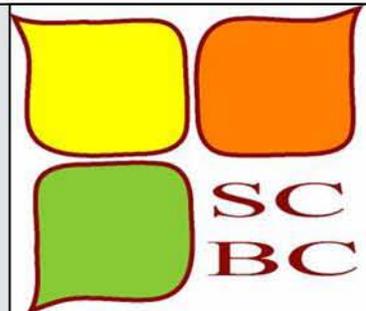




# Annual Report Fiscal Year 2006



Prepared for the  
South Carolina Energy Advisory Committee



## **Message from the Director**



Because we depend on energy so much, we often take it for granted. Only in times of emergency, such as the oil crisis in 1973 and the more recent impacts from Hurricanes Katrina and Rita, do we fully realize its importance and understand how susceptible our energy supply is to disruption by natural disasters and outside forces.

South Carolina spends almost \$18 billion annually on energy costs, some of which is the result of wasteful energy practices. Through conservation and better energy efficiency, this wasted money can be saved and put to more productive uses in our state's economy.

In addition, emissions from energy production, such as sulfur dioxide, nitrogen oxide, and carbon dioxide, often have adverse effects on our personal health, resulting in higher health care costs as well as causing serious harm to the environment. Energy conservation and use of renewable energy resources can reduce the harmful health and environmental effects of energy use. Conservation of energy also has positive economic benefits because money not spent on energy can be spent on other South Carolina goods and services. Renewable energy resources produced in South Carolina, such as wood waste, landfill gas and biodiesel, provide jobs and strengthen our state's economy.

To address these issues, the 1992 South Carolina Energy Conservation and Efficiency Act established the South Carolina Energy Office (SCEO) as a part of the State Budget and Control Board. The SCEO carries out the state policy and program mandates of the Act and also administers the State Energy Program funded by the US Department of Energy. Additionally, we carry out substantial functions related to radioactive waste disposal mandated by legislation passed by the General Assembly in 2000.

The 2005-2006 Annual Report summarizes some of the accomplishments of the South Carolina Energy Office in its mission to increase energy efficiency and diversity, enhance environmental quality and save energy dollars for South Carolina.

A handwritten signature in black ink that reads "John F. Clark". The signature is written in a cursive style.

John F. Clark  
Director, South Carolina Energy Office  
State Budget and Control Board

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# Annual Report for the South Carolina Energy Office 2005-2006

## Facilities

The South Carolina Energy Office (SCEO) promotes energy efficiency in government agencies and public schools by encouraging the adoption of programs and procedures designed to capture and measure energy use, analyze key energy data for the development and implementation of energy saving measures, and incorporate these improvements into a master energy plan. In addition, the SCEO provides energy audits or assessments, special grants, or low interest loans to encourage installation of energy efficient equipment or systems improvements in public facilities.

The three energy conservation loans issued in FY06 to the Office of the Adjutant General, South Carolina School for the Deaf and Blind, and Winthrop University are expected to generate over \$2.6 million in energy savings. The ConserFund loan program has 29 loans in its portfolio, and a total energy savings of nearly \$30 million is expected over the life of these projects.

SCEO has assisted borrowers in financing an array of energy conservation measures such as: implementation or upgrade of energy management and control systems; modification or installation of heating ventilation and air conditioning systems; lighting retrofits; light switch reconfigurations; replacement and installation of chillers; installation of air handlers and heat reclaim units; and other energy cost-savings improvements. As loans are repaid, the funds are recycled through a revolving loan fund and continue to finance new energy savings opportunities for taxpayer-supported facilities.

### ConserFund Loans FY99-06

- Charleston Area Regional Transit Authority
- Charles Lea Center, Spartanburg
- Cherokee County School District (2)
- Clemson University
- Darlington County School District (2)
- Greenville County
- Lexington School District Two
- Office of the Adjutant General
- Pickens County School District
- Piedmont Technical College
- SC Department of Corrections
- SC Division of General Services (4)
- SC School for the Deaf and Blind (4)
- Town of Ware Shoals
- Trident Technical College
- USC-Columbia (2)
- Winthrop University (3)
- Williamsburg Regional Hospital

### School Energy Efficiency Initiative Projects 2000-2006

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| Allendale County School District    | Greenwood County School District 51 |
| Bamberg County School District 1    | Hampton County School District 1    |
| Bamberg County School District 2    | Hampton County School District 2    |
| Barnwell County School District 45  | Lee County School District          |
| Clarendon County School District 2  | Lexington County School District 4  |
| Dillon County School District 1     | Marion County School District 1     |
| Dillon County School District 2     | Marion County School District 2     |
| Dillon County School District 3     | Marion County School District 7     |
| Dorchester County School District 2 | Orangeburg County School District 3 |
| Florence County School District 2   | Sumter County School District 2     |
| Florence County School District 3   | Sumter County School District 17    |
| Florence County School District 4   | Williamsburg County School District |

### School Energy Efficiency Improvement

**Grants:** This grant program assisted the state's poorest school districts with lighting efficiency retrofits and other energy efficiency improvements. Florence School District 2 completed the last grant project, which was an installation of energy efficient HVAC equipment and lights and ceilings at the Alternative/Adult Education School during the past year. Since 2000, 24 school districts received \$2.9 million for energy efficiency projects. Life cycle energy cost savings from these projects will total \$6.2

million. In addition to lowering school district operating costs, the projects improved the school learning environment through better lighting and more comfortable heating and cooling.

**Energy Accounting:** The SCEO and SchoolDude.com are working together to provide a Web-based energy accounting system to public entities in the State of South Carolina. Through SCEO's and SchoolDude's efforts, South Carolina is one of only a few states in the nation with a statewide, Web-based energy accounting system. This system, called Utility Direct, allows public entities to track their energy costs and usage. Public facility managers are able to monitor and analyze their utility expenditures in order to identify problems and savings opportunities. It also simplifies preparation of the required annual energy consumption reports, since the SCEO can access the utility data of participating public sector entities online. Through on-going support, organization of regional seminars and online demonstrations, the SCEO worked with 53 public entities, comprised of 31 school districts, 11 state agencies and 11 universities and colleges in this Web-based energy accounting system.

The *Thirteenth Annual Report on Energy Use in South Carolina's Public Facilities*, covering 156 school districts, state agencies and public colleges and universities, was published and distributed to respondents, along with individual analyses for each organization. This information provides baselines and measurements for taxpayer-funded entities to save energy dollars. In FY04, public facilities spent \$199 million on energy for 169 million square feet of building space. In comparison with FY98 per-square-foot consumption rates, this figure represents a savings of \$6.2 million through energy efficiency.

**Higher Education Rewards Program:** In FY05, the grants awarded through the Rewards for Higher Education Energy Efficiency Projects (RHEEEP) program totaled \$75,775 and were extended through FY06. These projects will significantly improve the energy efficiency of the college facilities, including:

- Trident Technical College installed occupancy sensors to control lighting in classrooms and restrooms in student buildings on all three campuses.
- Greenville Technical College installed occupancy sensors on HVAC equipment at the Buck Mickel Center and the University Center.
- The Medical University of South Carolina installed two 20hp variable frequency drives on cooling tower fan motors at the MUSC Hollings Cancer Center.
- Piedmont Technical College installed an Alerton DDC Control Monitoring System, submeters, and pulsars to interface with EMS, sensors, pieces of test equipment, and LED exit lights.
- USC upgraded five air handler unit controls at the Swearingen Engineering Facility.

**2000-2006  
RHEEEP Grants Implemented**

- Citadel (3)
- Greenville Technical College
- Lander University
- MUSC (3)
- Piedmont Technical College (2)
- Trident Technical College
- USC-Columbia
- USC-Upstate
- USC-Beaufort

**Technical Workshops:** The SCEO conducted two technical workshops for facility managers, engineers, and contractors on steam plant improvement, training 74 people from 36 private and public entities. In addition, SCEO staff coordinated two state facilities association conferences, through the Association of South Carolina Energy Managers (ASCEM), a professional development organization for public sector energy managers.



**CEM Training:** For the second consecutive year, the Association of South Carolina Energy Managers and the SCEO partnered to offer a classroom training program to prepare qualified energy managers for the Certified Energy Manager (CEM®) certification examination. The Association of Energy Engineers (AAE) certifies this nationally recognized credential. In FY06 six energy managers passed the CEM examination due in part to the training provided by the SCEO. The Certified Energy Manager (CEM®) credential is widely accepted and used as a measure of professional accomplishment within the energy management field. It is recognized by the

US Department of Energy and the Office of Federal Energy Management Programs (FEMP), as well as numerous state energy offices, major utilities, corporations and energy service companies.

**Leadership in Energy and Environmental Design Building Program:** The SCEO was an integral part in implementing the Leadership in Energy and Environmental Design (LEED) program throughout the state. Developed and implemented by the US Green Building Council (USGBC), LEED provides a framework for assessing building performance and meeting sustainability goals. The SCEO was also instrumental in the formation of the South Carolina Chapter of the US Green Building Council to promote LEED and green building design and construction in the state. SCEO staff provided guidance to the Board of Directors for the collection of the chapter dues, creation of the by-laws and strategic plan, and implementation of the organization's 501(c) (3) status. In FY06, there were eight LEED certified projects in South Carolina, 25 registered projects, and over 200 LEED-accredited professionals.



**EarthCraft Houses:** The SCEO continued its partnerships with the Home Builders Association of Greenville, Charleston Trident Home Builders Association, and Southface Energy Institute to pilot the EarthCraft House program for the Greenville and Charleston areas. In FY06 the partnership built 18 EarthCraft Houses and trained over 100 builders and other building industry professionals. Three leading builders in the lowcountry have made a commitment to build 80 percent of their homes to EarthCraft House standards, and a leading Upstate builder has committed to building 100 percent of his houses to EarthCraft standards. One EarthCraft builder training was conducted this year for Crescent Resources, LLC a lowcountry development at Palmetto Bluffs, a large upscale residential project between Charleston and Savannah. The success of the EarthCraft House program in

Charleston and Greenville has led to participation by developers and builders in Hilton Head, Bluffton, and other parts of the state.

**Energy Audits:** SCEO provided Level II energy audits for one public school district, one state agency, and one industrial facility. Level II energy audits are walk-through energy assessments of building energy costs and efficiency, which identify recommendations for savings, cost analysis, and any operation and maintenance needs. Recommended measures for the three Level II audits would generate over \$200,000 in annual savings if implemented.

#### **FY06 Energy Audits**

- Calhoun County Schools-Sandy Run Elementary School, St. Matthews
- Cliffstar Corporation, Greer
- SC Department of Public Safety-Blythewood Facility, Buildings C & D, Blythewood

Additionally, FY06 implementation of audits conducted the previous year will provide annual savings of \$26,000 to the South Carolina National Guard, \$77,000 to the Wil Lou Gray Opportunity School, and \$143,000 to Greenville County.

**Industries of the Future (IOF):** Three Special Projects Grants have been awarded to the SCEO from the US Department of Energy (DOE) to promote energy efficiency in South Carolina industry through the Federal Industries of the Future program.

The first grant targeted South Carolina's metalcasting industry, a very high energy user. This grant was successfully completed through a partnership with the South Carolina Manufacturing Extension Partnership

(SCMEP), which performed detailed energy assessments of 34 metalcasters in South Carolina. The USDOE awarded \$178,425 and SCMEP contributed \$45,000 to fund the \$223,425 project. Production and process changes resulting from these energy assessments are expected to generate almost \$3 million in annual energy savings.

The second grant, scheduled to be completed by FY07, is helping South Carolina incorporate industrial best practices as defined and developed by USDOE. The USDOE awarded \$100,000 and SCMEP contributed \$45,000 to fund the \$145,000 project. SCMEP developed a Website ([www.scmep.org](http://www.scmep.org)) for South Carolina industry and provided energy assessment information and comparative review information to identify successful energy use practices. The annual SCMEP Energy Symposium in Columbia in FY07 will provide more information and a forum for state industry representatives.

The final grant, a \$91,000 USDOE Special Project Grant, was awarded to the SCEO in partnership with SCMEP to implement energy efficiency initiatives for South Carolina's largest industrial energy users. SCMEP contributed an additional \$64,400 for the grant to generate \$155,600 for the program. Fourteen of the state's large energy users will be identified for application of USDOE tools, best practices, and other resources to create large energy use improvements. Additionally, the project will emphasize recycling and reuse of production by-products. The grant project intends to reduce energy consumption, limit impact on production output and develop energy efficient strategies which could be replicated industry-wide. Tools to accomplish these goals include energy assessments, comparative reviews, specialized technical assistance, and instruction on best practices for large-scale industrial energy efficiency.

The Industries of the Future (IOF) program and the SCEO/SCMEP partnership intends to help South Carolina businesses remain competitive both nationally and internationally through greater energy efficiency.

**Manufactured Housing Energy Efficiency:** Because of federal preemption, state and local governments are not allowed to impose residential energy code standards on manufactured housing. South Carolina has one of the highest percentages of new manufactured homes in the nation, and energy efficiency in these homes is critically important if the state is ever to achieve significant energy efficiency in the residential sector.

Unlike conventional homes, manufactured home buyers pay a sales tax on the purchase of new and used homes. In order to encourage buyers to purchase energy efficient manufactured homes in South Carolina, the State offers a \$300 sales tax cap for manufactured homes meeting or exceeding energy efficiency standards specified in state law.

For new manufactured homes meeting these levels, the SCEO produces energy efficiency certification labels for dealers. In FY06, the SCEO distributed approximately 2,000 labels. Nearly 47,000 energy efficiency labels have been distributed since 1998, with the higher energy efficiency standards saving manufactured home owners over \$9 million annually compared to non-energy efficient homes. The SCEO maintains a database of all energy efficient manufactured housing labels issued, and offers additional energy-saving advice to interested home owners.

**Performance Contracting Grants:** The SCEO submitted two successful US Department of Energy (DOE) Special Project Grant applications for performance contracting.

The first grant award to the SCEO was \$46,425 to develop a report for public colleges and universities about the advantages and disadvantages of performance contracting. Six case studies are being developed on public institutions of higher education in the southeast region that have undertaken performance contracting projects, including The Citadel, University of South Carolina, and Winthrop University.

These case studies focus on key elements of the performance contracting process including: the preliminary planning phase; procurement and contract negotiation; project implementation; and monitoring and verification. A summary of the case studies will identify best practices, common problem areas, and lessons learned. These studies will be presented throughout the state and nationally.

The second DOE grant provided \$98,000 for a partnership with the National Association of Energy Service Companies (NAESCO) to help public buildings reduce energy consumption in two steps: (1) through a NAESCO analysis of successful public building programs; and (2) through a NAESCO certification for state energy office staff. NAESCO is developing and will deliver a training program for state energy office staff and public facility managers to help certify employees as energy performance contract specialists.

**Utility Bill Analysis Program:** The SCEO, working with the State Procurement Office to establish a statewide term contract, has made utility bill analysis services readily available to state and local government units in South Carolina. Seven vendors met the contract solicitation criteria and have been placed on a Qualified Provider List (QPL) to provide analysis of energy and telecommunications bills.

Utility bill analysis is the systematic and thorough review of an organization's utility bills to find billing errors or misapplied rates and to obtain refunds of overcharges from the utility providers. The utility bill analyst also examines the organization's usage patterns and current utility rates to determine if alternative rates are available that would lower the organization's utility costs. The utility bill analyst assists the organization in negotiating with the utility provider to make account changes favorable to the organization.

A governmental unit may contract with any of the qualified vendors for energy utility bill analysis or telecommunications bill analysis or both types of analysis. There are no upfront fees; the contractor is compensated from utility bill refunds and cost savings. The state term contract information may be accessed at: <http://www.state.sc.us/mmo/solaward.htm> for review or download.

## Renewable Energy Resources

The South Carolina Energy Office (SCEO) promotes renewable energy and sustainable development practices throughout the state to offset and replace traditional methods of energy production and consumption in order to mitigate environmental degradation and to promote economic development. Many of the SCEO programs are highlighted in this section.



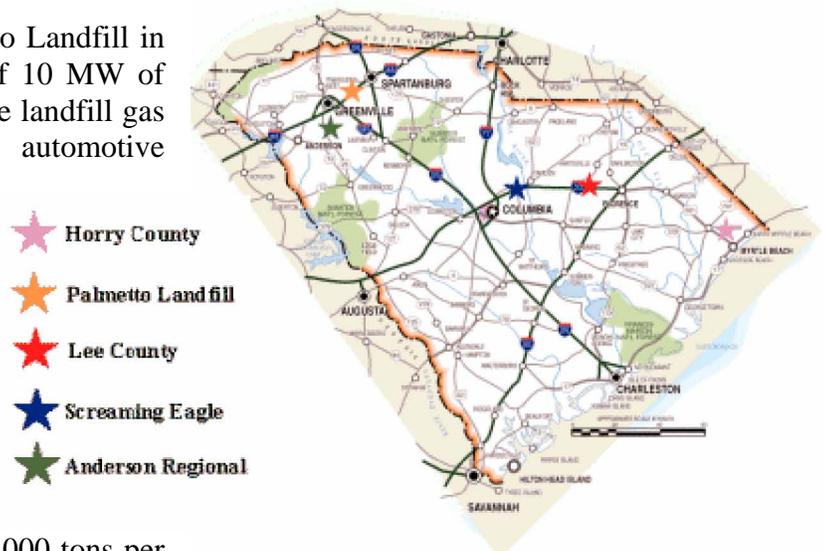
**Landfill Gas to Energy Projects:** Since 1999, the SCEO has partnered with the US Environmental Protection Agency's Landfill Methane Outreach Program (LMOP) to evaluate, reclaim and use landfill gas for energy in the state. Strong efforts on Landfill Gas to Energy (LFGTE) projects have resulted in significant energy and environmental benefits for South Carolina. The map below locates current landfill projects around the state.

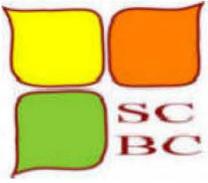
Santee Cooper has installed generating stations at Horry County Landfill near Conway which produce 3.3 MW of power and are expected to increase to 9 MW. A second facility located at Allied Waste's Lee County Landfill generates 5.4 MW of electricity and is expected to increase to 21 MW. In FY06, an energy project at Screaming Eagle Landfill in Richland County was completed. It is generating 5.5 MW of green power and is expected to increase to 11 MW. An energy facility at Anderson Regional Landfill will be completed in early FY07, generating 5.5 MW, eventually increasing to 13 MW. These facilities bring Santee Cooper's green power generation to a current total of 19.7 MW and a projected total of 54 MW. Three upcoming projects, including the Richland Northeast Landfill, Oak Ridge Landfill in Dorchester County, and the Hickory Hill Landfill in Jasper County, will bring the projected total to 71 MW by 2012.

The largest LFGTE project to date, the Palmetto Landfill in Spartanburg County produces the equivalent of 10 MW of electricity and will soon upgrade to 12 MW. The landfill gas produced at this site is sent to BMW's automotive manufacturing facility near Greer. The methane powers four turbines. BMW plans to retrofit the system in FY07 to supply 40 percent of the plant's electrical needs and 100 percent of thermal needs. BMW will be the first automotive manufacturing plant in the country to utilize landfill gas for its paint shop. The gas will fuel 23 oven burners and provide indirect heat for the area. This will greatly reduce the factory's reliance on natural gas and reduce carbon dioxide emissions by 17,000 tons per

year. Another South Carolina factory, JW Aluminum, announced plans in FY06 to build a smelting plant at the Berkeley County Landfill and derive most of its energy from landfill gas at the site. According to the US Environmental Protection Agency, this \$5 million project will be the first of its kind in the country.

At the end of the 2006 legislative session, the South Carolina General Assembly passed S.1245, which included a provision providing tax credits for manufacturers to use landfill gas. Beginning in FY07, a manufacturing facility can get 25 percent of the landfill gas energy equipment costs in a business income tax credit.





**Biomass Renewable Energy:** Working with two federal grants, the SCEO successfully completed a series of biomass projects. The first was to identify available biomass research in the state and compile data into a comprehensive report. The report, *Biomass Energy Potential in South Carolina: A Conspectus of Relevant Information*, was conducted on behalf of the US Department of Energy/Southeast Biomass State and Regional Partnership. The second grant was to establish a working group for biomass energy.

The South Carolina Biomass Council (SCBC) was established in April 2006 and council members were divided into five major working groups including: 1) Solid Biomass Fuels, 2) Gaseous Biomass Fuels, 3) Liquid Biomass Fuels, 4) Public Policy and Incentives, and 5) Bio-products Committee. Additionally, the SCEO developed and published a Website for the SCBC at <http://www.scbiomass.org>. The formation of the Strategic and Tactical Research on Energy Independence Commission (STREIC) by the South Carolina General Assembly in FY06 provided a forum to create incentives and overcome barriers for biomass energy. In FY07 STREIC will be staffed by the SCEO and advised by the SCBC. The SCEO continues to maintain an inventory of biomass energy users and resource producers in the state.

**Green Power:** The SCEO partnered with the South Carolina Office of Regulatory Staff, major electric utilities in the state, and the non-profit North Carolina Green Power to explore opportunities for expanding the existing North Carolina program into South Carolina. Consideration of opportunities continues into FY07. If successful, the effort will enable green power producers in South Carolina, including biomass energy producers and small solar photovoltaic systems, to sell power into South Carolina's electricity grid under attractive terms.

**Hydrogen:** The SCEO worked with South Carolina organizations to make South Carolina a hub of hydrogen fuel cell research and development. Many research institutions, businesses, universities, and governmental entities around the state explored opportunities for hydrogen technology.

Some of these entities include the Savannah River National Laboratory in Aiken, which has been a major part of the US Department of Energy's hydrogen research for the past 20 years and is believed to contain the largest concentration of hydrogen researchers in the country. A recent addition of the Center for Hydrogen Research

near Aiken provided over 60,000 square feet of lab space for the Savannah River National Laboratory and private partners to investigate hydrogen disciplines. The National Science Foundation Center for Fuel Cells (the only one of its kind in the nation) at the University of South Carolina in Columbia was established to help industry advance the technology and commercialization of fuel cells by performing pre-competitive research. Clemson University has incorporated hydrogen production and storage and automotive system integration into its International Center for Automotive Research (CU-ICAR). The South Carolina Hydrogen and Fuel Cell Alliance in Aiken, represents the statewide interests of South

Carolina universities and the National Laboratory. FuelCellSouth, based in Columbia, brings together fuel cell researchers, entrepreneurs, and existing businesses in an environment ready for the emerging hydrogen economy.

The Greater Columbia Fuel Cell Challenge was launched with the help of funding from the South Carolina Research Authority to create a plan to make the region a center for fuel cell use. EngenuitySC is a strategic leadership council designed to coordinate initiatives in Columbia for technologies such as hydrogen fuel cells and to work closely with the Fuel Cell Challenge. The SCEO continues to work with the Greater Columbia Fuel Cell Challenge, EngenuitySC, and FuelCellSouth on collaborative efforts and was asked to participate at the FuelCellSouth Exhibition in April 2006. The SCEO is also a partner with the South Carolina Hydrogen Fuel

Cell Alliance in preparations to host the National Hydrogen Association's 20<sup>th</sup> Annual Hydrogen Conference in 2009 at the Columbia Metropolitan Convention Center.

**Solar:** Solar energy is becoming increasingly popular in South Carolina due in part to the efforts of the SCEO and the South Carolina Solar Council, a creation of the SCEO. This past year, SCEO staff provided guidance to the SC Solar Council Board of Directors for creation of by-laws, a strategic plan, and the 501 (c) (3) designation.

In FY06, the SCEO worked with universities and builders to promote solar energy. With financial and technical assistance from the SCEO, the University of South Carolina – Aiken installed a solar water heating system at the Natatorium pool. The projected annual savings are \$19,000, which allow the project to pay for itself in less than four years. The SCEO designed a solar pools brochure using the USC-Aiken Natatorium as an example of the benefits of solar water heating – the most efficient way to use solar applications. The SCEO extended a \$1,000 rebate offer to builders incorporating solar water heating in an EarthCraft House.



Additionally, SCEO offered technical assistance to public and private entities to install solar projects and worked with builders and residential authorities to develop ‘solar-friendly’ covenants to benefit private residences. Finally, the SCEO continued to maintain a solar inventory of all known solar applications in the state, which currently total about 150.

In FY06, due in part to the input of the SCEO, the South Carolina General Assembly passed provisions for solar heating and cooling. South Carolina now allows an income tax credit up to 25 percent of solar installation and equipment costs for homes or businesses, up to \$3,500.

## Transportation

The transportation sector accounts for 25 percent of all energy used in South Carolina, 39 percent of energy expenditures, and 44 percent of the state's air pollution (53 percent of nitrous oxides, 24 percent of volatile organic compounds, 32 percent of carbon dioxide, and 70 percent of carbon monoxide). Use of alternative fuels not only improves air quality, but also develops markets for domestically produced fuels. Many of the transportation activities supported by the SCEO are included in this section.

**Palmetto State Clean Fuels Coalition:** The Palmetto State Clean Fuels Coalition (PSCFC) is a SCEO-sponsored group of public and private stakeholders. The PSCFC and its stakeholders continued to improve access to alternative fuels for the public by installing alternative fuels infrastructure and educating public and private sector fleet managers, the general public, fueling station owners, and government entities. In FY06 the SCEO partnered with the PSCFC for a DOE grant of \$20,000 to promote and encourage growth of alternative fuel infrastructure.

**Alternative Fuel Refueling Infrastructure:** E85 is an alternative fuel with a blend of 85 percent ethanol and 15 percent gasoline. In addition to ethanol's superior performance characteristic (octane=105), it burns more cleanly than gasoline, and is a completely renewable, domestic, environmentally-friendly fuel that enhances the nation's economy and energy independence. Vehicles with E85-compatibility are known as Flexible Fuel Vehicles (FFVs). These vehicles use both E85 and gasoline. DaimlerChrysler, Ford, GMC, Mazda, Mercury and Isuzu have all produced FFVs. In FY06, South Carolina had 36 publicly accessible E85 refueling stations, making it a national leader in public availability.

In FY06, 39 South Carolina stations sold biodiesel (commonly blended into B20). B20 consists of 20 percent biodiesel and 80 percent diesel, and is better for the environment because it has lower emissions compared to petroleum diesel. Any diesel vehicle can use B20 with minor compatibility improvements.

The SCEO continued work on previously-awarded DOE Special Projects grants, including: (1) the installation of an above-ground, 3,000-gallon ethanol storage tank at the University of South Carolina; (2) the retrofit of four 65,000 gallon tanks at United Energy's bulk storage facility in Aiken to store and dispense ethanol and biodiesel; and (3) the conversion of 11 South Carolina Schwann's home delivery service trucks to use propane.

In FY06 the SCEO received a \$25,000 federal grant to establish a government fleet ethanol fueling station in Rock Hill, in order to support the use of E85 by the City of Rock Hill, York County Natural Gas, the City of Clover, Palmetto State Clean Fuels Coalition and York Technical College. This installation is projected to be completed in early FY07.

**Biodiesel Production:** The SCEO completed the report, *An Assessment of the Restaurant Grease Collection and Rendering Industry in South Carolina*, and identified over eight million gallons of yellow grease (used cooking oil) that could be used for biodiesel production.

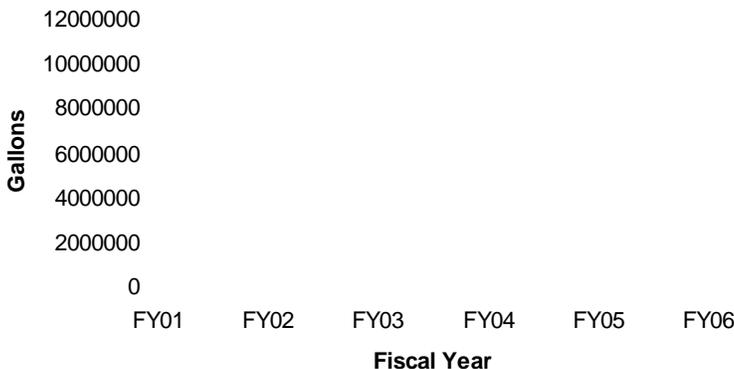
In FY06, a biodiesel facility in Taylors, Carolina Biofuels, initially produced 10 million gallons of biodiesel and will eventually produce 30 million gallons annually. The facility is using soy oil as a feedstock. Southeast Biodiesel announced plans to build a new biodiesel production facility that will use waste grease as its primary feedstock. The facility is located in North Charleston at the former Charleston Naval Base. Southeast Biodiesel began production in fall 2006. The plant will have an annual production capacity of two million gallons per shift. The facility will start with two shifts, and may increase to three shifts if demand for biodiesel increases.

The SCEO continues to offer support to these and other alternative fuel facilities interested or beginning to build production facilities in South Carolina.

**Alternative Fuel Vehicles:** In FY06, the SCEO was recognized in the July/August 2006 edition of the US Department of Energy's *Conservation Update Newsletter* for its continued efforts to promote alternative fuels. The SCEO and PSCFC organized events and promotions to increase public awareness of and demand for alternative fuels. In September 2005, the SCEO coordinated with the Governor's Office and General Motors (GM) for a one-year free lease of an E85-capable Chevy Avalanche. The SC Department of Agriculture used the vehicle as part of its fleet. This promotion was part of a campaign by GM and the Governors' Ethanol Coalition to increase the awareness of ethanol and flexible fuel vehicles. South Carolina Agriculture Commissioner Hugh Weathers promoted the brightly decorated E85 Avalanche in his day-to-day professional activities. A second Avalanche has been obtained for FY07, and now both the Department of Agriculture and the South Carolina Energy Office are driving E85 demonstration vehicles.



Alternative Fuel Usage FY01-06



In FY06, approximately 10.3 million gallons of alternative fuel were used throughout South Carolina. Of that amount, 9,800,000 gallons were ethanol, 396,000 were biodiesel and 53,000 were compressed natural gas. This is a five-fold increase from FY05. The increase can be attributed to the availability of publicly-accessible pumps, high gasoline prices, and increased public awareness of alternative fuels.

In October 2005, the SCEO and PSCFC joined more than 80 Clean Cities Coalitions across the nation to celebrate the displacement of more

than one billion gallons of petroleum. This milestone was reached by promoting alternative fuels, including ethanol, biodiesel, and compressed natural gas, as well as alternative fuel vehicles, hybrid electric vehicles, idle reduction applications, and fuel economy improvements.

In November 2005, the SCEO and PSCFC hosted a Biofuels Showcase at the Colonial Center in Columbia. The event featured speakers from the National Biodiesel Board, National Ethanol Vehicle Coalition, and FuelCellSouth. They educated participants on ethanol (E85), biodiesel (B20) and hydrogen alternative transportation fuels, and provided information. Fleet managers from Georgia Power and the City of Rock Hill shared their experiences with converting fleets to alternative fuels. The showcase also included a "Ride-and-Drive" event where attendees asked questions of GM, Ford, and DaimlerChrysler representatives, and then test drove ethanol and hybrid vehicles.

**Alternative Fuel Incentives:** The South Carolina legislature provided substantial support for alternative transportation fuels in its FY06 legislative session. Due in part to the efforts of the SCEO, South Carolina now offers a \$0.20 per gallon tax credit for production of biodiesel and ethanol. Additionally, producers of ethanol and biodiesel can claim a 25 percent tax credit for the purchase of eligible equipment. Dealers and retailers who purchase equipment to store and dispense biodiesel or ethanol are allowed a tax credit of 25 percent of the cost

of the eligible equipment. Retailers of biodiesel and ethanol are allowed to claim a state-funded rebate of \$0.05 per gallon of alternative fuel sold and pass that savings on to consumers. Finally, buyers of flexible fuel vehicles, plug-in hybrids or hydrogen fuel cell vehicles are entitled to \$300 sales tax rebates. Those who convert a hybrid to a plug-in hybrid can receive up to a \$500 sales tax rebate for equipment.

The South Carolina General Assembly also created the Strategic and Tactical Research on Energy Independence Commission (STREIC) to generate recommendations for current and potential renewable energy legislation aimed at reducing dependence on petroleum and enhancing state economic development. Serving on the seven-member commission are four legislative appointees (selected by the Speaker of the House, the Chair of the House Ways and Means Committee, the Speaker Pro Tempore of the Senate, and the Chair of the Senate Finance Committee), one Governor appointee, the Agriculture Commissioner, and the Director of the South Carolina Institute for Energy Studies, who serves as the chair of the commission. STREIC will be staffed by the SCEO and chaired by Dr. Nick Rigas. The commission must make recommendations to the governor and the General Assembly by January 15, 2007.

**Truck Stop Electrification:** The SCEO previously obtained a \$1.5 million competitive federal grant, with a cost share of \$1.9 million by IdleAire Technologies, to install an Advance Travel Center Electrification (ATE) station at three truck stop locations along I-85 in South Carolina, Georgia, and North Carolina.

Long-haul truckers traditionally idle their engines to heat or cool the cab during required rest periods. Extended idling adversely affects driver rest, engine maintenance, local air quality, and wastes fuel and energy. The SCEO partnership with IdleAire Technologies provides a solution for drivers who stop at the ATE Truck Stop on I-85, exit 63, in Spartanburg. IdleAire has equipped each of the 60 parking spaces with heating and cooling connections, electrical outlets and access to communication services. This ATE service provides benefits to the fleets, drivers, lot owners, and local communities.



The ATE solution is focused on the inherent problem that an idling diesel engine is a terribly inefficient source of energy for heating and cooling a truck cab. In winter as well as summer, 85 percent - 95 percent of the energy in diesel fuel is wasted as heat and atmospheric pollutants. The IdleAire system provides immediate, measurable, long-term air quality improvements, removing 100 percent of emissions associated with extended diesel idling. On average, truck diesel engines consume a gallon of fuel per hour of idling. As of June 2006, the 60 parking spaces at the ATE location in Spartanburg displaced an average of 5,178 gallons of diesel fuel per month while reducing carbon dioxide emissions by 54 metric tons. The project is expected to save 62,000 gallons of diesel fuel and reduce 648 metric tons of carbon dioxide annually. The total annual savings rate for all three ATE locations (SC, NC, GA) funded by this grant is 217,476 gallons of diesel fuel and 2,268 metric tons of carbon dioxide.

## Public Information

Distributing information is an integral part of achieving awareness and education in a community. The South Carolina Energy Office (SCEO) reaches a variety of audiences in the state through its Website, newsletter, marketing materials, information distributed through the news media, and participation at community events.



**SCEO Website:** Since its inception in 1997, the SCEO Website has provided information to the public on SCEO programs and educated consumers on how to save energy dollars. Due to the high cost of natural gas and gasoline, the Website continued to experience heavy traffic in FY06 with nearly one million hits. The popularity of the Website remains steady, attracting visitors from all 50 states and every continent. In FY06 the Website began undergoing a much needed “renovation.” In conjunction with the efforts of the State Budget and Control Board, the Website will receive a new look in FY07. Information will be more easily accessible and updated regularly. The Website will also meet state disability requirements so hearing and visually-impaired citizens of South Carolina can learn more about energy. The Website will continue to cover a

range of conservation, efficiency, renewable energy, education, data, and other energy-related topics. To access the SCEO Website, go to [www.energy.sc.gov](http://www.energy.sc.gov).

**Energy Data:** SCEO used its comprehensive energy model to conduct energy forecasts and comprehensive assessments of the opportunities and constraints for various types of energy production and usage within South Carolina.

**Utility Price Data Survey:** All electricity providers in the state were surveyed for industrial, commercial, and residential utility prices. Information was compiled and placed on the Website for consumers to compare utility costs and other data pertaining to the state’s 45 electricity retailers. The SCEO’s Website is the only comprehensive listing of South Carolina electric utility prices.

### Other Public Information Activities:

In FY06 the SCEO did the following:

- Participated in four America Recycles Day events, speaking to approximately 160 people.
- Answered nearly 400 information requests from the public.
- Distributed approximately 9,500 energy-related publications to citizens throughout the state.
- Talked to 1,150 people at 15 events about energy in South Carolina and various programs and services that the SCEO offers.
- Participated in a regional home show in Columbia to showcase energy-saving techniques and technology for the residential sector. The SCEO answered questions from many attendees, and distributed more than 1,500 pieces of literature.
- Participated in five Earth Day events, including airing of *Earth Today* and *Energy Tonight* statewide over South Carolina Educational Television.
- Participated in a WIS-TV special news segment devoted to energy.



*Action for a Cleaner Tomorrow  
School Districts in SC*



**Energy Education:** The SCEO facilitated the training of 194 teachers in energy lessons from the *Action for a Cleaner Tomorrow* curriculum. The teachers represented 47 school districts in 34 counties. 4,711 6<sup>th</sup> grade students enjoyed an hour-long, hands-on energy presentation in their classrooms. Students increased their knowledge of energy an average of 60 percent based on the differences between pre-test and post-test scores. In addition, the SCEO, in partnership with the South Carolina Department of Health and Environmental Control (DHEC), offered a free, full-day “Take Action Today” teacher workshop, in which nearly 200 teachers were instructed on alternative transportation fuels.

**SCEO Video Production Wins an Emmy:** “Energy Tonight” was named the winner of the 2006 Emmy in the Excellence in Television, Youth Programming category by the Academy of Television Arts and Sciences. Modeled after “Entertainment Tonight”, the program presents students as anchors and reporters in a fun, fast-paced news magazine that provides segments on radioactive waste disposal in our state, how landfill gas is being used to manufacture luxury cars, and a family’s home energy makeover. Supported by DHEC’s Office of Solid Waste Reduction and Recycling, Palmetto Landfill, US Environmental Protection Agency, US Department of Energy and Ameresco, the half-hour program, aired statewide via ETV/PBS on Earth Day, and nationwide in October for Energy Awareness Month.

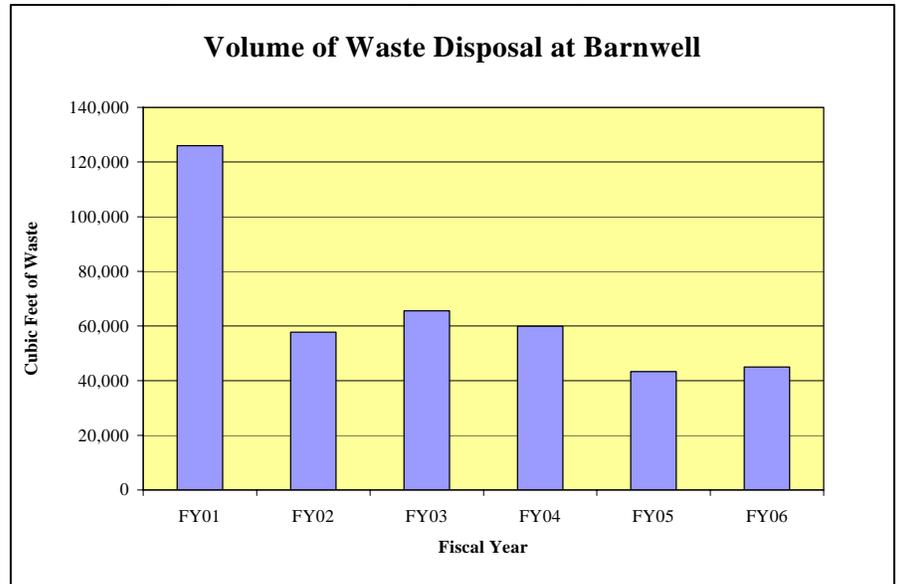


## Radioactive Waste Disposal Program

**Reducing Waste Volume While Maximizing Disposal Revenues:** The Radioactive Waste Disposal Program (RWDP) continued to reduce the volume of radioactive waste accepted at the Barnwell site in accordance with state law, while maximizing the dollars received for each shipment.

The volume of waste received at Barnwell each year has declined dramatically since the 1980s. The chart illustrates how the total amount of waste received at the disposal site has continued to decline since the passage of a new state law in 2000. After July 1, 2008, the disposal site will accept waste only from South Carolina, Connecticut, and New Jersey, which make up the Atlantic Compact.

Money received for radioactive waste disposal at the state-owned Barnwell facility is earmarked for higher education scholarships, school construction, Barnwell County needs, and for rebates to South Carolina companies that use the disposal site. Disposal revenues are highly dependent on an evolving waste processing and disposal market. RWDP staff recommends disposal rate schedules designed to achieve the highest revenues possible. In some cases, staff negotiates disposal rates directly with customers.



In FY06, state law allowed the acceptance of 45,000 cubic feet of waste at the Barnwell site, and 44,989 cubic feet of waste were received. As volumes have decreased, the SCEO has been successful in achieving higher revenues per cubic foot of space used, thus mitigating the financial effect of lower disposal volumes. Per-cubic-foot dollars billed to customers for disposal of waste at Barnwell have increased from an average of \$522 in FY01 to \$645 in FY06.

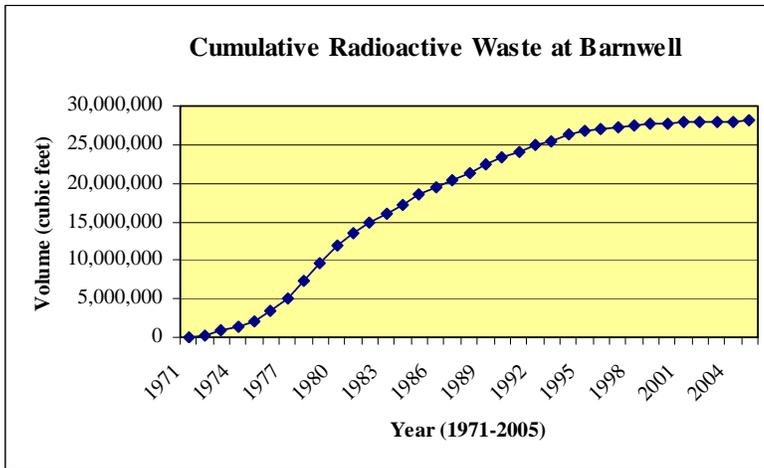
Customers using the Barnwell site were billed \$29 million for waste disposed in FY06. Of this amount, approximately \$17.1 million was required for facility operating costs and other obligations. Of the remaining \$11.9 million, \$2 million was transferred to Barnwell County government, and \$9.9 million was earmarked for the higher education scholarship fund and the public school building fund.

By the end of FY06, the RWDP had entered into disposal agreements with customers to reserve 54,000 cubic feet of the 75,000 cubic feet of disposal capacity available under state law for FY07 and FY08. This leaves 21,000 cubic feet of disposal capacity for Atlantic Compact regional generators, and generators outside the Atlantic compact region that do not have access agreements. Reserving disposal capacity at firm prices through multi-year commitments with customers reduces uncertainty in revenue projections from year to year and provides a buffer against fluctuations in the disposal market.

**Analyzing Facility Operating Costs:** In presenting its operating costs for FY06 to the Public Service Commission (PSC), the disposal facility operator used revised accounting categories that resulted from the report of a collaborative working group that had been initiated by the RWDP in 2003. The new method of

reporting operating costs divides them into fixed costs, variable costs and irregular costs. The classification of costs in this manner makes it easier to evaluate costs in each category and to identify fluctuations from one year to another. This simplification of the accounting categories has resulted in continued savings in litigation costs and improved communications among the parties to the PSC's allowable cost proceedings.

**Projecting Barnwell Extended Care Costs:** Once the Barnwell site closes, the State of South Carolina will be responsible for Barnwell's ongoing monitoring and maintenance. The RWDP oversees a special account where fees are deposited to cover these future costs. A consultant's report prepared for the RWDP in FY03 projected the State would need a balance of \$90.5 million as of July 1, 2007, in order to generate enough interest to cover all of the State's costs for taking care of the Barnwell site after it closes.



During State budget shortfalls in previous years, money was transferred from this account to cover other State spending needs, reducing the balance of the account to \$24 million. In the past two legislative sessions the General Assembly has restored funds to the Barnwell account, so that the balance of the fund at the end of FY07 should exceed \$115 million, well above the estimated amount needed.

**Supporting Barnwell County Economic Development:**

The Radioactive Waste Disposal Program worked with Barnwell County Council to prepare recommendations to the Budget and Control Board for disbursements from the Barnwell Economic Development Fund. The fund was established with an initial deposit of \$12 million from Connecticut and New Jersey as an incentive for South Carolina's membership in the Atlantic Compact. During the fiscal year, the Board approved disbursements of \$1.3 million toward development of a new library, airport terminal, and law enforcement center in Barnwell County.

**Calculating Rebates for South Carolina Customers:** For the sixth year, the RWDP worked closely with the Office of State Treasurer to calculate disposal rebates due to South Carolina customers of the Barnwell site. State law directs that South Carolina generators be eligible to receive rebates of 33.3 percent of any disposal fees paid, exclusive of certain taxes and surcharges included in the disposal fees.

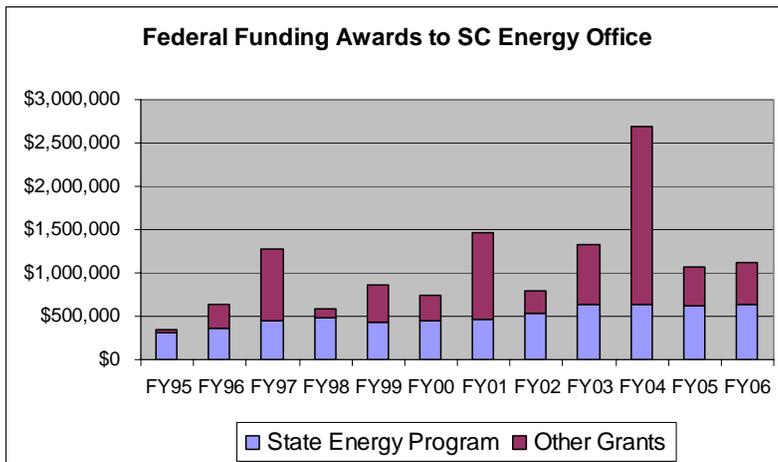
For FY06, eight South Carolina generators requested disposal rebates totaling \$350,000. The RWDP notified all generators regarding the availability of rebates, collected the rebate requests, deducted the excluded taxes and fees from the disposal fees, and provided a report to the Office of State Treasurer for issuance of the rebate funds.

**Supporting the Atlantic Compact Commission and the Governor's Nuclear Advisory Council:** The RWDP provided technical support to South Carolina's Commissioners on the Atlantic Compact Commission and maintained close communications with the Compact staff. The RWDP also provided staff support for the Governor's Nuclear Advisory Council, which met three times in FY06. The Atlantic Compact Commission also has a Website with up-to-date information. The Website is maintained in part by SCEO staff. The Website can be found at [www.atlanticcompact.org](http://www.atlanticcompact.org).

## Funding and Administration

The South Carolina Energy Office, a unit of the State Budget and Control Board, has a staff of 16 and a budget of \$2.6 million, derived from federal grant funds, federal petroleum violation trust funds, and fees from radioactive waste surcharges at the state-owned disposal facility near Barnwell. It also manages an \$8 million revolving loan fund. The SCEO receives no state appropriations.

**Federal Funding:** The SCEO received 11 federal grant awards in FY06 totaling \$1.1 million. These grant funds support energy efficiency programs for industry, state government, higher education, and schools. The grants also promote the use of renewable energy sources—solar, biomass, and alternative transportation fuels. The largest federal award was \$636,000 for implementation of the State Energy Program.



**Planning and Reporting:** Staff completed its annual process to update the SCEO Strategic Action Plan, develop and submit the annual State Energy Program Plan to the US Department of Energy, submit quarterly action reports to the US Department of Energy, and prepare the SCEO Annual Report on accomplishments during the previous fiscal year.

**Saving Measures:** The SCEO uses a federally-formulated metric process to track and measure energy savings over time for activities carried out by the SCEO. As displayed below, life cycle savings for selected public and private sector projects undertaken through FY06 totaled just under \$250 million.

| Life-Cycle Energy Savings from Selected SCEO Activities |                      |
|---|----------------------|
| <b>Public Sector</b>                                    |                      |
| State Government  | \$46,365,151         |
| School Districts  | \$20,490,370         |
| Local Government  | \$9,390,169          |
| Non-profit  | \$529,273            |
| Workshops (Government)                                  | \$13,718,504         |
| <b>Sub-Total</b>  | <b>\$90,286,308</b>  |
| <b>Private Sector</b>                                   |                      |
| Residential-Manufactured Housing                        | \$119,614,311        |
| Residential-Other                                       | \$587,280            |
| Industrial/Commercial TA/Audits                         | \$27,776,440         |
| Workshops (Industrial/Commercial)                       | \$5,635,153          |
| Education/Public Information                            | \$600,306            |
| Transportation  | \$2,945,685          |
| <b>Sub-Total</b>  | <b>\$157,159,175</b> |
| <b>TOTALS</b>   | <b>\$247,652,641</b> |