Sarasota County
Energy Efficiency Upgrade
Financing Program:
Market Assessment

January 2012

Prepared by the Environmental Finance Center for Sarasota County.
Part of the DOE Technical Assistance Program Report Series

AUTHORS:

CHRISTINE E. BOYLE
GLENN BARNES
ABOUT THE ENVIRONMENTAL FINANCE CENTER AT THE UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL

The Environmental Finance Center is part of a network of university-based centers that work on environmental issues, including water resources, solid waste management, energy, and land conservation. The EFC at UNC partners with organizations across the United States to assist communities, provide training and policy analysis services, and disseminate tools and research on a variety of environmental finance and policy topics.

The EFC at UNC is dedicated to enhancing the ability of governments to provide environmental programs and services in fair, effective, and financially sustainable ways.

ACKNOWLEDGEMENTS

This report was a collaborative effort within EFC and with several supporting organizations. We extend special appreciation to Jon Breece, Casey Wichman and Jeff Hughes for map making and draft editing. This analysis would not be possible without the data and energy resources of Sarasota County Information Technologies and Revenue Departments.

This report is a product of the Environmental Finance Center at the University of North Carolina, Chapel Hill. Findings, interpretations, and conclusions included in this report are those of the authors and do not necessarily reflect the views of EFC funders, University of North Carolina, the School of Government, or those who provided review.

We are grateful to the Environmental Protection Agency for supporting and guiding the work of our Region IV Offices.

© 2012 ENVIRONMENTAL FINANCE CENTER AT THE UNIVERSITY OF NORTH CAROLINA, CHAPEL HILL
Environmental Finance Center, School of Government
Knapp-Sanders Building, CB# 3330
University of North Carolina at Chapel Hill
Chapel Hill, NC 27599-3330
Web: www.efc.unc.edu

All rights reserved
EXECUTIVE SUMMARY

Sarasota County is evaluating the feasibility of a market-based residential and commercial energy efficiency financing program. The residential portion of the program would target households with high energy saving potential and good credit, to complement the existing Get Energy Smart Retrofit Loan Program, while the commercial program would target local businesses with high potential energy-cost savings. This analysis uses information on Sarasota County’s building stock and financial indicators to assess demand for the proposed Sarasota County Energy Efficiency Upgrade Program. In doing so, the assessment ultimately identifies areas of the county which have high demand for home and commercial energy efficiency upgrade loans. To identify areas and sectors within the county with particularly high demand for energy-efficiency upgrades, the UNC Environmental Finance Center created a set of metrics to identify key sub-sectors, as a means of guiding the program structure and rollout.

Through this analysis, we identify several findings that could help inform the Sarasota Program rollout, including:

**Potential for a residential energy efficiency upgrade program in the near-future is limited**
Using our rating system, the analysis finds that Sarasota’s housing debt burden, large stock of vacation homes, and high reliance on cheap electricity limit the financial viability for a market-based energy efficiency loan program and the potential energy-cost savings. While zip codes 34275, 34228 & 34235 combined have about 3,981 “very-high demand homes” – demonstrating potential for a neighborhood based program launch – county-wide, demand for an energy retrofit financing program appears low.

**Food sales and food service industries provide a large opportunity for improved efficiency and a multi-pronged financing approach**
Sarasota County’s large food service and sales sector show large room for energy-efficiency gains and present a unique opportunity for a program targeting both restaurant operators and property owners for energy financing. Although the majority of energy used in food sales and service is generated by refrigeration, energy for HVAC amounts to 29 percent of restaurants’ average end use. Targeting restaurant property owners for HVAC and thermal envelope efficiency loan packages presents an opportunity to design and market low operating cost, “green-niche” restaurant spaces, while a rebate program for energy-efficient refrigerators will appeal to restaurant operators.

**Retail space, shopping centers, and office buildings have high cost-savings potential through energy-efficiency upgrades**
These three commercial subsectors in Sarasota have been identified as prime targets for energy efficiency upgrades based on the large share of building stock these subsectors occupy as well as their high annual energy expenditures. Low-cost efficiency upgrades that are specific to retail space, shopping centers, and office buildings include adopting new lighting technologies, upgrading buildings’ thermal envelopes, and HVAC system updates.

**Health care centers and nursing homes with high energy demand present a large and untapped market for energy-efficiency upgrades**
Driven by intensive 24-hour operation and large building size, nursing homes and convalescent centers in Sarasota County are a dominating sector with high energy intensity and present a prime market segment for energy efficiency upgrade financing.
INTRODUCTION

The energy efficiency upgrade financing program under consideration, the Sarasota County Energy Efficiency Upgrade Financing Program (“the Program”), is a county-wide energy-efficiency financing program designed to create green collar jobs while allowing the County to promote sustainable and verifiable energy savings to households and commercial entities. Assessing the market for energy-efficiency upgrades prior to launching the Program helps administrators identify sub-sectors and geographies with high potential demand for energy-efficiency upgrade financing packages. This is accomplished by measuring the determinants of demand across Sarasota County’s tax parcels, then assessing how the Program could supply financing products to meet demand. This Market Assessment will help guide the ultimate structuring of the Program and will be used as a sales management tool for a targeted marketing campaign.

This Market Assessment first measures structural and financial characteristics that influence the demand for cost-effective energy-efficiency solutions. It then details the energy-efficiency upgrade project potential for each sector. By identifying particular property types and sub-sectors with demonstrated demand for energy-efficiency solutions, the Market Assessment provides a starting point for efforts to market the program on a sector-by-sector basis throughout Sarasota County. Lastly, the assessment gauges whether an energy efficiency upgrade finance program has sufficient demand to justify the resource requirement to develop such a program.

As Table 1 (below) illustrates, Sarasota has high concentrations of residential and commercial and buildings. Sector-specific market assessments can be found on the following pages:

RESIDENTIAL MARKET ASSESSMENT .................................................................................................................. 5
COMMERCIAL MARKET ASSESSMENT ............................................................................................................ 14

<table>
<thead>
<tr>
<th>City area*</th>
<th>Number of residential parcels</th>
<th>Number of commercial parcels</th>
<th>Number of industrial parcels</th>
<th>Total parcels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>single family residential</td>
<td>other residential</td>
<td>detached retail</td>
<td>food / food service</td>
</tr>
<tr>
<td>Northwest</td>
<td>55,666</td>
<td>45,437</td>
<td>318</td>
<td>320</td>
</tr>
<tr>
<td>Southwest</td>
<td>34,795</td>
<td>21,139</td>
<td>179</td>
<td>102</td>
</tr>
<tr>
<td>Northeast</td>
<td>8,350</td>
<td>1,383</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Southeast</td>
<td>23,467</td>
<td>5,734</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>Total</td>
<td>122,278</td>
<td>73,693</td>
<td>536</td>
<td>446</td>
</tr>
</tbody>
</table>

Data source: Sarasota County Revenue Department (2011) "Parcel Level data." ;
Note: Zip codes 34251, 34266, and 34224 excluded from residential analysis due to very low number of residential parcels (<100)
*Zip codes per quadrant: NW (34228, 34229, 34231, 34232, 34233, 34234, 34235, 34236, 34237, 34238, 34239, 34242, 34239); SW (34292, 34293, 34223, 34275, 34285); NW (34240 & 34241); SE (34286, 34287, 34288, 34289, 34291)
RESIDENTIAL MARKET ASSESSMENT

Overview

Sarasota County has a diverse housing stock with many characteristics that influence how energy efficiency improvement programs should be targeted across the county. A typical single family dwelling unit property in Sarasota County has 2.8 bedrooms, 2 baths, and was built in 1976. This home is 1,778 square feet with an assessed value of $183,270. The typical residence uses electric power for both heating and cooling. This household spends $1,662 per year on energy bills ($138 per month). Up to 56 percent of homes in Sarasota County are classified as vacation homes. Based on such characteristics, this section presents a demand ranking system through which we assess the potential market for energy efficiency financing program participation by households.
THE TRAFFIC LIGHT DEMAND RATING SYSTEM

METHODOLOGY

To identify concentrations of high demand potential loan recipients, we create a set of demand indicators based on existing research from the Home Energy Saver program to categorize various housing characteristics (see measures of demand below).

Next, we assign each residential parcel points (1 – 3) for each determinant of demand, based on the demand level, then sum each parcel’s points to fit into the Traffic Light Demand Rating System. Using our Traffic Light Energy Retrofit Demand Index, the final step is locating spatial concentrations of high demand customers within Sarasota County (see map on Page 9).

Measures of Demand

The Traffic Light Demand Rating System uses four housing characteristics, detailed below in the Determinants of Demand section, identified as influencing a household’s demand for energy efficiency retrofits. For each of these four housing characteristics, we estimate potential demand for energy efficiency retrofits according to two measures of demand.

- The first measure of demand is the energy efficiency/energy expenditure for each housing characteristic. For example, although a home with larger square footage is more efficient per square foot than a smaller home, it has larger overall energy expenditures, and a higher demand for energy upgrades. Annual energy expenditures provide a basis for a cost-benefit calculation for the breakeven point where potential energy utility savings become greater than the total loan amount.

- The second measure of demand is the home’s energy retrofit upgrade project potential. This measure takes into account project potential specific to the housing characteristics. For example, homes using electricity-powered heat pumps are already more energy efficient than homes using gas-powered furnaces, but since the heat pump home is already quite efficient, the home using a furnace may possess more energy efficiency upgrade potential.

Either energy efficiency or retrofit project upgrade potential is used to assign points to each residential parcel, as appropriate for each housing characteristic.

Point System

Each of the three housing and one financial characteristic has specific thresholds identified as contributing to a home’s energy efficiency, or retrofit upgrade, potential. For the analysis, specific points are allotted to each characteristic in the following structure:
For the Sarasota County Market Assessment, points are assigned to each residential parcel, for each of the four characteristics, creating a 12 point scale (3 max points * 4 characteristics = 4 – 12 point scale). In the summary Potential Market for Residential Energy Retrofit Upgrades in Sarasota County, per parcel points are aggregated to the zip code level.

**DETERMINANTS OF DEMAND**

**Housing Stock Determinants**

A household’s energy-efficiency depends upon specific characteristics of the building. Its age and condition suggest a potential need for the retrofit and rehabilitation work that could be enabled through a county financing program. In Sarasota County, 99 percent of the single family home stock was built before 2007, with roughly 55 percent built before 1977. Therefore, the majority of the building stock was built before residential energy-efficiency requirements were in place.

The breakdown of building types within a jurisdiction helps a local government determine likely demand for upgrades that could be addressed by a county energy-finance program. A separate determinant of whether households would be able to pay back loans for energy-efficiency projects is discussed in the Financial Determinants section.

When viewing the charts below, look for zip codes with more green area to identify the concentrations of high demand across the county’s zip code areas.

---

**RED: Low Demand: Worth 1 Point**
There is very little potential for dollar and energy savings.

**YELLOW: Medium Demand: Worth 2 Points**
There is potential for dollar and energy savings, but specific retrofits would not increase energy efficiency as significantly as in High Demand homes, meaning energy bill savings for retrofits would be relatively low.

**GREEN: High Demand: Worth 3 Points**
A home with this characteristic possesses high potential savings from energy efficiency improvements.

---

**Year of Construction**:  
The year a property is built is one key determinant of potential energy and cost savings. Newer homes, especially those built within the last decade, are more likely to have energy efficient appliances, while very old buildings, such as those built before 1940, and may be difficult to retrofit. The majority of Sarasota’s homes were built between 1940 and 1979, and may be in need of technology upgrades depending on the last remodel.

---

**Housing Floor Space (Area)**

The size of a home also influences the potential for energy and cost savings. Larger homes are generally more attractive for many types of retrofits (e.g., air and duct sealing), due to the increased energy savings across the entire footprint of the home. However, houses that are very large, such as 4000+ square feet, begin to lose some of the benefits from retrofit improvements. For example, such a large home may have one heat pump for the basement and first floor, and another heat pump for the second and third floor. Therefore, paying to replace these two heat pumps with more energy efficient ones would not provide the same savings opportunity as replacing one inefficient heat pump that serves an entire 2000-2500 square foot home. Sarasota County has a large volume of small homes, between 1,000 to 2,000 square feet in size.

---

Primary Energy Source for Heating / Cooling:
The type of energy source used for cooling homes is another key determinant. According to U.S. Green Building Council (USGBC) research, homes that are fueled by natural gas have the highest potential for savings from energy-efficiency improvements, followed by those using oil and electric heat. Sarasota's homes overwhelmingly rely on electric power, thus limiting energy efficiency upgrade options such as gas heat pumps and gas tankless hot water heaters.

Financial Determinants for Energy-Efficiency Upgrade Project Financing (Loans)

Beyond the demonstrated need for energy-related improvements, Program demand also depends on property owners’ ability to pay for the initial upgrade, either with cash or through a loan. Several demographic factors indicate whether sufficient equity is available to pay for comprehensive upgrades in Sarasota. For example, the mean household income is $45,641; 62.4 percent of households are moderate-income and above. The median home price in the study area is $153,500. Of the owner-occupied units, 45 percent, or 55,265 homes, have no mortgage burden – such households will be the prime target market for a market-based residential program. For homeowners with a mortgage, monthly payments are $1,486 on average. Of particular concern in Sarasota County is the dual high-mortgage-burden and the “under water housing” crisis. In the county, 41.1 percent of households pay more than 35 percent of their household income to cover their mortgages.

To account for the underwater housing crisis, we create a metric called *underwater*, measured as the current value of the home minus the last sale price of the home. This indicates whether or not a home is “underwater”—that is, if the home is currently worth less than the amount for which it was purchased. Underwater homes cannot take on more debt and would not be eligible for an energy efficiency upgrade loan.

![Graph showing number of residential parcels compared to purchase price of home](image)

Note: Only 67,655 residential parcels in Sarasota County had sales data to calculate the underwater status. Therefore demand may be underestimated in the following zip codes where housing sales data is not available: 34223, 34286, 34287, 34288, and 34291.

**BRINGING IT ALL TOGETHER IN THE MAP:** The next step in the residential market assessment is adding up points per parcel and assigning each parcel a ‘traffic light ranking.’ The map on the next page illustrates the number of high demand ‘green’ parcels per zip code and estimates potential demand for zip codes in the incorporated area of Sarasota County.

---

5 *ibid*
6 *ibid*
Potential Market for Residential Energy Retro-fit Upgrades
Sarasota County, FL

Demand by Zip Code

Concentration of High Demand Units
- Very High (over 30%)
- Low (<10%)
- High (20% to 30%)
- Average (10% to 20%)
- Excluded

Labels indicate the number of high-demand single-family detached parcels.
Demand determined using a 12-point rating system. See Overview of the Traffic Light Demand Rating System for details.

Source: Sarasota County Department of Revenue
Background map: USGS

Reference Map of Zip Codes in Sarasota County

UNC Environmental Finance Center
POTENTIAL RETROFITS FOR A TYPICAL HIGH DEMAND HOME

To provide a snapshot into the types of retrofit improvements potential loan recipient households would undertake, we used the Department of Energy's Home Energy Saver calculator to create a profile of common improvements for representative high demand households in Sarasota County, FL (see Table 2).

Any project recommendations would be based on an audit assessment of cash flow positive or cash flow neutral payback. For residential energy retrofit loans, the monthly loan payment will be equal to or less than the household's monthly utility-bill savings. It is important to note that the projected demand for energy efficiency retrofits in Sarasota County overall is low. The sample packages are presented below to provide information on potential packages for the high-demand households.

Please note that the estimated loan amounts assume that the homeowner decides to make all the recommended improvements within the upgrade package category. If a homeowner decided to only take on some of the recommended retrofit projects, the cost and loan amount would be lower.

Representative High “Green” Demand Household in Sarasota County (11-12/12 points):
Built in 1974, this home is 2,307 sq. ft., and valued at $260,266 and uses an electric heat pump for heating and cooling. The home’s average annual energy bill is approximately $1,949 ($162 per month).

Table 2 SAMPLE ENERGY-EFFICIENCY UPGRADE PACKAGES, TARGET MARKETS & COSTS

<table>
<thead>
<tr>
<th>Upgrade Packages</th>
<th>Upgrade Cost (Range)</th>
<th>Annual Energy Bill Savings*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Efficiency Package [target markets: VERY HIGH, HIGH &amp; AVERAGE DEMAND]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar hot water heater</td>
<td>$5,500-8,000</td>
<td>$500</td>
</tr>
<tr>
<td>EnergyStar Refrigerator</td>
<td>$1,600</td>
<td>$128</td>
</tr>
<tr>
<td>Air Sealing: 25% air leakage reduction</td>
<td>$2,500 - $3,750</td>
<td>$120</td>
</tr>
<tr>
<td><strong>Total</strong>:</td>
<td><strong>$9,600 - $13,350</strong></td>
<td>$748/yr</td>
</tr>
<tr>
<td>Medium Retrofit Package [target markets: VERY HIGH &amp; HIGH DEMAND]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar hot water heater</td>
<td>$5,500-8,000</td>
<td>$500</td>
</tr>
<tr>
<td>EnergyStar Refrigerator</td>
<td>$1,600</td>
<td>$128</td>
</tr>
<tr>
<td>Air Sealing: 25% air leakage reduction</td>
<td>$2,500 - $3,750</td>
<td>$120</td>
</tr>
<tr>
<td>Solar Attic Fan</td>
<td>$500 - $800</td>
<td>$200</td>
</tr>
<tr>
<td>SEER 14 Heat Pump (4 ton unit)</td>
<td>$5,000-$6,000</td>
<td>$513</td>
</tr>
<tr>
<td><strong>Total</strong>:</td>
<td><strong>$15,100 - $20,150</strong></td>
<td>$1,461/yr</td>
</tr>
<tr>
<td>Deep Retrofit Package [target market: VERY HIGH DEMAND]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solar hot water heater</td>
<td>$5,500-8,000</td>
<td>$500</td>
</tr>
<tr>
<td>EnergyStar Refrigerator</td>
<td>$1,600</td>
<td>$128</td>
</tr>
<tr>
<td>Air Sealing: 25% air leakage reduction</td>
<td>$2,500 - $3,750</td>
<td>$120</td>
</tr>
<tr>
<td>Solar Attic Fan</td>
<td>$500 - $800</td>
<td>$200</td>
</tr>
<tr>
<td>SEER 14 Heat Pump (4 ton unit)</td>
<td>$5,000-$6,000</td>
<td>$513</td>
</tr>
<tr>
<td>2 pane Energy Star Windows</td>
<td>$11,000 - $15,000</td>
<td>$194</td>
</tr>
<tr>
<td>Cool roof: Solar reflectance</td>
<td>$3,000 - $5,000</td>
<td>$29</td>
</tr>
<tr>
<td><strong>Total</strong>:</td>
<td><strong>$29,100 - $38,925</strong></td>
<td>$1,660/yr</td>
</tr>
</tbody>
</table>

* Annual energy bill savings are the estimated reduction in energy bill amounts, per retrofit, for the representative home. These annual savings are estimated as cost savings over and above the minimal building code mandated for new units. Accordingly, savings may be underestimated if residential units do not meet minimal new construction standards prior to retrofit.
COMMERCIAL MARKET ASSESSMENT

Overview
Commercial buildings in Florida fall under the Energy Efficiency Standards of the 2007 Florida Building Code (2007 FBC) that must meet or exceed the ASHRAE 90.1-2004 code that mandates baseline levels of energy-efficiency. The role of energy-efficiency in commercial businesses, however, goes beyond state mandates or a building’s environmental footprint. The business case for energy-efficiency and renewable-energy retrofits and investments includes:

- Reducing operating costs through energy savings
- Increased reputational advantage in the “green” niche market
- Creation of new markets and economic expansion
- Stronger tenant retention, leading to lower vacancy and turnover rates
- Mitigated business risk associated with energy price volatility

Promotion of financing mechanisms for energy-efficiency loans should address the business incentives of energy efficient investments for commercial buildings.

Methodology
To identify the potential market for energy-efficiency upgrade financing in Sarasota’s commercial sector, we used a variety of data sources. Parcel data was used to analyze the saturation of each sub-sector in Sarasota. The U.S. Department of Energy's Commercial Buildings Energy Consumption Survey (CBECS) was used to assign energy intensities to each sub-sector. Lastly, retail prices to commercial customers for gas, electricity, and heating oil were obtained from U.S. Energy Information Administration databases. For the calculation of energy intensities and ranking of sub-sectors, the following methodology was used:

1) Using indoor square footage and heating fuel type data for commercial parcels, we assigned an energy intensity index based on the 2003 CBECS end-use energy consumption tables.
2) Next we created an energy-dollar intensity for each sub-sector by multiplying U.S. EIA energy price information by the CBECS energy-intensity index for each type of fuel used at each commercial parcel.
3) Then we aggregated each parcel into one of 34 sub-sectors based on parcel data use codes, and 8 larger sectors based on CBECS principal building activities. We then calculated annual energy expenditures per sector, sub-sector, and unit to illustrate the commercial building composition and energy use in Sarasota.
4) Lastly we ranked sub-sectors in terms of annual energy expenditures to ascertain the ones most likely to respond to cost savings from energy-efficiency investments.

---
Commercial Targets and Upgrade Project Potential

The majority of Sarasota’s commercial buildings are: detached retail stores, strip mall retail, and office buildings. Although smaller in number, restaurant and convenience stores have high energy intensity and thus, high potential energy cost savings. Within the main commercial sectors, several substantive characteristics bear directly on the demand for energy-efficiency loans in commercial buildings. We use Energy Information Administration statistics to identify sectors in Sarasota County with high energy intensity and estimate the per-building and aggregate energy consumption in order to evaluate sectors and sub-sectors to target for a commercial energy-efficiency lending program. As seen in Table 3 below, there is a lot of variation between commercial subsectors, which indicates a need for a marketing strategy that is both diverse and specific.

Table 3

<table>
<thead>
<tr>
<th>Estimated Energy Intensity and Expenditures by Commercial Building Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Units</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Food Sales/Service</strong></td>
</tr>
<tr>
<td>Grocery Stores</td>
</tr>
<tr>
<td>Convenience Stores</td>
</tr>
<tr>
<td>Restaurants</td>
</tr>
<tr>
<td><strong>Shopping Centers</strong></td>
</tr>
<tr>
<td>Shopping Centers (with Supermarkets/Department Stores)</td>
</tr>
<tr>
<td>Shopping Centers</td>
</tr>
<tr>
<td><strong>Detached Retail</strong></td>
</tr>
<tr>
<td>Department Stores</td>
</tr>
<tr>
<td>Retail Establishments (Retail Stores, Rental Centers, Dealerships)</td>
</tr>
<tr>
<td><strong>Office Space</strong></td>
</tr>
<tr>
<td>Office Buildings =&gt; 10,000 sq ft</td>
</tr>
<tr>
<td>Office Buildings &lt; 10,000 sq ft</td>
</tr>
<tr>
<td><strong>Health Facilities</strong></td>
</tr>
<tr>
<td>Nursing Home/Assisted Living</td>
</tr>
<tr>
<td>Outpatient Health Care</td>
</tr>
<tr>
<td>Medical Offices</td>
</tr>
<tr>
<td><strong>Lodging</strong></td>
</tr>
<tr>
<td>Hotels</td>
</tr>
<tr>
<td>Hotel Condo Unit</td>
</tr>
<tr>
<td><strong>Sources:</strong> 1 -- Sarasota County Tax Parcel Data, 2 -- EIA Commercial Building Energy Consumption Survey (Table E6A), 3 -- Table 5.6.A. Average Retail Price of Electricity to Ultimate Customers by End-Use Sector, by State, February 2011, Commercial (10.11 cents/KWH)</td>
</tr>
</tbody>
</table>
Top Target Commercial Clusters within Sarasota

**Food Sales and Service Locations**

1) Grocery Stores (average energy cost $254,077 per facility); 2) Convenience Stores (average energy cost $15,375 per facility); 3) Restaurants and Fast Food (average energy cost $12,354 per facility)

Food sales and service locations have the highest energy cost per square foot of any commercial sector in Sarasota County. There are only a handful of stand-alone grocery stores, but they are relatively large, averaging more than 50,000 square feet each. These stores illustrate potential for larger energy efficiency investments -- and larger energy cost-savings. The restaurants and convenience stores, by contrast, are significantly smaller, averaging about 4,000 square feet and 3,000 square feet, respectively. But there are large numbers of restaurants and convenience stores, which would allow for a wide marketing effort.

**Shopping Centers and Detached Retail Establishments**

1) Shopping Centers with Grocery Stores/Department Stores (average annual energy cost $214,538 per facility); 2) Other Shopping Centers (average annual energy cost $38,859 per facility); 3) Freestanding Department Stores (average annual energy cost $271,516 per facility); 4) Retail Establishments (average annual energy cost $7,231 per facility)

Strip malls, shopping centers, and freestanding department stores dominate Sarasota’s retail sector, and these facilities have high annual energy costs. Freestanding department stores are very large facilities, on average more than 120,000 square feet, and on average they have the highest annual energy costs of any sub-sector identified in this report. Shopping Centers that contain grocery stores or department stores also have very high annual energy costs that are under-estimated in this report. Shopping Centers without grocery stores or department stores vary in size, but as a group there are more than 450 of them in Sarasota County, making them a large potential target for marketing. The same holds for retail establishments such as retail stores, retail centers, and car dealerships. While each individual unit is relatively small, there are more than 1,000 of them in the county, and in aggregate this sub-sector has high annual expenditures for energy.

Approximately one-third of shopping centers are owned by entities located outside of Sarasota County. Therefore, marketing efforts to these facilities should include some type of long-distance communications such as mailings, emails or phone outreach as it is unlikely that in-person events or local media advertising with reach this sector completely.

It is worth noting that there are some types of retail establishments that use less energy on average and have smaller facilities for which we do not see a high potential for upgrades. These include service locations such as gas stations, auto repair shops, drycleaners and laundromats as well as public assembly facilities such as bowling alleys, movie theatres, clubs, and museums.

**Office Space**

1) Office Buildings => 10,000 sq ft (average annual energy cost $52,082 per building); 2) Office Buildings < 10,000 sq ft (average annual energy cost $10,775 per building)

The 143 large office buildings in Sarasota each spend more than $50,000 annually in energy with an average unit size of almost 30,000 square feet. These larger facilities illustrate the potential for larger energy efficiency investments and larger energy cost-savings. The smaller office buildings, a

---

8 Grocery stores use significantly more energy than other shopping center stores, and it is not possible from the parcel level data to separate these functions by square footage.
group that includes single and multi-tenant structures as well as banks, have significantly smaller indoor square footage (about 6,000 square feet per facility) and annual energy costs ($10,775 per building). While each of these smaller office buildings has modest annual energy expenditures, the aggregate expenditures for this sub-sector are large when viewed as a whole.

**Health Facilities**
1) Nursing Homes/Assisted Living Facilities (average annual energy cost $43,528 per facility); 2) Outpatient Care Offices (average annual energy cost $17,108 per facility); 3) Medical Offices (average annual energy cost $7,551 per facility)

The health care industry has a strong presence in Sarasota County, in particular long term care facilities such as nursing homes and assisted living facilities. In total, there are 148 of these units, with an average size of more than 30,000 square feet. The typical long-term care facility spends more than $43,000 annually on energy.

Sarasota County also has six private hospitals that are significant energy users. The average size is 200,000 square feet, and they have estimated annual energy costs greater than $500,000. Hospitals often fall into the “MUSH” category of energy efficiency improvements—municipalities, universities, schools and hospitals, or more broadly the “public sector.” Of course, private hospitals are not part of the public sector, but they can be addressed by efficiency programs targeting hospitals broadly, and there is some concern that private hospitals may not be eligible for financing using certain DOE grants.

**Lodging and Tourism**
1) Hotels (average annual energy cost $27,438 per facility); 2) Hotel Condo Units (average annual energy cost $1,186 per facility)

There are 145 hotels in Sarasota County, averaging more than 20,000 square feet of indoor space. While the energy intensity of hotels is not as high as it is for other types of facilities, their larger size presents opportunities for efficiency gains. By contrast, hotel condo units (smaller units that are rented out for vacationers) each only use $1,186 of energy per year, but there are more than 850 of them in the county. Collectively, these units spend more than $1 million every year on energy. And all of the hotel condo units were built in 1983 or earlier, which means they likely have outdated technology.

**Energy-efficiency Upgrade Potential**
Sarasota’s commercial properties, while diverse, also share common features that the Program should integrate into its product offerings in order to be most effective. According to the “Energy-efficiency Trends in Residential and Commercial Buildings” study, published by the U.S. Department of Energy-efficiency and Renewable Energy in October 2008, the primary energy-consumption end uses for commercial buildings are lighting (25.5%), space heating (14.2%) and space cooling (13.1%). These end uses, totaling over 50 percent of total commercial energy consumption, are the focus for the following energy-efficiency improvements.

**Upgrade Recommendations For All Commercial Buildings**
In general, the commercial building stock in Sarasota is dated. While some structures such as stand-alone department stores (average year built 1998) and office condo units (average year built 1995) are relatively newer, many key commercial building categories are much older. The average year built of office buildings in the county, for example, is 1976. The average year built for shopping centers is 1970. And the average year built for hotels is 1963. Grocery stores and
convenience stores, which use the largest energy per square foot of any commercial structure in the county, have an average year built of 1981 and 1983, respectively.

Thus, these buildings are likely to have outdated technology and could see vast energy-cost reductions via improvements in lighting technologies, thermal building envelope upgrades, and new climate-control equipment.

Electronic ballasts, as opposed to traditional magnetic ballasts found in fluorescent lights, can produce a 30 percent increase in energy-efficiency in commercial buildings. Currently, electronic ballasts saturate the lighting market, but older buildings that have yet implemented them could see drastic energy cost savings.

A building's thermal envelope makes up the barrier between its internal and external space – its composition directly affects the efficiency of a building's heating and cooling system. In Sarasota's commercial buildings, upgrading building insulation to DOE's recommended levels could produce up to a 30 percent reduction in energy costs.

Lastly, changing the way energy is used in commercial buildings can lead to significant reductions in energy costs. Improving climate-control equipment and ensuring that systems are installed properly can improve the use of energy for commercial buildings. For example, the use of occupancy-sensor lighting systems can reduce lighting costs in office buildings by up to 45 percent.

**Upgrade Recommendations: Food Sales and Service**

Sarasota County's large food service and sales sector shows large room for energy-efficiency gains and presents a unique opportunity for a program targeting both restaurant operators and property owners for energy financing.

In addition to the previous recommendations that can be applied generally to all commercial buildings, the EPA best practices for food sales and service include the following five steps for restaurant operators:

- Install compact fluorescent lamps,
- Install a high-efficiency pre-rinse spray valve,
- Fix water leaks immediately,
- Perform walk-in refrigerator maintenance, and
- Replace worn-out cooking and refrigeration equipment.

To illustrate the last point above, Table 4 on the next page presents estimated cost savings for businesses in the food sales and service industry from adopting one of the listed appliances. Replacing outdated, inefficient appliances with efficient appliances has the benefit of increasing productivity as well as inducing energy-cost savings.
Table 4: Estimated annual electricity savings from adopting energy star appliances in food service

<table>
<thead>
<tr>
<th>Annual Electricity Savings from Adopting One of the Following Energy Star Appliances</th>
<th>Steamer</th>
<th>Fryer</th>
<th>Convection Oven</th>
<th>Griddle</th>
<th>Holding Cabinet</th>
<th>Reach-in Refrigerator</th>
<th>Reach-in Freezer</th>
<th>Ice Maker</th>
<th>Dishwasher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Electricity Savings</td>
<td>$1,000</td>
<td>$100</td>
<td>$190</td>
<td>$190</td>
<td>$310-880</td>
<td>$55-70</td>
<td>$175-325</td>
<td>$130</td>
<td>$720</td>
</tr>
</tbody>
</table>


As restaurants are typically leased from property owners, energy efficiency upgrades for improving the HVAC or thermal envelope must target the landlords and property owners. Targeting restaurant property owners for HVAC and thermal envelope efficiency loan packages presents an opportunity to design and market low operating cost, “green-niche” restaurant spaces, while a rebate program for energy-efficient refrigerators will appeal to restaurant operators.

**Nursing Homes and Convalescent Hospitals: Upgrade Recommendations**

Nursing homes, which provide 24-hour care to elderly and disabled patients, have high energy bills when compared to other building uses in Sarasota. These buildings could see energy cost reductions by making improvements to lighting, building envelopes, and climate-control equipment (similar to other commercial buildings).

An improvement unique to nursing homes would be to replace motors that power HVAC systems, refrigeration, and vertical transportation. In a case study performed by the Consortium for Energy-efficiency’s “Motor Decisions Matter” campaign, retrofitting complete HVAC systems with energy-efficient motors, at an average cost of $29,452, could recoup annual savings of over $11,000 per year; as a result, payback on investment would take less than three years\(^\text{12}\). Thus buildings that have the highest energy bills have the most to gain from energy-efficiency upgrades.

KEY FINDINGS
This analysis generated several findings to inform the Sarasota Energy Efficiency Upgrade Financing Program development, including:

**Potential for a residential energy efficiency upgrade program in the near-future is limited**
Using our rating system, the analysis finds that Sarasota’s housing debt burden, large stock of vacation homes, and high reliance on cheap electricity limit the financial viability for a market-based energy efficiency loan program and the potential energy-cost savings. While zip codes 34275, 34228 & 34235 combined have about 3,981 “very-high demand homes” – demonstrating potential for a neighborhood based program launch – county-wide, demand for an energy retrofit financing program appears low.

**Food sales and food service industries provide a large opportunity for improved efficiency and a multi-pronged financing approach**
Sarasota County’s large food service and sales sector shows large room for energy-efficiency gains and presents a unique opportunity for a program targeting both restaurant operators and property owners for energy financing. Although the majority of energy used in food sales and service is generated by refrigeration, energy for HVAC amounts to 29 percent of restaurants’ average end use. Targeting restaurant property owners for HVAC and thermal envelope efficiency loan packages presents an opportunity to design and market low operating cost, “green-niche” restaurant spaces, while a rebate program for energy-efficient refrigerators will appeal to restaurant operators.

**Retail space, shopping centers, and office buildings have high cost-savings potential through energy-efficiency upgrades**
These three commercial subsectors in Sarasota have been identified as prime targets for energy efficiency upgrades based on the large share of building stock these subsectors occupy as well as their high annual energy expenditures. Low-cost efficiency upgrades that are specific to retail space, shopping centers, and office buildings include adopting new lighting technologies, upgrading buildings’ thermal envelopes, and HVAC system updates.

**Health care centers and nursing homes with high energy demand present a large and untapped market for energy-efficiency upgrades**
Driven by intensive 24-hour operation and large building size, nursing homes and convalescent centers in Sarasota County are a dominating sector with high energy intensity and present a prime market segment for energy efficiency upgrade financing.