median household income | $43,276 | $46,291 | $52,762 |
| persons below poverty level | 16.80% | 16.10% | 14.30% |
| **Basic Housing Information** | | | |
| housing units | 9,258 | | |
| owner occupied units | 38.50% | 66.70% | |
| persons per household | 2.17 | 2.5 | 2.6 |
| home ownership rate | 35.50% | 67.80% | 66.10% |
| housing units in multi-unit structures | 48.70% | 17.00% | 0.259 |
| median value of owner-occupied homes | $345,700 | $152,700 | $186,200 |

The estimated population for 2012 is 20,433 which is comprised of a majority of white, relatively well-educated residents. The median household income is slightly below the state average and almost $10,000 less than the US average. There are approximately 9258 housing units in the Town which are predominately rental properties, with almost 50% multifamily units. The median value of the owner-occupied homes is $345,700 which is more than double the state average, which makes homeownership a challenge for many residents.

Table 4 below drills down into the housing stock in Carrboro.

**Table 4:** Demographic data about the Town of Carrboro housing stock

| **Subject** | **Carrboro** | | **North Carolina** | |
|---|---|---|---|---|
| | Estimate | % | Estimate | % |
| HOUSING OCCUPANCY | | | | |
| Total housing units | 9,418 | | 4,286,863 | |
| Occupied housing units | 8,881 | 94.3% | 3,664,119 | 85.5% |
| Vacant housing units | 537 | 5.7% | 622,744 | 14.5% |
| | | | | |
| UNITS IN STRUCTURE | | | | |
| Total housing units | 9,418 | | 4,286,863 | |

| | | | | |
|---|---|---|---|---|
| 1-unit, detached | 3,290 | 34.9% | 2,797,820 | 65.3% |
| 1 to 4 units | 1703 | 18.1% | 371162 | 8.7% |
| 5 to 20 or more units | 4230 | 44.9% | 512212 | 4.3% |
| Mobile home | 195 | 2.1% | | |
| | | | | |
| YEAR STRUCTURE BUILT | | | | |
| Total housing units | 9,418 | | 4,286,863 | |
| Built 2005 or later | 340 | 3.6% | 831006 | 19.4% |
| Built 2000 to 2004 | 669 | 7.1% | 897,042 | 20.9% |
| Built 1990 to 1999 | 2,067 | 21.9% | 719,962 | 16.8% |
| Built 1980 to 1989 | 2,454 | 26.1% | 643,839 | 15.0% |
| Built 1970 to 1979 | 2,196 | 23.3% | 428,881 | 10.0% |
| Built 1960 to 1969 | 913 | 9.7% | 335,578 | 7.8% |
| Built 1950 to 1959 | 445 | 4.7% | 177,247 | 4.1% |
| Built 1940 to 1949 | 174 | 1.8% | 253,308 | 5.9% |
| Built 1939 or earlier | 160 | 1.7% | | |
| | | | | |
| HOUSE HEATING FUEL | | | | |
| Occupied housing units | 8,881 | | 3,664,119 | |
| Utility gas | 2,758 | 31.1% | 919,701 | 25.1% |
| Electricity | 5,891 | 66.3% | 2,086,193 | 56.9% |
| Other fuel | 221 | 2.6% | 647642 | 17.7% |
| No fuel used | 11 | 0.1% | 10,583 | 0.3% |
| | | | | |
| VALUE | | | | |
| Owner-occupied units | 3,150 | | 2,483,743 | |
| Less than $50,000 | 42 | 1.3% | 238,438 | 9.6% |
| $50,000 to $99,999 | 29 | 0.9% | 459,366 | 18.5% |
| $100,000 to $149,999 | 149 | 4.7% | 516,368 | 20.8% |
| $150,000 to $199,999 | 292 | 9.3% | 429,963 | 17.3% |
| $200,000 to $299,999 | 671 | 21.3% | 421,443 | 17.0% |
| $300,000 to $499,999 | 1,300 | 41.3% | 281,003 | 11.3% |
| $500,000 to $999,999 | 654 | 20.8% | 111,936 | 4.5% |
| $1,000,000 or more | 13 | 0.4% | 25,226 | 1.0% |
| Median (dollars) | 345,700 | | 152,700 | |
| | | | | |
| MORTGAGE STATUS | | | | |
| Owner-occupied units | 3,150 | | 2,483,743 | |
| Housing units with a mortgage | 2,513 | 79.8% | 1,678,864 | 67.6% |
| Housing units without a mortgage | 637 | 20.2% | 804,879 | 32.4% |

To highlight some of the information found in the Table 3:

1. Units in structure: Approximately 30% of the housing units in Carrboro are single-family detached. Almost 45% are structures with 5 or more units which made Carrboro a good candidate for a multifamily pilot program.

2. Age of housing stock: The majority of the housing units were built after 1970, with over 25% being built in the 1980's. Homes built in the 1980s housing boom have been known to be poorly insulated and present good opportunities for significant energy savings.

3. House Heating Fuel: Over 60% of the housing units heat with electricity. In the mild Carrboro climate, this presented good opportunities for upgrading HVAC equipment to high efficiency, air source heat pumps.

4. Average Home Value: As stated before, the estimated median home value in Carrboro is around $345,000. Over 40% of the single family units in Carrboro have an estimated value of $300,000 - $500,000. This is well above the NC average. The high cost of homeownership means it is harder for Carrboro residents to own their homes; driving more residents to rent. The high rental rate means less interest in an energy efficiency incentive program, especially if the property owner does not pay the utility bills. Again, this made Carrboro an attractive area for a multifamily program as opposed to solely focusing on single-family homes.

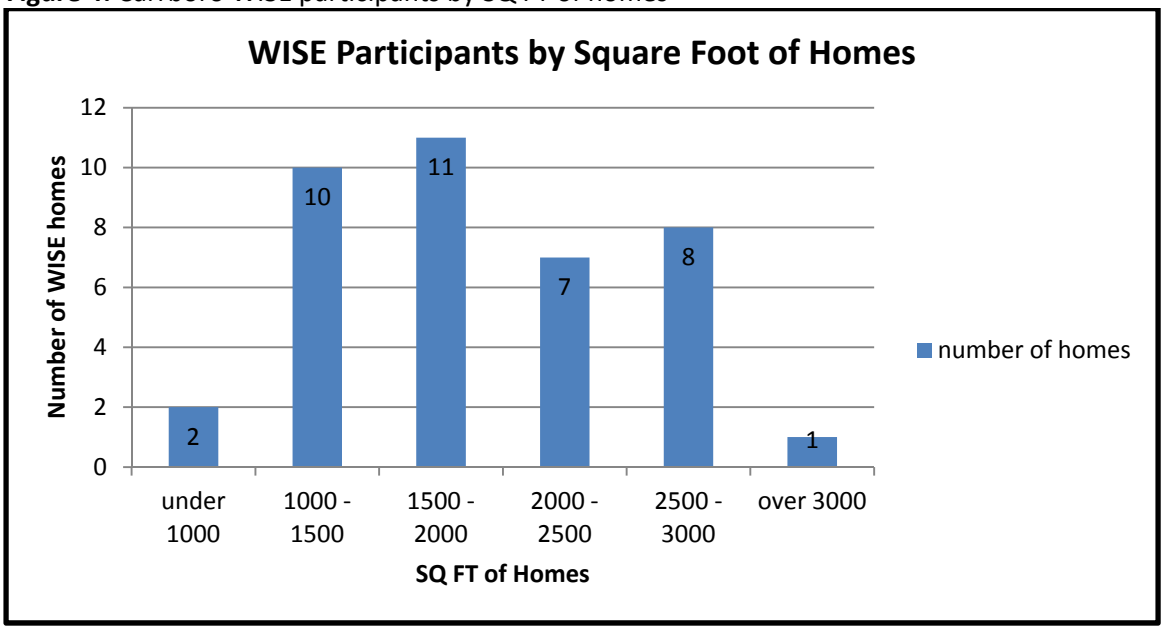
5. Mortgage status: Approximately 80% of the Carrboro homes have a mortgage which is about 12% more than NC. Typically homeowners that do not have a mortgage on their homes are more likely to move forward with energy efficiency improvements. Generally the homes are older and have more opportunities and the living expenses are lower which makes the cost of improvements more accessible. This could be another factor that impacted the number of single-family homeowners that participated it the Carrboro WISE program.

*Data Analysis: Carrboro WISE Single-Family Program*

Below is the analysis of the program projects and data collected. The Carrboro WISE single family program had 45 applicants, assessed 39 homes and completed 18 eligible projects. Below are charts analyzing:

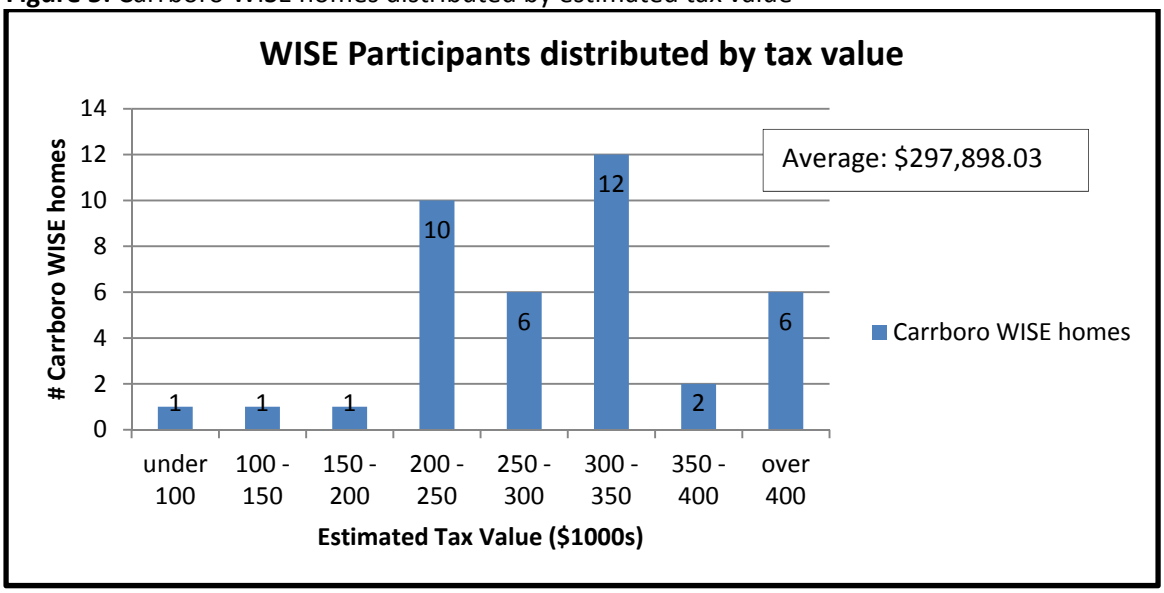
- the average square footage of the homes that participated in the program (Figure 4)
- the average value of the homes (Figure 5)
- the average age of the homes (Figure 6)
- WISE jobs by contractor (Figure 7)
- Estimated Energy (kWh) savings (Figure 8)
- Estimated Energy (Therms) savings (Figure 9)
- Total estimated savings for single family (Figure 10)
- Total estimated cost savings for single family (Figure 11)

**Figure 4:** Carrboro WISE participants by SQ FT of homes




The majority of the homes that participated in the Carrboro WISE program were 1000 to 2000 square feet.

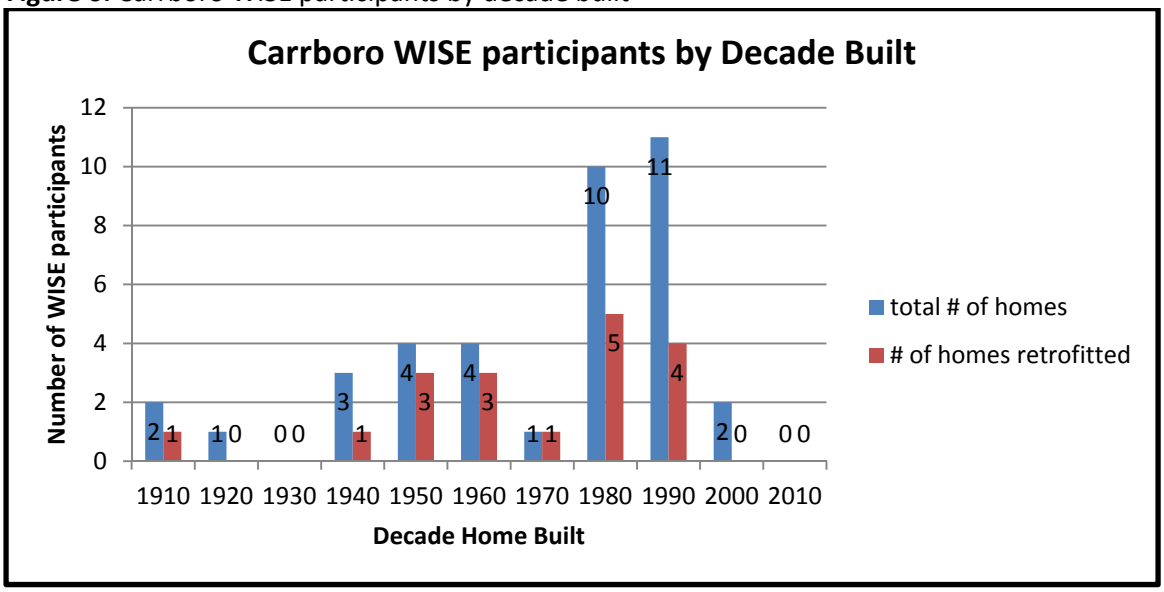
**Figure 5:** Carrboro WISE homes distributed by estimated tax value




The majority of the homes that participated in the Carrboro WISE program were between $250-$350,000. The average home value, based on 2009 tax estimates, was approximately $298,000. This is below the Carrboro median home value of $345,000 in 2010. [1]

[1] http://factfinder2.census.gov/faces/nav/jsf/pages/community_facts.xhtml

**Figure 6:** Carrboro WISE participants by decade built




Interestingly, most of the Carrboro WISE participant homes were built between 1980 and 2000. This is also when the largest percentage of homes were built in Carrboro. Additionally, this could be from the 'word of mouth' nature of the program, which was a significant driver of program participants. The projects are clustered in certain neighborhoods which typically have structures built around the same time period.

**Figure 7:** Carrboro WISE jobs by contractor

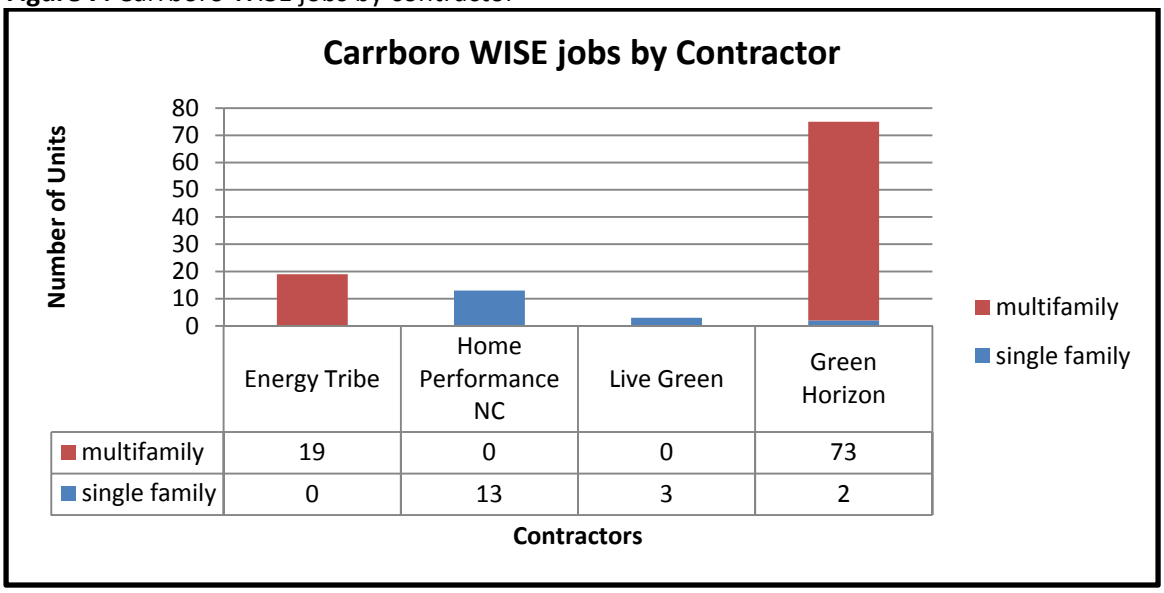
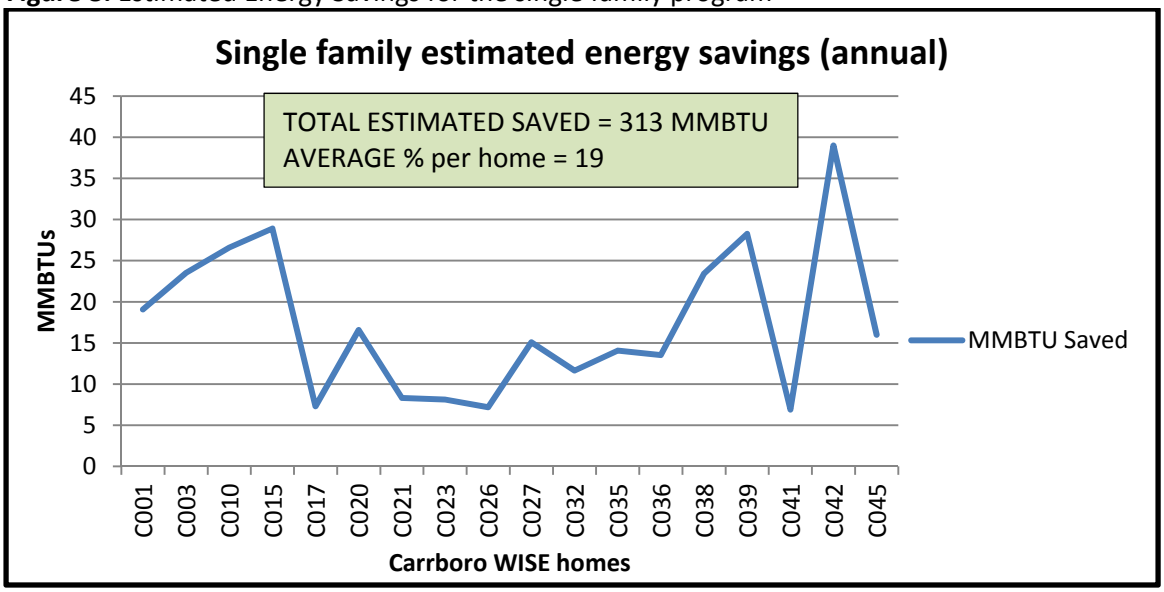



Figure 7 contains information around both the single family and multifamily programs. While there were 7 prequalified contractors eligible to work in the WISE program, only some of them completed projects. Home Performance NC, completed more of the single family projects than all the other contractors combined. Again, the 'word of mouth' nature of the program was a contributing factor to individual contractors gaining more work than others. Additionally, Home Performance NC actively

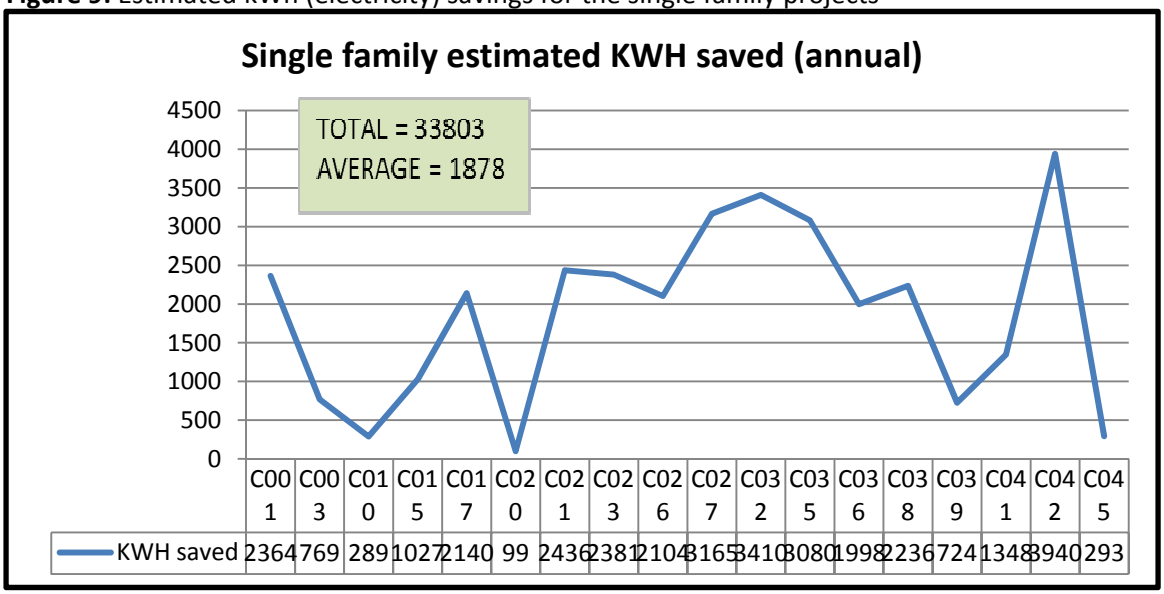
marketed in Carrboro and Chapel Hill, promoting themselves as a prequalified contractor to increase business. It is unknown if the other contractors did the same.

**Figure 8:** Estimated Energy Savings for the single family program




The single family program is estimated to save 313 MMBTUs per year. Measuring energy savings in MMBTU affords the opportunity to examine the energy savings from both electric and natural gas to gain a better understanding of the total % savings for the WISE program. The variation in savings in the chart above is for different sized homes, different energy baselines and different measures installed. On average each home is estimated to save approximately 17 MMBTU per year after the energy upgrades.

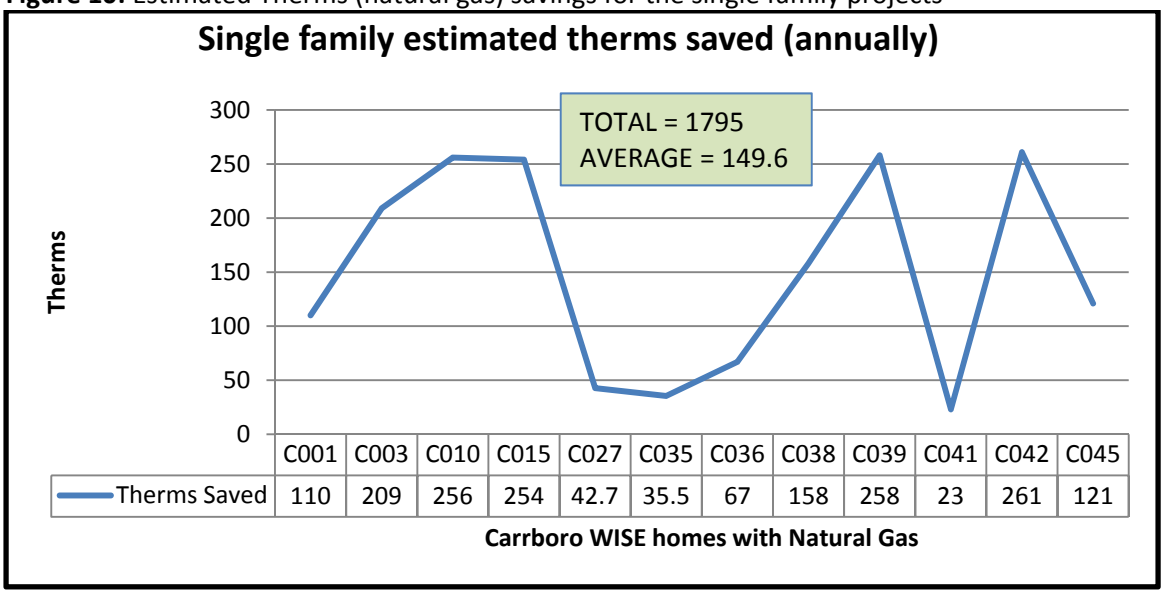
**Figure 9:** Estimated kWh (electricity) savings for the single family projects




To breakdown the energy savings even further, the chart above shows the estimated electricity (kWh) saved through the single family program. The average home is estimated to save 1878 kWh per year or

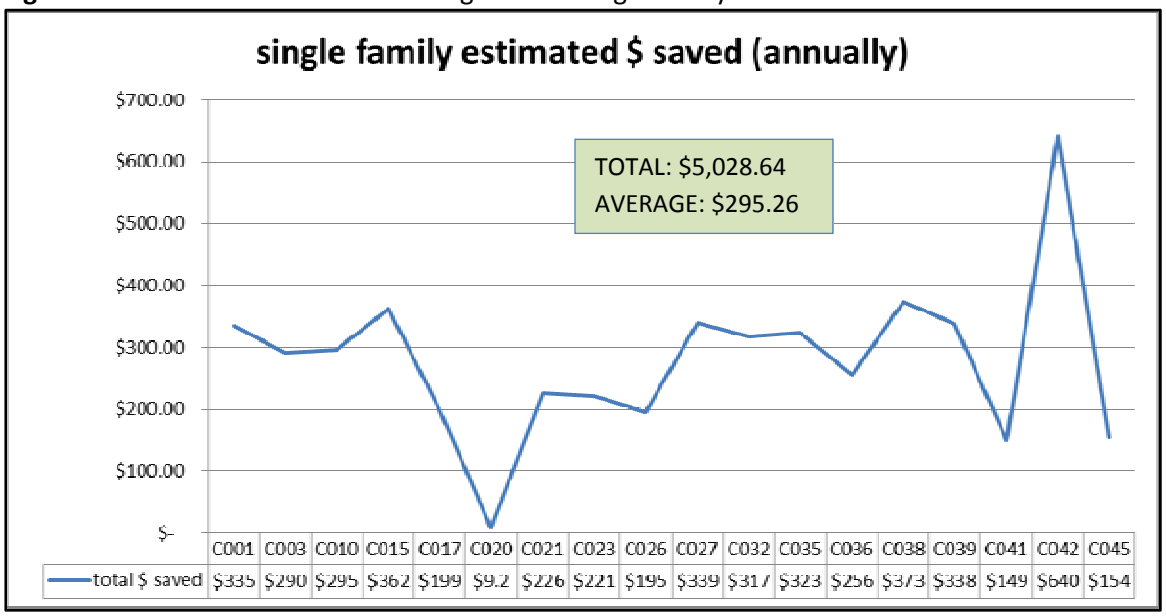
approximately 6.5 MMBTUs. The average percent saved per home is 14%. Again, depending on the measures installed and whether the home was all electric or heated with natural gas, impact the savings.

**Figure 10:** Estimated Therms (natural gas) savings for the single family projects




The same was done with natural gas in the chart above. The average natural gas saved per home is approximately 150 therms per year or 15 MMBTU. The average percent saved per home is 26.7%. Some of the homes that completed WISE projects were all electric and therefore not represented on the chart above.

**Figure 11:** Estimated annual cost savings for the single family homes




Finally, the reduction in consumption was converted to estimated cost savings. The cost savings were estimated using current PSNC ($1.05) and Duke Energy ($0.093) rates. The savings do not include

potential service charges and are based on the estimated reduced consumption provided through the contractor energy assessments. The actual savings are unknown at this time. On average, each WISE home is estimated to save approximately $300.00 a year on their utility bills (gas and electric). With an average project price of $5,475.00, the payback for the average projects is around 18 years. While, the payback does not always offer a compelling reason for implementing the upgrades, homeowners sited the improved comfort, air quality and impact on the environment as other motivating factors.

*Data Analysis: Carrboro WISE multifamily Pilot*

The multifamily pilot completed 2 projects. The first project was a 19 unit apartment complex that was largely vacant. The complex was undergoing a major renovation and through the WISE incentives was able to include energy efficiency upgrades for the entire project as well. Once completed, the complex was fully leased and tenants raved about the low utility bills.

The second project was a 73 unit condominium complex that was built in the 1960s. The entire project included air sealing and insulation of all 73 units as well as additional unit owners opting to upgrade windows, some appliances and HVAC systems. Because of the multiple owners, the project utilized the multifamily incentive design but largely followed the single family program process treating each unit as its own project in terms of paperwork and contracts. The metrics from both projects can be seen in the table below.

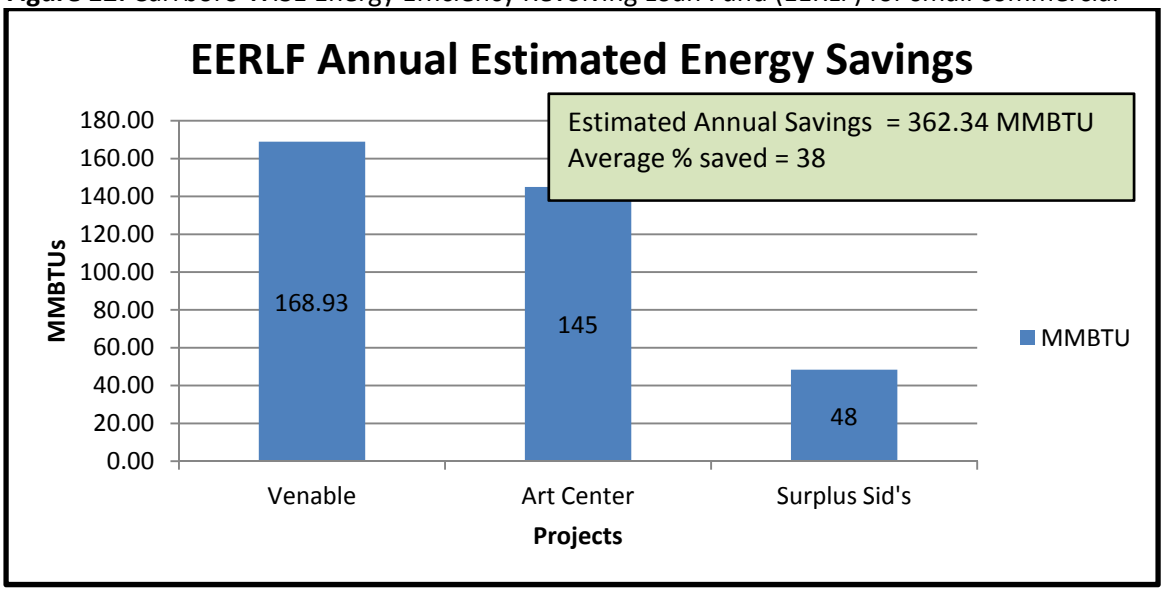
**Table 5:** Carrboro WISE Multifamily Pilot Program Metrics

| | |
|---|---|
| **Total number of units** | 92 |
| **Total Estimated kWh saved** | 295,965 |
| **Total Estimated MMBTU saved** | 1010 |
| **Average estimated MMBTU saved** | 11 |
| **Average estimated % saved per unit** | 21% |
| **Estimated cost savings ($)** | $ 27,524.75 |
| **Average estimated cost savings ($) per unit** | $299.18 |

Both of the multifamily projects were all- electric complexes. The estimated cost savings per unit is almost $300 per unit. This is above the estimated savings for the single-family projects. Both multifamily projects had significant opportunities for improvements. Additionally, both projects were part of larger rehab projects that were improved through the added focus on energy efficiency. In order to find success with multifamily energy efficiency, the best chance for getting an energy upgrade project to move forward is to time it with other planned renovations or capital improvements. Due to the split incentive – tenant realizes the utility cost savings but property owner pays for the upgrades – it is much harder to motivate investment in energy efficiency measures. Again, if it can be included in a larger project there is a better chance.

*Data analysis: Carrboro WISE EERLF*

**Figure 12:** Carrboro WISE Energy Efficiency Revolving Loan Fund (EERLF) for small commercial




The commercial program provided loans to 5 businesses. 3 of the businesses were in the same building and completed a comprehensive retrofit of the entire structure. The total estimated energy savings for the commercial projects is 362.34 MMBTU with an average percent saved of 38%. The table below provides the savings details for each project.

**Table 6:** Energy Savings for Commercial Program

| ` | MMBTU | % saved | $ saved | KWH saved | % KWH saved | therms saved | % therms |
|---|---|---|---|---|---|---|---|
| Venable | 168.93 | 49% | $ 1,030.00 | 8000 | 25% | 550 | 89% |
| Art Center | 145 | 22% | $ 2,200.00 | 22000 | 20% | 700 | 24% |
| Surplus Sid's | 48 | 44% | $ 758.34 | 4605 | 28% | 327 | 64% |
| **TOTAL** | **362.34** | | **$ 3,988.34** | **34605** | | **1577** | |

*Cumulative Savings for WISE program:* Table 7 shows the total estimated energy savings for ALL projects across the single family, multifamily and commercial programs.

**Table 7:** Total energy savings for the Carrboro WISE program: single-family, multifamily and commercial

| | |
|---|---|
| **Total number of units** | 113 |
| **Estimated MMBTU saved** | 1686 |
| **Average estimated % saved per unit** | 21% |
| **Estimated kWh (electricity) saved** | 364373 |
| **Estimated Therms (natural gas) saved** | 3372 |
| **Estimated cost savings ($)** | $ 39,685.40[2] |
| **Estimated CO2 reduction** | 89.7 metric tons |

**ACCOMPLISHMENTS:**

[2] The cost savings are estimated using current PSNC ($1.05) and Duke Energy ($0.093) rates. The savings do not include potential service charges and are based on the estimated reduced consumption. Actual savings are unknown at this time.

In terms of program performance based on number of retrofits completed, Carrboro exceeded expectations. Carrboro had a goal of 4 commercial loans and 100 residential units. Carrboro surpassed the goal on both accounts completing 5 loans and 110 residential units (18 single family and 92 multifamily units).

**Table 8:** Carrboro Program Performance

| | |
|---|---|
| Number of single-family applicants: | **45** |
| Number dropped out before completing an assessment: | **6** |
| Number of single-family assessments completed: | **39** |
| Number of qualified single-family WISE projects completed: | **18** |
| Estimated % energy savings *on average for each project* | **21%** |
| Number of multi-family units: | **92** |
| Conversion rate single-family: | **46%** |
| Overall conversion rate (single-family and multi-family): | **74%** |
| Number of Small Commercial assessments | **4** |
| Number of Small Commercial loans | **5** |

While less than 20 single family residential retrofits were completed, Carrboro completed projects at 2 multifamily complexes and 3 small commercial projects through 5 EERLF loans.

**Duke Pilot**

In 2011 Duke Energy proposed 3 pilot incentive programs across North Carolina structured to piggyback on existing energy efficiency incentive programs. The three areas selected were Greensboro, Charlotte and Chapel Hill and Carrboro through the Chapel Hill and Carrboro WISE programs (treated as one location for Duke's purposes). The incentive from Duke was comprised of the following:

**Table 9:** Duke Energy Incentive Pilot

| | |
|---|---|
| Home air sealing & attic insulation | $200 |
| Duct Sealing | $75 |
| Duct Insulation | $75 |
| ALL FOUR MEASURES COMBINED | $425 (additional incentive for completing all measures) |

The Incentive was offered to 100 homes in the Chapel Hill and Carrboro town limits participating in the WISE program. From November 2011 to April 2012 65 WISE participating homes successfully received the Duke Pilot Incentive in addition to the WISE incentive.

Duke and the Chapel Hill and Carrboro WISE programs worked together to develop the incentive process that would seamlessly be integrated with the WISE program process. The WISE program forms were modified to include the Duke Incentive on both the *Intent to Proceed* form and the Final project close-out. Once the project had been successfully completed – final test-out, QA and final paperwork received – the job package was sent to WECC, reviewed and the Duke Incentive would be paid directly to the contractor.

Duke Energy also co-wrote a press release about the incentive, created a sales sheet for the contractors to distribute to homeowners and funded a sales training for all of the participating contractors through Advanced Energy.

Since the pilot completion and analysis by Duke Energy, it has become a standing incentive across the Duke territory with some modifications. The incentive amount has been reduced and the incentive funds are paid directly to the homeowner instead of the contractor.

Duke was very pleased with the WISE program participation in the pilot but there were some challenges:

- WECC did not pay many of the incentives in a timely fashion to the contractors which caused some frustration that was directed towards the WISE program
- Some of the energy accounts were in names other than the homeowner's (ie. in maiden name or in husband or wife's name which differed from our program contact) which caused delays and confusion in incentive payment
- Duke's contractor hired to analyze the pilot requested very detailed data which was not asked for upon the start of the incentive (regardless of asking), which was challenging for the contractors as they had to compile the information after the fact.

**Contractor management and 3rd party quality assurance**

As stated previously in the workforce development section of the report, Advanced Energy, through their HPwES program (which incorporates contractor training/ mentoring and expert quality assurance) played a major role in the success of the Carrboro and Chapel Hill WISE programs.

A survey was conducted of the early adopters in Chapel Hill around QA and found that over half of the homeowners that moved forward with the project did so in part because of the third party quality assurance. Because of the third party review, homeowners were more confident that they made a good investment for their home and would experience real savings.

**Partnership with Clean Energy Durham for Energy Efficiency outreach and education**

Carrboro contracted with Clean Energy Durham, in collaboration with Chapel Hill, to pursue a grass roots energy savings education program. Specifically, a project was pursued in the winter and spring of 2013 that included the following components. First, program materials were assembled based on Clean Energy Durham's experience in Durham and several other communities, as captured in their signature "Pete Street" program. The second step involved publicity and recruitment via a variety of avenues. The focus of the work was twofold: intensive training of a small group of nine volunteers ("Elite Petes"), and an ongoing series of small workshops. Two types of workshops were pursued, a "Basic Energy Efficiency" (BEE) workshop and a "Hands On Workshop" (HOW). The BEE workshops were shorter workshops that provided foundational homeowner education on low cost/no cost energy efficiency and energy conservation measures. The HOW workshops included simple, accessible improvements resulting in improvements at the host site, and training for other participants to pursue in their home. The final step in the project was the collection of participation and effectiveness data to track all volunteer and participant activities, including follow-up information about energy saving projects undertaken following workshop attendance.

A significant success of the effort was the ability to publicize the program, train volunteers, and complete a number of workshops within a five month window. While it is not possible to quantify energy savings from the outreach performed, some sense of the scope of savings can be harnessed from

the results of a study of Clean Energy Durham efforts in other communities, where energy savings of 17.5% were estimated by the UNC Environmental Finance Center. A final point is that Clean Energy Durham has provided a license to both Carrboro and Chapel Hill to allow for continued use of the training materials developed. More information on Clean Energy Durham is available at http://www.cleanenergydurham.org/ and on the Pete Street program in particular at http://www.petestreet.org/#.

**Table 10:** Summary of Clean Energy Durham Outreach Metrics

| Component | # Workshops (Chapel Hill & Carrboro) | # Workshops (Carrboro) | # Participants (Chapel Hill & Carrboro residents) | # Participants (Carrboro residents) |
|---|---|---|---|---|
| Basic Energy Education Workshops | 18 | 6 | 116 | 39 |
| Hands On Workshops | 16 | 8 | 88 | 38 |

**Implementing relatively seamless program in 2 municipalities (Chapel Hill and Carrboro)**

Chapel Hill and Carrboro submitted a joint proposal to SEEA to receive Better Building Neighborhood Program (BBNP) funding. The original idea was to pilot a commercial energy efficiency revolving loan in Carrboro and a single-family residential program in Chapel Hill and then use lessons learned to expand the programs in both towns and create the basis for a regional energy alliance. Although the Towns submitted a joint proposal and desired to work towards expanded programs, the Chapel Hill WISE program and the Carrboro WISE program were substantially separate, with separate budgets, and overseen by the separate Towns' staff and governing boards. Clean Energy Solutions Inc (CESI) contracted with the Town of Chapel Hill for administrative services and the Town of Chapel Hill had an MOU with the Town of Carrboro to share the CESI administrative services. Therefore, originally one CESI employee, administered both the Chapel Hill and Carrboro WISE programs.

There were some challenges to having a singular administrator, such as:

- Underestimation of the amount of administrative time it takes to design and implement pilot programs. While the programs were similar, each town required different processes and each program varied slightly. Therefore the seamless transfer of knowledge was reduced in some cases. Each program could have benefited from an individual project manager in the pilot phase.
- While the WISE program was basically the same in Chapel Hill and Carrboro, each town had its own budget, own administrative processes and governing boards which meant that some of the economies of scale were not realized.
- Unique attributes of each community means that marketing messages and channels may or may not be effective in both communities. Again, this means additional time and resources to adapt messaging and materials.

However, regardless of the challenges there are several benefits to shared administration which were:

- The lowered cost of the administration and facilitation for two small towns with relatively small budgets to begin pilot energy efficiency programs. This is the biggest benefit.

- A shared prequalified contractor pool and improved quality of work for Carrboro residents. Carrboro utilized the Chapel Hill WISE prequalified contractors, which reduced the amount of time and effort to prequalify and train additional contractors. Advanced Energy provided QA in both Chapel Hill and Carrboro and therefore with each project the contractors gained more experience and expertise which potentially translates to better projects with additional energy savings.
- Lessons learned in one town could be transferred to the other town to keep the programs working in tandem if desired by the towns. Carrboro learned from the experience Chapel Hill gained implementing a single family program and Chapel Hill learned from Carrboro implementing a multifamily pilot program.
- Word of mouth and branding seemed to work across jurisdictional boundaries. Some of the marketing initiatives could have a broader impact such as the Chapel Hill Transit Bus Ads and the NPR radio sponsorships. The program does not have data to prove the increased impact.

Without the sharing of resources neither of the programs would have been as successful or as cost effective.

**Multifamily pilot**

Carrboro initiated a multifamily pilot in 2012 driven by a desire to reach this significant component of the building stock in Carrboro. A multifamily draft program design was created to guide the piloting of multifamily energy efficiency improvements. Incentive levels of up to $1500 per unit (not to exceed 50% of total energy efficiency upgrade cost) were adopted. An additional incentive covered the cost of the assessment (up to $3500) upon completion of the project. Eligible properties needed to: have at least 5 units and lie within the Town municipal boundary. Applications were considered on a first come first serve basis. Interest in the program was identified at 4-5 complexes, with projects moving forward for the Crest Street Apartments and Fidelity Court.

*Crest Street Project:*

Crest Street was a largely vacant multifamily complex with a single owner. The unoccupied status resulted in concerns such as vandalism. Renovation was planned to bring the complex back to a vibrant, multifamily living space near downtown Carrboro in 2012, at the inception of the WISE multifamily program. The WISE funds enabled the owner to install energy efficient appliances, reduce the drafts in the units through air sealing and increase insulation which reduces noise between units and further improves comfort. Between the building envelope improvements and addition of Energy Star appliances the entire complex was quickly rented and initial tenants have enjoyed reduced (~$20/ month) utility bills even in the summer.

*Fidelity Court Project:*

The Fidelity Court project has been a huge success story. The complex consists of 73 individually owned condominiums governed by an HOA, and was built in the 1960's, with a few renovations having taken place since that time. There was little insulation and the building envelopes were very leaky, causing drafts and exacerbating health conditions as owners and tenants breathed the air coming up from the crawl space and through the walls. In early 2013, a major renovation began that involved replacing the roof and undergoing other façade improvements, resulting in opportune timing to undertake energy

efficient upgrades as well. Every unit received attic and crawl space insulation and air sealing which reduces air infiltration into the units and energy consumption for heating and cooling, and increases the comfort and the health of the space. Some owners have chosen to replace windows, inefficient HVAC systems and appliances as well.

The project took coordination from the Town, CESI, the contractor, the HOA, the property manager, numerous individual owners, and SEEA to successfully complete. To our knowledge this is one of the only condominium projects that have been completed across the country through the Better Building Neighborhood Program (BBNP) working with multiple individual owners and the HOA. As of early June, the project contractor (Green Horizon) is finishing up work. The project should save each unit over 20% on their current electricity consumption. A summary of the WISE multifamily results described above is provided in the table below.

**Table 11:** Summary of Carrboro WISE Multifamily Program Metrics

| Property (# units) | Total Assessment Subsidy ($) | Total Retrofit Cost ($) | Total WISE Retrofit Subsidy ($) | Total Project Subsidy ($) | Energy Savings (%) |
|---|---|---|---|---|---|
| Crest Street Apts (19) | $800 | $57,000 | $28,500 | $29,300 | 22% |
| Fidelity Court (73) | $2700 | $157,078.63 | $60,169.31 | $62,869.31 | 18-23%[3] |
| TOTAL | $3500 | $214,078.63 | $88,669.31 | $92,169.31 | (x) |

**Cost per retrofit**

One of the benefits of administering the program through the Carrboro Town government was the low cost of overhead. Normal operational costs such as rent, utilities, internet, and phone service were not charged to the grant funds. Based on the total cost of administration of around $53,000, the average cost per project for administration was approximately $461.00. The Town was awarded $310,605 from SEEA over the course of the three year grant period, $227,605 went largely towards single family and multifamily projects – over 70% of the entire budget. Therefore each retrofit cost on average around $2070.00 regardless of the incentive structure. The $2070 included program administration as well as QA and marketing. Furthermore, operating the program through the Town government, the Town staff hours that are provided to the program at no cost, further reduce the cost per retrofit. This allowed more of the grant funds to go directly to energy efficiency and improving residents' homes.

## CHALLENGES:

**Working out of municipal government**

[3] All units received air sealing and insulation which provided an estimated 18% energy savings. Some units elected to receive energy efficient windows, Energy Star appliances and HVAC upgrades which provide additional savings.

The Carrboro WISE program was operated through the Carrboro municipal government. The Carrboro Environmental Planner was the 'program director' and primary liaison for the town while the program administration was contracted out to Clean Energy Solutions, Inc. Having a dedicated point person with the town to work with the different departments including the manager's office and elected officials is imperative for success. From reporting to financial and grant management and operations, without a dedicated individual to oversee all of the various tasks, timely progress and continuous process improvements are challenging.

Regardless of the dedicated oversight and commitment from staff, operating a pilot program through the municipal government has both benefits and challenges.

The benefits of operating a program through a municipal government:

- The cost of overhead was reduced: Unlike programs operating out of nonprofits or small organizations, the overhead such as rent, printing, utilities, etc. were all covered through the municipality as opposed to grant funds. Ultimately this meant more of the grant funds could be put directly to program activities and therefore in reduced energy consumption of Carrboro residents.

- Using co-branding of municipal government to instill trust in pilot program: Energy efficiency was not a known entity in many households much less the name Carrboro WISE. Homeowners are increasingly concerned about making smart investments with limited funds. Utilizing the trusted name of the Town of Carrboro helped homeowners trust the program and the brand.

- Cash flow is not an issue: The grant from SEEA and DOE was a reimbursement grant. Expenses were incurred, reviewed by SEEA and the Alliance to Save Energy (ASE) and finally DOE before the funds would be released to the Town. For smaller organizations and nonprofits this could be problematic as cash flow is tight and ultimately could hold up work. Operating the program through a municipal government meant that as long as the budget was approved by the town governing board and the contract was in place, the cash flow was not an issue and work was not contingent on receiving timely reimbursement for previous work.

The challenges, in the experience of Carrboro, seem to outweigh the benefits, even though they were less in number. The challenges of operating a pilot energy efficiency program through a municipal government were:

- Inflexibility of bureaucratic processes: This was the biggest challenge. Municipal governments must follow certain protocols in terms of financial records, procurement, and bidding for projects to name a few. Experimentation, inherent with all pilot programs, was impeded through the inflexibility of the processes. For example, if changes to the Carrboro WISE program design were desired to improve participation and increase impact, the changes had to be approved by the Board of Aldermen (BOA). Depending on the time of year and the BOA schedule this could take over a month which impeded productivity.

- Inefficiency of processes: Each aspect of the Carrboro WISE program was reviewed and approved by the multiple staff members/departments. All of the financial information must go through the finance department, all marketing collateral and outreach efforts must be reviewed and approved by multiple staff members, as stated above most changes to the program and any changes to the budget must be approved by the BOA. Additionally, all contracts must be

reviewed and signed by multiple departments. The review, coordination and final approval were time consuming. Therefore lessons learned by the program along the way or any changes generally took weeks or months to implement.

A pilot energy efficiency program needs flexibility and the ability to make quick changes to react to a dynamic market and to take advantage of opportunities when they arise.

**Contractor quality/ consistency**

From the very beginning of the WISE program, the services of Advanced Energy in Raleigh, NC were enlisted to help with contractor training/ mentoring and quality assurance. Advanced Energy is the only HPwES sponsor in the state and therefore the Carrboro WISE program was a HPwES program and could utilize the structure, standards and resources.

Carrboro utilized the Chapel Hill WISE contractor prequalification protocol. Chapel Hill WISE enacted a rigorous prequalification process for the contractors. First and foremost the contractors had to be vertically integrated meaning that the contractors could perform BPI energy assessments as well as act as the general contractor for the installation work. The Chapel Hill WISE contractor prequalification criteria are listed below:

1. BPI (Building Performance Institute) certification, including experience with combustion protocol
2. If applicable, RESNET (Residential Energy Services Network) certification or certifications that are pertinent to your performance as a qualified contractor in the Chapel Hill WISE Homes and Building Program
3. Energy modeling software for energy assessments– Either PSD Surveyor or other energy modeling software approved by the program's quality assurance (QA) provider
4. Relevant references available, including:

At least one of the following three:

a. A satisfactory Dun and Bradstreet Rating, or
b. Membership in the Better Business Bureau, or
c. A satisfactory banking reference

Each of the following:

d. A minimum of three current satisfactory professional/trade references, such as suppliers of materials, tools, credit;
e. A minimum of three satisfactory references from customers served within the past 6 months for home retrofits similar in nature to the WISE program design.

5. Ability to act as general contractor if subcontractors are needed
6. Acceptable insurance, including general liability and workers' compensation. Guidelines include:

a. The Town requires evidence of Contractor's current valid insurance (if applicable) during the duration of the named project and further requires that the Town be named as an additional insured. The required coverage limits are $1,000,000 per occurrence for Comprehensive General Liability and Business Automobile. Workers' Compensation coverage requirements are $100,000 for both employer's liability and bodily injury by disease for each employee and $500,000 for the disease policy limit.
b. Workers' Compensation Policy covering the obligations of the Contractor as required under the provisions of the Workers' Compensation Law, Employers Liability, and Disability Benefits.

7. Dispute Resolution Protocol covering the process undertaken by the Contractor to resolve any disagreements arising from proposed or conducted work.
8. Quality control (QC) process for reviewing work performed on a job site
9. A list ALL current trade licenses or licenses of subcontractors utilized, including electrical, plumbing, heating and fire sprinkler licenses.
10. Contractor Rate/ Fee Structure (see worksheet)

Chapel Hill found that there were already several contracting companies in the area focused on home performance contracting - providing energy assessments and retrofit projects specifically designed around energy efficiency. While all of these companies met the required program criteria and had the same credentials, the quality of their work and their understanding of building science varied substantially. For example the largest company with the most name recognition in the area ultimately was removed from the program because of the inconsistency in their quality of work and inability to meet the homeowners' needs.

To address these issues Chapel Hill implemented a debarment policy and worked closely with Advanced Energy to develop a contractor mentoring/ probationary policy and corrective action plan to help contractors improve the quality and consistency of their work. Carrboro adhered to this plan as well. Therefore if a contractor was on probation in Chapel Hill, they would also be placed on probation in Carrboro. All of the efforts helped ensure consistent quality across the program but the larger challenge of home performance contractor quality and consistency will take more standards development and training to achieve.

One of the goals of the Better Buildings Neighborhood Program (BBNP) was market transformation. The transformation in Carrboro and Chapel Hill came more from creating an accepted standard of work quality for home performance contractors as opposed to simple increased demand from homeowners for the services. Advanced Energy with their HPwES program will continue to work with the contractors, if interested, to further develop their skills and services.

**Altering the incentive level to drive demand and ensure the biggest impact of funds**

Over the course of the Carrboro WISE single family program the incentive level was changed 3 times to test different levels and interest in the program and ensure the greatest impact of grant funds possible. The different incentive levels are listed previously in the report in Table 1. The program began with a $1500 maximum incentive per home. The assessment was incentivized up to $150, with a cost of around $200 to the homeowner. A promotion was held to increase the demand in the single family program and keep the incentive level in-line with Chapel Hill in which the homeowner could receive up to $2350 - $2000 for the energy upgrades and a fully funded assessment if a WISE eligible project was implemented. At the completion of the promotion, the incentive was dropped back to $1500 but the assessment was still fully covered if a homeowner moved forward with work.

The challenge of changing the incentive level was ensuring that the contractors present the correct incentive amount to interested homeowners and managing homeowner expectations. If homeowners receive incorrect information or miss the promotion they are less likely to move forward. Homeowners that were not able to take advantage of the previous incentive amount might become disillusioned with the program or decide not to move forward because of the lower incentive amount. The program worked very hard to ensure that homeowners' and contractors' expectations were set to keep all engaged and satisfied with the program.

**Lack of interest in financing product for single family homes**
As discussed earlier in the report, Carrboro WISE offered financing for single family homes through the PowerSaver Loan Program and Sunwest bank in California. The homeowners that participated in the program did not request financing, electing to directly pay for the upgrades or put them on a credit card. Anecdotally, it seems that the contractors were confused by the process with the Sunwest product so did not actively promote it to the homeowners. Additionally, the loan application was online through a financial organization that was based across the country. Carrboro residents are very interested in local organizations and potentially were not comfortable borrowing money from an unknown institution. This was coupled with the widespread feeling of distrust of banks due to the recent predatory lending and real estate collapse. People are reluctant to take on extra debt these days and have a harder time being approved for loans, coupled with an unknown banking institution and it was not surprising that demand for the PowerSaver loan was low.

**External Factors that reduced interest in the program: Mild winters and economic downturn:**
Due to lack of understanding and available funds, home performance work is generally not on the top of property owners' lists. Much of the home performance work cannot be seen, such as air sealing and attic insulation. Homeowners are much quicker to invest in bathroom or kitchen renovations then spend $5-10K on improving the energy efficiency of their home. Additionally, where an upgraded kitchen or bathroom can increase the appraised value of the home, energy efficiency improvements do not currently translate to increased value. Energy prices in the southeast are low and the payback of many of the energy efficiency measures cannot justify the investment.

Similarly, when homeowners are not uncomfortable - cold or hot - in their homes and their energy costs are not too high, energy efficiency or saving energy rarely enters their mind. In Carrboro we had mild winters which potentially depressed the interest in the program.

**Demographic impact**
Regardless of a generous incentive that was provided through the WISE program, few low to moderate income homeowners participated in the program. Although the energy savings in low to moderate income homes are great, the homeowners were unable to pay the cost share portion of the project. Additionally, due to deferred maintenance issues, some of the homes needed other upgrades for health and safety in addition to the energy upgrades which ultimately increased the overall cost of the project.

In order to address this challenge, the program enlisted the services of Clean Energy Durham to provide direct outreach to low-to-moderate income neighborhoods through workshops that focused on low-cost/ no-cost measures for energy conservation. Through these workshops the homeowners learned simple things they could do to reduce their energy consumption and get a better understanding of the multiple benefits of energy efficiency.

## PROGRAM SUSTAINABILITY PLAN

**Carrboro WISE energy efficiency revolving loan fund (EERLF)**
While the Carrboro WISE single family and multifamily activities have stopped for the time being, the small commercial revolving loan fund will continue to operate to provide low interest loans to property

owners interested in improving the energy efficiency of their buildings, reducing their bottom lines and increasing their sustainability.

As for Carrboro WISE single family HPwES program, CESI continues to work with Advanced Energy and other stakeholders in the region to develop a regional energy alliance that the Town of Carrboro fully supports. Currently, CESI is speaking with Duke Energy about their interest in collaborating. Unfortunately a regional or statewide energy alliance would be unsustainable without the support of the utility provider.

A Direct Install or Pay-For-Performance program for which Duke has developed a model would be a possibility for the NC Regional Energy Alliance (REA). There are three attributes of the alliance that appear to be excellent complementary elements for Duke energy efficiency incentive programs for small buildings:

1. Strong contractor relationships attached to a working IT platform and an excellent quality assurance process;
2. Superior marketing capabilities, anchored by local governments, civic and business associations closest to the customer, and a track record in attracting in kind resources to supplement traditional funding sources to attract the attention of, and prequalify customers;
3. More generally, the credibility and public relations benefits of local nonprofit and government organizations partnering with Duke to deliver quality services.

The specific customer segments of greatest interest are single family and multifamily residential, and small commercial customers. For the residential program management and delivery (including multifamily), we believe that Advanced Energy, working with the local governments and nonprofit organizations, are appropriate selections as potential Duke partners/vendors. For the small commercial program, it may make sense for these organizations to partner with an existing Duke vendor with a strong track record and capability in serving this population.

The absence of the cash incentives enjoyed by the Carrboro and Chapel Hill WISE program participants will be a loss, but the benefits of collaboration with Duke can compensate and assure a stronger benefit to customers than either Duke or the Alliance providers could provide on their own. It is understood that the proposed collaboration, for the specific end use sectors, with the specific Direct Install program design and approximate level of incentives comes at a time when Duke is considering all concepts to render their new energy efficiency program offerings as attractive to their customers, their ratepayers, and their shareholders as possible. CESI and the Town of Carrboro believe it is a win/win situation with Duke, and are optimistic of an NC regional or statewide energy alliance, based on the lessons learned and successes from the Chapel Hill and Carrboro WISE programs being created in early 2014.

Appendix A: Program Forms

# Carrboro WISE Homes & Buildings Program: Homeowner Participation Agreement Form

The Town of Carrboro is conducting a Town-wide energy efficiency program for homeowners. Funding for this program is provided by the U.S. Department of Energy. Carrboro, through its contractor Clean Energy Solutions (CESI), will develop a network of prequalified contractors who will conduct energy assessments and complete home improvements for qualified homeowners.

**Please answer the following questions to determine your eligibility for this program and to provide other important information:**

1. Is your primary residence located within the Town's Corporate (city) limits? _____ (yes/no)
2. Are you the owner of the primary residence _____ (yes/no) and is it a single-family, detached structure _____? (yes/no)

*If you answered NO as part of either question above, unfortunately you are not eligible for the program at this time. If you answered yes to each, please continue.*

3. In what year was your home originally built? _____ (e.g., 1968)
4. Does your home have any other particular significance (e.g., historical, cultural, etc.) that would be relevant to the work performed as part of this program? _____
   _____
5. Does your home have any unusual characteristics/history/problems that would be relevant to the work performed as part of this program? _____
   _____
6. Were you referred to the Carrboro WISE Homes & Buildings Program by a contractor that is pre-qualified to do work for this program? _____ (yes/ no/not sure)

   If yes, who was it? _____
7. If you were not referred by a contractor, how did you hear about the Carrboro WISE Homes and Buildings Program? _____
   (e.g., listserv, PSA, newspaper, friend, neighbor, event, canvasser, etc.)

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Appendix A: Program Forms

9. Why are you interested in the Carrboro WISE program? (please circle one or two)
**Comfort** **Savings** **Environment** **Community** **Health** **Other**

**Please read and initial the statements below.**

As a participant of this program, I understand that I must:

_____ Contribute towards the cost of an Energy Assessment. Total cost of assessment will not exceed $600. (Town of Carrboro will subsidize 75% of the cost, up to $150. The rest of the cost is the responsibility of the homeowner.)

_____ Select a Carrboro WISE prequalified contractor to conduct the energy assessment.

_____ Agree to be present during the Energy Assessment.

_____ Submit the required documents to the Town of Carrboro in order to receive subsidies for the home performance assessment (documents include but are not limited to: Homeowner Participation Agreement, 12 months utility bills, Intent to Proceed Form, Invoice for Assessment and Customer Satisfaction Survey)

_____ Share 12 months of past home utility data and if proceed with improvements, 12 months of utility data after project completion. (Please list your utility providers: _____)

_____ Promptly notify the Program Coordinator if a dispute with the contractor arises, so that the appropriate dispute resolution process may begin.

_____ Participate in a customer satisfaction survey.

_____ Allow the Town to photograph and take video of program participants for publicity/promotional purposes.

**That for and in consideration of the promises and conditions set forth above, the Program Participant agrees:**

**Indemnification and Hold Harmless:** I agree to indemnify and hold harmless the Town of Carrboro and its officers, agents and employees from all loss, liability claims or expense (including reasonable attorney's fees) arising from bodily injury, including death or property damage to any person or persons caused in whole or in part by the negligence or willful misconduct of the Contractor except to the extent same are caused by the negligence or misconduct of the Town, including, but not limited to any claim or suit resulting from or related to mildew, fungus, moisture intrusion or mold of every type and nature.



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Appendix A: Program Forms

**Non-Discrimination:** All functions of the Town of Carrboro WISE Homes & Building Program shall be administered without discrimination because of race, creed, sex, national origin, age, economic status, sexual orientation, gender identity or gender expression.

**Program Policy:** The Town of Carrboro reserves the right to: (1) for any reason, change the Carrboro WISE Homes & Building Program, as needed and without notice; (2) photograph and take video of program participants for publicity purposes; (3) suspend or terminate this agreement due to (a) loss of funds to support this program and/or (b) participant negligence or willful misconduct.

**Data Collection:** The Town of Carrboro reserves the right to submit any data collected as part of the Carrboro WISE Homes & Buildings Program to DOE (Department of Energy) in accordance with the ARRA (American Recovery and Reinvestment Act) reporting requirements.

I certify, under the penalties of law, that the statements made in this Agreement have been examined by me, and are true and complete to the best of my knowledge. I understand that by signing this Agreement, I consent to any other inquiry to verify or confirm the information I have given. I also understand that the Town will not share my personal information without explicit written request.

Name: _____

Address: _____

Telephone Number: _____ E-mail Address: _____

Homeowner Signature _____

Date _____

**Thank you for your interest!**

**Questions:** Call Nora Barger | 919.918.7334

Please return this form to: Nora Barger | Energy Efficiency Coordinator | 301 West Main Street| Carrboro, NC 27510 | nbarger@cleanenergysol.com | (f) 919.918.4454*

Homeowner Participation Agreement Forms will be reviewed every Monday. Once the Agreement is reviewed you will receive an email containing the list of pre-qualified contractors and next steps for program participation.

*If you submit your form by email or fax, please mail the original, signed document to the address above for our records.

**For Office Use Only:**
Homeowner # _____ Notes: _____

BETTER BUILDINGS

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carrboro wise Homes & Buildings Program

# Assessment Subsidy Form

**Please Note:** *This form must be submitted as a hand-signed original. Copies, faxes or digital versions will not be accepted. Please return by mailing or dropping off at the address listed at the bottom of page 2.*

This form acknowledges the completion of the energy efficiency assessment for the property listed below through the Carrboro WISE Homes and Buildings Program. Once signed by both parties (Homeowner and Town), the total subsidy amount (listed below) will be paid directly to the Contractor. This form acts as homeowner authorization that the work has been completed to your satisfaction and should not be signed if there is outstanding work to be completed by the Contractor.

After the subsidy is administered, additional reporting or customer surveys may occur as part of participation in the Carrboro WISE Homes and Buildings Program and in accordance with ARRA (American Reinvestment and Recovery Act) requirements.

**Contractor Rating:**

Please rate you WISE contractor based on your experience with your WISE Program Home Energy Retrofit project for each of the following categories.
(1 star = poor, 5 stars = excellent).

| | ★1 | ★2 | ★3 | ★4 | ★5 |
|---|---|---|---|---|---|
| **Customer Service** | ○ | ○ | ○ | ○ | ○ |
| **Ability and Willingness to Answer Questions** | ○ | ○ | ○ | ○ | ○ |
| **Cleanliness of Assessment Process** | ○ | ○ | ○ | ○ | ○ |
| **Quality of Work / Assessment Report** | ○ | ○ | ○ | ○ | ○ |
| **Comments:** | | | | | |

**TOTAL ENERGY EFFICIENCY ASSESSMENT SUBSIDY: 75% of the cost of the Assessment up to $150***

*In order to process this form, the Town must have (1) a copy of the energy efficiency assessment report from the contractor and (2) a copy of the contractor invoice

Better Buildings

visit us online at:
wiseprogram.info

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Appendix A: Program Forms

carrboro wise Homes & Buildings Program

# Assessment Subsidy Form

**That and for in consideration of the mutual promises and conditions set forth above (or attached), the Town and Program Participant agree:**

**Indemnification and Hold Harmless:** I agree to indemnify and hold harmless the Town of Carrboro and its officers, agents and employees from all loss, liability claims or expense (including reasonable attorney's fees) arising from bodily injury, including death or property damage to any person or persons caused in whole or in part by the negligence or willful misconduct of the Contractor except to the extent same are caused by the negligence or misconduct of the Town, including, but not limited to any claim or suit resulting from or related to mildew, fungus, moisture intrusion or mold of every type and nature.

**Non-Discrimination:** All functions of the Town of Carrboro WISE Homes and Building Program shall be administered without discrimination because of race, creed, sex, national origin, age, economic status, sexual orientation, gender identity or gender expression.

**Program Policy:** The Town of Carrboro reserves the right to: (1) for any reason, change the Carrboro WISE Homes and Building Program, as needed and without notice; (2) photograph and take video of program participants for publicity purposes; (3) suspend or terminate this agreement due to (a) loss of funds to support this program and/or (b) participant negligence or willful misconduct.

**Data Collection:** The Town of Carrboro reserves the right to submit any data collected as part of the Carrboro WISE Homes and Buildings Program to DOE (Department of Energy) in accordance with the ARRA (American Recovery and Reinvestment Act) reporting requirements.

I certify, under the penalties of law, that the statements made in this Agreement have been examined by me, and are true and complete to the best of my knowledge. I understand that by signing this Agreement, I consent to any other inquiry to verify or confirm the information I have given. I also understand that the Town will not share my personal information without explicit written request.

| | | | |
|---|---|---|---|
| Name | | Telephone Number | |
| Address | | Date | |
| E-mail Address | | Contractor | |

**Homeowner Signature :** _____

For questions, and to drop off or maill this form, contact:

**Carrboro WISE**
attn: Mark Kuykendall
301 West Main Street
Carrboro, NC 27510

mark@wiseprogram.info
cell: (919) 914-0094

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U.S. DEPARTMENT OF ENERGY

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Appendix A: Program Forms

carrboro wise
Worthwhile Investments Save Energy

# Carrboro WISE
## Homes & Buildings Program

## Subsidy Estimate / Intent to Proceed Form

Yes! I wish to move forward and be eligible to receive subsidies for energy efficiency upgrades to my home. This form documents the scope of work I have reached with my contractor, estimates my rebate, and obligates me to proceed.

**Project ID: C045**
**Homeowner Name: Marina Heatzig**
**Address: 101 Wrenn Place Chapel Hill, NC 27516**
**Phone: 919-218-0068**
**Email: mheatzig@gmail.com**
**Contractor: Green Horizon**

### Scope of Work

**Improvements & Estimated Energy Savings**

| ENERGY EFFICIENCY IMPROVEMENT | ESTIMATED COST | 20-40% SUBSIDY | Estimated Subsidy |
|---|---|---|---|
| WISE Assessment | $ 200 | 100 % | $ 200 |
| Air Sealing | $ 250 | 40 % | $ 100 |
| Sub Floor Insulation | $ 600 | 40 % | $ 240 |
| Duct Replacement | $ 1250 | 40 % | $ 500 |
| | $ 0 | 0 % | $ 0 |
| | $ 0 | 0 % | $ 0 |
| | $ 0 | 0 % | $ 0 |
| | $ 0 | 0 % | $ 0 |
| | $ 0 | 0 % | $ 0 |

**Total Estimated Savings: %**
**Total Estimated Cost: $ 2300**
**Total Estimated Subsidy: $ 1040**
**Total Estimated Invoiced Cost: $ 1260**

Appendix A: Program Forms

## Financing

Did your contractor inform you about available financing options? Yes | No

Will you be obtaining financing for the project? Yes | No

If yes, please provide the following, so that we may fulfill our federal reporting requirements:

Lender:

Amount:

Interest Rate:

Term:

## Intent to Proceed

I agree with the Scope of Work, above and/or attached, and will proceed with the energy efficiency improvements detailed in the scope of work. I acknowledge that I will submit all paperwork needed to receive the subsidy from the Town, paid directly to the contractor upon my authorization.

That and for in consideration of the mutual promises and conditions set forth above (or attached), the Program Participant and Contractor agree:

Indemnification and Hold Harmless: I agree to indemnify and hold harmless the Town of Carrboro and its officers, agents and employees from all loss, liability claims or expense (including reasonable attorney's fees) arising from bodily injury, including death or property damage to any person or persons caused in whole or in part by the negligence or willful misconduct of the Contractor except to the extent same are caused by the negligence or misconduct of the Town, including, but not limited to any claim or suit resulting from or related to mildew, fungus, moisture intrusion or mold of every type and nature.

Non-Discrimination: All functions of the Town of Carrboro WISE Homes and Building Program shall be administered without discrimination because of race, creed, sex, national origin, age, economic status, sexual orientation, gender identity or gender expression.

Program Policy: The Town of Carrboro reserves the right to: (1) for any reason, change the Carrboro WISE Homes and Building Program, as needed and without notice; (2) photograph and take video of program participants for publicity purposes; (3) suspend or terminate this agreement due to (a) loss of funds to support this program and/or (b) participant negligence or willful misconduct.

Data Collection: The Town of Carrboro reserves the right to submit any data collected as part of the Carrboro WISE Homes and Buildings Program to DOE (Department of Energy) in accordance with the ARRA (American Recovery and Reinvestment Act) reporting requirements.

I certify, under the penalties of law, that the statements made in this Agreement have been examined by me, and are true and complete to the best of my knowledge. I understand that by signing this Agreement, I consent to any other inquiry to verify or confirm the information I have given. I also understand that the Town will not share my personal information without explicit written request.

**Homeowner Signature: _____ Date: _____**

**Print Name: _____**

You have 30 DAYS from receipt of this form to complete and return it to the WISE Program Manager. If the form is not returned within 30 DAYS you may not be eligible for the same subsidy levels currently offered by the program. Please return the signed original form to:
**Mark Kuykendall | Program Manager | 301 West Main Street | Carrboro NC 27510**

carrboro wise
Worthwhile Investments Save Energy

# Carrboro WISE
## Homes & Buildings Program

## Energy Efficiency Improvement Invoice

This form acknowledges the completion of the proposed scope of work for the energy efficiency improvement project listed below through the Carrboro WISE Homes and Buildings Program. Once signed by both parties (Homeowner and Town), the total subsidy amount (listed below) will be paid directly to the Contractor. This form acts as homeowner authorization that the work has been completed to your satisfaction and should not be signed if there is outstanding work to be completed by the Contractor.

After the subsidy is administered, additional reporting or customer surveys may occur as part of participation in the Carrboro WISE Homes and Buildings Program and in accordance with ARRA (American Reinvestment and Recovery Act) requirements.

**Project ID: C045**
**Homeowner Name: Marina Heatzig**
**Address: 101 Wrenn Place Chapel Hill, NC 27516**
**Phone: 919-218-0068**
**Email: mheatzig@gmail.com**
**Contractor: Green Horizon**

### Scope of Work: Improvements & Estimated Energy Savings

| ENERGY EFFICIENCY IMPROVEMENT | ESTIMATED COST | ACTUAL COST | 20-40% SUBSIDY | SUBSIDY AMOUNT |
|---|---|---|---|---|
| WISE Assessment | $ 200 | $ 200 | 100 % | $ 200 |
| Air Sealing | $ 250 | $ 250 | 40 % | $ 100 |
| Sub Floor Insulation | $ 600 | $ 600 | 40 % | $ 240 |
| Duct Replacement | $ 1250 | $ 1250 | 40 % | $ 500 |
| | $ 0 | $ 0 | 0 % | $ 0 |
| | $ 0 | $ 0 | 0 % | $ 0 |
| | $ 0 | $ 0 | 0 % | $ 0 |
| | $ 0 | $ 0 | 0 % | $ 0 |
| | $ 0 | $ 0 | 0 % | $ 0 |

**Total WISE Subsidy: $ 1040**

Appendix A: Program Form

carrboro wise Homes & Buildings Program

Worthwhile Investments Save Energy

# Energy Efficiency Improvement Invoice

**NOTE to Contractor:**

In order to process the subsidy, the following information must accompany this form or already be on file:

- Detailed scope of work for project including all estimates
- Completed utility incentive forms with submission date
- Signed utility data release form (or Electronic Consent Form from Homeowner)
- Signed appliance disposal form (or Electronic Consent Form from Homeowner)
- All contractor invoices for work performed
- Other information pertinent to the program upon request

This form is to be transmitted electronically directly from the Homeowner per the instructions on the following page.

**Contractor Rating:**

Please rate you WISE contractor based on your experience with your WISE Program Home Energy Retrofit project for each of the following categories.
(1 star = poor, 5 stars = excellent).

| | ★1 | ★2 | ★3 | ★4 | ★5 |
|---|---|---|---|---|---|
| Customer service | ○ | ○ | ○ | ○ | ○ |
| Ability and willingness to answer questions | ○ | ○ | ○ | ○ | ○ |
| Cleanliness of job site | ○ | ○ | ○ | ○ | ○ |
| Quality of work | ○ | ○ | ○ | ○ | ○ |

BETTER BUILDINGS

visit us online at:
wiseprogram.info

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## Financing

Did your contractor inform you about available financing options? Yes | No

Will you be obtaining financing for the project? Yes | No

If yes, please provide the following, so that we may fulfill our federal reporting requirements:

Lender:

Amount:

Interest Rate:

Term:

## Intent to Proceed

I agree with the Scope of Work, above and/or attached, and will proceed with the energy efficiency improvements detailed in the scope of work. I acknowledge that I will submit all paperwork needed to receive the subsidy from the Town, paid directly to the contractor upon my authorization.

That and for in consideration of the mutual promises and conditions set forth above (or attached), the Program Participant and Contractor agree:

Indemnification and Hold Harmless: I agree to indemnify and hold harmless the Town of Carrboro and its officers, agents and employees from all loss, liability claims or expense (including reasonable attorney's fees) arising from bodily injury, including death or property damage to any person or persons caused in whole or in part by the negligence or willful misconduct of the Contractor except to the extent same are caused by the negligence or misconduct of the Town, including, but not limited to any claim or suit resulting from or related to mildew, fungus, moisture intrusion or mold of every type and nature.

Non-Discrimination: All functions of the Town of Carrboro WISE Homes and Building Program shall be administered without discrimination because of race, creed, sex, national origin, age, economic status, sexual orientation, gender identity or gender expression.

Program Policy: The Town of Carrboro reserves the right to: (1) for any reason, change the Carrboro WISE Homes and Building Program, as needed and without notice; (2) photograph and take video of program participants for publicity purposes; (3) suspend or terminate this agreement due to (a) loss of funds to support this program and/or (b) participant negligence or willful misconduct.

Data Collection: The Town of Carrboro reserves the right to submit any data collected as part of the Carrboro WISE Homes and Buildings Program to DOE (Department of Energy) in accordance with the ARRA (American Recovery and Reinvestment Act) reporting requirements.

I certify, under the penalties of law, that the statements made in this Agreement have been examined by me, and are true and complete to the best of my knowledge. I understand that by signing this Agreement, I consent to any other inquiry to verify or confirm the information I have given. I also understand that the Town will not share my personal information without explicit written request.

**Homeowner Signature: _____ Date: _____**

**Print Name: _____**

You have 30 DAYS from receipt of this form to complete and return it to the WISE Program Manager. If the form is not returned within 30 DAYS you may not be eligible for the same subsidy levels currently offered by the program. Please return the signed original form to:
**Mark Kuykendall | Program Manager | 301 West Main Street | Carrboro NC 27510**

carrboro wise
Worthwhile Investments Save Energy

## Homes & Buildings Program: Utility Data Release Form

The Carrboro WISE Homes & Buildings program is a performance-based energy efficiency incentive program with expectations to reach 15% or more in energy savings through each subsidized energy efficiency improvement project. In order to monitor the performance of each project, the program—adhering to Department of Energy (DOE) guidelines—requires at least two (2) years of post project utility data. This *Utility Data Release Form* will facilitate the process of acquiring the data directly from the applicable utilities for your home.

Please fill out **ALL** information that is pertinent to your home. If you do not have a gas provider, simply write N/A in that section. Note that this form is written in a way so that the program can request your data from the utility on an annual basis which begins approximately one year from the end of construction.

---

I authorize the following utilities to release my usage history (Kwh and/or therms) for the most recent 12 months to:

**Organization**: Town of Carrboro: Carrboro WISE Homes & Buildings Program
**Address**: 301 West Main Street | Carrboro, NC 27510
**Phone**: 919 918.7334
**Fax**: 919 918.4454
**Email**: nbarger@cleanenergysol.com

This authorization remains in effect from _____ to _____.
(Please estimate a time period of 2 years that begins right after construction. Example: *June 2011 to June 2013.*)

**Electric Utility**: _____
(Duke Energy Carolinas, Piedmont Electric Member Corporation (PEMC))

Account number: _____

Name on Account: _____

Service Address: _____

Customer Signature: _____

Customer Name: _____

BETTER BUILDINGS

**Gas Utility**: _____
(Public Service of North Carolina (PSNC))

Account number: _____

Name on Account: _____

Service Address: _____

Customer Signature: _____

Customer Name: _____

---

Please fax the authorization to 1-800-640-5991.

Please ensure that the account number, service address (city and state) and account name are clearly shown on the form. All of these items may be found on your monthly bill.

Appendix B: Events outreach material: Energy Fair Brochure, Agenda and WISE Mob outreach material

**ENERGY EFFICIENCY EDUCATION FAIR**

**9:00 am - 4:00 pm on SATURDAY, FEBRUARY 26, 2011**

**CENTURY CENTER, CARRBORO, NC**

Come out and learn about ways you can effectively reduce your utility bill & the energy-use footprint of **YOUR RESIDENTIAL OR COMMERCIAL BUILDING**!

Learn about the NEW energy efficiency incentive programs **in Carrboro & Chapel Hill!**

Offered on a first-come, first-served basis, drop by the Fair to find out how to get started so you do not miss the savings!

The fair will also feature various experts and vendors from the community to discuss a variety of topics related to energy efficiency.

sponsored by:

**The Towns of Carrboro & Chapel Hill**

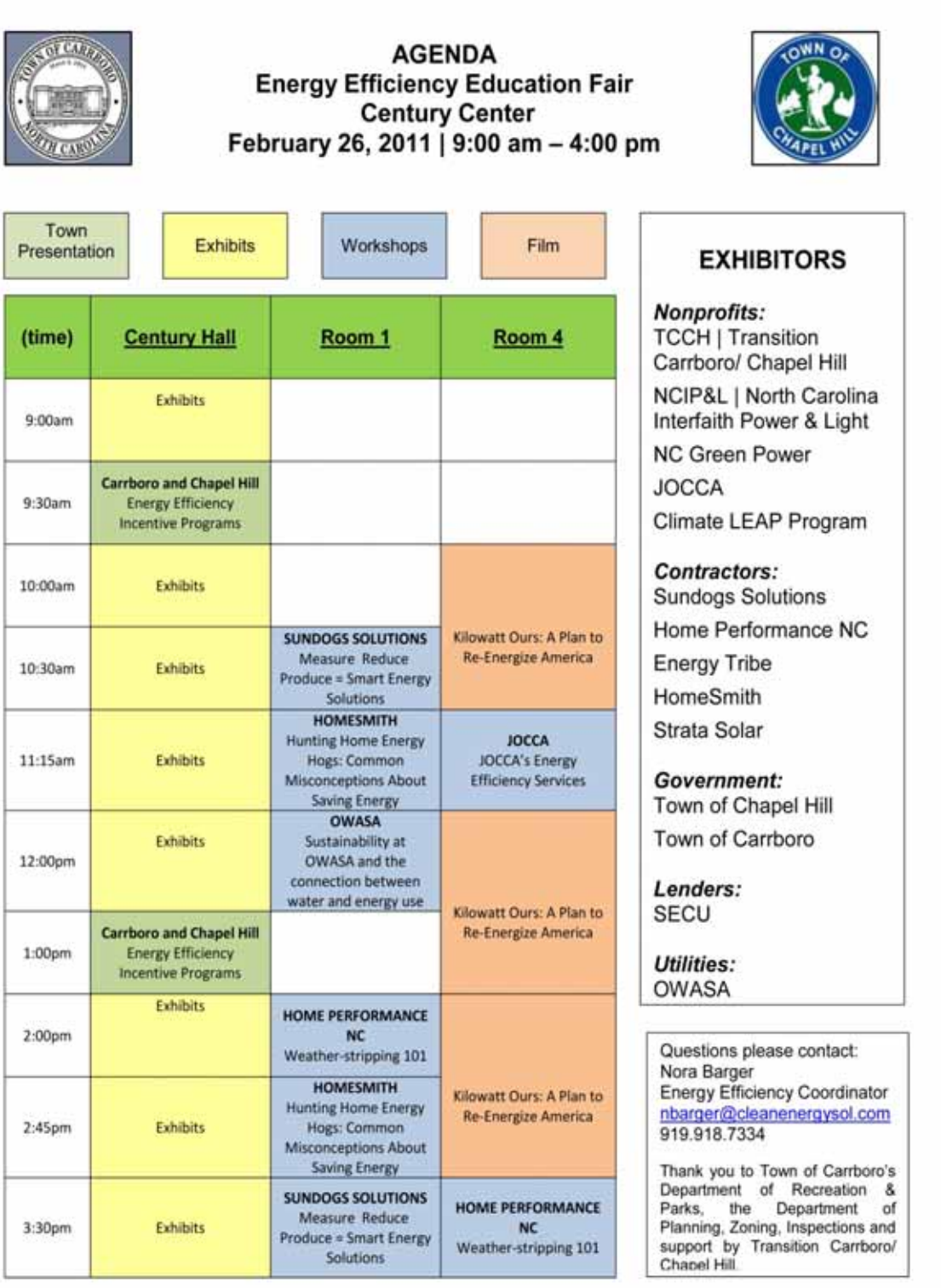
For more information contact

**Nora Barger, Energy Efficiency Services Coordinator**

**email: nbarger@cleanenergysol.com**

**telephone: (919) 918-7334**

Appendix B: Events outreach material: Energy Fair Brochure, Agenda and WISE Mob outreach material



**AGENDA**
**Energy Efficiency Education Fair**
**Century Center**
**February 26, 2011 | 9:00 am – 4:00 pm**

Town Presentation | Exhibits | Workshops | Film

| (time) | Century Hall | Room 1 | Room 4 |
|---|---|---|---|
| 9:00am | Exhibits | | |
| 9:30am | **Carrboro and Chapel Hill** Energy Efficiency Incentive Programs | | |
| 10:00am | Exhibits | | Kilowatt Ours: A Plan to Re-Energize America |
| 10:30am | Exhibits | **SUNDOGS SOLUTIONS** Measure Reduce Produce = Smart Energy Solutions | |
| 11:15am | Exhibits | **HOMESMITH** Hunting Home Energy Hogs: Common Misconceptions About Saving Energy | **JOCCA** JOCCA's Energy Efficiency Services |
| 12:00pm | Exhibits | **OWASA** Sustainability at OWASA and the connection between water and energy use | Kilowatt Ours: A Plan to Re-Energize America |
| 1:00pm | **Carrboro and Chapel Hill** Energy Efficiency Incentive Programs | | |
| 2:00pm | Exhibits | **HOME PERFORMANCE NC** Weather-stripping 101 | Kilowatt Ours: A Plan to Re-Energize America |
| 2:45pm | Exhibits | **HOMESMITH** Hunting Home Energy Hogs: Common Misconceptions About Saving Energy | |
| 3:30pm | Exhibits | **SUNDOGS SOLUTIONS** Measure Reduce Produce = Smart Energy Solutions | **HOME PERFORMANCE NC** Weather-stripping 101 |

**EXHIBITORS**

***Nonprofits:***
TCCH | Transition Carrboro/ Chapel Hill
NCIP&L | North Carolina Interfaith Power & Light
NC Green Power
JOCCA
Climate LEAP Program

***Contractors:***
Sundogs Solutions
Home Performance NC
Energy Tribe
HomeSmith
Strata Solar

***Government:***
Town of Chapel Hill
Town of Carrboro

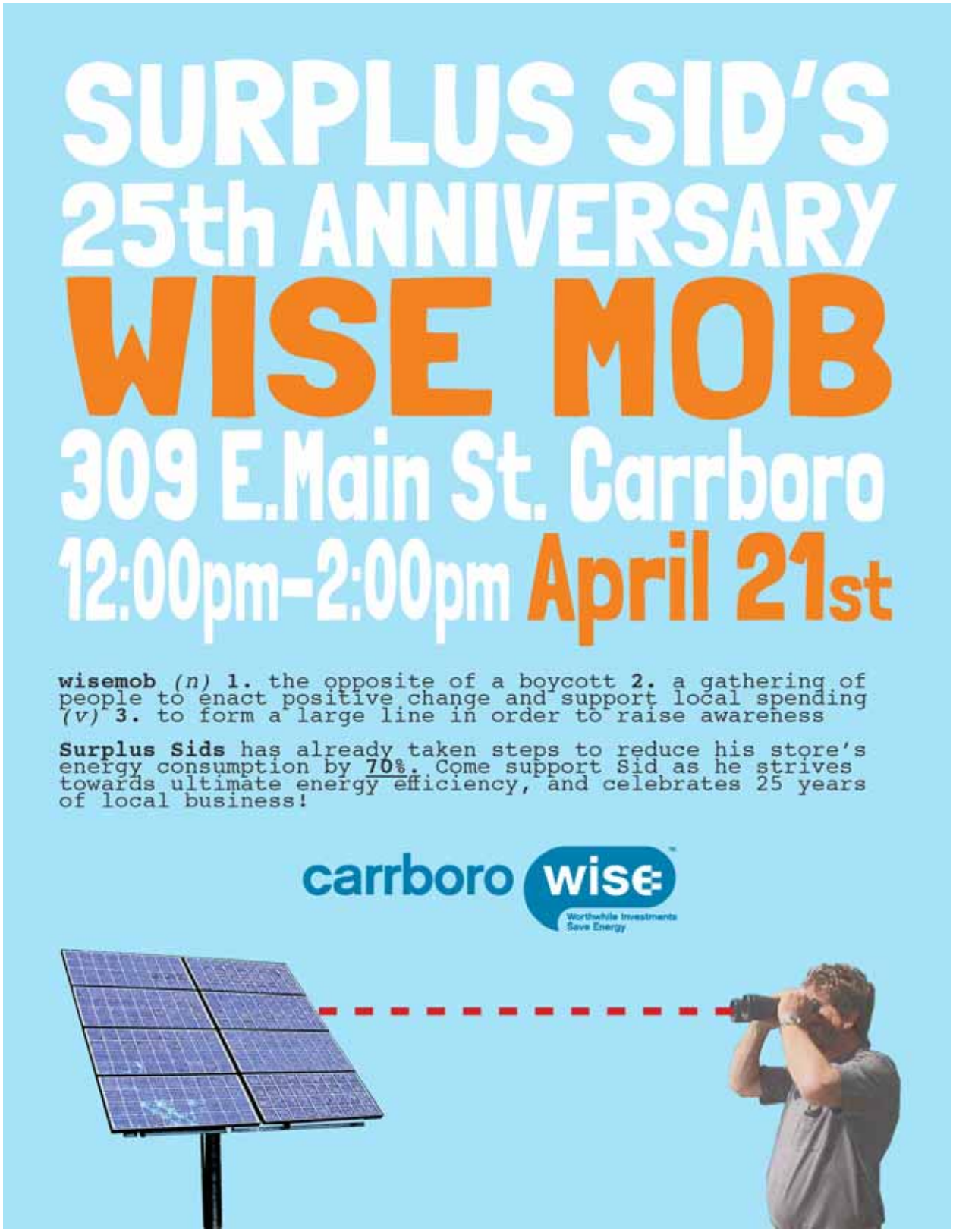
***Lenders:***
SECU

***Utilities:***
OWASA

Questions please contact:
Nora Barger
Energy Efficiency Coordinator
nbarger@cleanenergysol.com
919.918.7334

Thank you to Town of Carrboro's Department of Recreation & Parks, the Department of Planning, Zoning, Inspections and support by Transition Carrboro/ Chapel Hill.

Appendix B: Events outreach material: Energy Fair Brochure, Agenda and WISE Mob outreach material




Appendix C: Market Characterization Study

# WISE: Worthwhile Investments Save Energy Homes & Buildings Program

## *Energy Consumption Market Analysis*

*Carrboro & Chapel Hill, NC*

Aspen Price
DELTA Internship Program
Institute for the Environment
December 2011

## Background on the WISE Program

The WISE Program (Worthwhile Investments Save Energy) is a residential energy efficiency program being conducted in both Carrboro and Chapel Hill, North Carolina, which is administered by a consultant from Clean Energy Solutions (CESI). WISE is funded by an American Recovery and Reinvestment Act grant, which was granted by the U.S. Department of Energy, and is being administered by the Southeastern Energy Efficiency Alliance. The goals of the program include reducing energy consumption, lowering utility bills, creating jobs, promoting an energy retrofit market, and creating a sustainable energy retrofit program that can continue once the grant funds have been spent. Through the program, homeowners receive a subsidy for a Home Performance Assessment that is performed by a pre-qualified contractor. If the assessment demonstrates a potential for at least 15% energy savings, homeowners qualify for subsidies on selected energy improvements as well. Only owner-occupied, single-family detached homes that are at least 12 months old and located within city limits are eligible. In addition, the applicant must have lived in the home for at least four months prior to the assessment in order to have adequate baseline energy data. Carrboro and Chapel Hill's programs are two separate programs, although they operate similarly and are managed by the same consultant.

**Energy Assessment Subsidy**

A subsidy of up to $150 of the cost of the energy assessment is provided for energy assessments performed by one of the pre-qualified contractors.

**Energy Improvement Subsidies**

Subsidies of up to $1,500 are available for home energy improvements. Improvements such as envelope air sealing and insulation improvements, duct sealing and repair, and outdoor thermostats for homes with heat-pumps can receive up to a 40% subsidy. Energy-efficient appliances, HVAC upgrades, water heater replacements, programmable thermostats, lighting upgrades, solar hot water, and even solar photovoltaic or geothermal systems receive a 20% subsidy. The subsidies are applied after federal, state, and Duke Energy and Piedmont Electrical Membership Corporation incentives are applied.

**Additional Incentives**

Through a partnership with Duke Energy, a subsidy of up to $425 is available for insulation and air sealing improvements for Duke Energy customers. The Duke Energy pilot program is ending on January 31, 2012, but it may be reinstated in the second quarter of 2012, pending approval by the NC Public Utilities Commission.

**Marketing & Outreach**

The WISE program is marketed through the town websites, newsletters, and news articles and press releases. Limited targeted marketing has been conducted. In Chapel Hill, Phase I of the WISE program began in March 2011 and quickly reached its capacity of 125 participants. Phase II launched October 3rd, 2011 and continues to receive applicants. Carrboro has been receiving applicants for the residential program since November 2011.

[1] Information from Chapel Hill and Carrboro program websites: http://www.ci.carrboro.nc.us/ecd/EEBLF.htm , http://www.townofchapelhill.org/index.aspx?page=1666
[2] "Chapel Hill Awarded for WISE Program." July 14, 2011. http://www.townofchapelhill.org/index.aspx?recordid=3178&page=22

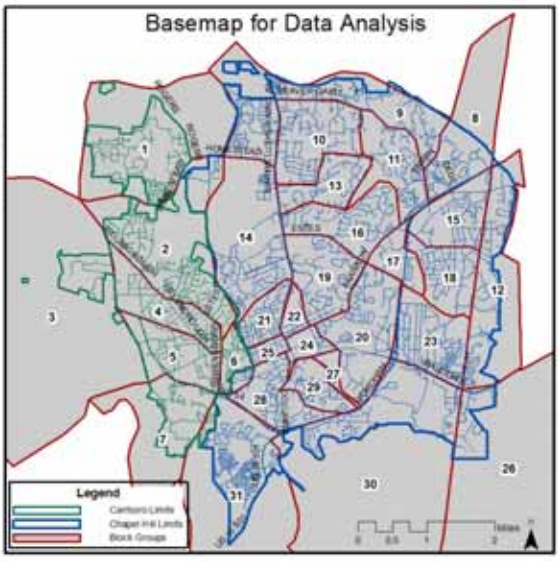
## Market Analysis Purpose

The overarching goal of the WISE program is to reduce residential energy consumption, but it also seeks to reduce the burden of high energy costs on residents who may be lower income, living on fixed incomes, or living in older homes that are not very energy efficient. The WISE program hopes to target outreach and education efforts to neighborhoods where housing and demographic data suggest the benefits of energy retrofits could truly have a high impact on the quality of life of residents.

This market analysis seeks to determine which neighborhoods would be best to target to achieve the program goals. It looks at both demographic and housing data, using US Census Bureau information at the block group level, and GIS building data and property information. The information that was analyzed is displayed in the table below. Unless otherwise noted, all data in this report came from the American Community Survey 2005—2009.

| *Demographic Data* | *Housing Data* |
|---|---|
| Median Household Income | Year Built of Residential Structure |
| Households with Social Security Income | Heating Source Type |
| Households with Supplemental Security Income | Homeownership |
| Median Value of Owner-occupied Housing Units | Dwelling Type |
| Owner-occupied Housing Units Without a Mortgage | Square Footage |
| Ethnicity | |

A basemap like the one to the right is used to show the spatial distribution of each data category. In the maps, each block group is given an ID number to help identify it throughout the analysis. Block Group (BG) ID numbers 1-7 are Carrboro block groups, and 8-31 are Chapel Hill block groups. It should be noted that 12 and 26 are within Durham County, although they include portions of Chapel Hill city limits. As can be seen in the maps, the block groups don't match the city limits and in some cases only a small portion of the city area is within a block group. It should be noted that the data for the block groups are aggregated for the entire block group, so in the cases where the block group is larger, results from this analysis may not be very representative of the houses within city limits.

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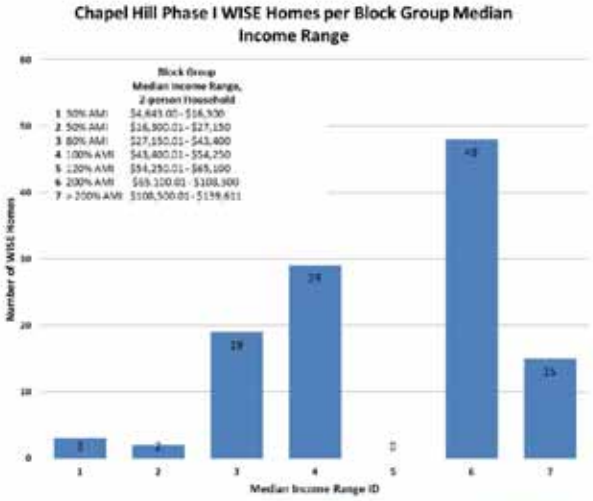
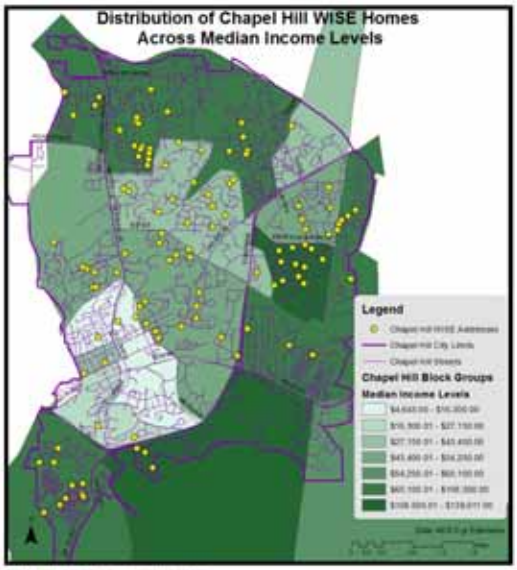
## Income Distribution of Chapel Hill WISE Phase I Participants

The Chapel Hill WISE Phase I participants found out about the program through town press releases and local news articles and approached the city to sign up for the program. To determine what income groups these general marketing efforts were reaching, a histogram was created which charts the number of homes in each median household income range (in 2009 dollars). The 2011 area median income (AMI) for the Durham-Chapel Hill Metro Area is $67,8003[1]. Low-income households, calculated as 80% of the AMI, are those making $38,000 for a one-person household, $43,400 for a two-person household, and $54,250 for a four-person household. The average household size in Chapel Hill is 2.2 people. For the purposes of the histogram, the median incomes of the block groups were classified based on a two-person household, and the number of Phase I homes within each block group was totaled. Fifty-four percent of the participating homes fall above 200% of the AMI, 25% at 100% of AMI, and just 21% in block groups with an average median income below the 80% income limit. This suggests that either these lower-income households are not able to make the investment in energy retrofits, or traditional methods of outreach are not reaching them and more targeted outreach methods are needed.




[1] HUD FY 2011 Income Limits Documentation System: http://www.huduser.org/portal/datasets/il/il2011/select_Geography.odn

## Demographic Data Analysis

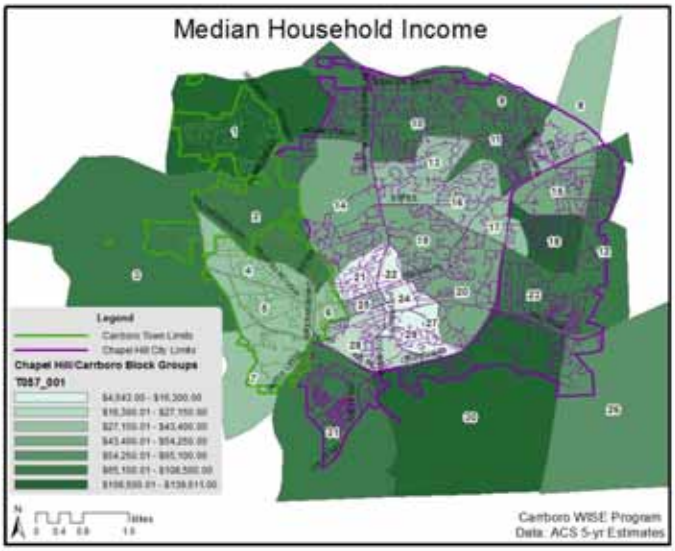
The demographic data analyzed includes Median Household Income, Households with Social Security Income and Supplemental Security Income, Median Value of Owner-Occupied Housing Units, Owner-Occupied Housing Units without a Mortgage, and Ethnicity. This data is mapped to show the spatial distribution for all of the block groups in Chapel Hill and Carrboro.

### Median Household Income

Figure 1 shows the distribution of Median Household Income across both jurisdictions. Block groups 21, 22, 24, 27, and 29 are on and around the UNC-Chapel Hill campus, where the primary residents are students, which accounts for Median Household Income being so low.

There are two components to looking at income for the WISE program. For one, the program participants have to be able to afford the energy assessments and improvements once the subsidy has been applied. However, the WISE program is intended to help reduce the burden of high energy costs on its residents. Reducing high energy costs for a household that has a lower income in the first place can provide a huge benefit to their quality of life.

As noted previously, low-income households are identified as making 80% of the AMI, which is approximately $43,400 for a two-person household. Thus, in order to pursue the goal of reaching out to more lower-income households, the outreach and education efforts should be focused on the block groups that have a Median Household Income of less than $43,400.

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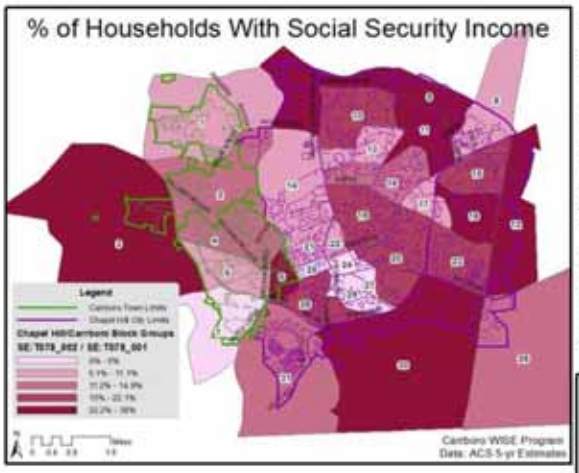


**Social Security and Supplemental Income**

Another demographic that WISE may want to focus outreach and education towards is homeowners who are elderly, blind, or disabled, as they are often living on fixed incomes and would greatly benefit from lower energy bills and more comfortable homes. As shown in the Social Security Income map, the proportion of elderly individuals in each block group is higher on the outskirts of town, with the exception of BG6, than in downtown Carrboro. Conversely, the block groups that have the highest proportions of individuals receiving Supplemental Security Income are located primarily in the downtown areas of both Carrboro and Chapel Hill.

Carrboro sent a letter to all of the homes that are registered under the Homestead Act to alert them to the WISE program. Several responded with interest but ultimately did not participate due to the cost share aspect of the program. Other outreach methods should be pursued, such as advertising at senior centers and other gathering locations.

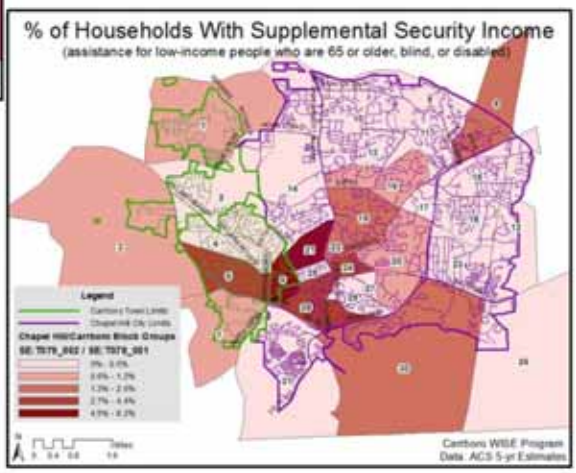


Image: www.personal.psu.edu

Image: www.seniorcarehomeswidwest.com

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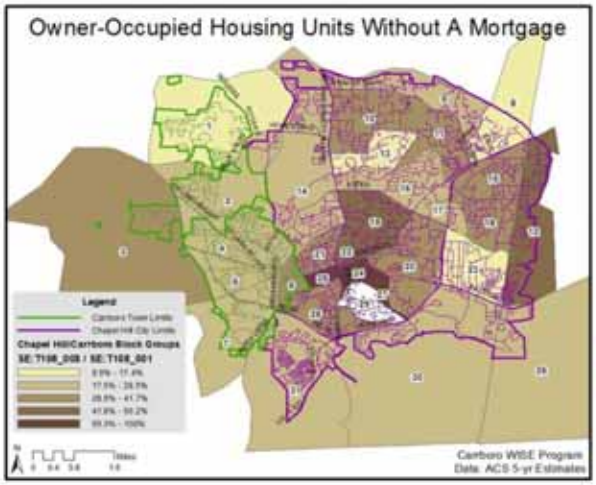
WISE: Energy Consumption Market Analysis




**Ability to Pay for Energy Improvements**

Homeowners that do not have a mortgage may be more likely to have the financial means to pay for energy improvements to their home. The areas adjacent to the University and north of Franklin Street in Chapel Hill have a high proportion of owner-occupied housing units without a mortgage; these areas also have some of the oldest homes that may not be very energy efficient.

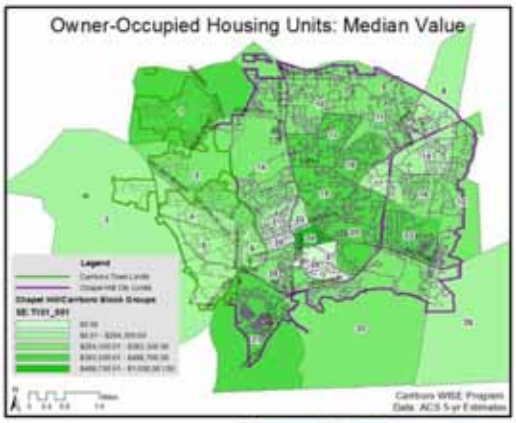



Image: www.chapel-hill-homesforsale.com

Image: www.shelterstoday.wordpress.com

Image: Dilip Barman, www.photos.dilip.info

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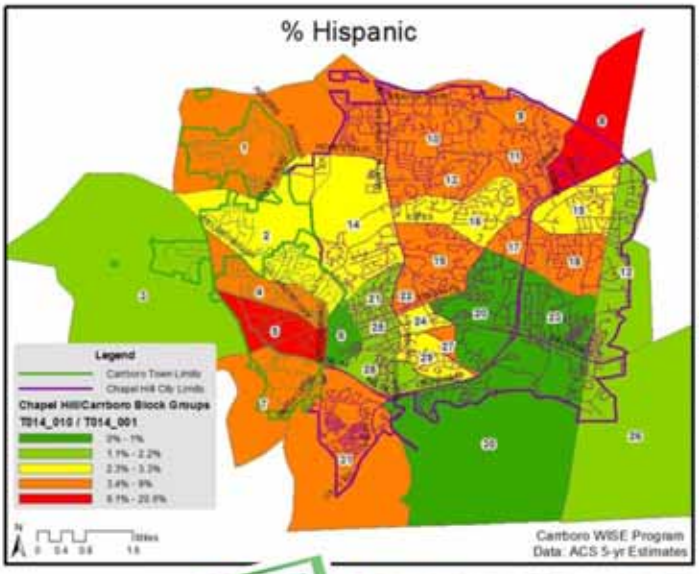
WISE: Energy Consumption Market Analysis




**Hispanic/Latino Population**

Chapel Hill and Carrboro have a large Hispanic population. Many of the block groups have a Hispanic population of between 4% and 9%; two in particular, BG5 and BG8, have a Hispanic population of up to 20%. Hispanic residents may not connect with the standard news and media sources that WISE is advertised in. It may be beneficial to conduct outreach in these areas using channels that Hispanics are more likely to use on a regular basis. In addition, when doing outreach and education efforts in these areas, it is important to have bilingual information, and possibly even a translator to help answer questions and communicate effectively.



Image: www.flickr.com

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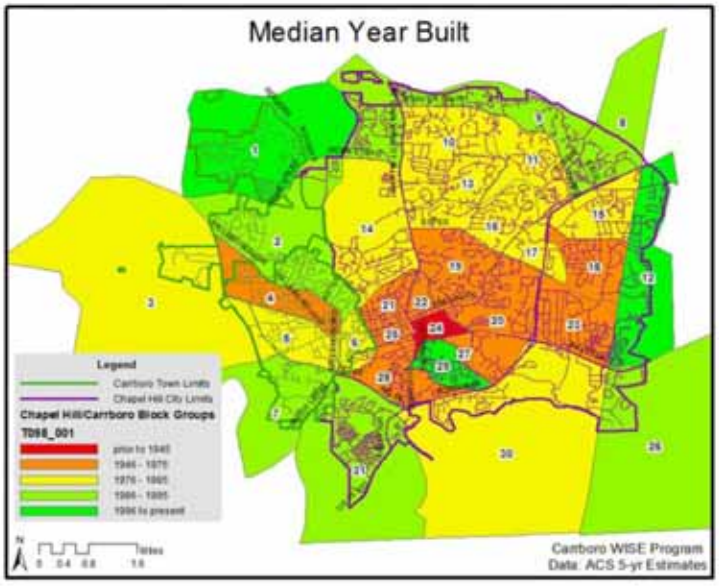
## Housing Data Analysis

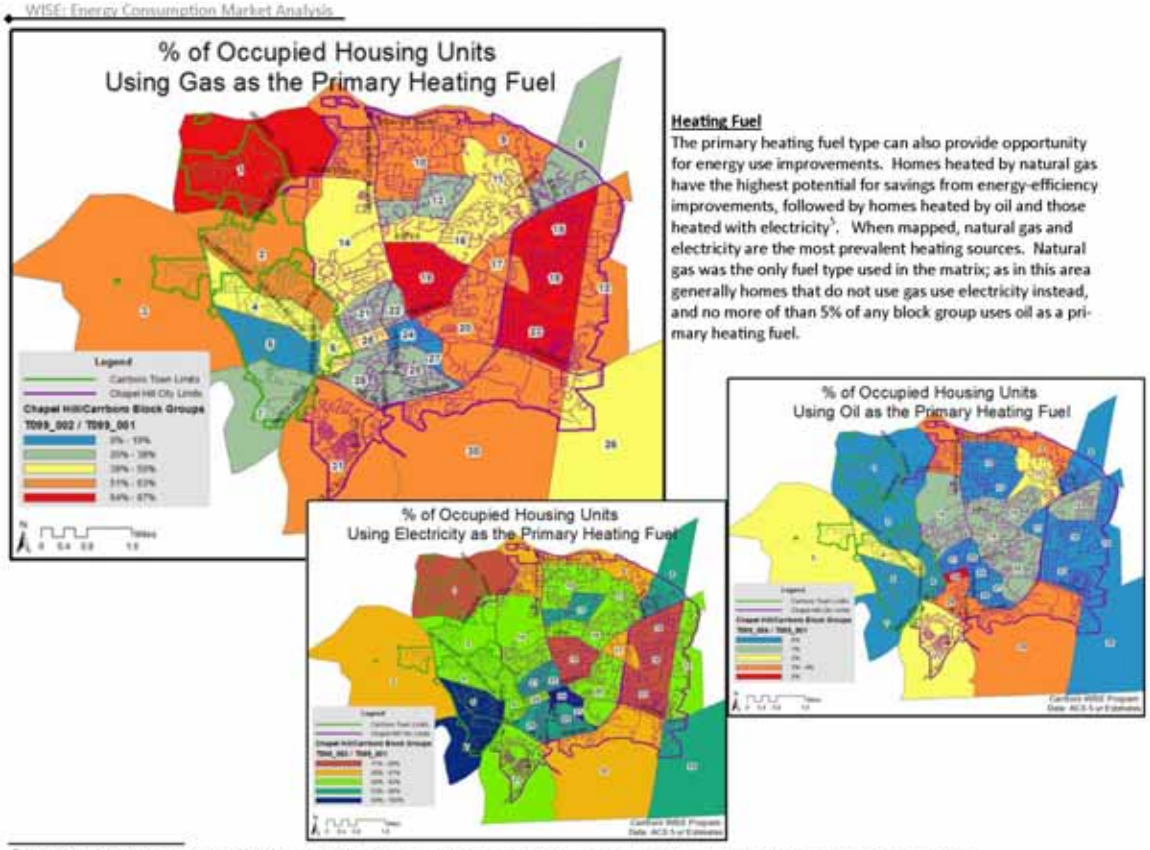
**Year Built**

The year built of a structure can help determine where energy retrofits could provide the most value to a homeowner. Median year built data shows the general construction of different parts of each jurisdiction. Predictably, the older structures are located in the center of both Chapel Hill and Carrboro, and structures are newer the further they are from the central downtown districts. It should be noted that year built data does not reveal if there have been any additions, upgrades, or extensive renovations to the structures.

North Carolina Building Codes did not require insulation or other energy efficiency features before 1975, thus homes built before that date are good candidates for energy retrofits[4]. Homes built fifteen or more years ago also tend to have older and less efficient appliances and heating and cooling systems. Upgrading appliances and heating and cooling systems can provide a great energy savings. Because of this, neighborhoods in target block groups with an average year built of 1995 or newer are not considered for targeted outreach.




[4] *2011 North Carolina Clean Energy Data Book.* NC Sustainable Energy Association. June 2011. www.energync.org.




**Heating Fuel**

The primary heating fuel type can also provide opportunity for energy use improvements. Homes heated by natural gas have the highest potential for savings from energy-efficiency improvements, followed by homes heated by oil and those heated with electricity[1]. When mapped, natural gas and electricity are the most prevalent heating sources. Natural gas was the only fuel type used in the matrix; as in this area generally homes that do not use gas use electricity instead, and no more of than 5% of any block group uses oil as a primary heating fuel.

[1] *City of Greensboro Better Buildings Project; Market Assessment*. Environmental Finance Center. July 2011. http://www.efc.unc.edu/publications.html.

## Block Group Level Analysis

The demographic and housing data available at the block group level from the American Community Survey datasets helps identify which parts of each jurisdiction the WISE program should focus on. Homeowners who hear about the program through general marketing efforts and are interested in the program will likely apply. However, the goal of WISE is also to reach out to populations who may not hear about the program but would benefit greatly from energy improvements in their home. This analysis uses demographic and housing data to locate the specific neighborhoods the WISE program should target for outreach and education, and uses GIS housing data layers to determine the characteristics of each of those neighborhoods.

### Methodology

A matrix of demographic data and housing data was used to determine which block groups to focus on. With the exception of income, each of the mapped datasets has five categories, thus each of those were given a value between 1 and 5, with the lower value being more desirable.

**Median Household Income**: 50% income limit and below given a value of 1, 80% given a value of 2, 100% given a value of 3, 120% given a value of 4, and 200%+ given a value of 5.
**Social Security Income:** highest proportion of residents given a value of 1, lowest proportion given a value of 5.
**Supplemental Security Income:** highest proportion of residents given a value of 1, lowest proportion given a value of 5.
**Year Built:** older homes given a value of 1, newer homes given a value of 5
**Gas Heating:** highest proportion of homes heated with natural gas given a value of 1, lowest proportion given a value of 5.

The rankings were then totaled for each block group, and three block groups with the lowest total value were chosen for further analysis. In instances where more than three block groups had a low value, the block groups with the lowest demographic data totals were given priority.

### GIS Analysis

Building footprint shapefiles were obtained from Chapel Hill and Carrboro, which include building type classifications and year built and square footage data. To determine occupancy, the property owner's address on the tax record was compared with the physical address of the property. Matching addresses indicate that the property is likely owner-occupied. Residences that had post office boxes as the mailing address were not included in this study, due to the added difficulty in determining owner-occupancy.

Houses were selected that are classified as single-family detached residential, owner-occupied, and located within town limits. Records that appeared to be accessory structures, and records that were classified as single-family but the building footprints showed them to be townhouses or other attached dwelling unit types were deleted. The neighborhood shapefiles that are maintained by the GIS departments in Carrboro and Chapel Hill were used to categorize neighborhoods and count the number and characteristics of the homes within each neighborhood boundary.

Neighborhoods with less than 45% homeownership and/or an average year built after 1995 are not recommended as target neighborhoods, as the potential for finding eligible applicants is low.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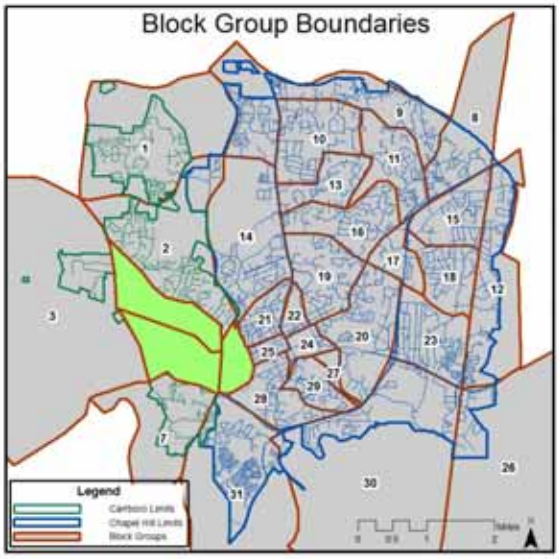
## Carrboro Analysis - Targeting Lower-Income Households

From the matrix ranking, in Carrboro, block groups 4, 5, and 6 have the highest concentration of residents and homes that would benefit most from energy retrofits. These block groups were analyzed further.

In general, these block groups have a Median Household Income of between $27,150 and $43,400. Up to 38% of households receive Social Security Income, and up to 8% of households receive Supplemental Security Income. The median year built of houses in these block groups is between 1946 and 1985. In block groups 4 and 6, between 39% and 50% of homes use natural gas as the primary heating fuel. In addition, between 17% and 42% of homeowners do not have a mortgage, indicating they may be better able to afford energy improvements.




**Matrix: Carrboro Block Groups with Highest Potential for Energy Improvement Value**

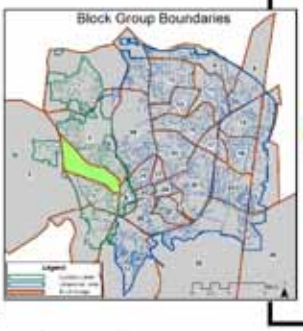
| | Demographic Data | | | | Housing Data | | | |
|---|---|---|---|---|---|---|---|---|
| Block Group | Median Household Income | Social Security Income | Supplemental Security Income | *Total* | Year Built | Gas Heating | *Total* | All Total |
| 1 | 5 | 4 | 4 | ***13*** | 5 | 1 | ***6*** | 19 |
| 2 | 5 | 3 | 5 | ***13*** | 4 | 2 | ***6*** | 19 |
| 3 | 5 | 1 | 4 | ***10*** | 3 | 2 | ***5*** | 15 |
| 4 | 2 | 3 | 5 | ***10*** | 2 | 3 | ***5*** | 15 |
| 5 | 2 | 4 | 2 | ***8*** | 3 | 5 | ***8*** | 16 |
| 6 | 2 | 1 | 1 | ***4*** | 3 | 3 | ***6*** | 10 |
| 7 | 2 | 5 | 4 | ***11*** | 4 | 4 | ***8*** | 19 |

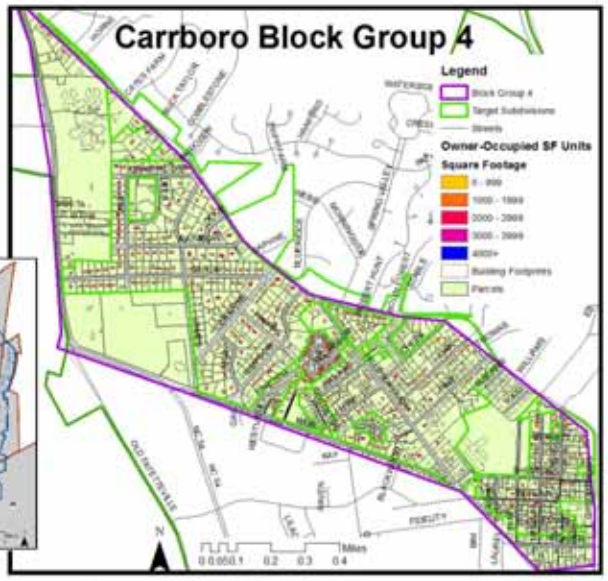
**Carrboro Block Group 4**

Block Group 4 is located between Greensboro Street, Hillsborough Road, Main Street, and Old Fayetteville Road. In this block group, much of the land area is residential and the majority of the neighborhoods have older homes and a high proportion of homeownership.

The subdivisions with the highest prevalence of owner-occupied, single-family detached homes are listed in the chart below. The subdivisions are highlighted in green in the map to the right, and owner-occupied single-family homes are color-coded according to square footage ranges. Rental properties and commercial properties are displayed as a black building footprint outline.

The Old Carrboro and Hillsborough Road neighborhoods have the oldest homes, dating back to the 1940's or earlier, but these are also very large neighborhoods with a mixture of rental and owner-occupied properties. Bel Arbor has a high homeownership rate but was built in 1997, so it is not recommended as a target neighborhood.




| Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Plantation Acres | 153 | 79% | 1,907 | 1975 | 1971 | Simpson St, Phipps St, Lorraine St, Melba Cir, Mary St, James St, Rainbow Dr, Dove St, Carol St, Quail Roost Dr |
| Hillsborough Road | 141 | 64% | 1,518 | 1956 | 1955 | Hillsborough Rd, James St, N Greensboro St, Shelton St, High St |
| Old Carrboro | 77 | 52% | 1,557 | 1941 | 1942 | N Greensboro St, E Poplar Ave, Ashe St, Center St, Oak Ave, Evans Ct, Lindsay St, Shelton St |
| Hunter Place | 15 | 71% | 1,520 | 1963 | 1963 | Hunter Pl |
| Cheswick | 9 | 60% | 1,465 | 1989 | 1989 | Cheswick Ct |
| **Non-Target Subdivision** | **# of O-O Houses** | **% of Total Houses** | **Average Sq. Ft.** | **Average Year Built** | **Median Year Built** | **Streets/Description** |
| Bel Arbor | 28 | 93% | 2,120 | 1997 | 1997 | Bel Arbor Ln, Rocky Pt, Woods Walk Ct |

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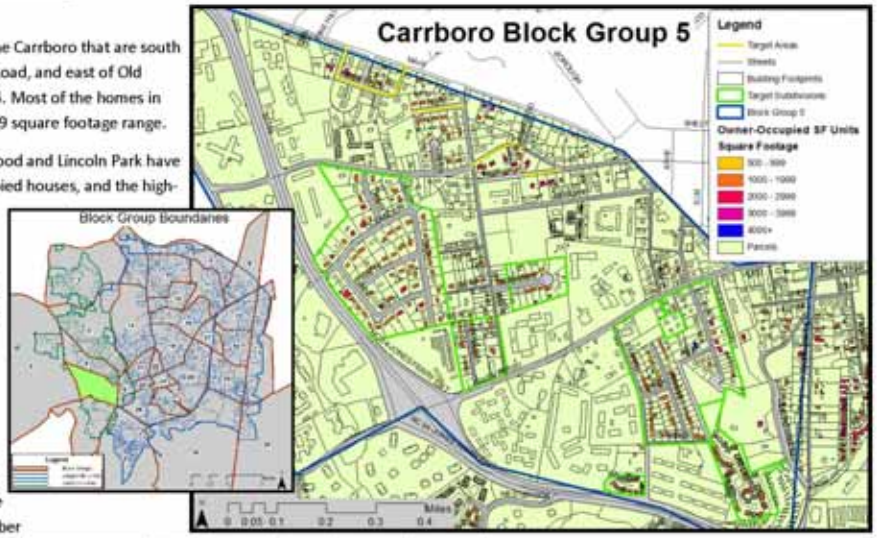
**Carrboro Block Group 5**

Block Group 5 includes portions of the Carrboro that are south of Main Street, west of Smith Level Road, and east of Old Fayetteville Road and Highway NC 54. Most of the homes in Block Group 5 are in the 1000 to 2999 square footage range.

Of the selected subdivisions, Windwood and Lincoln Park have the greatest number of owner-occupied houses, and the highest average square feet, around 1,500. Doing targeted mailings or canvassing in these neighborhoods would likely yield a high success rate of finding applicants who are eligible for and interested in the WISE program.

Other areas that are not within a dedicated subdivision but have a high proportion of owner-occupied single-family detached homes were also selected, shown in yellow on the map. These areas have a lower number of homes each and more diverse types of homes, and would also be good areas to target outreach efforts.

Block Group 5 has the highest percentage of Hispanics (20.6%) in all of Carrboro, although it cannot be determined at the block group level what proportion of Hispanics own their own homes. This is an area where multilingual outreach efforts will be key to attracting a diverse applicant pool.




| Target Subdivision | # of O-O Houses | % of Total Houses | Avg. Sq. Ft. | Avg. Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Windwood | 57 | 78% | 1,617 | 1967 | 1966 | Oleander Rd, Gary Rd, Lilac Dr, Lynn Dr, Keith Rd, Cathy Rd |
| Lincoln Park | 48 | 62% | 1,415 | 1970 | 1966 | Barnes St, King St, Prince St, Laurel Ave, Queen St, Ruth St |
| Whispering Hills | 20 | 61% | 1,111 | 1984 | 1984 | Daffodil Ln, South Peak Dr, Lantern Way, Barbee Ct |
| Crestwood | 12 | 71% | 1,196 | 1964 | 1966 | Glosson Clr |
| Alabama Avenue | 12 | 67% | 1,007 | 1960 | 1957 | Davie Rd, Neville Dr, Alabama Ave |
| Wild Spring | 9 | 64% | 1,182 | n/a | n/a | Walden Dr |
| | | | | | | |
| **Target Area** | | | | | | |
| Kay St | 8 | 80% | 1,560 | 1964 | 1960 | Kay St |
| W. Poplar Ave., 200 block S. side | 8 | 80% | 2,255 | 1987 | 1999 | 200 block of W. Poplar Ave., S. side |
| W. Poplar Ext. | 4 | 100% | 1,949 | 1946 | 1947 | W. Poplar Ext. |
| Westview Dr. | 8 | 47% | 1,833 | 1963 | 1962 | Westview Dr. |

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WISE: Energy Consumption Market Analysis

**Carrboro Block Group 6**

Block Group 6 borders Chapel Hill, and is made up of the area between Merritt Mill Road and S. Greensboro Street. Much of the land area in this block group is commercial, but two neighborhoods, Lloyd-Broad Street and Carr Court are good target neighborhoods.

Of the selected Carrboro block groups, this block group has the highest proportion of households receiving both Social Security Income and Supplemental Security Income, as well as the highest proportion of housing units without a mortgage. This suggests that the homeowners in these neighborhoods are older and have lived in their homes for awhile.


| Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Lloyd-Broad Street | 35 | 51% | 1,270 | 1958 | 1960 | Lloyd St., Hill St., Broad St., Cobb St., Fowler St., Starlite Dr. |
| Carr Court | 17 | 77% | 1,022 | 1960 | 1957 | Brewer Ln., Hargraves St., Eugene St., Wesley St. |
| Non- Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
| Roberson Place | 57 | 84% | 2,382 | 1999 | 1999 | Knolls St., Purple Leaf Pl., Wannamaker Pl., Sweet Bay Pl., Red Sunset Pl. |

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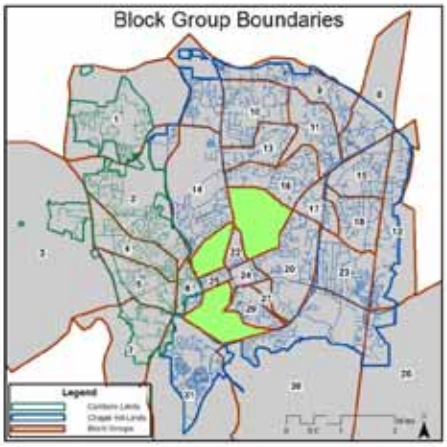
WISE: Energy Consumption Market Analysis

## Chapel Hill Analysis - Targeting Lower-Income Households

The analysis of Chapel Hill was conducted in much the same way as in Carrboro. However, in this matrix the Demographic Data puts more influence on the overall total. The homes in Chapel Hill that are the oldest and the most likely to have natural gas heating are in areas where the Median Household Income is highest.

In block groups 19, 21, and 28 there is a wide median household income range, from $12,294 to $49,803. Between 5.1% and 22.1% of the households receive Social Security Income, and between 1.3% and 8.2% receive Supplemental Security Income. The median year built is between 1945 and 1976, and between 20% and 87% of households are primarily heated with natural gas. In addition, between 28.6% and 60.2% of homes do not have a mortgage.




| | Demographic Data | | | | Housing Data | | | |
|---|---|---|---|---|---|---|---|---|
| Block Group | Median Household Income | Social Security Income | Supplemental Security Income | *Total* | Year Built | Gas Heating | *Total* | All Total |
| 8 | 2 | 4 | 3 | ***9*** | 4 | 4 | ***8*** | 17 |
| 9 | 5 | 1 | 5 | ***11*** | 4 | 2 | ***6*** | 17 |
| 10 | 5 | 2 | 5 | ***12*** | 3 | 2 | ***5*** | 17 |
| 11 | 5 | 1 | 5 | ***11*** | 3 | 3 | ***6*** | 17 |
| 12 | 5 | 1 | 5 | ***11*** | 5 | 2 | ***7*** | 18 |
| 13 | 2 | 4 | 5 | ***11*** | 3 | 4 | ***7*** | 18 |
| 14 | 3 | 4 | 5 | ***12*** | 3 | 3 | ***6*** | 18 |
| 15 | 3 | 2 | 5 | ***10*** | 3 | 1 | ***4*** | 14 |
| 16 | 2 | 3 | 4 | ***9*** | 3 | 3 | ***6*** | 15 |
| 17 | 2 | 4 | 5 | ***11*** | 3 | 2 | ***5*** | 16 |
| 18 | 5 | 1 | 5 | ***11*** | 2 | 1 | ***3*** | 14 |
| 19 | 3 | 2 | 3 | ***8*** | 2 | 1 | ***3*** | 11 |
| 20 | 3 | 2 | 4 | ***9*** | 2 | 2 | ***4*** | 13 |
| 21 | 1 | 4 | 1 | ***6*** | 2 | 4 | ***6*** | 12 |
| 22 | 1 | 4 | 3 | ***8*** | 2 | 4 | ***6*** | 14 |
| 23 | 5 | 2 | 5 | ***12*** | 2 | 1 | ***3*** | 15 |
| 24 | 1 | 5 | 2 | ***8*** | 1 | 5 | ***6*** | 14 |
| 25 | 2 | 5 | 5 | ***12*** | 2 | 3 | ***5*** | 17 |
| 26 | 4 | 3 | 5 | ***12*** | 4 | 3 | ***7*** | 19 |
| 27 | 1 | 5 | 5 | ***11*** | 2 | 5 | ***7*** | 18 |
| 28 | 1 | 2 | 2 | ***5*** | 2 | 4 | ***6*** | 11 |
| 29 | 1 | 5 | 5 | ***11*** | 5 | 4 | ***9*** | 20 |
| 30 | 5 | 1 | 3 | ***9*** | 3 | 2 | ***5*** | 14 |
| 31 | 5 | 3 | 5 | ***13*** | 4 | 2 | ***6*** | 19 |

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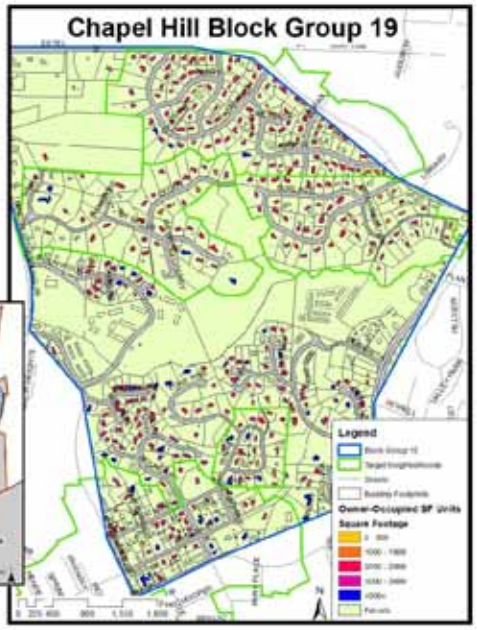
**Chapel Hill Block Group 19**

This block group is bounded by Franklin Street to the south and east, Estes Drive to the north, and Martin Luther King Jr. Boulevard to the west. The homes here are much older than other selected block groups, dating as far back as the 1920's and 1930's. The homes are also much larger than other parts of town, ranging from 2,500 to 3,200 square feet, and 80% of them use gas as the primary heating source. The impact of energy improvements on large homes can be quite substantial[6], and as these homes are generally also 50 to 80 years old, this block group has great potential for energy improvements.


| Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Estes Hills | 129 | 91% | 2,644 | 1964 | 1964 | Caswell Rd, Cumberland Rd, Chatham Ln, Surry Rd, Granville Rd, Cherokee Rd, Halifax Rd, N. Estes Dr |
| Franklin-Rosemary Historic District | 103 | 54% | 3,277 | 1932 | 1922 | E. Franklin St, E. Rosemary St, Hillsborough St, N. Boundary St, North St, Henderson St |
| Hidden Hills | 51 | 84% | 2,578 | 1961 | 1960 | Meadowbrook Dr, Burlage Cir, Hoot Owl Ln |
| Mt. Bolus | 43 | 83% | 2,812 | 1963 | 1961 | Mt. Bolus Rd, Martin Luther King Jr. Blvd, Sycamore Dr, Maple Dr, Cedar St, Weeping Cherry Ct |
| Tenney Circle | 23 | 88% | 3,089 | 1939 | 1938 | Tenney Cir, Bowling Creek Rd |

[6] *City of Greensboro Better Buildings Project; Market Assessment*. Environmental Finance Center. July 2011. http://www.efc.unc.edu/publications.html.

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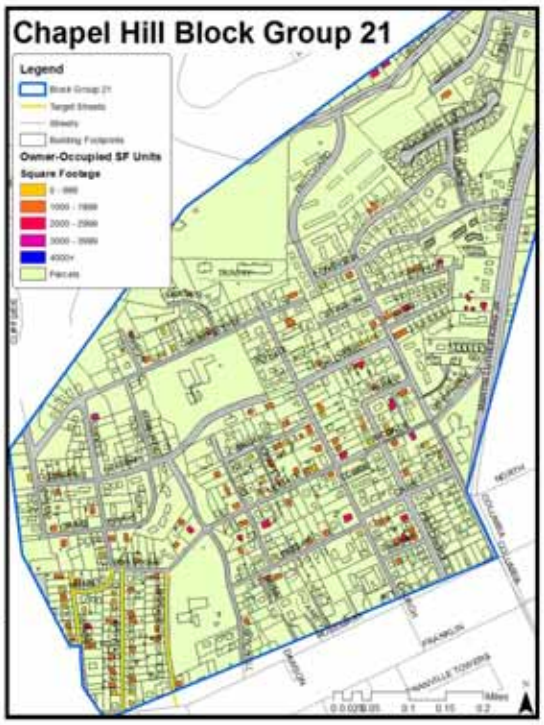
**Chapel Hill Block Group 21**

This block group is located just north of downtown Chapel Hill, and is bounded by Umstead Drive to the west, Martin Luther King Jr. Boulevard to the east, and Rosemary Street to the south. Northside is the only neighborhood in this block group that has owner-occupied homes, and it is bounded roughly by Columbia street to the east and the block group boundaries to the north, south, and west. As shown in the table, the ownership rate in the greater Northside neighborhood is low; just 32%. Due to Northside's proximity to the UNC campus and downtown Chapel Hill, there is a large student rental market in the neighborhood.

Several streets, including Sunset Drive, Nunn Street, N Graham Street, and N Roberson Street were selected due to the high proportion of homeownership. Houses on these blocks have an average size of 1,152 square feet and were built in the 1950's. The Median Household Income in this block group is extremely low, at $12,294, although it is very likely that is skewed by the large student population, and homeowners have a higher median income. This is reflected in the higher Average Household Income, which is $27,381.

Directing outreach and education efforts at these selected streets would hopefully yield more interested and qualified applicants than doing outreach for the entire area.

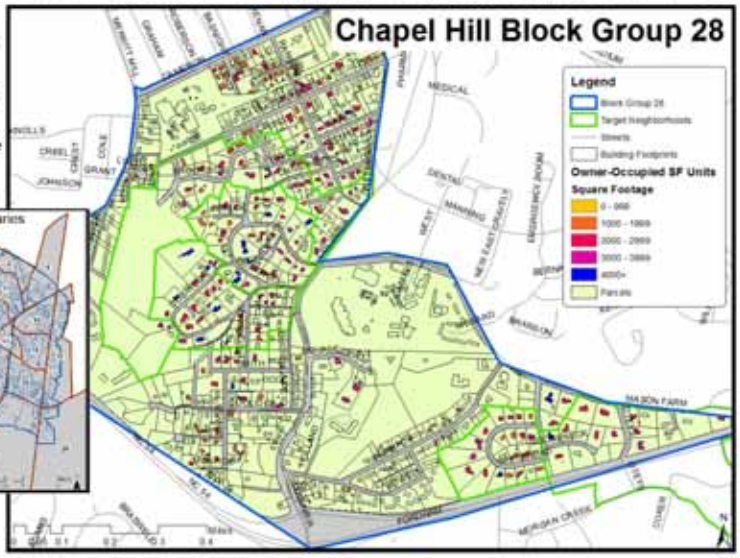




| Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Northside (selected streets) | 76 | 66% | 1,152 | 1957 | 1952 | Sunset Dr, Nunn St, N Graham St, N Roberson St |
| **Non- Target Subdivision** | **# of O-O Houses** | **% of Total Houses** | **Average Sq. Ft.** | **Average Year Built** | **Median Year Built** | **Streets/Description** |
| Northside (neighborhood) | 248 | 32% | 1,239 | 1956 | 1952 | Rosemary St, Pritchard Ave, McMasters St |

**Chapel Hill Block Group 28**

Block Group 28 is located to the southwest of the UNC campus and UNC Hospital complex, and is bounded by Fordham Boulevard on the south, Merritt Mill Road to the west, and Cameron Street to the north. Similar to other areas adjacent to the University, homeownership rates are lower, around 60% in some neighborhoods.

The homes are generally older and larger, built between 1940 and 1960, and with footprints of 2,000 and 3,000 square feet. Twenty percent of households in this block group receive Social Security Income, and 3% receive Supplemental Security Income. This indicates that there is a high proportion of seniors living in these neighborhoods, and energy improvements would provide significant energy savings in these homes.




| Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Westwood | 55 | 82% | 3,030 | 1945 | 1942 | Westwood Dr, Culbreth Pl, W University Dr, Penick Ln |
| Forest Hills | 49 | 66% | 2,095 | 1946 | 1949 | Dogwood Dr, Woodland Ave, Valentine Ln, Dogwood Ct, Chase Park Rd |
| Name Unknown | 45 | 64% | 2,704 | 1952 | 1954 | Briarbridge Ln, Briarbridge Valley Rd, Vance St, Brookside Dr, W University Dr, Hilltop St, McCauley St |
| Whitehead Circle | 19 | 86% | 2,490 | 1957 | 1955 | Whitehead Cir |
| Goose Farm | 18 | 64% | 2,559 | 1960 | 1957 | Mason Farm Pl, Oteys Rd, Whitehead Rd, Gooseneck Rd, Coker Ln, Fordham Blvd, Coker Dr, Mason Farm Rd, Morgan Creek Rd |

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WISE: Energy Consumption Market Analysis

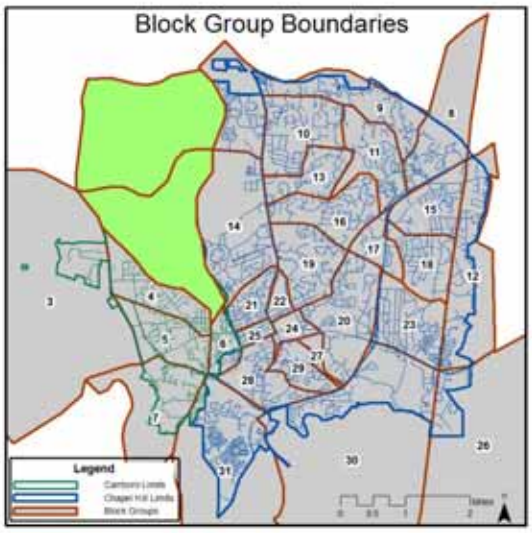
## Carrboro Analysis - Targeting Households with the Ability to Pay

There are two methodologies for attracting qualified applicants into the WISE program. The methodology that has been covered is targeting homes that are older and likely to have a high potential for energy improvements which are also located in areas with lower-income households, where program participants would greatly benefit from reduced utility bills and a more comfortable home.

The other methodology is getting as many homes through the WISE program as possible, in an effort to reduce the aggregated residential energy usage across both jurisdictions. Under this methodology, the age of the home and primary heating fuel type characteristics are still important indicators of potential ability for achieving the required 15% energy savings. However, doing outreach to households with a higher Median Household Income would likely yield more applicants that are easily able to pay for the improvements, and will get more homes through the WISE program before the program deadline.

This second analysis uses the same matrix system as before, but applies the second methodology and ranks the income levels in an opposite manner from before; giving a value of 1 to the highest incomes and a value of 5 to the lowest incomes. Other demographic data is not used for this analysis, and year built and gas as the primary heating fuel are ranked in the same manner as in the first analysis.

The block groups that came out with the lowest rankings are 1, 2, and 3 on the outer edges of Carrboro. The Median Household Income for these three block groups ranges from $70,143 to $139,611. These block groups also have a high proportion of homes (50% - 87%) that use gas as the primary heating fuel. It was determined that block group 3 is not suitable for a closer analysis, as only a small portion of Carrboro's city limits extend into this block group. Within the city limits there is just one neighborhood; Winsome Lane. This neighborhood has an average house size of over 4,000 square feet and a median year built of 1996. Due to the size and age of the homes, it is unlikely that energy improvements would provide a substantial savings, and in addition this neighborhood on its own is too small for targeted outreach efforts to be worthwhile. Block groups 1 and 2 were given a closer analysis.




| Block Group | Demographic Data: Median Household Income | Housing Data: Year Built | Housing Data: Gas Heating | Housing Data: Total | All Total |
|---|---|---|---|---|---|
| 1 | 1 | 5 | 1 | 6 | 7 |
| 2 | 1 | 4 | 2 | 6 | 7 |
| 3 | 1 | 3 | 2 | 5 | 6 |
| 4 | 4 | 2 | 3 | 5 | 9 |
| 5 | 4 | 3 | 5 | 8 | 12 |
| 6 | 4 | 3 | 3 | 6 | 10 |
| 7 | 4 | 4 | 4 | 8 | 12 |

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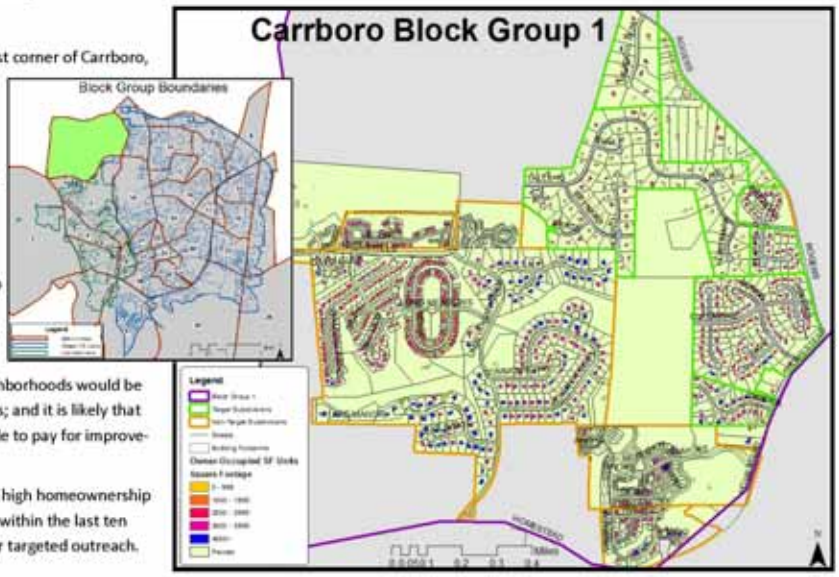
WISE: Energy Consumption Market Analysis

**Carrboro Block Group 1**

This block group is located in the northwest corner of Carrboro, and the portion that is within the town limits is bounded by Rogers Road to the east, Homestead Road to the south, and Old NC 86 to the west. This block group has a lot of residential neighborhoods and with the exception of the Rogers Road neighborhood, they all have a homeownership rate of greater than 90%. The Median Household Income in this block group is the highest in either jurisdiction, at $139,611. In addition, approximately 75% of the homes use gas as their primary heating source. The identified target neighborhoods would be good to market the WISE program towards; and it is likely that many of the applicants would be easily able to pay for improvements.

While the non-target neighborhoods have high homeownership rates, many of the homes have been built within the last ten years and thus are not good candidates for targeted outreach.




| Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Fox Meadow | 86 | 92% | 1,753 | 1987 | 1988 | Bugle Ct, Reynard Rd, Tallyho Trl, Brace Ln, Hound Ct, Kit Ln |
| Camden Place | 24 | 100% | 3,641 | 1994 | 1995 | Gloucester Ct, Camden Ln |
| Highland Meadows | 19 | 95% | 3,036 | 1994 | 1994 | Staffield Ln, Whitmore Cir |
| Rogers Road | 14 | 48% | 1,300 | 1975 | 1961 | Rogers Rd |
| Meadow Run | 11 | 92% | 2,554 | 1990 | 1993 | Rogers Rd, Meadow Run Ct |
| Lake Hogan Farms | 361 | 97% | 3,332 | 2001 | 2001 | Lake Hogan Farm Rd, Long Meadows Rd, Blocker Rd, Bay View Dr |
| Legends | 51 | 94% | 2,640 | 2009 | 2009 | Lake Hogan Farm Rd, Legends Way, Long Meadows Rd |
| Claremont | 33 | 66% | 3,314 | 2008 | 2008 | Camellia, Lucas, Orlando, Claremont, Jewell |
| Winmore | 30 | 70% | 2,891 | 2008 | 2008 | Winmore, Camellia, Homestead, |
| Highlands North | 18 | 100% | 2,861 | 1998 | 1998 | Tallyho Trl, Staffield Ln, Brendan Ct |

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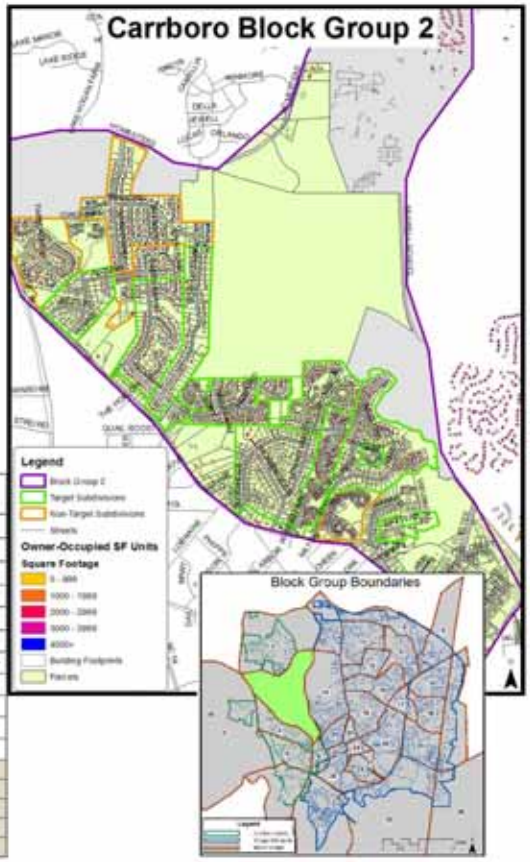
**Carrboro Block Group 2**

This block group has a lot of neighborhoods with very high homeownership rates. Most homes were built in the late 80's or early 90's, and approximately 52% of homes use gas as the primary heating fuel. The Median Household Income in this block group is $70,143. This block group is a good candidate for targeted outreach because of the high density of eligible applicants.



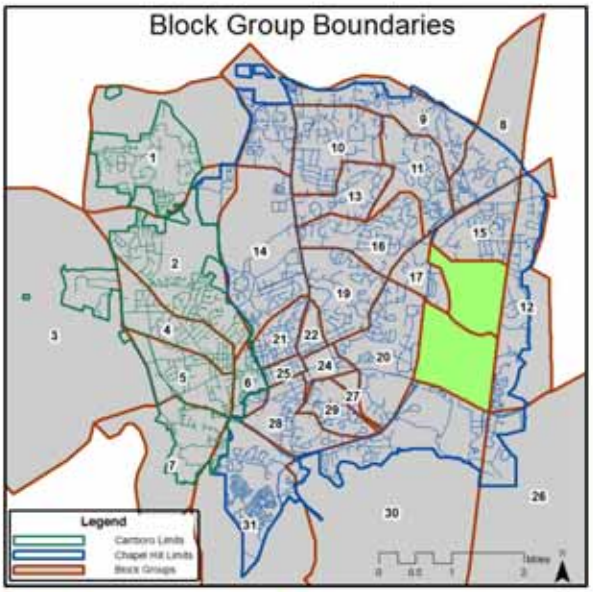

| Target Subdivision | # of O-O Houses | % of Total | Avg. Sq. Ft. | Avg. Year Blt. | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Bolin Forest | 111 | 97% | 2,132 | 1988 | 1990 | Bolin Forest Dr, Pathway Dr |
| Fairoaks | 106 | 94% | 1,812 | 1989 | 1989 | Pathway Dr, Parkview Ave |
| Spring Valley | 93 | 97% | 1,721 | 1987 | 1986 | Spring Valley Rd, Pathway Dr |
| Webbwood | 89 | 81% | 1,684 | 1979 | 1978 | Morningside Dr, Blueridge Rd |
| Quarterpath Trace | 76 | 94% | 2,407 | 1992 | 1992 | Robert Hunt Dr, Pathway Dr |
| Cates Farm | 73 | 100% | 2,995 | 1995 | 1995 | Wyndham Dr, Cates Farm Rd |
| Cobblestone | 59 | 98% | 2,367 | 1989 | 1988 | Cobblestone Dr, Rockgarden Dr |
| Barington Hills | 42 | 89% | 1,573 | 1976 | 1976 | Barington Hills Rd, Autumn Dr |
| Waverly Forest | 23 | 100% | 2,210 | 1994 | 1994 | Waverly Forest Ln, Hanford Rd |
| Sudbury | 17 | 89% | 1,994 | 1995 | 1995 | Sudbury Ln |
| Watters Road | 9 | 90% | 2,677 | 1934 | 1963 | Watters Rd |
| Wexford | 98 | 97% | 3,501 | 1997 | 1996 | Tramore Dr, Wyndham Dr |
| Sunset Creek | 68 | 99% | 2,892 | 1997 | 1997 | Sunset Creek Cir, Farm House Dr |
| The Cedars | 47 | 94% | 2,113 | 1999 | 2000 | Stable Rd, Weathervane Dr |
| Williams Woods | 26 | 100% | 3,044 | 1997 | 1997 | Autumn Dr, Cates Farms Rd, |
| Home Hollow | 9 | 75% | 3,497 | 2004 | 2005 | Autumn Dr |

WISE: Energy Consumption Market Analysis

## Chapel Hill Analysis - Targeting Households with the Ability to Pay

This second analysis uses the same matrix system as before, but applies the second methodology and ranks the income levels in an opposite manner from before; giving a value of 1 to the highest incomes and a value of 5 to the lowest incomes. Other demographic data is not used for this analysis, and year built and gas as the primary heating fuel are ranked in the same manner as in the first analysis.

The matrix yields two block groups, 18 and 23, as the block groups on which a closer analysis would be beneficial. These block groups are on the eastern side of Chapel Hill, abutting the Durham County line. The Median Household Incomes in these block groups are relatively high, ranging from $66,071 to $119,967.

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| Block Group | Demographic Data: Median Household | Housing Data: Year | Housing Data: Gas | Housing Data: Total | All Total |
|---|---|---|---|---|---|
| 8 | 4 | 4 | 4 | 8 | 12 |
| 9 | 1 | 4 | 2 | 6 | 7 |
| 10 | 1 | 3 | 2 | 5 | 6 |
| 11 | 1 | 3 | 3 | 6 | 7 |
| 12 | 1 | 5 | 2 | 7 | 8 |
| 13 | 4 | 3 | 4 | 7 | 11 |
| 14 | 3 | 3 | 3 | 6 | 9 |
| 15 | 3 | 3 | 1 | 4 | 7 |
| 16 | 4 | 3 | 3 | 6 | 10 |
| 17 | 4 | 3 | 2 | 5 | 9 |
| 18 | 1 | 2 | 1 | 3 | 4 |
| 19 | 3 | 2 | 1 | 3 | 6 |
| 20 | 3 | 2 | 2 | 4 | 7 |
| 21 | 5 | 2 | 4 | 6 | 11 |
| 22 | 5 | 2 | 4 | 6 | 11 |
| 23 | 1 | 2 | 1 | 3 | 4 |
| 24 | 5 | 1 | 5 | 6 | 11 |
| 25 | 4 | 2 | 3 | 5 | 9 |
| 26 | 2 | 4 | 3 | 7 | 9 |
| 27 | 5 | 5 | 5 | 10 | 15 |
| 28 | 5 | 2 | 4 | 6 | 11 |
| 29 | 5 | 5 | 4 | 9 | 14 |
| 30 | 1 | 3 | 2 | 5 | 6 |
| 31 | 1 | 4 | 2 | 6 | 7 |

**Chapel Hill Block Group 18**

This block group is located south of Ephesus Church Road, and is made up almost entirely of single-family homes. The Median Household Income in this block group is high, at $119,967, and in addition 87% of homes use gas for heating; the highest proportion of all of the block groups. There are over 500 homes in this area, with a high occupancy rate, an older housing stock, and mid-to-large home sizes.

The identified target area, Tinkerbell Road, is considered part of a neighborhood in an adjacent block group, but was pulled out separately to look at the housing characteristics along that street. It shares similar characteristics to the other neighborhoods; the homes were built in the mid-1960's and there is a high homeownership rate of 84%. The high density of older homes, the high proportion of homes using gas for heat, and the high median income makes this a desirable block group to focus outreach efforts.



| Target Subdivision | # of O-O Houses | % of Total Houses | Average Sq. Ft. | Average Year Built | Median Year Built | Streets/Description |
|---|---|---|---|---|---|---|
| Ridgefield | 190 | 83% | 1,970 | 1961 | 1962 | Leclair St, Willow Dr, Long Leaf Dr, Grove St, Belmont St, Wildwood Dr, Walnut St, Ridgefield Rd, Spruce St |
| Briarcliff | 186 | 91% | 2,427 | 1969 | 1968 | Leclair St, Emory Dr, Long Leaf Dr, Churchill Dr, Brigham Rd |
| The Oaks II | 115 | 95% | 3,946 | 1988 | 1987 | Lancaster Dr, New Castle Dr, Nottingham Dr, Pinehurst Dr |
| **Target Areas** | | | | | | |
| Tinkerbell Rd. | 47 | 84% | 1,816 | 1964 | 1964 | Tinkerbell Rd |

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**Chapel Hill Block Group 23**

Block Group 23 is bounded by NC 54 to the south and US 15-501 to the west, and Meadowmont Lane to the east. Glen Lennox and Meadowmont both have a high proportion of renters, both students and seniors. There are also quite a few high-end houses bordering the Chapel Hill Country Club and golf course. The Median Household Income reflects this mix, at $66,701.. In addition, 76% of homes are heated with gas, and the majority of them are between 30 and 60 years old, which makes them good potential candidates for energy improvements. The homes in The Oaks are also large, with an average of 3,920 square feet, and the homeownership rate is high at 92%. This neighborhood has a mix of lower-income and higher-income residents, all living in homes that are likely able to find 15% energy savings. This neighborhood would be a good one to target to achieve both of the objectives of doing outreach towards lower-income residents and getting a lot of participants in the program.

Meadowmont has a large number of owner-occupied single-family homes as well, but the majority of them have been built within the last ten years. In addition, homes in Meadowmont are already quite energy efficient; they were built to exceed the energy standards by approximately 30%[7].


| Target | # of O-O | % of Total | Average | Average | Median | Streets/Description |
|---|---|---|---|---|---|---|
| Glen Lennox | 89 | 64% | 1,923 | 1954 | 1953 | Cleland Dr, Hayes Rd, Rogerson Dr, Oakwood Dr, Berkeley Rd, Douglas Rd, Hamilton Rd, Maxwell Rd, Flemington Rd |
| The Oaks | 81 | 92% | 3,920 | 1980 | 1979 | Kendall Dr, Burning Tree Dr, Cleland Dr, Pinehurst Dr, Whitley Dr, Oak Tree Dr, Raleigh Rd, Mulligan Dr |
| Meadowmont | 145 | 84% | 3,295 | 2002 | 2000 | Falson Rd, Simerville St, Weaver Mine Trail, Meadowmont Ln, Barbee Chapel Rd, Sprunt St, Village Crossing Dr |

[7] *Meadowmont Village Newsletter*. Spring 2003. http://www.meadowmont.com/inside.php?p=news/newsletter&ed=03_2spr

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## Summary

In summary, there are two tactics that the WISE program can take when doing targeted outreach and education.

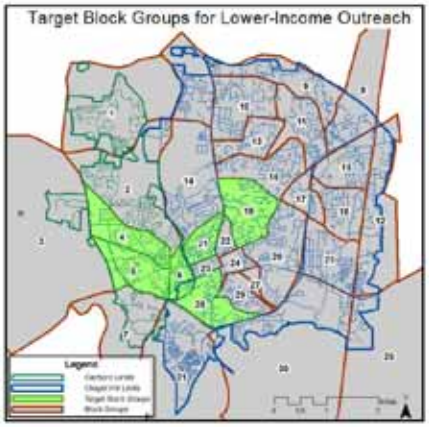
**Goal:** Include more lower-income people in the program

**Strategy:** Conduct targeted outreach in central Carrboro, in block groups 4, 5, and 6, as well as in the areas just outside of downtown Chapel Hill, block groups 19, 21, and 28. This will likely attract applicants living in older homes with the potential for at least 15% energy savings, who are also of lower income status.

**Goal:** Target those who can pay for improvements, and get as many WISE applicants as possible.

**Strategy:** Conduct targeted outreach in the neighborhoods in northwest Carrboro, block groups 1 and 2, and in eastern Chapel Hill, in block groups 18 and 23. These neighborhoods have a high density of older homes and high Median Household Incomes, indicating energy improvements would meet the 15% savings threshold and the homeowners would also be easily able to pay for the improvements.

A combination of these strategies could be used to attract a diverse applicant pool.





**Potential Outreach Methods**

The outreach methods will vary based on the target population, but potential outreach methods could include: direct mailings to target neighborhoods; advertisements in neighborhood newsletters, with HOA associations, or on neighborhood email listservs; advertisements at senior centers, community centers, the Latino Credit Union, multilingual newspapers, and on radio spots; advertisement through the Chapel Hill Preservation Society, or door-to-door solicitation with a crew of volunteers, interns, or Americorps volunteers.

**Conclusion**

This Market Analysis provides specific information for neighborhoods in Carrboro and Chapel Hill that are potential targets for outreach and education regarding the WISE energy improvement program. The maps and neighborhood-level data can help an outreach coordinator determine where to focus their efforts, depending on which participant groups it is trying to attract. These strategies will ultimately help the WISE program achieve its overarching goals of both reducing community energy usage and reducing the burden of high energy bills on lower-income residents.

CARRBORO WISE
Worthwhile Investments Save Energy

# Carrboro WISE Homes & Buildings Energy Efficiency Revolving Loan Fund Application

INSTRUCTIONS | Please read the Energy Efficiency Revolving Loan Description and Criteria before completing this application. It is important that you fill out all sections of this application completely. Questions regarding this application or the application process should be directed to the Town's Economic and Community Development Director or the Energy Efficiency Coordinator.

NAME OF APPLICANT: _____ DATE: _____

# OF YEARS IN OPERATION: _____ (circle one) CORPORATION PARTNERSHIP SOLE PROPRIETORSHIP

EMPLOYER ID #: _____ PRIVILEGE LICENSE #: _____

ADDRESS OF APPLICANT: _____

ADDRESS OF PROJECT (IF DIFFERENT FROM ABOVE): _____

PHONE NUMBER: _____ CONTACT PERSON: _____
(Name and Position)

AMOUNT OF LOAN REQUEST: _____ TERM LENGTH REQUESTED: _____

**BUSINESS OVERVIEW:** BRIEFLY DESCRIBE THE FOLLOWING ASPECTS OF YOUR BUSINESS/ PROPERTY. (You may attach separate sheets or provide a written history and description of your business if you wish.)

HOW MANY EMPLOYEES DOES THE BUSINESS CURRENTLY HAVE? _____

WHAT TYPE OF BUSINESS DO YOU OWN? _____

HOW WILL THE PROJECT AFFECT YOUR COMPANY? _____

AGE OF BUILDING (YR. BUILT): _____ TOTAL SQUARE FEET OF BUILDING: _____ # OF OCCUPANTS: ___

DO YOU PLAN TO MOVE? (Y/N) _____

PRIMARY HEATING FUEL: _____ PRIMARY SERVICE UTILITY: _____

IF YOU ARE LEASING, DESCRIBE THE TERMS OF YOUR LEASE (RENT AND LENGTH OF LEASE) and PROVIDE A COPY OF YOUR CURRENT LEASE: _____

DESCRIBE HOW THIS PROJECT WILL FIT WITHIN THE CONSTRAINTS OF YOUR LEASE: _____

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TOWN OF CARRBORO NORTH CAROLINA

BETTER BUILDINGS

Appendix E: EERLF Loan Application

**PROJECT DESCRIPTION AND COSTS:** BRIEFLY DESCRIBE THE FOLLOWING ASPECTS OF YOUR PROJECT. (You may attach separate sheets/ spreadsheets for costs if you wish.)

** *To be provided with assistance of energy auditor/ contractor*

DESCRIBE THE PROJECT, EMPHASIZING ENERGY EFFICIENCY FEATURES: _____

** *LIST EQUIPMENT PURCHASED (INCLUDE RATED ANNUAL ENERGY CONSUMPTION AND MODEL #'S):* _____

** *LIST REMOVED/ REPLACED EQUIPMENT (INCLUDE MODEL #'S):* _____

** *DO YOU PLAN TO UTILIZE ANY OTHER UTILITY INCENTIVES (ie. Duke Energy or PSNC)? PLEASE DESCRIBE:* _____

** *WILL OTHER IMPROVEMENTS OCCUR AT THE SAME TIME AS THE ENERGY EFFICIENCY PROJECT? IF SO, PLEASE DESCRIBE:* _____

** *PROVIDE ITEMIZED COST ESTIMATES FOR THE PROJECT, INCLUDING ESTIMATES FROM A CONTRACTOR, MAKING SURE TO SEGREGATE ENERGY EFFICIENCY COSTS FROM OTHER IMPROVEMENTS:* _____

** *PROVIDE AN ESTIMATE OF THE SIMPLE PAYBACK FOR THE ENERGY EFFICIENCY MEASURES YOU WILL PURSUE WITH THESE FUNDS:* _____

** *PROVIDE A 12-MONTH CASH FLOW PROJECTION, INCLUDING ENERGY SAVINGS AND LOAN REPAYMENTS:* _____

** *EXPECTED ANNUAL ENERGY SAVINGS, AS A % REDUCTION FROM THE BASELINE (previous 12 months of energy bills):* ___

** *EXPECTED ANNUAL COST SAVINGS FROM THE INSTALLED ENERGY EFFICIENCY MEASURES:* _____

** *EXPECTED kWhs SAVED PER YEAR FOR INSTALLED MEASURES:* _____

** *EXPECTED % SAVINGS kWh OF PREVIOUS 12 MONTHS FOR INSTALLED MEASURES:* _____

** *EXPECTED THERMS SAVED PER YEAR FOR INSTALLED MEASURES:* _____

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Appendix E: EERLF Loan Application

** *EXPECTED % SAVINGS THERMS OF PREVIOUS 12 MONTHS FOR INSTALLED MEASURES:* _____

** *EXPECTED GALLONS SAVED PER YEAR (heating oil/ propane/ LPG) FOR INSTALLED MEASURES:* _____

** *EXPECTED % SAVINGS GALLONS OF PREVIOUS 12 MONTHS FOR INSTALLED MEASURES:* _____

** *ESTIMATED TOTAL LABOR HOURS FOR AUDIT AND RETROFIT INSTALLATION:* _____

**OTHER REQUIRED INFORMATION**

PLEASE PROVIDE 12 MONTHS OF PAST UTILITY BILLS FOR YOUR BUSINESS.

PLEASE PROVIDE A RECENT (ie. within last 90 days) CREDIT REPORT.

DO YOU AGREE TO MAKE ALL RELEVANT DOCUMENTS AVAILABLE ON REQUEST? (Y/N) _____

DO YOU AGREE TO PROVIDE 36 MONTHS OF UTILITY DATA AFTER THE PROJECT IS COMPLETED? (Y/N) _____

DO YOU UNDERSTAND THAT THE **EERLF** LOAN WILL BE SECURED BY A NOTE ON EQUIPMENT? (Y/N) _____

HAVE THE APPLICANT FIRM OR ANY OWNER OF MORE THAN 20% OF THE BUSINESS FILED FOR BANKRUPTCY OR PROTECTION FROM CREDITORS? (Y/N) _____ ; IF YES, PROVIDE DETAILS: _____

THE TOWN MAY AUDIT/ INSPECT APPLICANT'S FINANCIAL RECORDS UPON REQUEST IF LOAN BECOMES PAST DUE. (please initial) _____

DO YOU AGREE TO PROVIDE A WAIVER OF LIEN IF A TENANT AND NOT A BUILDING OWNER? (Y/N) _____

IF THE BUSINESS CLOSES OR RELOCATES, THE LOAN RECIPIENT IS RESPONSIBLE FOR FULL REPAYMENT OF THE LOAN. (please initial) ____

HOW DID YOU HEAR ABOUT CARRBORO'S EERLF PROGRAM? _____

WHAT MOTIVATED YOU TO APPLY FOR A CARRBORO EERLF LOAN? _____

AS _____ (title) OF _____,
I CERTIFY THAT THE INFORMATION PROVIDED IN THIS APPLICATION AND IN DOCUMENTS AND EXHIBITS PROVIDED IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE. I FURTHER COMMIT TO The FOLLOWING ACTIONS, AS DESCRIBED MORE FULLY IN THE PROJECT APPLICATION:

A. UNDERTAKE AND CARRY OUT THE PROJECT AS DESCRIBED IN THE PROJECT APPLICATION, AND DOCUMENTS AND EXHIBITS PROVIDED,
B. PROVIDE THE TOWN WITH NECESSARY INFORMATION FOR COMPLETING REQUIRED REPORTS,
C. MAKE ALL RELEVANT RECORDS AVAILABLE TO TOWN AND ITS PARTNERS UPON REQUEST,
D. BEGIN PROJECT ACTIVITIES ONLY FOLLOWING EXECUTION OF A LEGALLY BINDING COMMITMENT BETWEEN THE TOWN AND THE APPLICANT AND THE REALEASE OF OTHER CONDITIONS, IF ANY, PLACED ON THE LOAN BY THE TOWN OF CARRBORO,
E. COMPLETE PROJECT ACTIVITIES NO LATER THAN _____,
F. *(OPTIONAL)* SECURE AND OBTAIN ADDITIONAL LOAN FUNDS IN THE AMOUNT OF $ _____ AS DESCRIBED IN THIS APPLICATION, AND

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Appendix E: EERLF Loan Application

G. *(OPTIONAL)* PROVIDE $_____ IN EQUITY FROM THE APPLICANT'S OWN RESOURCES FOR THE PROJECT AND COVER ANY COST OVERRUNS IN THE PROJECT FROM APPLICANTS OWN RESOURCES.

MY FIRM IS COMMITTED TO UNDERTAKE THIS PROJECT, AND BUT FOR THE PROVISION OF THE EERLF ASSISTANCE, THIS PROJECT WILL NOT BE UNDERTAKEN:

**PARTNERSHIP AND SOLE PROPRIETORSHIPS**

SIGNED: _____

TITLE: _____

DATE: _____

**CORPORATIONS**

_____
(Name)

BY: _____
(President)

ATTEST: _____
(Secretary)

(SEAL)

DATE: _____

BELOW PLEASE LIST ALL OF THE FOLLOWING: ANY OWNER OF 20% OR MORE OF A CORPORATION AND ALL OFFICERS OF THE CORPORATION; ALL PARTNERS; THE SOLE PROPRIETOR.

| Print Name & Title | Signature | % owned |
|---|---|---|
| Print Name & Title | Signature | % owned |
| Print Name & Title | Signature | % owned |
| Print Name & Title | Signature | % owned |
| Print Name & Title | Signature | % owned |
| Print Name & Title | Signature | % owned |

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