Energy Use in South Carolina's Public Facilities

Fiscal Year 2002

Eleventh Annual Report

A Report to the
South Carolina General Assembly
prepared by the
South Carolina Energy Office
Division of Insurance and Grants Services
State Budget and Control Board

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EXECUTIVE SUMMARY

Energy Use in South Carolina's Public Facilities, Fiscal Year 2002 summarizes energy consumption and cost data for most public school districts, state agencies and public institutions of higher learning in South Carolina. It is required by the South Carolina Energy Conservation and Efficiency Act of 1992.

In fiscal year 2002, South Carolina public facilities saved $12.67 million in energy costs compared to fiscal year 1998 as a result of more energy efficient buildings (Table 1).

Table 1. Energy Cost Savings for Fiscal Year 2002

Category	Energy Cost Savings (In millions)
School Districts	$1.36
State Agencies	$5.41
Colleges with Housing	$5.10
Colleges without Housing	$0.80
Total	**$12.67**

Table 2 indicates that the public entities that submitted energy data reports spent $168.1 million on energy in FY 2002, 85.4 percent of which was spent on electricity. Natural gas accounted for 13.4 percent of energy expenditures.

Table 2. Energy Expenditures (in millions of dollars) by Fuel Source - FY 2002

Fuel Source	School Districts	State Agencies	Colleges With Housing	Colleges without Housing	Totals
Electricity	$81.010	$26.213	$28.733	$7.506	$143.462
Natural Gas	$7.011	$5.977	$8.427	$1.099	$22.467
Fuel Oil	$0.117	$0.106	$0.042	$0.000	$0.298
Propane	$0.647	$0.784	$0.028	$0.001	$1.455
Coal	$0.000	$0.000	$0.382	$0.000	$0.382
Kerosene	$0.000	$0.002	$0.000	$0.000	$0.002
Total Expenditures*	**$88.787**	**$33.083**	**$37.612**	**$8.606**	**$168.089**

*Totals do not necessarily sum to totals due to independent rounding.

Table 3 shows that four-year colleges and universities benefited from the lowest unit costs for electricity and natural gas. Overall, school districts paid the highest average unit energy prices with state agencies and two-year colleges falling in between.

Table 3. Average Unit Energy Costs – FY 2002

Cost- per- Unit	School Districts	State Agencies	Colleges with Housing	Colleges without Housing	Overall Average
Electricity ($/kBtu)	$0.022	$0.017	$0.014	$0.018	$0.019
Electricity ($/kwh)	$0.076	$0.058	$0.048	$0.063	$0.065
Natural Gas ($/kBtu)	$0.009	$0.007	$0.005	$0.009	$0.007
Natural Gas ($/therm)	$0.865	$0.676	$0.524	$0.905	$0.662
Fuel Oil ($/kBtu)	$0.006	$0.005	$0.005	$0.000	$0.006
Fuel Oil ($/gallon)	$0.894	$0.687	$0.721	$0.000	$0.785
Propane ($/kBtu)	$0.011	$0.006	$0.012	$0.025	$0.008
Propane ($/gallon)	$0.980	$0.570	$1.066	$2.308	$0.709
Average for All Energy Sources ($/kBtu)	**$0.020**	**$0.013**	**$0.010**	**$0.016**	**$0.015**

As indicated in Table 4, the 85 school districts (Marion School Districts 3 and 4 were consolidated to form Marion School District 7) included in this report spent $88.8 million to provide energy for 101.3 million square feet of building space, and averaged $0.89 per square foot. The median cost per square foot was $0.88 for South Carolina's school districts as compared to a national median of $0.98 per square foot. Most school districts used from 30 to 50 kBtu per square foot, with an overall average of 45.07 kBtu per square foot.

Table 4. Fiscal Year 2002 Summary Data

Institutions	Total Sq.Ft. (in millions)*	Total Energy Cost (in millions)*	Avg. $/Sq.ft.**	Avg. kBtu/Sq.ft.**
School Districts (85)	101.3	$88.8	$0.89	45.07
State Agencies (32)	24.7	$33.1	$1.39	109.94
Colleges with Housing (12)	28.2	$37.6	$1.21	124.85
Colleges without Housing (21)	7.2	$8.6	$1.21	74.20
Totals*	161.5	$168.1	$1.03	69.45

Figures do not necessarily sum to totals due to independent rounding.

*Includes the total space, total cost and total usage reported,

**These numbers represent the adjusted cost per square foot and use (kBtu) per square foot. Non-heated and non-air conditioned structures have been omitted, as well as outdoor lighting cost and usage.

Twelve four-year colleges and universities spent $37.6 million to provide energy for 28.2 million square feet of building space, averaging $1.21 per square foot. The median cost per square foot is $1.14 with the energy use averaging 124.85 kBtu per square foot.

The four-year colleges vary widely in size. Three of the twelve institutions, Clemson University, the Medical University of South Carolina and the University of South Carolina (Columbia campus), comprise 64.2 percent of the total square footage and

68.4 percent of the total energy expenditures for this category. Consequently, the average cost per square foot and the average use per square foot figures basically reflect the energy consumption for these three institutions.

Twenty-one public colleges without housing, a group composed of technical colleges and two-year campuses of the University of South Carolina, spent $8.6 million on energy, averaging $1.21 per square foot. The median cost per square foot is $1.18 as compared to the national median for two-year colleges of $1.31 per square foot. Energy consumption for these institutions averaged 74.20 kBtu per square foot for their 7.2 million square feet of building space.

State agencies vary considerably in their types of energy use. Altogether, 32 agencies spent $33.1 million in identifiable energy costs for state-owned facilities. Because a number of agencies have utility costs included in their rent payments to private sector landlords, the total actual energy costs for state government cannot be determined. Average cost for 24.7 million square feet of building space owned by 31 agencies was $1.39 per square foot. Average energy use was 109.94 kBtu per square foot. Three state agencies are responsible for 54.7 percent of total state building space, and pay 58 percent of state agency energy bills. The largest of these three state agencies, the Department of Corrections, had energy expenditures of $10 million for 6.4 million square feet. The Office of General Services (Facilities Management and Statewide Building Services) spent $5.4 million for 4.6 million square feet, and the Department of Mental Health spent $3.8 million for 2.5 million square feet.

Many factors influence the high variability in energy use by public facilities, including age of buildings, energy conservation measures, energy efficiency of building design, hours of operation, building uses, outdoor lighting, high technology equipment, fuel types, fuel costs, and climatic differences. Table 5 provides a five-year historical comparison of energy use (kBtu) per square foot for the four categories in this study.

Table 5. Five-year Energy Use (kBtu) per Square Foot Comparison with Annual Mean Temperature, 1998-2002

Fiscal Year	School Districts	State Agencies	Colleges with Housing	Colleges without Housing	Fiscal Year Mean Temperature (F^0)*
1997-98	45.02	127.44	140.06	82.74	65.3
1998-99	45.07	119.14	138.46	71.30	64.0
1999-00	45.30	117.19	134.56	75.83	63.1
2000-01	48.13	121.66	127.15	79.03	64.0
2001-02	45.07	109.94	124.85	74.20	64.3

*Southeast Regional Climate Center

This report is an aggregate summary of information provided by 155 responding entities. Each public institution that participates in this study receives a customized written report that details its energy cost and use per square foot data and provides comparisons to the average for facilities in the same category. An important result of the energy consumption reporting process is that it provides necessary information for institutions to develop energy conservation plans and goals. In fiscal year 2002, energy conservation measures accounted for an estimated $12.18 million in savings for all four categories included in this report.

When high energy use patterns are identified, the Energy Office works with these institutions to address problems and provide technical assistance through our Rebuild South Carolina and ConserFund loan programs.

Through the Rebuild South Carolina program, energy technicians perform energy audits of the facilities to locate problems and propose solutions. If the institution needs assistance in financing energy saving projects, the Energy Office offers the ConserFund loan program for implementation of energy efficiency measures. Institutions are then able to repay the loans from the cost savings achieved as a result of these energy efficiency measures.

This report is intended to summarize the energy consumption and cost data submitted to the South Carolina Energy Office for fiscal year 2002. This data helps convey to the public, agency leaders, school administrators and public facility managers the manner in which public facilities are consuming energy, and can serve as a tool which will help them improve their performance. Using standard measures of energy consumption, it is possible to render an analysis of a given agency's performance in comparison with other agencies as well as to establish a historical trend of energy use. Presentation of these measures in an accurate and systematic manner is the primary purpose of this report.

Introduction

Purposes

The information contained in this report represents the South Carolina Energy Office's eleventh compilation of energy cost and energy consumption data submitted by South Carolina's public school districts, state agencies, universities and public colleges. This report summarizes fiscal year 2002 data for 85 public school districts, 32 state agencies and 33 universities and public colleges. Also included is an analysis of information obtained from each school district, agency and college on energy costs and energy consumption. For the purposes of this study, the energy use and cost figures were based solely on buildings and other fixed facilities on the grounds (including outdoor lighting) of the reporting entity. Transportation energy use and costs were not included. Estimates were used for three public entities that failed to report their energy use data, and for one institution which submitted incomplete data.

This report is required by Section 48-52-620 (E) of the South Carolina Energy Conservation and Efficiency Act of 1992 (see Appendix A). It provides aggregate energy use numbers so the Energy Office can determine state public sector baselines and goals and measure results over time. The data highlights success stories that can be used as models, and also identifies institutions and buildings that are likely candidates for help in reducing energy costs. A very significant benefit of the reporting process is that it provides necessary information for individual institutions to use in reducing energy costs. By utilizing this data, institutions can develop energy conservation plans and goals. Most importantly, the reporting process provides accurate information to the general public and to public officials about energy use involving taxpayer dollars.

The specific objectives of energy use reporting are:

- To encourage meaningful, consistent, and methodical collection of energy data on a periodic basis;
- To define a collective baseline of energy conservation data for facilities;
- To encourage the establishment of effective, practical energy conservation goals;
- To assist in establishing optimal standards for energy efficiency and building performance; and
- To ultimately define goals and offer guidance as energy plans are established.

Review of Responses

This report includes information about South Carolina's 85 public school districts, which, overall, reported $88.8 million in energy costs for 101.3 million square feet of space. For two school districts (Clarendon School District 3 and Chesterfield School District), historical information was used to estimate FY 2002 figures for use with aggregate data.

All of South Carolina's state agencies that own facilities (a total of 32) responded except for a Department of Transportation district section (historical data was used to estimate figures for this entity). Thirty-one agencies lease facilities and are unable to provide separate energy consumption data. Energy data for some of the leased facilities are included with information from the Office of General Services, which operates many of the state buildings in Columbia. Energy data for leased facilities outside of the Office of General Services are not included in this report. The data for the 31 state agencies located in state-owned buildings comprises over 24.7 million square feet of building space and $33.1 million in energy costs.

Because dormitories have unique energy use characteristics, public colleges are divided into two groups depending upon whether or not they offer housing: colleges with housing (mainly four-year colleges), numbering 12; and colleges without housing (mainly technical colleges), numbering 21. The public colleges submitted data totaling $46.2 million in energy costs and representing 35.4 million square feet of space. Historical data was used to estimate energy cost and consumption figures for Denmark Technical College, which submitted incomplete energy data.

The State Energy Office will continue to request and gather energy consumption data from those entities which did not respond within the required timeframe. Although the State Energy Office is not a regulatory body, we will encourage those institutions that were unable to respond to submit their energy data reports as soon as they are available. This will allow the establishment of a more comprehensive and meaningful baseline of information.

Appendix B provides complete lists of responding and non-responding entities.

FINDINGS

Performance Indicators

Two performance measures are used in this report: energy cost per square foot and energy use per square foot.

The first indicator, annual energy cost per square foot, is widely used for comparison. The advantage of this measure is that energy costs can be readily identified and compared. However, this indicator accounts for differences due to energy prices as well as energy use.

The second performance indicator is annual energy use per square foot. By converting energy use to a standard measurement of British thermal units (Btu), a building owner may compare the energy efficiency of buildings using different energy sources. (A Btu is equal to the quantity of heat required to raise the temperature of one pound of water by one degree Fahrenheit.) This method also provides a comparative measure of performance that allows valid comparisons of energy use from year to year regardless of variations in energy costs and reductions or increases in building space.

Both performance indicators are calculated using adjusted figures that exclude data for some buildings, mainly those which are not heated and cooled, as well as buildings for which the primary energy expense is for outdoor lighting. Other structures omitted from the adjusted performance indicators include buildings for which no square footage was reported because this would skew the average energy cost per square foot and average energy use per square foot figures for all other buildings. Throughout this report, table footnotes specify when total or adjusted data have been used.

There is great variation among reporting entities. Some of the reasons for this variation include the following:

Age of buildings

Older buildings were often built with less concern for energy efficiency. Deterioration over the years and limited technology compound this effect.

Energy conservation measures

Many entities have implemented energy conservation plans, which include low-cost and no-cost methods of energy use reduction. Some have carried out extensive energy conservation retrofits.

Energy efficient design

Great strides have been made in recent decades to incorporate energy efficiency into building design. Many South Carolina public facilities reflect these advances.

Hours of operation

Some buildings are lightly used, while some are in use 24 hours a day. Some facilities, such as schools, are in use only nine or ten months of the year.

Building uses

Although many state-owned buildings are primarily office buildings, uses for state facilities vary greatly. Libraries, cafeterias, warehouses, laboratories, meeting facilities, prisons, maintenance garages and security buildings, for example, have widely varying energy needs.

Metering issues

Sometimes outside lights are metered to buildings. If the building is small and the outdoor lighting is extensive (e.g., parking areas), this can skew the per square foot figures for cost and use. In addition, there are cases where multiple buildings are served by one meter. This, too, can alter the square foot figures for cost and use.

High technology

Facilities housing large amounts of electronic equipment (including computers) will show high cost and usage results.

Fuel types

Different fuel sources entail different levels of expense. It may cost more to heat with electricity than with natural gas, for example, but natural gas use will yield higher Btu per square foot numbers. In some areas, electricity is the only choice available.

Fuel prices

Fuel prices can vary by region, utility, and size of purchaser.

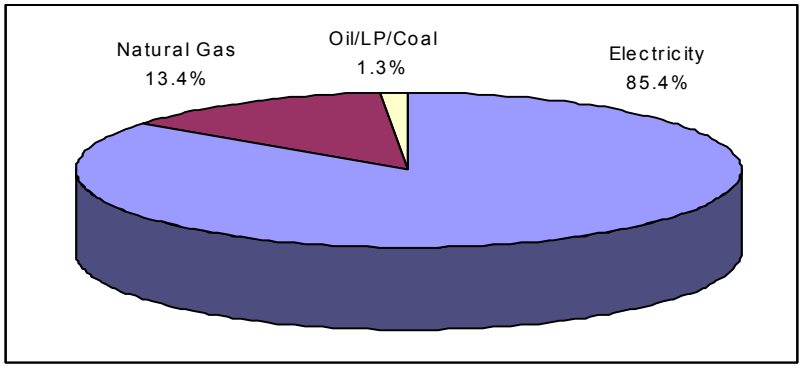
Climate

In the upper part of the state, air conditioning is needed considerably less than in the rest of the state. Conversely, this region is likely to need more winter heating.

Cost Overview

Electricity costs comprise 85.4 percent of the total public sector energy costs and natural gas accounts for 13.4 percent of the total cost for FY 2002. Figure 1 shows the energy expenditure breakdown by fuel source for South Carolina's public entities.

Figure 1. Energy Expenditures - FY 2002



As noted previously, respondents fall into several categories, which are reported and evaluated separately. The categories are as follows: public school districts; state agencies; colleges with housing; and colleges without housing. Table 1 presents a five-year comparison of the total expenditures for each of these categories.

Table 1. Five-year Comparison of Total Energy Expenditures, 1998-2002 (In millions)

Fiscal Year	School Districts	State Agencies	Colleges with Housing	Colleges without Housing	Totals
1997-98	$73.7	$31.3	$33.2	$7.1	$145.3
1998-99	$75.2	$32.5	$33.9	$7.2	$148.8
1999-00	$80.1	$32.7	$37.2	$7.8	$157.8
2000-01	$90.4	$36.8	$36.0	$8.6	$171.8
2001-02	$88.7	$33.1	$37.6	$8.6	$168.0

The expenditures by all categories of respondents on each energy source are shown in Table 2.

Table 2. Energy Expenditures (in millions of dollars) by Fuel Source - FY 2002

Fuel Source	School Districts	State Agencies	Colleges with Housing	Colleges without Housing	TOTALS
Electricity	$81.010	$26.213	$28.733	$7.506	$143.462
Natural Gas	$7.011	$5.977	$8.427	$1.099	$22.467
Fuel Oil	$0.117	$0.106	$0.042	$0.000	$0.298
Propane	$0.647	$0.784	$0.028	$0.001	$1.455
Coal	$0.000	$0.000	$0.382	$0.000	$0.382
Kerosene	$0.000	$0.002	$0.000	$0.000	$0.002
Total Expenditures	**$88.787**	**$33.083**	**$37.612**	**$8.606**	**$168.089**

As illustrated in Table 2, the largest energy expense in each category is for electricity. Public school districts and colleges without housing spend a larger proportion (91.3% and 87.2%, respectively) of their energy budgets on electricity than do colleges with housing and state agencies (76.4% and 79.2%, respectively). Natural Gas is the second most used fuel source, with fuel oil and propane expenditures comprising a small percentage for all categories.

Table 3 below indicates that public institutions in South Carolina face a wide range of energy costs, with school districts paying the highest prices. It also indicates that school districts have unit energy costs that are twice as much as that of colleges with housing.

Table 3. Average Unit Energy Costs - FY 2002[1]

Cost per Unit	School Districts	State Agencies	Colleges with Housing	Colleges without Housing	Overall Average
Electricity ($/kBtu)	$0.022	$0.017	$0.014	$0.018	$0.019
Electricity ($/kwh)	$0.076	$0.058	$0.048	$0.063	$0.065
Natural Gas ($/kBtu)	$0.009	$0.007	$0.005	$0.009	$0.007
Natural Gas ($/therm)	$0.865	$0.676	$0.524	$0.905	$0.662
Fuel Oil ($/kBtu)	$0.006	$0.005	$0.005	$0.000	$0.006
Fuel Oil ($/gallon)	$0.894	$0.687	$0.721	$0.000	$0.785
Propane ($/kBtu)	$0.011	$0.006	$0.012	$0.025	$0.008
Propane ($/gallon)	$0.980	$0.570	$1.066	$2.308	$0.709
Average for All Energy Sources ($/kBtu)	**$0.020**	**$0.013**	**$0.010**	**$0.016**	**$0.015**

[1] Coal was excluded from this particular comparison table because Clemson University is the only entity currently reporting the use of this fuel type. Clemson paid $61.86 per ton of coal and $0.002 per kBtu of coal in FY 2002. Also, kerosene is not included here because it is used only by two DOT maintenance shops.

School District Findings

A. Five-year Historical Trend

Table 4. Energy Statistics for South Carolina School Districts, 1998-2002

Fiscal Year	Square Feet (in millions)*	Total Energy Cost (in millions)*	Cost per Square Foot**	Total kBtu (in millions)*	kBtu per Square Foot**
1997-98	89.7	$73.7	$0.83	4,031.0	45.02
1998-99	91.9	$75.2	$0.82	4,085.9	45.07
1999-00	94.4	$80.1	$0.85	4,276.3	45.30
2000-01	98.0	$90.4	$0.92	4,675.9	48.15
2001-02	101.3	$88.8	$0.89	4,467.9	45.07

*Includes the total space, total cost and total usage reported,
**These numbers represent the adjusted cost per square foot and use (kBtu) per square foot. Non-heated and non-air conditioned structures have been omitted, as well as outdoor lighting cost and usage.

In fiscal year 2002, school districts saved an estimated $1.36 million as compared to fiscal year 1998 through greater energy efficiency (See Appendix D for savings methodology). As Table 4 above illustrates, a comparison of the energy performance measures of the school districts in South Carolina indicates there was an increase of 12.7 percent in the amount of square footage reported to the South Carolina Energy Office during the five-year period 1998 to 2002. It also shows an increase of 20.4 percent in the total energy cost and an increase of 10.8 percent in the total amount of energy used (kBtu) by the school districts for the same period. The school districts experienced an increase in the energy cost per square foot (7.2%) and an increase (0.1%) in the kBtu per square foot, the two most relevant measures of energy cost and usage.

B. Energy Use per Square Foot, FY 2002

Figure 2 shows that the annual energy use per square foot ranges from 30 to 50 kBtu for most public school districts in South Carolina for fiscal year 2002. The reported average annual kBtu (1,000 Btu) per square foot for public school districts is 45.07 kBtu per square foot (down 6.4% from FY 01).

Figure 2. School Districts, Energy Use per Square Foot, FY 2002[2]

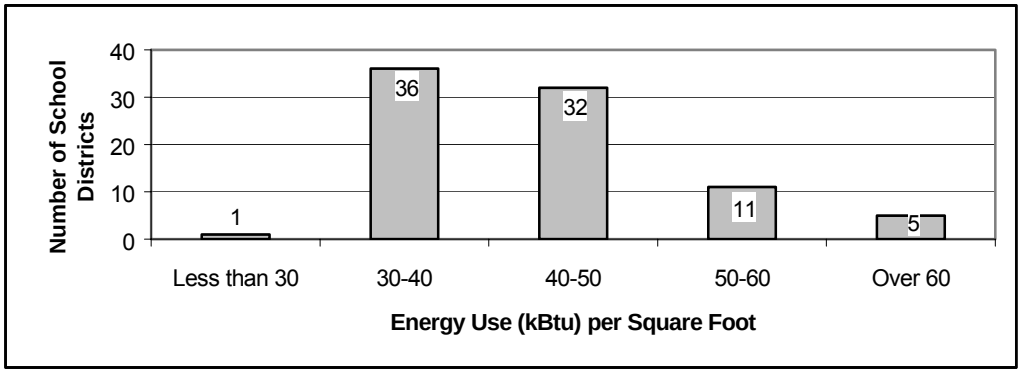


Table 5 identifies the ten school districts with the lowest energy use per square foot averages for FY 2002.

Table 5. School Districts, Lowest Energy Use per Square Foot, FY 2002

School District	Square Feet	KBtu/sf
Clarendon SD1	**234,503**	**27.90**
Anderson SD3	**296,251**	**30.48**
Sumter SD2	**1,305,213**	**30.85**
Dillon SD1	**143,802**	**31.29**
Lexington SD1	**2,587,035**	**31.34**
Lexington SD3	**468,719**	**31.79**
Florence SD3	**603,974**	**32.68**
Marlboro SD	**800,016**	**32.69**
Marion SD2	**330,255**	**33.27**
Dillon SD3	**183,584**	**33.42**

C. Cost per Square Foot

Figure 3 illustrates that the cost per square foot ranges from $0.60 to $1.00 for most public school districts. The reported average cost per square foot for South Carolina public school districts is $0.89 per square foot (down 3.3% from FY 01). The median cost per square foot is $0.88 as compared with the national median of $0.98 per square foot.[3]

[2] Historical data was used for Chesterfield School District and Clarendon School District 3, which did not submit their energy consumption reports for fiscal year 2002.
[3] *American School & University*. "M&O Cost Study," April 2002, pages 24-32.

Figure 3. School Districts, Average Energy Cost per Square Foot, FY 2002[4]

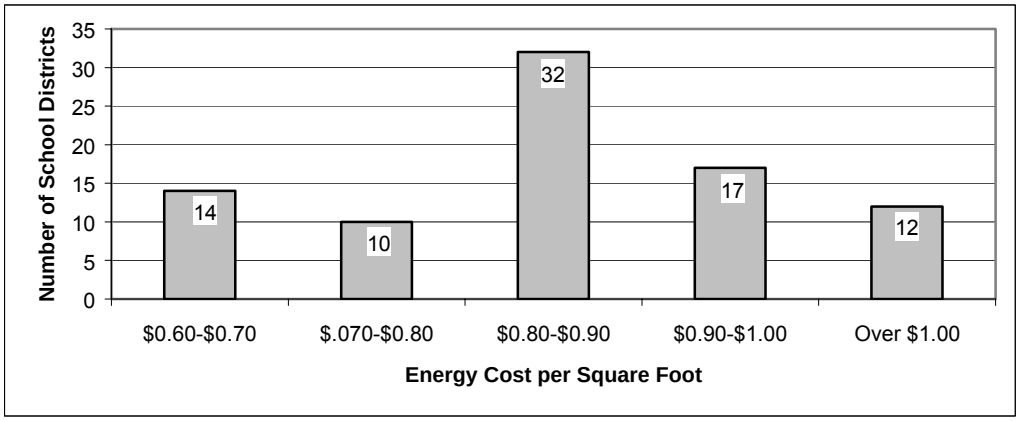


Table 6 shows the ten school districts with the lowest reported cost per square foot averages for FY 2002.

Table 6. School Districts, Lowest Energy Cost per Square Foot, FY 2002

School District	Square Feet	$/sf
Greenwood SD51	**275,477**	**$0.62**
Lexington SD1	**2,587,035**	**$0.64**
Anderson SD3	**296,251**	**$0.64**
Spartanburg SD5	**967,764**	**$0.66**
Anderson SD5	**1,601,747**	**$0.67**
Spartanburg SD3	**669,305**	**$0.67**
Orangeburg SD5	**1,15,295**	**$0.67**
Lexington SD3	**468.719**	**$0.67**
Anderson SD1	**960,169**	**$0.67**
Oconee SD	**2,044,999**	**$0.68**

[4] Historical data was used for Clarendon School District 3 and Chesterfield School District, which did not submit their energy consumption data for fiscal year 2002.

Cutting Energy Costs Can Have an Immediate Impact on a School District's Bottom Line

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SCHOOL DISTRICT IN THE SPOTLIGHT: DARLINGTON SCHOOL DISTRICT

After examining the building-by-building energy consumption report analysis provided by the Energy Office, Darlington School District applied for ConserFund loans for two projects in order to increase the energy efficiency of its school buildings. The first project involved installing a district-wide energy management system on all HVAC units, with an annual energy cost savings projection of $94,650. Heating, ventilating and cooling equipment typically is the greatest consumer of energy in any building. Now, students in Darlington School District have a comfortable environment, with moderate temperatures so they can focus on their studies instead of the climate, while the school district is reducing energy costs.

The second project, located at Hartsville High School, entailed replacing the full expanse of existing windows with energy efficient windows and closed off the remaining area with an insulated wall structure to decrease heating and cooling loads in order to reduce energy costs. Estimated energy cost savings from this project is $8,281.

In the U.S., energy use and utilities account for 34 percent of a school's maintenance and operations budget. With assistance from the Energy Office, Darlington School District will realize over $2 million in utility cost savings over the life-cycles of these two projects.

State Agency Findings

A. Five-year Historical Trend

Table 7 indicates that from 1998 to 2002, the total amount of square footage for South Carolina state agencies, as reported to the Energy Office, increased by 2.1 percent. During this same time period, the total energy cost for state agencies increased by 5.4 percent and the total kBtu consumed decreased by 12.0 percent. There was an increase in the energy cost per square foot, 2.2 percent, while the kBtu per square foot decreased by 13.7 percent during the five-year comparison study. State agencies realized an overall improvement in energy efficiency from FY 1998 to FY 2002 and saved an estimated $5.4 million in energy costs (See Appendix D).

Table 7. Energy Statistics for South Carolina State Agencies, 1998-2002

Fiscal Year	Square Feet (in millions)*	Total Energy Cost (in millions)*	Cost per Square Foot**	Total kBtu (in millions)*	kBtu per Square Foot**
1997-98	24.2	$31.3	$1.36	2,886.7	127.44
1998-99	24.6	$32.5	$1.38	2,844.2	119.14
1999-00	24.3	$32.7	$1.41	2,739.4	117.19
2000-01	24.4	$36.8	$1.61	2,787.9	121.66
2001-02	24.7	$33.1	$1.39	2,541.7	109.94

*Includes the total space, total cost and total usage reported.
**These numbers represent the adjusted cost per square foot and use (kBtu) per square foot. Non-heated and non-air conditioned structures have been omitted, as well as outdoor lighting cost and usage.

B. Fiscal year 2002 Findings

Due to the diverse nature and use of state agency facilities, comparison of their energy usage and expenditure patterns can be difficult. One important indicator that should be considered when evaluating the performance of state agencies is that a handful of state agencies manage the greatest amount of building space and pay a majority of the energy bills. The largest energy bills for state agencies were $10.0 million for 6.4 million square feet operated by the Department of Corrections, $5.4 million for 4.6 million square feet managed by the Office of General Services (Facilities Management and Statewide Building Services) and $3.8 million for 2.5 million square feet maintained by the Department of Mental Health. These three agencies account for 54.7 percent of the total square footage for all reporting state agencies and pay 58.0 percent of all reported state agency energy bills.

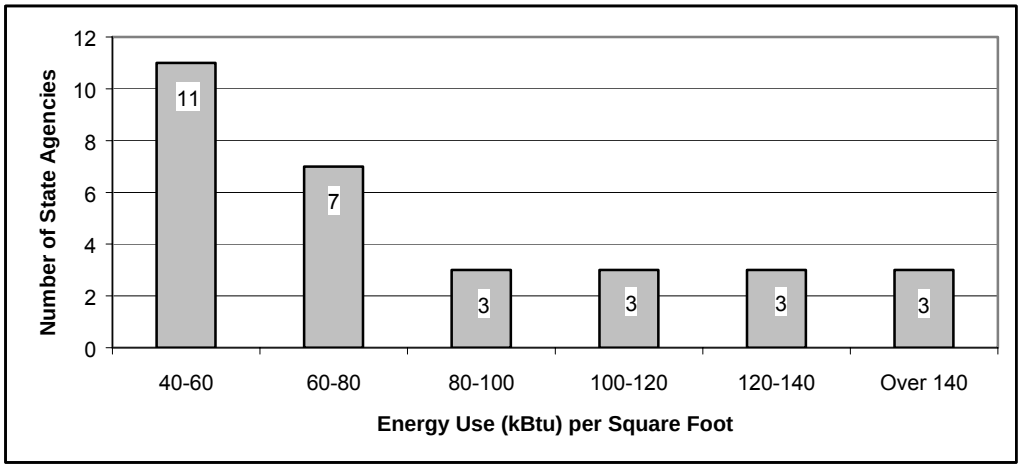
An additional consideration is that many buildings are reported not by the individual agencies using them, but by the State Budget and Control Board's Office of General Services, which manages them. Furthermore, some of those

agencies also have additional facilities which they manage themselves, and these are reported by the agency instead of General Services. As a result, it can be difficult to discern an individual agency's actual energy expenditures and use, and this problem is compounded by the existence of several joint-use facilities. Such a facility is the State Park Health Center, which is operated by DHEC, the Department of Corrections, and the Department of Mental Health.

C. Energy Use per Square Foot, FY 2002

Figure 4 indicates that for most state agencies, annual energy use ranges from 40 to 120 kBtu per square foot, with the overall average being 109.94 kBtu per square foot (down 9.6% from FY 01). The three agencies that use the most energy have averages ranging from 143.46 to 230.76 kBtu per square foot**,** which tend to skew the overall average upwards.

Figure 4. State Agencies, Energy Use per Square Foot, FY 2002[5]



There are a variety of reasons for high usage among some state agencies; most often it is due to heavy concentrations of electrical equipment, high water heating needs, and long hours of facility operation. The Department of Mental Health, the Department of Juvenile Justice and the Department of Corrections operate facilities on a 24-hour/7-day basis. This presents a challenge in comparing them with the other state agencies which operate on normal business hours.

In addition, agencies vary greatly in size. Table 8, which shows the state agencies with the lowest average annual energy use per square foot, also correlates somewhat with the variability in agency size.

[5] This chart includes 30 agencies; the data from Patriots Point Development Authority was not compatible with this study's measurement index methodology and therefore was not included in this survey. A second agency, Santee Cooper, was not included in the unit energy use analysis due to its status as a power provider. Historical data was used for a DOT district section which did not submit its energy data report for FY 2002.

Table 8. State Agencies, Lowest Energy Use per Square Foot, FY 2002

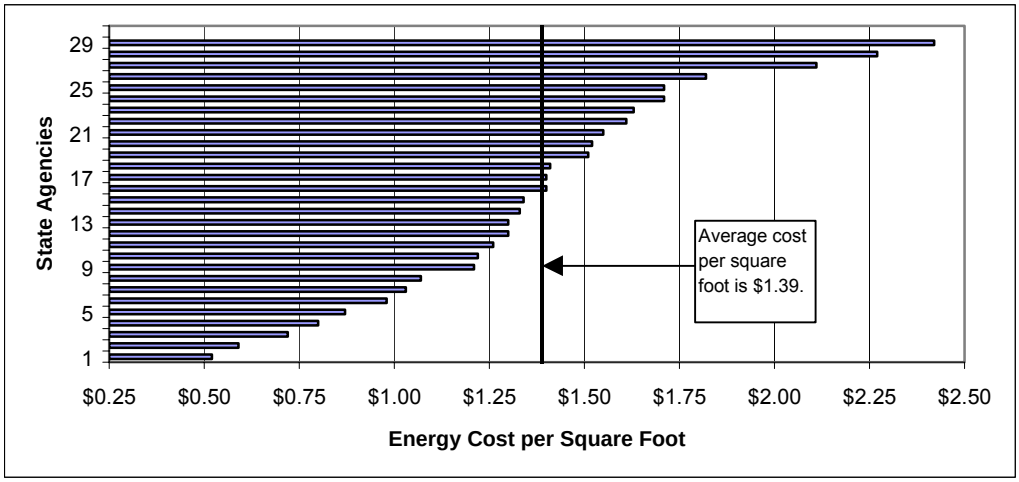
State Agency	Square Feet	kBtu/sf
SC Aeronautics Division	**26,700**	**42.51**
SC Sea Grant Consortium	**5,200**	**43.76**
SC Military Department	**1,582,291**	**45.58**
SC Department of Education	**215,106**	**47.57**
Wil Lou Gray Opportunity School*	**275,000**	**50.20**
SC Vocational Rehabilitation	**733,083**	**51.27**
SC Forestry Commission	**79,126**	**51.64**
SC Division of Public Railways	**14,400**	**53.65**
SC School for the Deaf & Blind	**320,589**	**54.99**
SC Dept. of Labor, Licensing & Regulation	**104,477**	**55.95**

*Indicates this entity submitted total energy use only, not building-by-building data.

D. Cost per Square Foot, FY 2002

For South Carolina state agencies, the average annual energy cost is $1.39 per square foot (down 13.7% from FY 01), with a median cost per square foot of $1.37. The leveling off of natural gas rates in 2002 contributed to the decrease in the average energy cost per square foot from FY 2001 to FY 2002.

Figure 5. State Agencies, Energy Cost per Square Foot, FY 2002[6]



[6] Includes 29 agencies; Patriots Point Development Authority was excluded since its data was incompatible with this study's measurement index methodology. A second agency, Santee Cooper, was not included in the unit energy cost analysis due to its status as a power provider. Because Santee Cooper is a provider, it does not pay for energy; including them at $0/sf would skew the overall averages. SLED, which had an average energy use per square foot of $3.85, also is not included in this chart.

Table 9 lists the ten South Carolina state agencies with the lowest average energy cost per square foot for fiscal year 2002.

Table 9. State Agencies, Lowest Energy Cost per Square Foot, FY 2002

Agency	Square Feet	$/sf
Wil Lou Gray Opportunity School*	**275,000**	**$0.52**
SC Division of Aeronautics	**26,700**	**$0.69**
SC Department of Education	**215,106**	**$0.72**
SC Military Department	**1,582,291**	**$0.80**
SC School for the Deaf & Blind	**320,589**	**$0.87**
SC Department of Public Safety	**191,590**	**$0.98**
SC Vocational Rehabilitation	**733,083**	**$1.03**
SC Sea Grant Consortium	**5,280**	**$1.07**
SC Dept. of Labor, Licensing & Regulation	**104,477**	**$1.21**
SC Forestry Commission	**79,126**	**$1.22**

*Indicates this entity submitted total energy use only, not building-by-building data.

Lighting Upgrade Saves Money in Lean Budget Year

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STATE AGENCY IN THE SPOTLIGHT: SOUTH CAROLINA DEPARTMENT OF CORRECTIONS

Faced with aging buildings, shrinking operations budgets and deferred maintenance, facility and energy managers of South Carolina state-owned agencies are forced to make difficult choices on how to spend their limited budgets for facility maintenance and capital improvements. Often, energy efficiency improvements become a lower priority when funds are allocated. However, in May 2002, the South Carolina Department of Corrections secured a $42,500 ConserFund Loan agreement with the SC Energy Office to upgrade its administrative headquarters with T-8 lamps and electronic ballasts. For years, commercial lighting has been dominated by the common 1.5-inch diameter (T-12) cool-white fluorescent lamps and transformer-type magnetic ballasts. This older technology is fast becoming obsolete. High-efficiency 1-inch (T-8) lamps—teamed up with electronic ballasts—are setting new standards for low power consumption, low life-cycle cost and illumination that more closely resembles natural light.

The benefits of using the more energy efficient T-8 lamps in buildings results in electrical cost savings for lighting and conserves valuable resources. The T-8 lamps are rated at 32 watts; the older T-12 lamps were rated at 40 watts; this is a 20 percent energy savings. In addition, the new T-8 lamp provides a higher quality of illumination than the T-12 lamp it replaces. The 4-ft. T-8 fluorescent lamps use up to 20 percent fewer watts than standard T-12 lamps, saving approximately $12.80 in energy costs over the life of each lamp (8 cents per kWh). If used with an electronic ballast, as in the administration headquarters building, an additional 7-10 percent efficiency can be obtained. After consultation with the Energy Office, the T-8 retrofit project was implemented at the administration headquarters with a projected annual kWh reduction of 325,668. Although an upgrade to T-8s with electronic ballasts may have a higher initial cost, in the long run it will produce better light quality with the same amount of light, and significant energy savings over the T-12 lamps.

The good news for the Department of Corrections is that the ConserFund loan created a projected annual cost savings of $12,750, which exceeds the annual loan repayment.

Colleges with Housing Findings

A. Five-year Historical Trend

As shown in Table 10, the total square footage of colleges with housing in South Carolina increased by 3.7 percent during the period 1998 to 2002. The total energy cost during this period rose by 13.3 percent, and the total kBtu increased by 14.0 percent. The average cost per square foot during this period decreased by 3.2 percent, while the average kBtu per square foot fell by 10.9 percent. By implementing energy conservation measures, these colleges and universities saved an estimated $5.1 million in FY 2002 as compared with FY 1998 (See Appendix D).

Table 10. Energy Use Statistics for South Carolina Colleges with Housing, Fiscal Years 1998-2002

Fiscal Year	Square Feet (in millions)*	Total Energy Cost (in millions)*	Cost per Square Foot**	Total kBtu (in millions)*	KBtu per Square Foot**
1997-98	27.2	$33.2	$1.25	3,326.4	140.06
1998-99	27.6	$33.9	$1.23	3,792.7	138.46
1999-00	28.2	$37.2	$1.16	4,053.8	134.56
2000-01	28.0	$36.0	$1.23	3,901.7	127.15
2001-02	28.2	$37.6	$1.21	3,792.1	124.85

*Includes the total space, total cost and total usage reported.

**These numbers represent the adjusted cost per square foot and use (kBtu) per square foot. Non-heated and non-air conditioned structures have been omitted, as well as outdoor lighting cost and usage.

B. Fiscal year 2002 Findings

Colleges with housing, like state agencies, are a relatively disparate group. Three of the 12 institutions, Clemson University, the Medical University of South Carolina and the University of South Carolina (Columbia campus), comprise 64.2 percent of the total square footage and 68.4 percent of the total energy expenditure for this category. As a result, the average cost per square foot and the average use per square foot figures mostly reflect the average for these three institutions.

C. Energy Use (kBtu) per Square Foot, FY 2002

The colleges with housing category consists of four-year colleges and one two-year institution with on-campus housing (Denmark Technical College). Average energy use for colleges with housing is 124.85 kBtu per square foot (down 1.8 percent from FY 01). Figure 6 provides a comparative range of energy use per square foot for colleges with housing.

Figure 6. Colleges with Housing, Energy Use per Square Foot, FY 2002

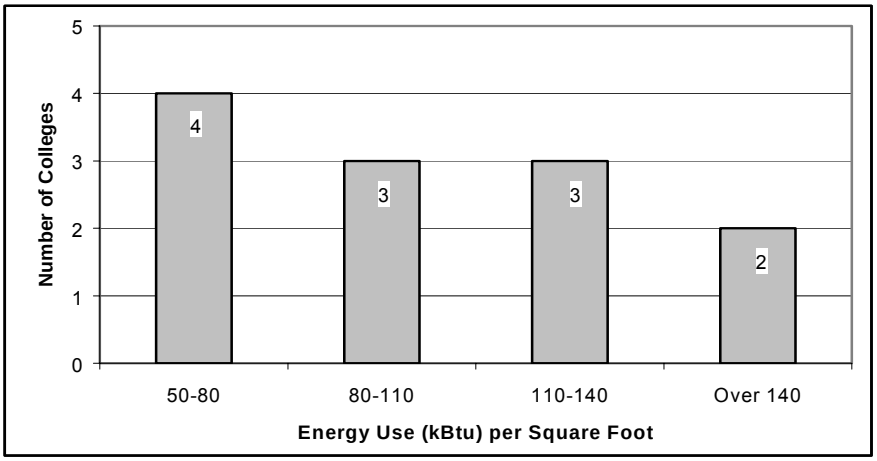

Table 11 shows the five colleges with housing that experienced the lowest energy use (kBtu) per square foot.

Table 11. Top Five Colleges with Housing, Lowest Energy Use per Square Foot, FY 2002

College/University	kBtu/sf
Francis Marion University	**53.12**
Coastal Carolina University	**56.01**
USC-Spartanbrug	**79.06**
Lander University	**80.68**
College of Charleston	**99.85**

D. Energy Cost per Square Foot

Annual average cost per square foot ranges widely for colleges with housing in South Carolina, but most of these institutions fall between $0.90 and $1.30, as indicated in Figure 7 on the next page. Average cost per square foot for colleges with housing is $1.21 per square foot (down 1.9 percent from FY 01). The median cost per square foot is $1.14, which is somewhat higher than the national median energy expenditures for four-year colleges of $0.99 per square foot.[7]

[7] *American School & University.* "College M&O Cost Study," April 2002, pages 50b-50j.

Figure 7. Colleges with Housing, Energy Cost per Square Foot, FY 2002

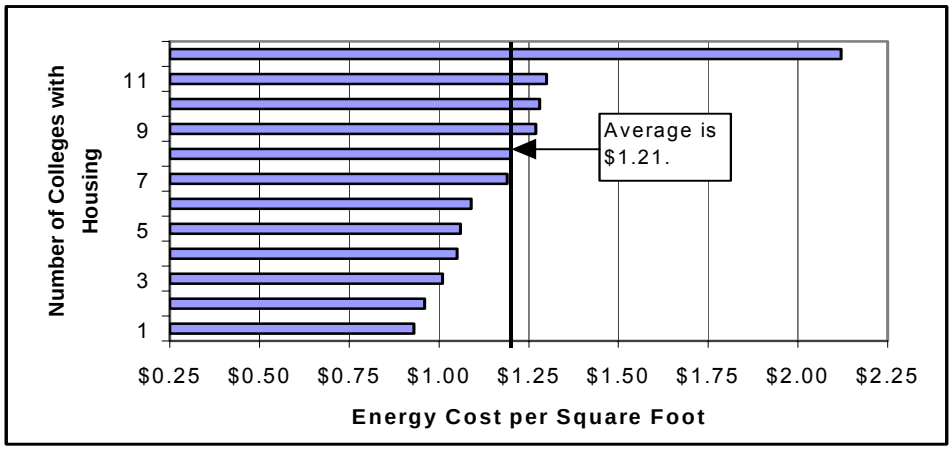

Table 12 highlights the five colleges with housing that have the lowest energy costs per square foot.

Table 12. Top Five Colleges with Housing, Lowest Energy Cost per Square Foot, FY 2002

College/University	$/sf
Francis Marion University	**$0.93**
Lander University	**$0.96**
Clemson University	**$1.01**
Winthrop University*	**$1.05**
Coastal Carolina University	**$1.06**

*Indicates this entity did not submit building-by-building data.

HVAC and Lighting Upgrades Result in Significant Energy Cost Savings

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UNIVERSITY IN THE SPOTLIGHT: LANDER UNIVERSITY

As the economy forces institutions of higher learning to squeeze their budgets, administrators have to be alert to money-saving opportunities. Campuses with aging, inefficient equipment can save thousands of dollars by upgrading their lighting fixtures, heating and cooling systems, and energy management controls. A case in point is Barratt Hall, a 24,000 square foot one-story structure built in 1967 on the campus of Lander University. Renovation of the building, which included extensive replacement of HVAC and lighting components, began in 1997 and was completed in the spring of 2000.

The original HVAC system was replaced with water source heat pumps, a heat exchanger, and cooling tower. Each unit was installed with unitary controllers to provide individual controlling and scheduling, and then was interfaced with an existing building control system. Energy-efficient fixtures with T-8 lamps and electronic ballasts replaced the existing fluorescent and incandescent lighting system.

Using energy consumption reports provided by the Energy Office and FASER energy management software, Lander University officials were able to determine the actual savings provided by the HVAC and lighting retrofits. The energy consumption reports indicated that the average annual utility cost for the three years prior to installation of the new equipment was $41,732. In the first year after implementation of the retrofits, the cost was reduced to $16,916. This presents an annual energy cost savings of $24,816, which translates into $496,320 in life-cycle savings. The reduction in annual energy costs is 59 percent. The energy cost savings allow for a payback period of 3.9 years to cover the materials cost of $96,369. Installation and engineering design were performed in-house, producing even more financial savings.

Colleges without Housing Findings

A. Five-year Historical Trend

South Carolina colleges without housing reported an increase of 18 percent in the amount of total square footage from 1998 to 2002. Table 13 indicates that during the same period, total energy cost increased by 21.1 percent, and total kBtu declined by 1.8 percent. The average energy cost per square foot decreased by 2.7 percent and the average kBtu per square foot fell by 6.1 percent. In FY 2002, these colleges saved an estimated $800,000 through energy efficiency improvements compared to FY 1998 (See Appendix D).

Table 13. Energy Use Statistics for South Carolina Colleges Without Housing, 1998-2002

Fiscal Year	Square Feet (in millions)*	Total Energy Cost (in millions)*	Cost per Square Foot**	Total kBtu (in millions)*	kBtu per Square Foot**
1997-98	6.1	$7.1	$1.12	541.4	82.74
1998-99	6.3	$7.2	$1.11	478.2	71.30
1999-00	6.6	$7.8	$1.16	523.7	75.83
2000-01	6.9	$8.6	$1.24	547.7	79.03
2001-02	7.2	$8.6	$1.21	531.9	74.20

*Includes the total space, total cost and total usage reported.
**These numbers represent the adjusted cost per square foot and use (kBtu) per square foot. Non-heated and non-air conditioned structures have been omitted, as well as outdoor lighting cost and usage.

B. Energy Use (kBtu) per Square Foot, FY 2002

The average energy use for the 21 institutions is 74.2 kBtu per square foot (down 6.1 percent from FY 01).

Figure 8. Colleges without Housing, Energy Use per Square Foot, 2002

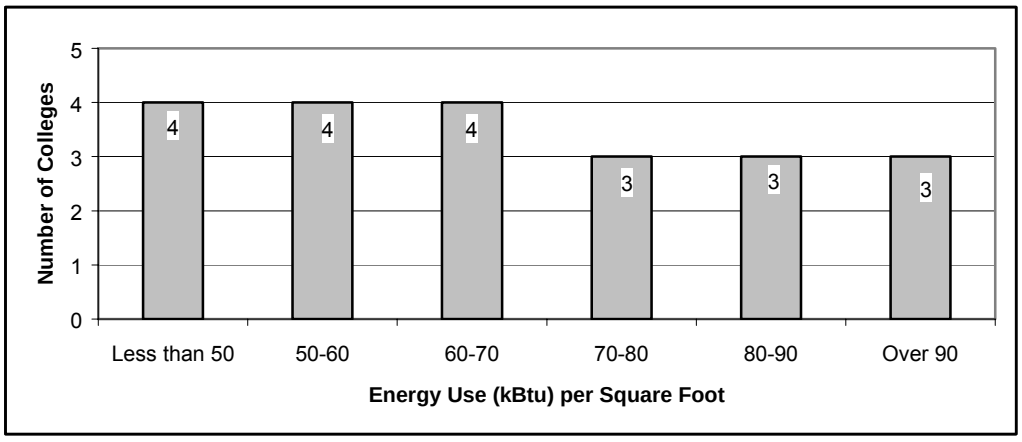


Table 14 shows the five colleges without housing that have the lowest energy use (kBtu) per square foot.

Table 14. Top Five Colleges without Housing, Lowest Energy Use per Square Foot, FY 2002

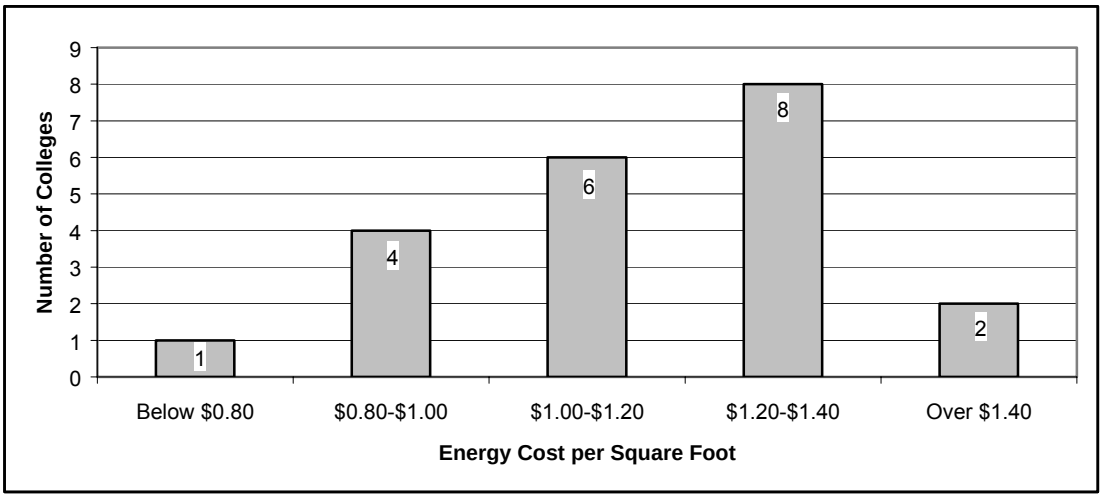
College	kBtu/sf
USC-Union	**35.11**
USC-Salkehatchie	**36.31**
Williamsburg Technical College*	**36.54**
Central Carolina Technical College	**46.06**
Orangeburg-Calhoun Technical College	**56.36**

*Indicates this entity submitted total energy use only, not building-by-building data.

C. Energy Cost per Square Foot, FY 2002

The average energy cost per square foot ranges from $0.80 to $1.40 for most colleges without housing. The average cost per square foot is $1.21 (down 2.7 percent from FY 01). The median cost per square foot is $1.18, which is $0.13 lower than the national median energy cost per square foot for two-year colleges of $1.31.[8]

Figure 9. Colleges without Housing, Energy Cost per Square Foot, FY 2002



[8] *American School and University.* "College M&O Cost Study," April 2002, pages 50b-50j.

Table 15 shows the five colleges without housing that have the lowest reported energy cost per square foot for fiscal year 2002.

Table 15. Top Five Colleges without Housing, Lowest Energy Cost per Square Foot, FY 2002

College	$/sf
USC-Union	**$0.66**
Spartanburg Technical College	**$0.87**
Orangeburg-Calhoun Technical College	**$0.87**
Williamsburg Technical College*	**$0.90**
USC-Salkehatchie	**$0.91**

*Indicates this entity submitted total energy use only, not building-by-building data.

CONCLUSION

In developing a report such as this, accuracy and detail of data are always critical issues. As data is received each fiscal year, comparisons are made to the data from previous years to identify inconsistencies, and correct any past or current data problems. With this increasingly accurate historical database, the South Carolina Energy Office is able to make detailed year-to-year comparisons among entire facilities as well as among individual buildings.

As an increasing number of state institutions assist us in our goal to obtain detailed, building-by-building energy data for every public facility in the state, our ability to analyze this data increases significantly. It is now possible to compare middle schools, high schools, portables, offices, classroom buildings, labs, etc. The ability to make more "apples-to-apples" comparisons increases the validity of the data and helps us identify patterns of high energy use and cost within certain types of facilities. When such patterns are identified, the Energy Office works with institutions to address problems and propose solutions.

Each public institution that participates in this study receives a customized written report that details its cost and use per square foot data and provides comparisons to the average for facilities in the same category. These comparisons are extremely effective in identifying institutions with unusually high energy usage and/or expenditures, which can then be cross-referenced against the detailed, building-by-building data (provided by most public entities) to locate specific problems. Once these problems are identified, the Energy Office can provide technical assistance through our Rebuild South Carolina program.

Through the Rebuild South Carolina program, energy technicians perform energy audits of the facilities to locate problems. Once identified, the auditors can propose solutions to these problems, such as lighting retrofits and improving the efficiency of HVAC systems. If institutions need assistance in order to finance such energy saving procedures, the Energy Office's ConserFund energy financing program can provide low-interest loans for the implementation of energy efficiency measures. Institutions are able to repay the loans from the cost savings achieved as a result of energy-efficient improvements.

Because of the need for accountability in government, it is increasingly important to be able to pinpoint the sources of all expenditures incurred within an institution. As reports such as this one reach the hands of our public officials, they can be an effective tool to identify potential dollar savings. As public needs necessitate government expenditure cutbacks, the response has frequently been to downsize, thereby eliminating jobs and services in many cases. However, the volume of potential dollar savings that can be realized through energy conservation within public institutions is tremendous. Information on potential cost savings can be extremely valuable, as it presents alternatives which will not only increase energy efficiency, but may also enhance program services.

This report summarizes the energy consumption and cost data submitted to the South Carolina Energy Office each fiscal year. This data helps convey to the public, to agency leaders, and to public facility managers the manner in which public facilities are consuming energy, and can serve as a methodological tool which will help them improve their performance. It is impossible to evaluate performance in energy efficiency without using standard measures. Presentation of these measures in an accurate and systematic manner has been, and will continue to be the primary purpose of this report.

APPENDIX A: LEGAL REQUIREMENTS

This report is mandated by the South Carolina Energy Conservation and Efficiency Act, Section 48-52-620 (E). The principal purposes of this report are twofold:

(1) To compile factual information on the current use and cost of energy for state agencies and public school districts; and
(2) To ensure that state government agencies establish comprehensive energy efficiency plans and become models for energy efficiency in South Carolina, and assist the Department of Education in achieving energy efficiency in public schools [Section 48-52-420 (9)].

The preparation of this report assists in accomplishing several other purposes important to energy conservation, namely:

(3) To ensure that internal governmental energy use patterns are consistent with the State's long range interests [Section 48-52-210 (B) (9)];
(4) To ensure that short-term energy decisions do not conflict with long range energy needs [Section 48-52-210 (B) (8)];
(5) To define baseline energy use measurements; and
(6) To assist in establishing standards for energy efficiency and building performance.

APPENDIX B: RESPONDING AND NON-RESPONDING ENTITIES

Note: Institutions in bold letters indicate they utilized the FASER energy accounting software program, which provides an extremely detailed breakdown of energy cost and usage. Thirty-one percent of institutions reported their energy data on FASER.

School Districts (32.9% reported on FASER):

Responding

Abbeville SD60
Aiken SD
Allendale SD
Anderson SD1
Anderson SD2
Anderson SD3
Anderson SD4
Anderson SD5
Bamberg SD1
Bamberg SD2
Barnwell SD19
Barnwell SD29
Barnwell SD45
Beaufort SD
Berkeley SD
Calhoun SD
Charleston SD
Cherokee SD
Chester SD
Clarendon SD1
Clarendon SD2
Colleton SD
Darlington SD
Dillon SD1
Dillon SD2
Dillon SD3
Dorchester SD2
Dorchester SD4
Edgefield SD
Fairfield SD
Florence SD1
Florence SD2
Florence SD3
Florence SD4
Florence SD5
Greenville SD
Greenwood SD50
Greenwood SD51
Greenwood SD52
Hampton SD1
Hampton SD2
Horry SD
Jasper SD
Kershaw SD
Lancaster SD
Laurens SD55
Laurens SD56
Lee SD
Lexington SD1
Lexington SD2
Lexington SD3
Lexington SD4
Lexington SD5
Marion SD1
Marion SD2
Marion SD7
Marlboro SD
McCormick SD
Newberry SD
Oconee SD
Orangeburg SD3
Orangeburg SD4
Orangeburg SD5
Pickens SD
Richland SD1
Richland SD2
Saluda SD
Spartanburg SD1
Spartanburg SD2
Spartanburg SD3
Spartanburg SD4
Spartanburg SD5
Spartanburg SD6
Spartanburg SD7
Sumter SD2
Sumter SD17
Union SD
Williamsburg SD
York SD1
York SD2
York/Rock Hill SD3
York SD4

Not Responding

Chesterfield SD
Clarendon SD3

State Agencies (30.0% reported on FASER)**:**

Responding

Aeronautics Div., Dept. of Commerce
Agriculture, Dept. of
Arts Commission
Corrections, Dept. of
Disabilities & Special Needs, Dept. of
Education, Dept. of
Educational Television, South Carolina
Employment Security Commission
Forestry Commission
General Services, Facilities Management
General Services, Statewide Building Services
Health and Environmental Control, Dept. of
John de la Howe School
Juvenile Justice, Dept. of
Labor, Licensing and Regulation, Dept. of
Mental Health, Dept. of
Military Dept. (Adjutant General)
Natural Resources, Dept. of
--Division of Wildlife and Fisheries
--Division of Marine Resources
Old Building Exchange Commission
Parks, Recreation and Tourism, Dept. of
Patriots Point Development Authority
Public Railways Div., Dept. of Commerce
Public Safety, Dept. of
Public Service Authority (Santee Cooper)
School for the Deaf & Blind
Sea Grant Consortium
State Fleet Management
State Law Enforcement Division
State Ports Authority
Transportation, Dept. of
--Headquarters and 6 DOT Districts
(DOT District 1 FASER User)
Vocational Rehabilitation Dept.
Wil Lou Gray Opportunity School

Not responding

Transportation, Dept. of (District 5)

Agencies listed below either lease space through the Office of General Services (and their energy use is therefore reported under General Services—Facilities Management or General Services—Statewide Building Services), or their utility bills are included in their lease payments to other entities (usually private landlords or local government), and they are thus unable to identify energy use.

Leased State Agency Facilities:

Accident Fund, State
Administrative Law Judge Division
Alcohol and Other Drug Abuse Services, Dept. of
Archives and History, Dept. of
Attorney General's Office
Board of Economic Advisors
Board of Financial Institutions
Commission on Higher Education
Confederate Relic Room & Museum
Consumer Affairs, Dept. of
Election Commission, State
Ethics Commission, State
Health and Human Services, Dept. of
Higher Education Tuition Grants Comm.
Housing Finance & Development Authority, State
Insurance, Dept. of
Legislative Audit Council
Legislative Council of the Gen. Assembly
Legislative Information Systems
Natural Resources--Land, Water & Conservation
Office of Appellate Defense
Office of the State Archaeologist
Probation, Parole and Pardon, Dept. of
Procurement Review Panel
Public Service Commission
Revenue, Dept. of
Second Injury Fund
Social Services, Dept. of
State Library
State Museum Commission

Human Affairs Commission

Colleges with Housing (33.3% reported on FASER)**:**

Responding

The Citadel
Clemson University
Coastal Carolina University
College of Charleston
Denmark Technical College*
Francis Marion University
Lander University
Medical University of South Carolina
South Carolina State University
University of South Carolina
USC-Spartanburg
Winthrop University

*Indicates this entity submitted incomplete energy data.

Colleges without Housing (23.8% reported on FASER)**:**

Responding

Aiken Technical College
Central Carolina Technical College
Florence-Darlington Technical College
Greenville Technical College
Horry-Georgetown Technical College
Midlands Technical College
Northeastern Technical College
Orangeburg-Calhoun Technical College
Piedmont Technical College
Spartanburg Technical College
Technical College of the Lowcountry
Tri-County Technical College
Trident Technical College
USC-Beaufort
USC-Lancaster
USC-Salkehatchie
USC-Sumter
USC-Aiken
USC-Union
Williamsburg Technical College
York Technical College

APPENDIX C: INFORMATION RECEIVED FROM RESPONDENTS

Energy Use/Type

Energy is needed for various purposes, including heating, cooling, ventilating, lighting (both interior and outdoor security lighting), water heating, and support equipment.

Information was requested on expenditures for, and consumption of, electricity, natural gas, propane, fuel oil, and coal. Monthly data was requested to allow analysis of trends and encourage state agencies and public school districts to review their consumption patterns on a monthly basis.

Building Size/Type

The South Carolina Energy Office is flexible in allowing respondents to submit the information in a format that is convenient to them. Submissions to the Energy Office are summarized in Table 11.

For most respondents, information is gathered on a building-by-building basis. The FASER energy accounting software used by many schools and agencies provides detailed building-by-building reports. For those using the energy data consumption form provided by the Energy Office, building-by-building details are solicited and provided in most cases. Some entities procure the services of performance contractors and auditors, which provide a somewhat less detailed building-by-building report.

Table 11. Data Received by Reporting Method and by Degree of Detail, FY 2002

	Building-by-building Detail[9]					
Category	FASER	Form	Contractor	Totals Only	Other/Not Reporting	TOTAL
School Districts	28	44	10	1	2	85
State Agencies	12	24	0	3	1	40*
Colleges with Housing	4	3	0	5	0	12
Colleges without Housing	5	12	1	3	0	21
TOTAL	**49**	**83**	**11**	**12**	**3**	**158**

[9] Building-by-building detail is the preferred method of reporting. Ninety percent of all entities reported in this manner.

* State agencies number 40 instead of 32 because two agencies are broken down into their constituent parts due to different reporting methods among the divisions. The Department of Transportation is treated in this table as eight separate agencies: a headquarters and seven regional offices. The Department of Natural Resources is treated as two agencies: the Wildlife Division and DNR-Charleston.

APPENDIX D: METHODOLOGY FOR ENERGY SAVINGS

The methodological approach used to determine the amount of energy savings for each category in this report (school districts, state agencies, colleges with housing, and colleges without housing) required adjusting the square footage and energy costs for each category.

Overall, there has been an improvement in the energy efficiency of South Carolina's public facilities since 1998. To estimate the cost savings for each category, the FY 1998 energy use per square foot was applied to the adjusted square footage for FY 2002. The resulting figure is a projection of FY 2002 kBtu (energy use) based on FY 1998 performance levels. Comparing the projected FY 2002 consumption with the actual consumption and applying the FY 2002 figures for cost per kBtu, the estimated cost savings is projected for each category.

Table 1 provides the total and adjusted energy data from which the energy savings are calculated.

Table 1. Adjusted Energy Data for Energy Savings, FY 2002

Institutions	Square Footage (in millions)		Energy Cost (in millions)		Adjusted Average $/Sq.Ft.	Adjusted Average kBtu/Sq.Ft.
	Total	Adjusted	Total	Adjusted		
School Districts	101.3	95.5	$88.8	$84.6	$0.89	45.07
State Agencies	24.7	20.5	$33.1	$28.5	$1.39	109.94
Colleges with Housing	28.2	26.4	$37.6	$31.8	$1.21	124.85
Colleges without Housing	7.2	7.0	$8.6	$8.4	$1.21	74.20
Totals	161.5	149.5	$168.1	$153.5	$1.03	69.45

Figures do not necessarily sum due to independent rounding.