

Chapter 6: Public Sector

Providing the State's myriad of services is an energy intensive enterprise. In addition to the array of services North Carolinians expect to receive from their state governments, we have a diverse array of local governments each providing vital services to its citizens. From lighting our school buildings, to heating our hospitals, to fueling our police cruisers, North Carolina spends a significant amount of money each year on public sector energy bills. The best estimate available on overall energy expenditures by public sector entities is approximately \$500 million during FY 2000-01 (excluding the community college system for which data are not available).

North Carolina state government is the state's single largest employer, with over 123,000 full time equivalent employees delivering state services. The vast majority of these workers are located within the State's University System (37%), the State's prison system (15%), its hospitals (13%), and the Department of Transportation (10%). The remaining 25% are responsible for everything else State government does—from monitoring environmental regulations to staffing the State zoo. While a considerable number of state employees are located in North Carolina's capitol city, the majority resides across the state's system of 16 four-year and 59 two-year higher education institutions, the 76-prison units, the dozens of state hospitals, and the 100-plus DOT facilities. Essentially, state government's presence (and therefore its energy consumption) is everywhere across the state – literally from Manteo to Murphy.

How much energy is used by all the public entities in the State is a difficult question to answer. Only since 1997 have State government accounting systems allowed for a department by department reporting of what state government as a whole pays for different energy sources. This uncertainty is exacerbated by the dearth of information collected on local governments' energy consumption. Since each county pays its bills separately (including the energy bills of the community college system across the State) and each city and school district does as well, it is only possible to estimate total public sector energy costs or use for any particular time period. As will be detailed below, the one study on this topic sponsored by the North Carolina Association of County Commissioners, the North Carolina League of Municipalities, and the North Carolina School Board Association was not comprehensive and only covered one time period (FY 99-00).

Figure 6-1 displays the expenditures on different fuel types by state government during FY 96-97 through FY 00-01. The data indicate that the state government spent almost \$180 million on energy bills in 1997, a slight increase to \$187 million the next biennium, and then a large leap to over \$264 million four years later. This is a 46% increase over the three biennia, or an annual growth rate of approximately seven and a half percent per year, significantly outpacing the growth in population or the economy.

There are considerable expenditures devoted to gasoline and natural gas. Over the three reporting periods, electricity expenditures have risen at an accelerating pace from 6.6% from FY 97 to FY 99 to 8.8% from FY 99 to FY 01. Natural gas expenditures and gasoline expenditures have been

The best estimate available on overall energy expenditures by public sector entities is approximately \$500 million during FY 2000-01.

Figure 6-1: FY97 Energy Cost Profile for State Activities (Total = \$192 million)

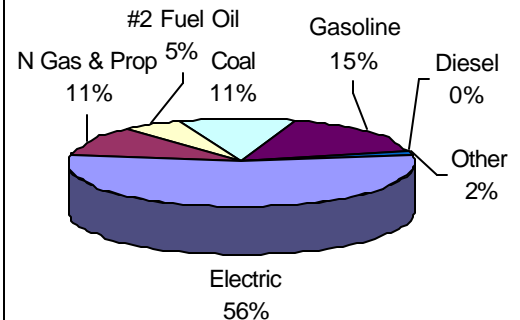
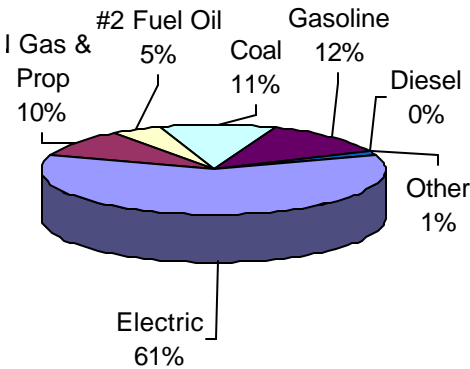


Figure 6-2: FY99 Energy Cost Profile for State Activities (Total = \$187 million)

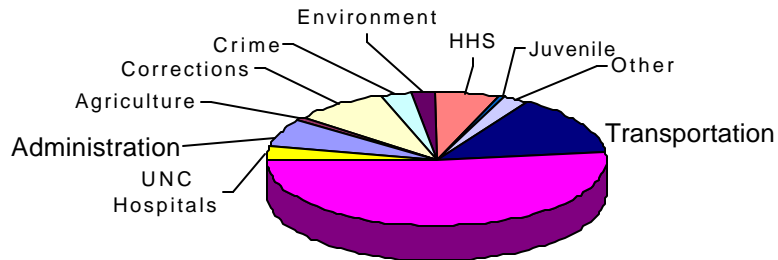


It is clear that the state government should make a concerted effort to monitor more closely its energy consumption. Without benchmark data on energy consumption and expenditures, efforts to evaluate the effectiveness of energy efficiency programs will be fruitless.

volatile – dropping from the first to the second reporting period and then exploding from the second to the last period. What accounts for these wild swings goes beyond the scope of this investigation but may include factors such as price and weather volatility. Unfortunately, data limitations prevent a more definitive statement on these trends since only three data points are available. However, *it is clear that the state government should make a concerted effort to monitor more closely its energy consumption. Without benchmark data on energy consumption and expenditures, efforts to evaluate the effectiveness of energy efficiency programs will be fruitless.*

Figure 6-3 displays the same information controlling for the type of state agency.

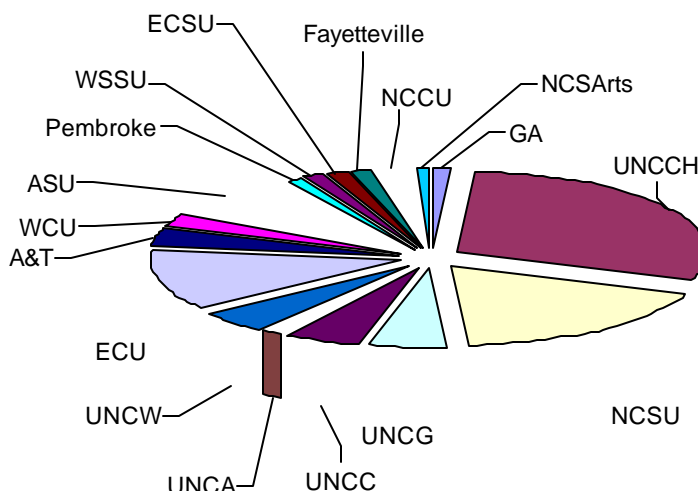
Figure 6-3: FY01 Breakdown of Energy Costs by State Agency (Total = \$239 million)



The data indicate that the University System is the largest consumer of energy dollars, with over half of expenditures devoted to the 16 institutions and their administration. Among the universities, UNC Chapel Hill and NCSU together consume approximately half of the total university expenditure, at \$40 million and \$24 million respectively. This does not include the UNC hospitals, which are reported under general government. If UNC hospitals were included in the University category, the increase would be a substantial one at \$7.5 million. Interestingly, the only reporting unit using any coal is UNC Chapel Hill, which spent a little over half of its energy bill (\$20.5 million) on coal purchases.

Looking to the future, with the passage of the Higher Education bonds in 2000 representing \$3.1 billion in additional buildings and renovations at the State's colleges and universities, the Higher Education share of energy expenditures will undoubtedly increase. Therefore, it is essential that these new buildings across our system of community colleges and universities be constructed with energy efficiency as a top priority. *State leaders took a positive step in that direction during the 2001 legislative session when the life-cycle cost analysis requirements for state buildings were enhanced by lowering the size standard for buildings subject to the requirement and more clearly defining procedures in undertaking the analysis. As these analyses are conducted, it is imperative that records be maintained to track the consequences of subjecting these new facilities to the newer life-cycle cost procedure.*

Figure 6-4: Energy Expenses by University



In the general government category three agencies dominate the expenditures, Transportation (\$34 million), Corrections (\$29 million), and Administration (state motor pool at \$17 million). To the extent that the State wishes to focus its attention on those areas that consume the lion's share of energy expenditures, policies targeted at those agencies would have the greatest impact.

Another significant public expenditure on energy is within the transportation area of state and local government. Issues associated with fuels, efficiency, and public transit affect the energy needs of the public sector. These issues will be discussed in the chapter on transportation.

Local Governments

During the 1999 to 2000 time period, the State's three most prominent local government groups joined forces to assess what they might do to reduce their energy expenditures. The North Carolina League of Municipalities, North Carolina Association of County Commissioners, and North Carolina Association of School Boards formed a collaborative association named LoGESO (Local Government Energy Savings Organization). LoGESO contracted with a nationally recognized public sector energy consulting firm (Public Energy Partners) to assess steps their respective constituents might do to conserve energy and to operate more efficiently.

Some of the findings of this investigation were as follows:

- ◆ There are 100 counties, 539 municipalities, and 117 school districts purchasing energy in the state.
- ◆ Annually, these jurisdictions spend over \$225 million on energy purchases.
- ◆ Current utility company rate structures "do not address the unique needs and load factors associated with most of the local government energy usage and requirements." Examples included excessive rates for street lighting, water pumping, and rates for

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- ◆ Fewer than 25% of potential energy efficiency opportunities had been realized in the pilot sites forming the focus of their study. This was due in part to the small size of most energy efficiency projects making them unattractive to contractors or energy service companies. Anything under \$100,000 would not attract competitive bids from established firms given the costs associated with assembling a bid.
- ◆ Few local jurisdictions tracked and reported energy use and expenditures. This made it difficult to manage their energy consumption.
- ◆ Based upon the consultant's experience elsewhere, North Carolina local governments could experience a 5-10% reduction in purchased energy with an aggressive energy reduction program. This would mean an estimated \$50 million in savings over a five year period.

Unfortunately, these projected savings are only estimations since no comprehensive data exist on the number of local government buildings (with the exception of schools), their size, energy bills, energy utilization, or energy source. Therefore, estimating the possible consequences of any particular strategy to reduce energy costs at the local government level is at best speculation. While certain initiatives hold the likelihood of reducing energy consumption across the State, precise estimates on energy savings across the 756 local jurisdictions are impossible without an accurate inventory of facilities. Therefore, ***the State Energy Office should take the lead in conducting a statewide inventory of each public facility owned or leased by county and municipal government including k-12 schools and community colleges.*** The net result of the inventory would be a calculation of average energy costs (\$) and/or energy used (kBtu) per square foot for each facility in order to establish a baseline against which future energy conservation measures could be measured. Whether this inventory should be accomplished through incentives or mandates is a policy choice. The State of South Carolina has mandated such reporting through statute, Section 48-52-620 (E), since 1992 and its Energy Office has reported energy consumption data annually since 1993 on all public facilities.

Public Schools

There are 117 individual school districts across the State with each responsible for paying its own energy bills. Within these districts reside 2112 individual schools enrolling 1.3 million students. Since the State's population has been growing over the past decades, the number of school facilities has also been growing in an effort to keep pace. For example, during the 1999-00 school year alone, over \$1.2 billion in capital outlay was budgeted for primary and secondary school expansions.

While data are not routinely kept to track energy use or expenditures across the 117 school districts, the NC Department of Public Instruction was able upon request to provide data for the years 2000 and 2001 on energy expenditures by type and source of funds. The data are depicted below.

As shown in Figure 6-5, during FY 2000 these 117 school districts reported spending \$152,468,807 in energy bills for their facilities (transportation expenses are not included here). The next year the public schools reported spending \$176,155,515. This represents an increase of 15.5% from one year to the next. Since the data are not available on actual energy consumption, it is not possible to determine if this increase was primarily due to changes in prices, weather, or consumption. Nonetheless, the growth in expenditures is notable. Given that local governments are providing 98% of the revenue to support this cost, this is a significant drain on local resources.

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Public Sector Policy Options

Given that one of the goals of the Energy Policy Council in developing a State Energy Plan is for the State government to lead by example in implementing energy conservation and renewable energy programs and given that the State and local governments are large energy users, it is important that the State take aggressive action to reduce its energy consumption profile and assist local governmental entities in doing the same. To that end, the Energy Policy Council recommends the following programs.

Mandatory Programs

Mandatory programs compel the public sector to improve the efficiency of new and existing public sector buildings and to allow the state to “lead by example”. The requirements, to be developed jointly by the State Energy Office, the Building Codes Council, and relevant agencies, will include the following:

- ◆ All new public buildings and renovations to existing buildings will exceed the state energy code by at least 30%.
- ◆ In addition to following the Life Cycle Cost Procedures already in place, designers of all new public buildings will provide estimates of energy consumption and energy bills for the building prior to construction – both total and per square foot energy costs. The per square foot estimates will allow for comparisons to other buildings constructed recently in the state to assess their relative efficiency.
- ◆ All state facilities with motors larger than 5 horsepower will develop a motor maintenance program.
- ◆ All public buildings are required to have a thorough energy audit performed within a ten year time frame. The audit should be available on file with the State Construction Office. If no recent audit exists, one must be completed within a year of the date this requirement takes effect.

Performance Contracting

A number of states have promoted the use of performance contracting to reduce energy bills in their public facilities. Performance contracts are a refinement of shared savings contracts with contract stipulations limiting the vendor’s reimbursement even if savings exceed expectations. Having

examined the viability of performance contracting procedures in place at the Federal government level and among numerous neighboring states, North Carolina's energy policy leaders are fashioning a performance contracting program through legislation that will:

- ◆ Authorize Agencies to utilize 12-year Installment (Lease) Purchase Contracts to finance comprehensive energy and water conservation performance contracts, after approval of the State Treasurer, the Office of State Budget, and the Council of State.
- ◆ Authorize Agencies to negotiate performance contracts, utilizing contract documents that have been pre-approved by the Department of Administration and State Treasurer's Office.
- ◆ Authorize the Department of Administration to approve contract proposals and designs.
- ◆ Authorize the Controller's Office to freeze the Agencies' utility allowances to enable them to service their contract-related debt.
- ◆ Provide incentive to Agencies by enabling them to finance the remediation of accumulated deferred maintenance with utilities funding that would otherwise have been expended on inefficient facilities.

Depending upon the eventual design of the program, the State Energy Office estimates energy cost savings between \$20 million to \$90 million a year in State government facilities alone. If local governments were to aggressively adopt a similar program, the energy savings would be even more substantial (perhaps double given the estimated ratio of local energy consumption to State government consumption).

Loans, Grants, and Incentives Programs

The State Energy Office should develop procedures that allow for the bundling of smaller scale energy efficiency projects from the State's numerous small towns and municipalities. Fewer than one in four identified energy efficiency projects are undertaken by local governments because, in part, they are too small to attract competitive bidders (LoGESO study of 2000). As part of this effort, the State could provide matching funds for local government energy efficiency projects. The LoGESO study pointed out that energy efficiency projects frequently get bumped down the list of other priorities faced by local governments. It would be wise for North Carolina to implement a financial incentive to raise energy efficiency on the list of priorities for local elected officials with consequent societal benefits to the citizens of the state.

One of the problems faced by local governments in addressing energy efficiency projects is access to capital. As pointed out in testimony before the Energy Policy Working Group, in the setting of priorities from year to year at the local government level, energy efficiency projects frequently get pushed down the list in favor of more immediate and pressing needs. To encourage local government officials to undertake projects that reduce energy consumption and save tax dollars, the State should expand its low-interest loan program targeted to energy efficiency projects undertaken by local authorities. In its design consideration should be given to financing

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arrangements wherein the savings accrued to the local government resulting from the projects be used to retire the loan and replenish the loan pool.

Training and Education Programs

The State Energy Office should facilitate the delivery of energy efficiency training to local government personnel, especially those responsible for the state's 2000+ school buildings. This could be accomplished by contracting the training through community colleges and technical institutes across the state. The State Energy Office will develop curriculum modules through the various construction management programs in the University system. They should also provide tuition abatement to facility services managers who avail themselves of the opportunity.

Local Building Designs

Local governments and local school systems often begin a new construction project with the use of stock plans. These designs may lack important energy efficient technologies, including upgraded insulation and window systems, daylighting systems, HVAC equipment and controls, and lighting systems. ***The State Energy Office needs to work with the North Carolina Department of Public Instruction to review existing stock plans. Then, the two agencies will determine how best to integrate improved, more efficient designs, possibly based on climatic zones within the state.*** Options include developing a set of specifications that emphasize efficient technologies, redrawing existing plans, or replacing designs with new and more efficient designs. Each set of plans will include an estimate of energy bills based on location and type of HVAC system.

Given the teaching opportunity a school building by itself provides, the Department of Public Instruction should encourage incorporation of renewable technologies into new and existing school buildings. The State Energy Office will provide energy-efficient design assistance, as well as matching funds for a certain number of demonstration projects each year that integrate technologies such as daylighting, solar, wind, and biomass into the school building so that it becomes a teaching resource.

Energy Data and Monitoring Program

The State Energy Office should establish a central repository for energy information. At a minimum, an energy data and analysis center should develop baseline information on energy consumption by state and local governmental entities. As part of this endeavor, and with the assistance of the NC Association of County Commissioners, the NC League of Municipalities, and the NC Association of School Boards, the State Energy Office will undertake a comprehensive energy inventory of all public facilities in the State. Every two years, the State Energy Office will conduct an assessment of energy use in public buildings to determine whether efficiency programs are having a significant impact on energy consumption. The results will be publicized statewide. Jurisdictions or school systems that have achieved the highest energy savings will receive special

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Working in conjunction with the State Construction Office, the State Energy Office should monitor, analyze, and report on the energy savings attributed to the new requirements on life-cycle cost analyses of the \$3.1 billion higher education building program currently underway across the State.