Comprehensive Program to Manage Energy, Water, and Other Utility Use for State Agencies and State Institutions of Higher Learning

A Report to

Governor Josh Stein

Pursuant to Executive Order No. 80, Section 8

And

The Joint Legislative Energy Policy Commission,

Joint Legislative Committee on Agriculture and Natural and Economic Resources, and the Fiscal Research Division

Pursuant to GS 143-64.12(j)

December 1, 2025

Prepared by:

North Carolina Department of Environmental Quality

State Energy Office

Utility Savings Initiative

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Preface:

This report contains the Department of Environmental Quality's status update to Governor Stein for the Comprehensive Energy, Water, and Utility Use Conservation Program pursuant to Executive Order No. 80, Section 8.

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List of Acronyms

Abbreviation	Definition
BAS	Building Automation System
Btu	British Thermal Unit
DEQ	Department of Environmental Quality (formerly DENR)
DHHS	Department of Health & Human Services
DIT	Department of Information Technology
DMVA	Department of Military & Veterans Affairs
DNCR	Department of Natural & Cultural Resources
DOA	Department of Administration
DOC	Department of Commerce
DOI	Department of Insurance
DOJ	Department of Justice
DOR	Department of Revenue
DOT	Department of Transportation
DPI	Department of Public Instruction
DPS	Department of Public Safety
ECM	Energy Conservation Measure
EO80	Executive Order 80
ESCO	Energy Service Company
EUI	Energy Use Intensity
FCAP	Facility Condition Assessment Program

Abbreviation	Definition
FY	Fiscal Year
GESC	Guaranteed Energy Savings Contract
GHG	Greenhouse Gas
GS	General Statute
Gsf	Gross Square Feet
HB	House Bill
HVAC	Heating, ventilation, & air conditioning
kW	Kilowatt
kWh	Kilowatt Hour
LED	Light Emitting Diode
LGC	Local Government Commission
MM	Million
$MTCO_{2e}$	Metric Tons of Carbon Dioxide Equivalent
NCCCS	North Carolina Community College System
OSBM	Office of State Budget & Management
SB	Senate Bill
SEO	State Energy Office
SL	Session Law
UNC	University of North Carolina
USI	Utility Savings Initiative

1.0 Executive Summary

North Carolina General Statute (GS) §143-64.12 requires the State Energy Office (SEO) to develop a comprehensive program to manage energy, water, and other utility use for state agencies and state institutions of higher learning. The statute requires all state-owned buildings to reduce energy usage intensity (EUI)[1] by 30% based on fiscal year (FY) 2002-03 levels by 2015. On October 29, 2018, Governor Cooper issued Executive Order No. 80 (EO80) which extends these energy saving goals and requires a 40% FY2002-03 EUI reduction by 2025.

As part of these mandates, the Utility Savings Initiative (USI) program within the SEO was founded to annually collect utility consumption reports from state agencies, University of North Carolina (UNC) System schools and affiliates, and community colleges. The data collected from these governmental units is utilized to generate a report that describes the Comprehensive Energy, Water, and Utility Use Conservation Program (i.e., the "Comprehensive Program") along with a summary of efficiency gains as required every odd numbered year by statute. Additionally, in accordance with EO80, an annual status update is required for each cabinet agency's utility consumption, costs, and progress in reducing energy consumption. The purpose of this report is to meet EO80 requirements by summarizing the collective progress of state-owned buildings towards the 40% EUI reduction goal. This report also includes recommendations for further actions that may be necessary to meet the EO80 goal for state-owned buildings. This report covers the progress for FY2024-25.

State-Owned Buildings Energy Use Intensity Reductions to Date

Accounting for all state-owned buildings includes utility consumption by cabinet agencies, other state agencies, and the University of North Carolina (UNC) System.[2] Collectively, for FY2024-25, all state-owned buildings attained an overall 28% reduction in EUI from the 2002-03 baseline. Without additional monetary investments to implement energy conservation measures, we are not on track to achieve the EO80 goal. Table 1 summarizes EUI reductions to date for cabinet agencies, other agencies, the UNC System, and the combined total for all state governmental units. A decrease in EUI from baseline correlates with increased energy efficiency. This data emphasizes that significant energy conservation measures and resources are needed by all state sectors in order to achieve the EO80 40% EUI reduction goal by 2025.

Table 1: State Government Buildings Energy Efficiency Gains (FY03-FY25)

Participant	Cabinet Agencies	Other Agencies	UNC System	State Governmental Units Total
Gross Square Footage % Change	29%	27%	68%	52%
Energy Usage Intensity (Btu/square foot) % Change	-33%	0%	-29%	-28%

According to the Department of Energy, "energy intensity is measured by the quantity of energy required per unit output or activity, so that using less energy to produce a product reduces the

[1] *Represents energy consumption per gross square foot (Btu/gsf)*
[2] *Excludes leased buildings whose utility bills are not paid by state governmental entities.*

intensity". Inversely, "energy efficiency improves when a given level of service is provided with reduced amounts of energy inputs or services are enhanced for a given amount of energy input."[3] Declines in energy intensity are often related to energy efficiency improvements.

Within state governmental units, the UNC System is a major contributor since they account for 73% of all energy consumed, 66% of the total gross square footage, and 71% of all utility spending. For FY2024-25, EUI for the UNC system decreased by 29% from baseline. Although the decline in energy consumption during FY2024–25 was less pronounced from baseline than in FY2023–24, overall usage remained elevated due to significant climatic extremes. December 2024 brought unusually cold conditions, with parts of North Carolina experiencing temperatures as low as 15°F and several locations setting new low-temperature records.[4] Conversely, the summer of 2025 ranked among the hottest on record, with a late-June heatwave affecting over 100 million people across 726 counties and pushing average U.S. temperatures 2.8°F above the 20th-century norm.[5] It is important to recognize that year-to-year comparisons with the baseline may not fully capture the effectiveness of the program, as annual results can be influenced by external factors such as weather variability and other conditions. Therefore, a more accurate measure of success lies in the cumulative lifetime avoided utility costs and the overall downward trend in energy consumption toward the 40% reduction goal. By these metrics, the UNC system continues to serve as the leading example among state agencies. Many UNC System constituents have designated full-time energy managers or energy management teams that consistently review bills, make energy retrofits, take advantage of federal or state funding opportunities, and plan for future initiatives. Such practices resulted in avoided utility costs of over $121 million for the UNC System alone in FY2024-25 while their gross square footage has increased by 68%. In addition, cumulatively, the UNC System has avoided $1.81 billion in utility costs since the Comprehensive Program began. Avoided utility costs represent the amount that would have been paid if energy efficiency retrofits or upgrades were not implemented. The UNC System makes up approximately 76% of avoided utility costs for FY2024-25 and sets an example for all state governmental units; therefore, the strategic energy plans of the highest performing UNC System schools should be assessed to obtain insight into additional energy efficiency projects that may be implemented.

The remaining totals for state governmental units consist of State agencies (both cabinet and other). Together, these agencies represent approximately 27% of state-building energy consumption, 34% of total state-owned square footage, and 29% of total state-owned utility spending. Since FY2002-03, agencies have avoided approximately $448 million in utility costs while their gross square footage has increased by 27%. Although both Cabinet and other agencies have seen increases in square footage, only Cabinet agencies have significantly reduced their Energy Use Intensity (EUI)—achieving a 33% reduction since FY2002-03. In contrast, other agencies showed no EUI reduction in FY2024-25 despite their growth in space. This shows that state agencies must improve their energy conservation efforts to make significant contributions to the EO80 goal that are relative to their size and energy usage levels. While smaller contributors, other agencies should achieve higher reductions since their conservation efforts still impact the collective state-owned building EUI. This report will

[3] *Energy Efficiency vs. Energy Intensity, Department of Energy https://www.energy.gov/eere/analysis/energy-efficiency-vs-energy-intensity*

[4] *NOAA Climate Prediction Center. (2024, November). U.S. Winter Outlook: December 2024–February 2025. National Oceanic and Atmospheric Administration. Retrieved from https://www.noaa.gov/news-release/us-winter-outlook-2024*

[5] *NOAA National Weather Service. (2025, July). Dangerous Heat Wave Grips Central and Eastern U.S. National Weather Service. Retrieved from https://www.weather.gov/news/072525-heatwave*

recommend definitive steps that these agencies can make to achieve greater reductions in energy usage and costs.

While USI has collected annual utility consumption and cost data from community colleges since FY2007-08, their progress is not included in state-owned building metrics since they are considered local governmental units. This should not devalue the need for their energy conservation efforts since community colleges represent over 31 million gross square feet and over $61 million in annual utility spending. Since their unique 2007-08 baseline, community colleges have achieved a 16% EUI reduction despite a 37% increase in square footage. In addition, they have cumulatively avoided over $44 million in utility costs through implemented energy conservation measures. To further environmental stewardship and management of local taxpayer dollars, USI recommends that community colleges replicate successful efforts from the UNC System to reduce utility consumption and costs.

Cost Savings and Air Pollution Benefits Related to Energy Conservation

While most energy efficiency projects require upfront initial investments, they are accompanied by energy savings and avoided costs in future years. Table 2 summarizes utility costs and avoided costs for cabinet agencies, other agencies, the UNC System, and a combined total for all state governmental units. Together these sectors spent $380 million on utilities which equates to over $1million dollars per day. The avoided costs of $159 million in FY24-25 helped reduce this cost significantly; avoided costs represent the amount of money that would have been utilized if the entity did not implement any energy efficiency retrofits or upgrades compared to the baseline. As the data shows, the Comprehensive Program has achieved $2.26 billion in savings for North Carolina taxpayers since the FY2002-03 baseline. Further investments in building efficiency improvements can result in additional utility savings for all state-owned buildings, while furthering the EO80 energy reduction goal. Actual savings may be higher due to rising fuel and electricity costs.

Additional cost savings for state agencies and universities often come from completing performance contract projects. One example is the Department of Adult Corrections (DAC) was approved for their $38.7 million performance contract with Schneider Electric in September 2023; the project is currently in construction, and its first performance year is expected to begin in FY2025-26. This Guaranteed Energy Savings Contract (GESPC) is expected to provide guaranteed savings of more than $60 million over the life of its twenty-year performance period.

Table 2: State Government Buildings Energy Costs and Savings (FY03-FY25)

Participant	Cabinet Agencies	Other Agencies	UNC System	State Governmental Units Total
Actual Utility Costs (FY25)	$103 Million	$8 Million	$270 Million	$380 Million
Avoided Utility Costs (FY25)	-$39 Million	$1 Million	-$121 Million	-$159 Million
Cumulative Avoided Utility Costs (FY03-FY25)	-$432 Million	-$16 Million	-$1.81 Billion	-$2.26 Billion

Energy efficiency improvements have also provided air pollution benefits by avoiding fuel combustion directly at the buildings or indirectly at central electric power plants.

FY2024-25 estimates show that the program avoided 1,066,665 metric tons of carbon dioxide equivalent ($MTCO_{2e}$)[6] in greenhouse gas (GHG) emissions for state governmental units (Figure 1A). Cumulatively since FY2002-03, approximately 12.3 million $MTCO_{2e}$ of GHGs have been avoided for state governmental units which is equivalent to annual CO_2 emissions from the electricity consumed in 2.56 million homes annually, or 3.2 coal-fired power plants in one year.[7]

[6] *$MTCO_{2e}$ is metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential. Carbon dioxide equivalents are commonly expressed as "metric tons of carbon dioxide equivalents ($MTCO_{2e}$)."*
[7] *EPA Greenhouse Gas Equivalencies Calculator; https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

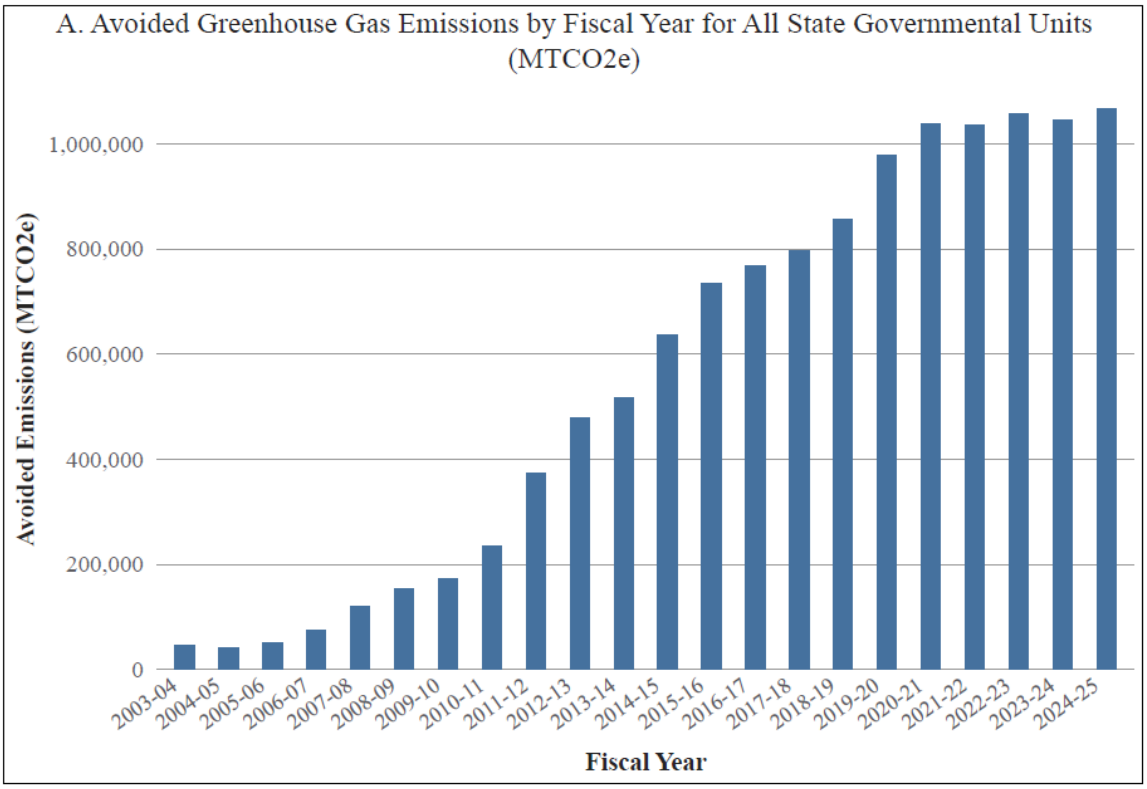
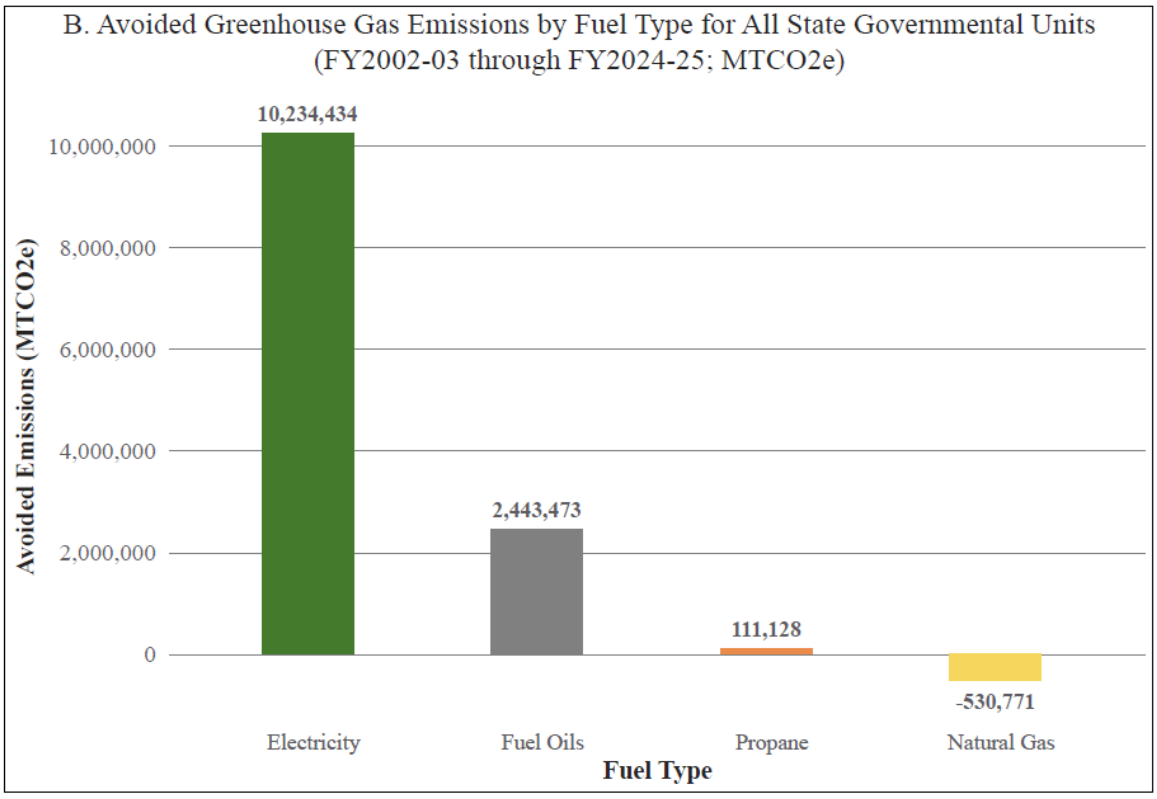


Figure 1: Avoided Greenhouse Gas Emissions for All State Governmental Units *($MTCO_{2e}$)* by (A) year and (B) fuel type.



Recommendations

USI consistently works with all government sectors to identify and suggest energy efficiency improvements. Some of these improvements are well-defined such as increasing building envelope insulation or converting to LED lighting, while other measures such as building controls and HVAC improvements are more complex and can be harder to gain support for implementation. Energy efficiency prioritization, reinforcement, and funding are needed to meet the energy reduction goal. A prudent step would be integrating the EO80 directive into statute to provide more legislative authority regarding this work. In addition, shifting the focus towards broad energy management concepts will help ensure energy efficiency becomes a cultural change with long-term commitments and results. This includes concepts such as the following:

- Offsetting competing energy priorities *(i.e., electric vehicle charging infrastructure vs. energy efficiency improvements)* with clean energy sources
- Designating full-time energy managers
- Investing in more sophisticated data collection, reporting, and analysis systems
- Considering alternative strategies for financing energy projects
- Utilizing Guaranteed Energy Savings Contracts
- Ensuring the content in utility management plans meets USI's best practices
- Establishing a mandate against purchasing non-LED lamps or fixtures (with exceptions incorporated, as needed)
- Installing motion-sensor LED lighting in high-traffic areas
- Conduct preventative maintenance checks on all motion-sensors including sinks, toilets, and lights
- Evaluating whether to opt in or out of electric utility rebate programs
- Evaluating whether to install rooftop solar, EV charging stations, or other on-site energy generation
- Applying for federal grant or stimulus funding opportunities
- Participating in performance contracting to complete energy efficiency projects

To understand how operational and cultural changes are effective and ensure that the EO80 goal is achievable, state agencies can employ several methods used by the UNC System to reduce energy intensity. The UNC System utilizes full-time energy managers, takes advantage of performance contracting, improves building controls, converts to LED lighting, looks for rebate and funding opportunities, and continuously implements both large and small energy efficiency measures. These same initiatives and strategies should be utilized by all governmental sectors wherever and whenever possible.

An example of the scope and savings that these types of Energy Conservation Measure (ECM) projects can yield is NC State University's ongoing GESC for a 'Combined heat and power co-generation installation at the Cates Plant, and installation of two (2) new packaged boilers at the Yarbrough Plant.' This effort is a 17-year amortized project that has a guaranteed savings of $103,005,060.00, is currently in year 12, and has yielded an annual savings of $8,931,133.00. Another illustration of the cost savings offered by ECMs is evident in a performance contract executed by the Department of Transportation (DOT) in 2021. This ongoing 15-year amortized project guarantees savings exceeding $51,000,000, with over $16 million in realized savings to

date. The contract generates a yearly return of over $3.2 million in guaranteed savings, covering a total of 122 buildings, 4485 fixtures, and more than 10,000 roadway fixtures.[8]

Another performance contract that would have had a positive impact on EUI reductions across the state was through the Department of Natural and Cultural Resources (DNCR). DNCR was working with Siemens to establish a performance contract at nine of their facilities across the state, however this contract was not approved during the last part of the review process in May 2024. If approved, this performance contract would have contributed towards reaching the EO80 40% EUI reduction goal this year and would have saved a total estimate of 35,806,418,472 BTUs across all 9 facilities over the lifetime of the project.

In summary, the EO80 goal can only be achieved with immediate investment and implementation of substantial energy efficiency improvements within the next fiscal year (i.e., FY2025-26) With rising energy costs and increasing demand, improving energy efficiency is more important than ever. Reducing energy use not only cuts operational expenses but also leads to compounded cost savings over time—helping agencies manage budgets more effectively and build long-term energy resilience. State governmental units should make the necessary changes to prioritize energy efficiency, enlist the support of leadership and designate energy managers, and explore all pathways to funding these critical improvements. The remainder of this report's narrative provides the following: significant changes from FY23-24's report; background on the USI program; reporting requirements; recommendations for state governmental units to reduce energy consumption; and the conclusion. Additionally, the appendices to this report contain: (A) detailed agency-specific energy performance data; (B) sources and assumptions used to calculate greenhouse gas offsets; (C) utility management plans; (D) the text of EO80; (E) statutory authority; and (F) suggested revisions to general law.

2.0 Background on the USI Program

In February 2002, North Carolina's governor issued an executive order to create the *Commission to Promote Government Efficiency and Savings on State Spending*. The impetus for this Commission was back-to-back challenging years of expenditures exceeding incoming revenue. By July of 2002, the Commission recommended the establishment of a Statewide initiative for utility savings. Therefore, on July 17, 2002, North Carolina's Governor issued a memorandum to members of the Council of State, Cabinet Secretaries, the University of North Carolina (UNC) System president and UNC Chancellors that formally established the USI program in the State Energy Office.

Senate Bill 668 (Session Law 2007-546, Section 3.1.(a)) was landmark legislation that ratified the USI's goals, mission, and requirements into state statute. This required the state to become a model for becoming energy efficient, eliminate waste, and reduce utility expenditures in state-owned buildings to save taxpayer dollars. The statute requires State agencies and the UNC System develop and implement a management plan, as well as provide annual updates that are consistent with the USI's Comprehensive Program. The statute also requires that energy consumption per gross square foot in all state-owned buildings be reduced relative to fiscal year 2003-04 levels by

[8] *2025 Guaranteed Energy Savings Contracts Annual Report*

the following amounts: (1) 20% by 2010; and (2) 30% by 2015. Community colleges must also submit an annual written report to the State Energy Office containing utility consumption and the corresponding costs for review.

Senate Bill 845 (Session Law 2008-198, Section 11.1) revised the base fiscal year for the EUI reduction requirements in state-owned buildings to 2002-03 levels. The base year has remained unchanged since that time.

House Bill 1292 (Session Law 2010-196, Sections 1 and 2) permitted institutions in the UNC System to credit unused General Fund appropriations into the next fiscal year for realized energy savings accrued by implementing energy conservation measures. Of the savings achieved, 60% must be utilized for future energy conservation measures. The savings were designed not to affect the recommended continuation utility budget requirements by the Director of Budget. To receive the credit balance, affected institutions were required to submit annual updates to their utility management plans regarding the use of funds using the criteria in GS §143-64.12(a)(1) through (a)(4). During FY 2024-25, twelve UNC System schools asked to carry forward nearly $20.8 million in utility savings and reported spending an additional $23 million for new energy efficiency projects.[9] These funds are specifically designated for energy efficiency improvements.

Senate Bill 734 (Session Law 2014-120, Section 55) revised the requirement that state-owned facilities provide updates regarding their utility usage and costs, as well as the implementation of management plans from an annual to a biennial-basis. House Bill (Session Law 2015-241, Section 14.30(u)) introduced a technical correction to clarify that energy reporting responsibilities were assigned to the State Energy Office within the Department of Environmental Quality, rather than the Department of Natural Resources. Senate Bill 257 (Session Law 2017-57, Section 14.1(f)) made further technical corrections, updating the names of the legislative entities to which the State Energy Office reports energy savings metrics.

In October 2018, Governor Cooper's EO80 (Section 8) built on the statutory requirements in GS §143-64.12(a) by directing cabinet agencies to collectively strive to reduce energy consumption per square foot by at least 40% of fiscal year 2002-03 levels by 2025. The EO required that the DEQ's USI program update the Comprehensive Program with strategies to assist state-owned buildings in reducing energy consumption to meet the EO80 goal. In addition, the USI program was tasked with encouraging and assisting, upon request, the UNC System, K-12 schools, and local governments in reducing energy consumption. To meet the EO80 goals, the EO required that cabinet agencies designate an *"Agency Energy Manager"*, prepare a biennial *"Agency Utility Management Plan"*, submit utility data and progress towards the EO80 goal, and required the USI program to provide an annual progress report to the Governor's Office.

2.1 Roles and Responsibilities of Key Entities

Table 3 provides a breakdown of responsibilities that entities involved with the Comprehensive Program are required to perform with reference to the corresponding statute or executive order.

[9] *The values in this report reflect the most accurate tabulation of the "savings claimed" and "cost of new projects" for FY2024-25 based on datasets provided by participating UNC System schools.*

Table 3: Roles and Responsibilities of Key Entities

Basis	Responsibility	Reference	Assigned Entity
EO80	Encourage and assist, as requested, higher education institutions, K-12 schools, and local governments in reducing energy consumption per square foot in state-owned buildings by at least 40% from FY 2002-03 levels by 2025.	EO80 Section 1(c) and 8	Cabinet Agencies; DEQ USI
	Designate an Agency Energy Manager that serves as an agency's primary point of contact.	EO80 Section 8(a)	Cabinet Agencies
	Implement strategies to support the energy consumption goal in EO80 and submit an Agency Utility Management Plan to the DEQ's USI program by March 1st of every odd-numbered year. The plan should describe the proposed strategies to reduce energy consumption per square foot in state-owned buildings by at least 40% from FY 2002-03 levels by 2025.	EO80 Section 8(b)	Cabinet Agencies
	Submit an Agency Utility Report to the DEQ's USI program by September 1st of each year. The report should contain the consumption, costs, and progress achieved towards meeting the statutory and EO80 directives.	EO80 Section 8(c)	Cabinet Agencies
	Assess the adequacy of agency Utility Management Plans and their compliance with EO80. Develop annual report describing the Comprehensive Program and summarize each cabinet agency's utility consumption, costs, and achieved reductions, completed by December 1st.	EO80 Section 8(b) and 8(d)	DEQ USI
	Develop and annually-update a Comprehensive Program to manage energy, water, and other utilities for state agencies and institutions of higher learning.	GS §143-64.12(a)	DEQ USI
	Submit a utility management plan consistent with the DEQ USI Comprehensive Program biennially. The plan should address findings or recommendations from the Department of Administration energy audits. In addition, the plan should include supporting strategies to reduce energy per gross square foot by at least 30% from FY 2002-03 levels by 2015.	GS §143-64.12(a) and (b1)	All state Agencies; UNC System
	Submit a biennial written report of utility consumption and costs.	GS §143-64.12(a)	Community Colleges
	Carry out the construction and renovation of facilities to further the energy conservation measures and ensure the use life-cycle cost analyses.	GS §143-64.12(a1)	All state Agencies; UNC System

Basis	Responsibility	Reference	Assigned Entity
GS	Create and implement the policies, procedures, and standards to ensure that state purchasing practices improve efficiency regarding energy, water, and utility usage. The cost of such products should be considered regarding their economic life. Administer the Building Energy Design Guidelines that include energy-use goals and standards, economic assumptions for life-cycle analysis, and other criteria on building systems and technologies. Modify the design criteria for constructing and renovating state buildings and the UNC System to require that a life-cycle cost analysis be conducted in accordance with GS §143-64.15.	GS §143-64.12(b); and GS §143-64.15	DOA
	Identify and recommend low-cost energy conservation maintenance and operating procedures that reduce energy consumption within state-owned buildings as part of the Facility Condition Assessment Program (FCAP). Consult with the DEQ USI program to develop an energy audit and procedure for conducting such audits. Conduct an energy audit for all state agencies and the UNC System every five years. The energy audit should serve as a preliminary energy survey.	GS §143-64.12(b1)	DOA
	Implement recommendations from Department of Administration and maximize the interchangeability and compatibility of energy management equipment components.	GS §143-64.12(b1)	All state Agencies; UNC System
	Conduct detailed system-level energy surveys every five years.	GS §143-64.12(b1)	DEQ USI
	Submit a report of the energy audit required in accordance with GS §143-64.12(b1) to the affected state agency or the UNC System.	GS §143-64.12(b1); and GS §143-64.12(b2)	DOA
	Review each energy audit conducted by the Department of Administration and consult with the affected state agency or the UNC System to incorporate the findings into the management plan required by GS §143-64.12(a).	GS §143-64.12(a); and GS §143-64.12(b2)	DEQ USI
GS	Identify and recommend facilities of state-agencies or the UNC System that are suitable for either: (1) building commissioning to reduce energy consumption; or (2) guaranteed energy savings contracts pursuant to GS §143-64.17.	GS §143-64.12(h); and GS §143-64.17.	DOA

Basis	Responsibility	Reference	Assigned Entity
	Develop a biennial report on the Comprehensive Program to the Joint Legislative Energy Policy Commission; the Oversight Committee on Agriculture and Natural and Economic Resources; and the Fiscal Research Division by December 1st of odd-numbered years. The report should contain the elements set forth in GS §143-64.12(j)(1) through (j)(5)	GS §143-64.12(j)	DEQ USI

3.0 Significant Changes from FY23-24 Report

In FY23–24, DPI managed the Western School for the Deaf (Cullowhee), Morehead Governor's School (Raleigh), and the Eastern School for the Deaf (Wilson)—all serving students with visual or hearing impairments. However, under Senate Bill 593 (2021), each school now operates independently under its own board of trustees. As a result, future utility data will be submitted separately by each institution.

The State Energy Office did not receive FY2024-25 energy usage information from the Department of Transportation (DOT) for the third time in as many years. Due to the lack of data, the SEO duplicated DOT's data from their FY2021-22 usage to provide consistency in DOT's weight among agencies in the state. At the drafting of this report, SEO also did not receive 2024-25 data from the Department of Environmental Quality (DEQ). SEO duplicated DEQ's data from FY2023-24 to provide consistency in DEQ's weight among agencies in the state. More information on this can be found in Appendix A of this report.

At the time of the drafting of this report, SEO did not receive FY2024-25 usage data from North Carolina Central University (NCCU) or North Carolina Agricultural and Technical State University (NC A&T). Due to the lack of data, the SEO duplicated NCCU and NC A&T's data from their FY2023-24 usage to provide consistency in their weight among other UNC system entities.

Staff turnover during FY2024–25 affected several government programs, including USI, and contributed to challenges in compiling this report. At the same time, SEO implemented a new data collection process—shifting to form-based submissions through Laserfiche and using a Power BI dashboard to generate the report. This transition is intended to improve data accuracy and enhance transparency in EO 80 reporting through more dynamic and accessible visual tools.

Finally, during the preparation of this report, SEO staff identified data input errors in the FY2023–24 report that affected the baseline figures. These inaccuracies have since been corrected. This year, we implemented new protocols for data collection and normalization to prevent similar issues in the future. Additionally, historical data was thoroughly reviewed to address inconsistencies that may have resulted from variations in agency reporting practices. Corrections were made where necessary. Moving forward, SEO staff will continue to refine and standardize the data collection and analysis process to ensure greater accuracy and reliability.

4.0 Comprehensive Program and Executive Order 80 Update

4.1 Primary Focus Areas of the Comprehensive Program

GS §143-64.12(a): *"The Department of Environmental Quality through the State Energy Office shall develop a comprehensive program to manage energy, water, and other utility use for state agencies and state institutions of higher learning and shall update this program annually"*

While state agencies and the UNC System are collectively mandated by GS §143-64.12(a) to achieve a 30% reduction in BTU's per square foot by the year 2015, some participants have encountered challenges in meeting this target individually. USI remains committed to supporting these participants in reaching the specified goal. Moreover, EO80 has introduced a new objective for state-owned buildings, requiring a 40% EUI reduction by 2025 compared to a 2002-03 baseline. Cabinet agencies are instructed to designate an Energy Manager responsible for overseeing utility data collection, reporting, and the development and execution of the agency's utility management plan, in alignment with GS §143-64.12(a) and EO80, Section 8. These plans should incorporate effective strategies that align with legal obligations and executive directives aimed at reducing energy consumption in state-owned buildings.

The USI program provides the Governor with an annual update on utility consumption and progress towards EUI reduction goals set by affected reporting entities under EO80. USI conducts individual site visits to identify best practices and ensure that governmental units maintain their achieved savings. Meeting the required EUI reduction targets will enhance the State's infrastructure value, increase energy security and cumulative utility cost savings, and decrease environmental pollution linked to fuel and electricity consumption.

Below are the primary focus areas of the Comprehensive Program managed by the USI:

Best Practices & Training

The USI team's site visits continue to be a crucial source of support for local and state government facility managers. USI offers guidance on soliciting initial energy audits, evaluations of projects, and implementation strategies. The team also examines utility bills and encourages participation in current energy-saving programs. An essential aspect of the USI program is providing relevant energy efficiency training for facility managers in local and state government agencies. This training typically includes the Energy Management for State Employees course (EM4SE) also known as the Energy Management Diploma series (offered by North Carolina State University's Office of Professional Development). The training covers topics such as creating utility management plans, analyzing utility bills, and teaching about building systems and programs to enhance efficiency. USI promotes collaboration with community user groups and stakeholders, as well as facilitates discussions and the sharing of best practices among government entities.

Another unique training opportunity is launching in early 2025, the SEO and the Division of Water Infrastructure (DWI) are partnering together to offer a no-cost energy efficiency training course for water and wastewater operators in North Carolina, the Water and Wastewater Energy Efficiency (WWEE) Course. The intended audience of this course is operators from distressed systems in more rural parts of the state. The goals of the course are to introduce water and

wastewater system operators to basic concepts of energy management principles (i.e. energy bills, demand, rates, basic energy conservation measures or ECMs), followed by an in-depth focus on energy efficiency opportunities specific to water and wastewater treatment plants (i.e. aeration, motors/VFDs, process improvements) while maintaining operations and enhancing productivity. The course will emphasize both identification and implementation of ECMs unique to each participating system. The training is designed to identify energy efficiency opportunities for each attendee's system and will allow operators to continually build upon these efficiencies at their systems long after the training has concluded.

Cost Estimates & Financial Options

USI assists state and local government building owners with developing cost estimates and prioritizing energy saving projects. Once project scopes are established, USI can then assist with recommending various types of funding mechanisms based on the situation. These often include equipment rebates, federal or state grants, tax incentives, Guaranteed Energy Savings Contracts (GESCs), and an assortment of utility provider programs. In addition, USI can review project proposals to ensure they best fit the needs of governmental units. On a more granular level, USI will review utility bills to look for saving opportunities such as rate classification changes or peak shaving. USI continuously seeks additional resources to expand energy efficiency programs within state and local government buildings.

Reporting Requirements

The USI team regularly updates and submits reports on the progress of key initiatives, including the Comprehensive Program, EO80 Section 8, GESCs, HB1292 credits, and utility management plans, to stakeholders for review. This provides a status update on significant achievements.

4.2 Overview of Utility Use and Efficiency Gains for all State Governmental Units and Community Colleges

GS §143-64.12(j)(1) reads: [The report shall contain:] *"A comprehensive overview of how state agencies and state institutions of higher learning are managing energy, water, and other utility use and achieving efficiency gains."*

EO80 Section 8 reads: "*DEQ shall develop an annual report that describes the Comprehensive Program and summarizes each cabinet agency's utility consumption, utility costs, and achieved reductions in energy consumption. DEQ shall complete this report for publication on its website and for the Council to submit to the Governor by February 1, 2019, and annually thereafter beginning December 1, 2019."*

The following sections, including tables and graphs per sector, provide a collective summary of energy and water reduction progress for the UNC System, cabinet agencies, and community colleges. Agency-specific narratives and their associated utility data are provided in Appendix A.

Participant	Cabinet Agencies	Other Agencies	UNC System	State Governmental Units Combined Total
1) GSF				
Baseline 2002-03 (Mgsf)	35	4	56	95
Current 2024-25 (Mgsf)	45	5	94	144
% Change	29%	27%	68%	52%
2) EUI				
Baseline 2002-03 (Btu/gsf)	128,210	52,715	169,521	149,343
Current 2024-25 (Btu/gsf)	86,388	52,833	120,057	107,185
% Change	-33%	0%	-29%	-28%
3) Water				
Baseline 2002-03 (gal/gsf)	65	20	50	54
Current 2024-25 (gal/gsf)	57	29	29	37
% Change	-12%	45%	-42%	-31%

Table 4: State Agency and State Institutions of Higher Learning Efficiency Gains[10]

Energy Consumption and Savings Highlights from Table 4

- EUI (BTUs/gsf)
  - The Cabinet Agencies are at a **33%** reduction from baseline.
  - Other Agencies are at a **0%** reduction.
  - The UNC System is at a **29%** reduction. The UNC System was at a **34%** reduction from baseline in FY2023-24.
  - Total combined state-owned buildings are at a **28%** reduction from baseline.
- Change in Square Footage and Water Usage
  - Total combined state-owned building area has increased significantly by **52%** compared to baseline.
  - Total combined water usage has decreased by **31%** from the baseline

[10] Values in Table 4 are calculated from aggregate and may be slightly different from subsequent agency specific values.

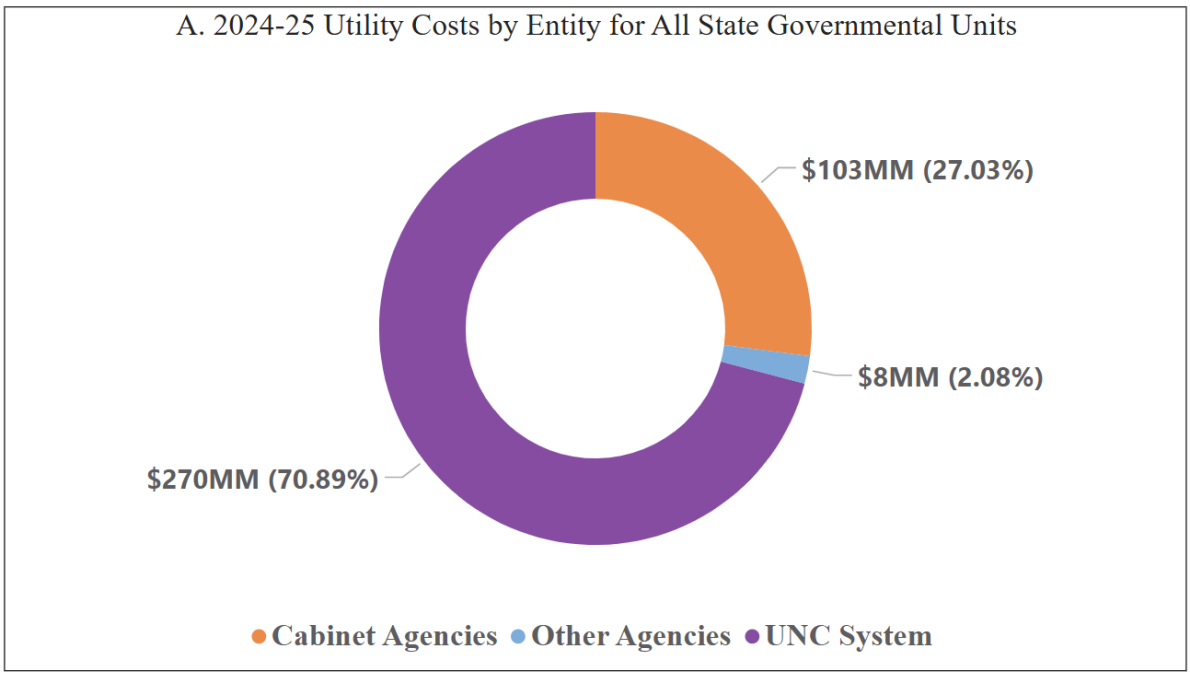
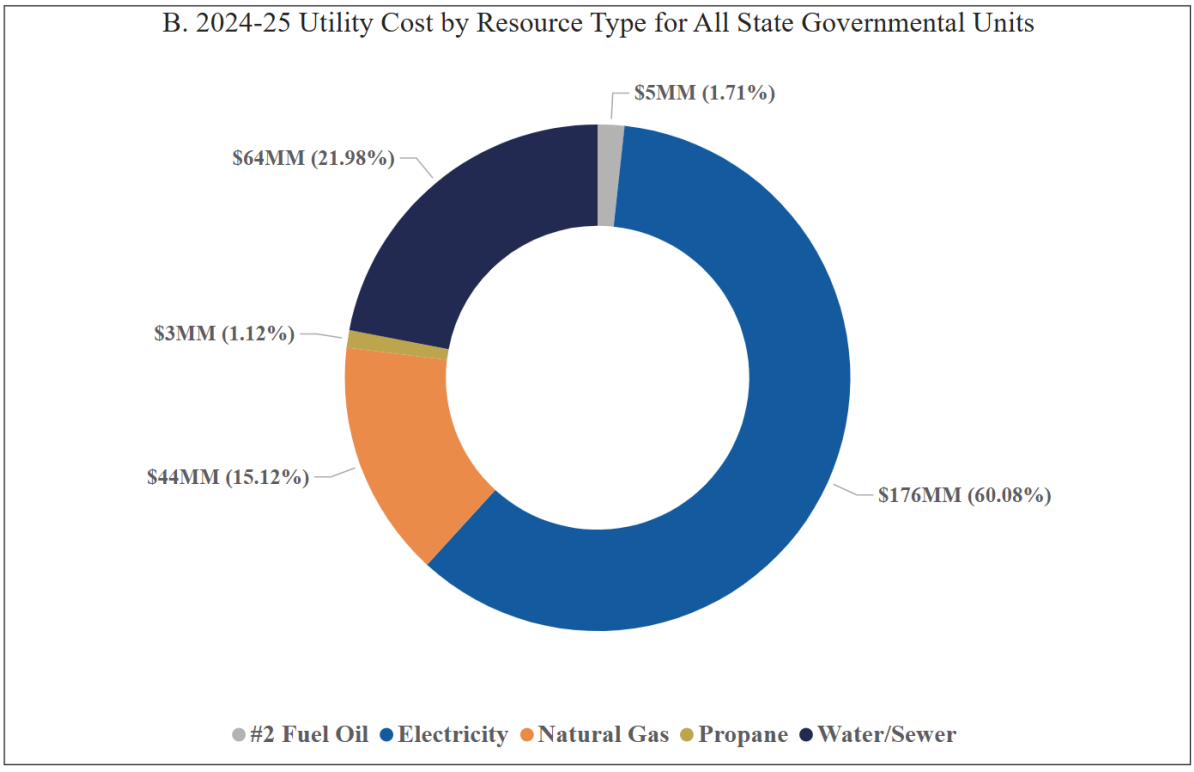


Figure 1: Total Utility Cost for All State Governmental Units ($357MM) by (A) Entity and (B) Resource Type.
These figures exclude totals from community colleges



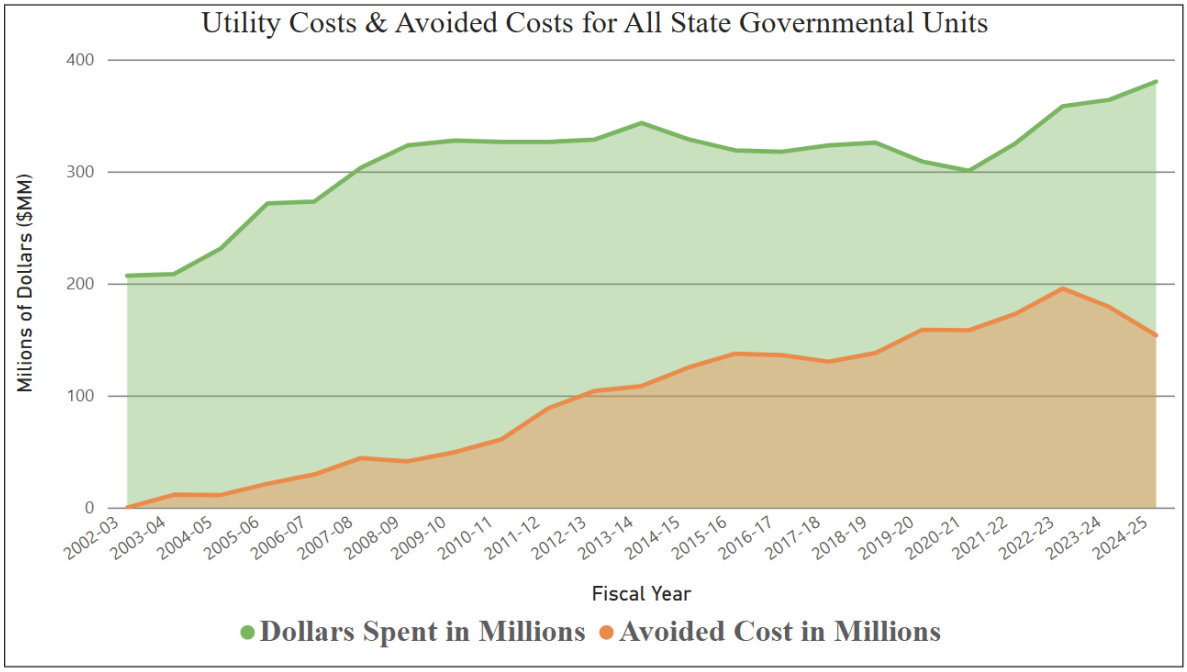


Figure 2: Avoided Utility Costs for All State Governmental Units

Utility Cost Highlights *(See Table 2 in the Executive Summary Section)*

- Avoided Utility Costs
  - Approximately $159 million in avoided utility costs in FY2024-2025.
  - Approximately $2.26 billion avoided in utility costs since FY2002-03.
- Expenditures
  - Approximately $380 million in total utility costs for all state-owned buildings during FY2024-2025. Over two-thirds of this amount is attributed to the UNC System.

UNC System

The UNC System continues to make significant progress in achieving EO80's 40% energy reduction goal; during FY2024-25, the UNC System achieved a 29% reduction in energy use intensity from the 2002-03 baseline, becoming the only group of entities in the program to do so. The UNC System avoided $184 million in utility costs during FY2024-25; avoided costs represent the amount of money that would have been required if the UNC System did not implement any energy efficiency retrofits or upgrades compared to the 2002-03 baseline. The SEO will continue to look to the UNC System for leadership in energy management and reduction and hold their implementation efforts up as best practices and policies.

Each year, members of the USI team and the SEO attend the annual Appalachian Energy Summit hosted at Appalachian State University; this Summit is designed for faculty, staff, and students at institutions of higher learning, as well as local and state government staff to share information, resources, and best practices surrounding energy and sustainability efforts across higher education campuses in North Carolina. This Summit has been in place since 2012 and provides a valuable opportunity for USI participants and institutions of higher learning to come together, network, and

share insights on their energy efficiency journeys. The transfer of knowledge at this event is critical for successful energy management programs like USI, and it allows for participants in the program to share resources and identify new ways to cut costs through better energy management. Additionally, the USI team meets with UNC System contacts on a quarterly basis to discuss program updates, potential funding opportunities, and highlight guest speakers or topics related to energy efficiency best practices.

Table 5 shows a summary of the UNC System's utility metrics as compared to the 2002-03 baseline. While the UNC System's square footage grew by 65%, total commercial sector energy costs in North Carolina from 2002-2023, the most recent year for which data was available, rose by approximately 56% during the same period.[11] However, utility costs for the UNC System (which also includes water and sewer) increased by only 99%, less than would be expected from both the national cost trends and the system's physical expansion. The UNC System had a 29% EUI reduction from baseline this fiscal year, a decrease from last year's 34% EUI reduction. Water usage has decreased by 41%, which is significant considering water costs have increased by 199% over the same timeframe. In general, both EUI and water usage intensity show a downward trend toward the 40% reduction goal (Figure 4).

At the time of the drafting of this report, SEO did not receive FY2024-25 usage data from North Carolina Central University (NCCU) or North Carolina Agricultural and Technical State University (NC A&T). Due to the lack of received data, the SEO duplicated NCCU and NC A&T's data from their FY2023-24 usage to provide consistency in their weight among other UNC system entities.

Table 5: UNC System Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	56,806,527	93,973,353	+65%
Total Utility Cost	$135,311,298	$269,586,113	+99%
Energy Usage (Btu/gsf)	168,835	120,057	-29%
Energy Cost ($/MMBtu)	$13.00	$21.17	+63%
Water Usage (gal/gsf)	49	29	-41%
Water Cost ($/kgal)	$3.80	$11.37	+199%

[11] *According to Electricity prices increase U.S. 2000-2025| Statista prices in the US have risen 69.3% during this time period (2003-2025) or 65.9% 2002-24. U.S. Energy Information Administration - EIA - Independent Statistics and Analysis*

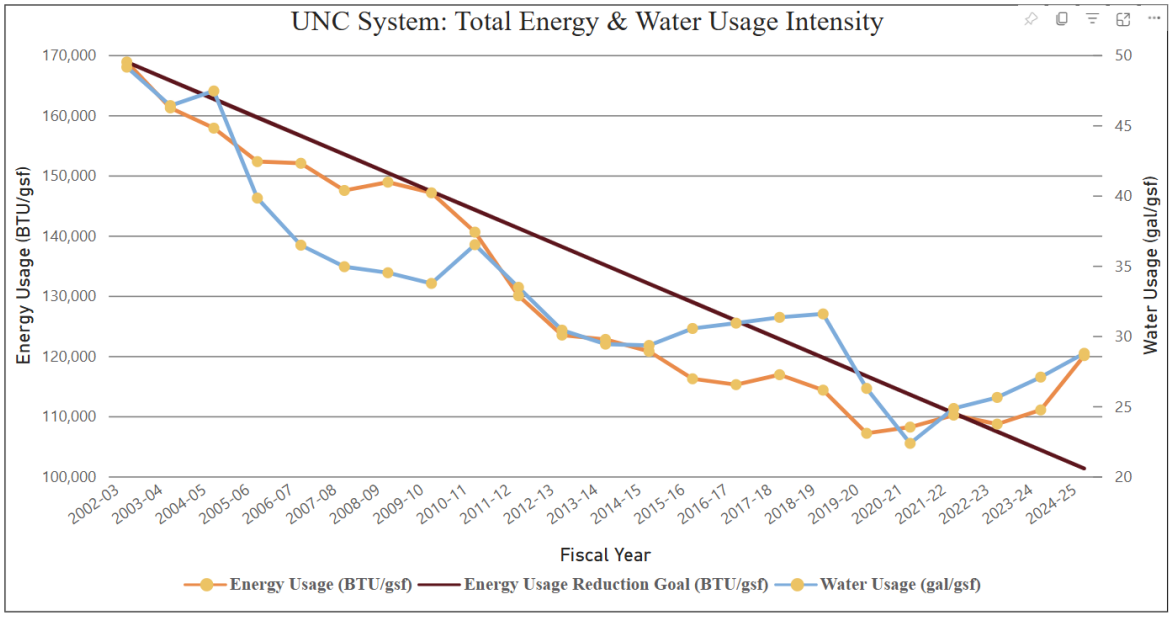


Figure 4: UNC System Utility Usage Over Time

Cabinet Agencies

As required in EO80, all cabinet agencies have appointed an energy manager to oversee the agency efforts in achieving the EO80 goal, however most of these designated energy managers, with the exception of DAC, continue to have other full-time jobs and responsibilities beyond energy management. Cabinet agencies spent nearly $103 million on utility costs during FY2024-25; the lack of full-time staff dedicated to energy management and energy efficiency improvements is negatively impacting the program's overall ability to meet the energy reduction goal of EO80. Many agencies struggle with deferred maintenance, outdated equipment, antiquated technology, aging infrastructure, limited staff and most importantly, the financial resources required to make major comprehensive energy improvements. Many cabinet agencies provided funding requests to address some of these energy related needs, but more dedicated resources to these efforts, as specifically outlined in Section 5.1, would help reduce utility spending and increase the likelihood of achieving EO80's energy reduction goal. USI staff at the SEO will continue to work alongside cabinet agency energy managers to reduce utility spending and implement energy efficiency improvements as resources allow.

DOT, DHHS, DPS, DAC, and DOA are the five largest agencies in terms of total utility spend, making up nearly 90% of the cabinet agency expenditures for FY2024-25. Figure 5 below demonstrates this spread across the ten (10) cabinet agencies during FY2024-25:

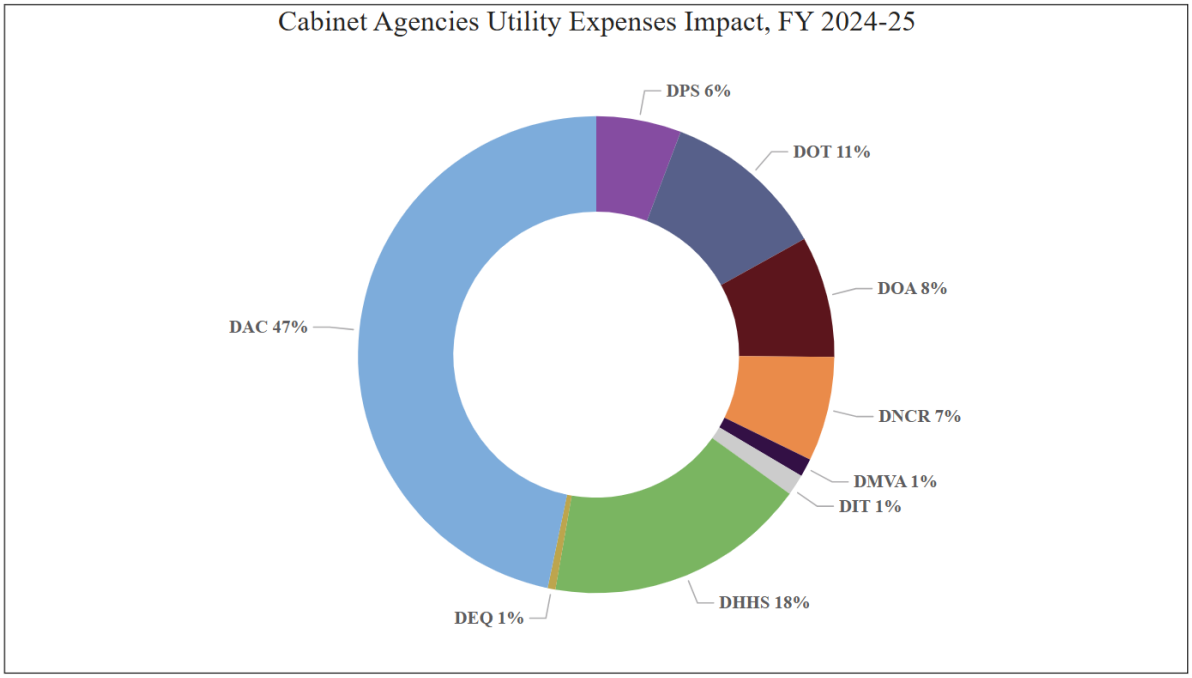


Figure 5: Cabinet Agencies Utility Expenses Impact, FY 2024-25

Table 6 shows a summary of the cabinet agencies' utility metrics as compared to the 2002-03 baseline. Square footage has decreased by 29% while utility costs have increased by 51%. The EUI for all cabinet agencies has decreased by 33% compared to the baseline, a slight decrease from FY2023-24's 34%. Water usage has decreased by 27% while water costs have increased by 101%. More detailed information about individual agencies' utility data can be found in Appendix A. Several important items should be noted:

- DOT has not submitted a utility consumption report since FY2022-23. DOT's utility consumption from FY2021-22 has been duplicated for all missing years in order to provide consistency across the cabinet agency sector;
- This was the second complete fiscal year where DPS and DAC were separate and distinct agencies; this split occurred in January 2023. The associated changes in DPS and DAC's profile and historical consumption data, most notably changes in square footage, had a significant impact on the overall outlook for cabinet agencies.

Table 6: Cabinet Agencies Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	34,702,727	44,652,795	+29%
Total Utility Cost	$68,065,031	$102,803,935	+51%
Energy Usage (Btu/gsf)	128,210	86,388	-33%
Energy Cost ($/MMBtu)	$12.34	$18.42	+49%
Water Usage (gal/gsf)	65	57	-12%
Water Cost ($/kgal)	$5.86	$12.53	+114%

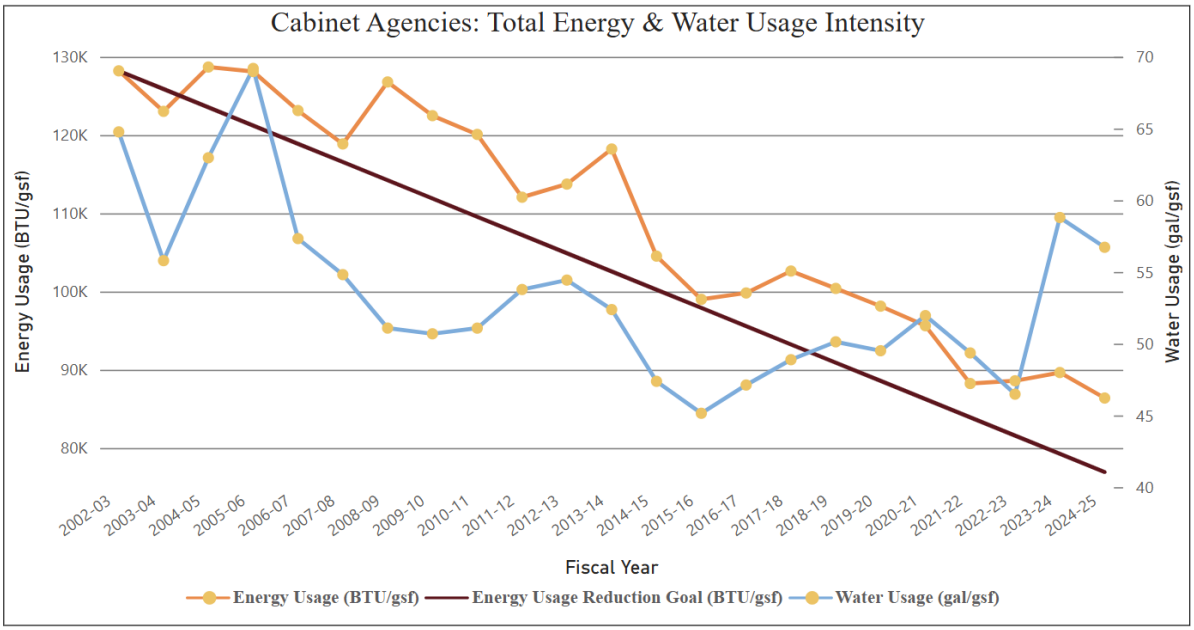


Figure 6: Cabinet Agencies Utility Usage Over Time

Other Agencies

While EO80 applies directly to the cabinet agencies, other state agencies are encouraged to adopt the same 40% EUI reduction goal. Such agencies include the Department of Agriculture and Consumer Services (DA&CS), the Department of Justice (DOJ), the Department of Public Instruction (DPI), and the Wildlife Resources Commission (WRC). A dedicated energy manager for each of these agencies, as well as robust strategic energy plans, would be decisive steps toward improving future reductions in EUI from the baseline. DA&CS recently completed an energy assessment with Waste Reduction Partners for their Farmers Market Restaurant facility where nearly $4,000 in annual energy savings were identified; as discussed more in Section 5.1, energy assessments through WRP are a valuable tool that agencies like the DOJ, DPI, WRC, and DA&CS should use to help understand the energy efficiency opportunities available at their facilities.

Table 7 shows a summary of these four (4) agencies' utility metrics as compared to the 2002-03 baseline. Since 2002-03, square footage and total utility costs have increased by 27% and 118% respectively. Water usage has actually increased by 45% while water costs have increased by 183% when compared to the baseline. It should be noted that the main WRC campus was not established until 2005–06. However, unlike in previous years, we applied a backward fill this year by assigning its first available data point (from 2005–06) to the baseline year. This approach was used to ensure the campus was adequately represented in the baseline, thereby enhancing comparability with current-year measures. This methodological change also explains the variation in baseline values between this year and prior reporting periods.

Table 7: Other Agencies Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	4,073,908	5,170,654	+27%
Total Utility Cost	$3,614,032	$7,892,637	+118%
Energy Usage (Btu/gsf)	52,715	52,833	0%
Energy Cost ($/MMBtu)	$15.02	$21.46	+43%
Water Usage (gal/gsf)	20	29	+45%
Water Cost ($/kgal)	$4.84	$13.71	+183%

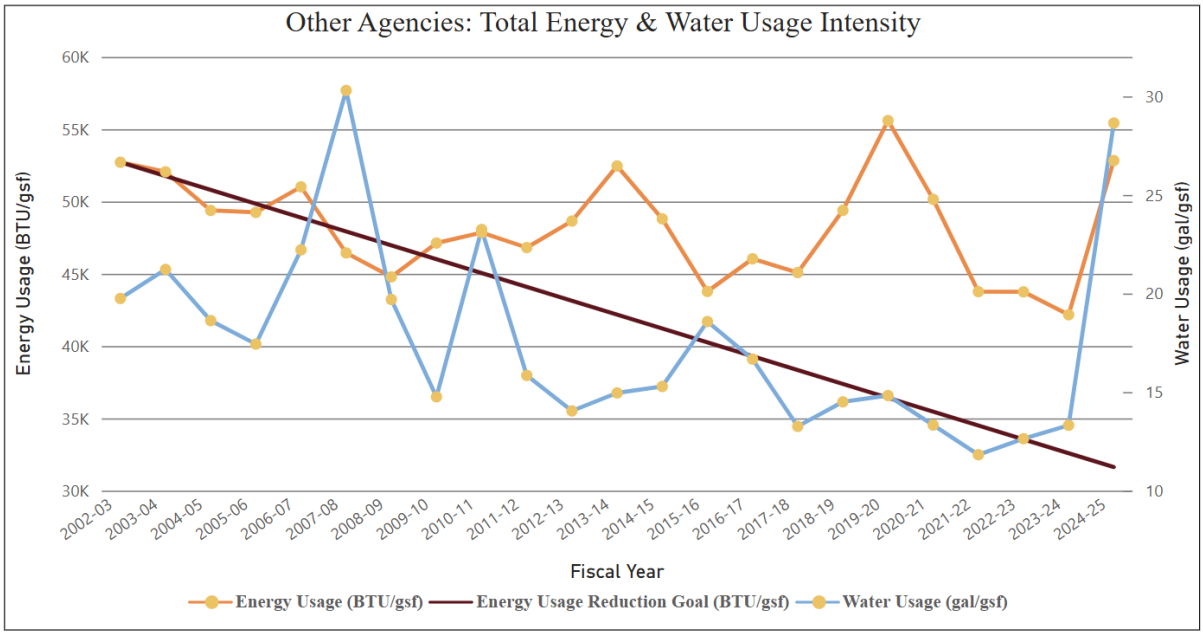


Figure 7: Other Agencies Utility Usage Over Time

Community Colleges

The USI team meets quarterly with community colleges to discuss program updates, including funding and educational/training opportunities, as well as coordinating guest speakers to present on best practices and case studies for successful energy efficiency projects or concepts in the higher education space. The USI team also performs site visits to community colleges as resources allow; these site visits are designed to build strong relationship and communication pathways between the community college and USI staff, provide assistance with data collection efforts, provide technical assistance and guidance with energy efficiency projects/goals around their campuses, performance contracting assistance, and generally provide support in community colleges reaching and exceeding their energy reduction goals. USI is involved in the North Carolina Association of Community College Business Officers (NCACCBO) and the North Carolina Association of Community College Facility Operations (NCACCFO); USI's involvement in these associations allows for continuous improvement in communication and relationship building efforts and provide a mechanism for providing annual updates to target audiences in the community college system. Energy efficiency and renewable energy continue to be topics of growing interest and attention in these two associations, and USI looks forward to continuing to bring awareness to these important topics to association members. North Carolina community colleges have been submitting annual utility consumption reports to the SEO since 2007-2008 (the baseline), as compared to the 2002-2003 baseline for all other USI entities. USI received annual utility consumption reports from 55 of the 58 community colleges for FY2024-25. At the time this report was drafted, SEO had not yet received data submissions from Central Carolina Community College, Piedmont Community College, or Tri-County Community College. To maintain consistency across the community college sector, usage data from FY2023–24 was carried forward using the last observation carried forward (LOCF) method for FY2024–25.

Table 8 shows a summary of the community college sector's utility metrics as compared to the 2007-08 baseline. Square footage has increased by 37% while utility costs have also increased by 65%. The combined community college EUI is at -16%. This is once again, a decrease from the EUI gains they had in FY2023-24. Water usage has decreased by 34% from baseline while water costs have increased by 341%.

Table 8: Community Colleges Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	22,795,156	31,336,170	+37%
Total Utility Cost	$37,189,830	$61,345,633	+65%
Energy Usage (Btu/gsf)	79,018	66,275	-16%
Energy Cost ($/MMBtu)	$19.18	$24.45	+28%
Water Usage (gal/gsf)	15	10	-34%
Water Cost ($/kgal)	$7.92	$34.97	+341%

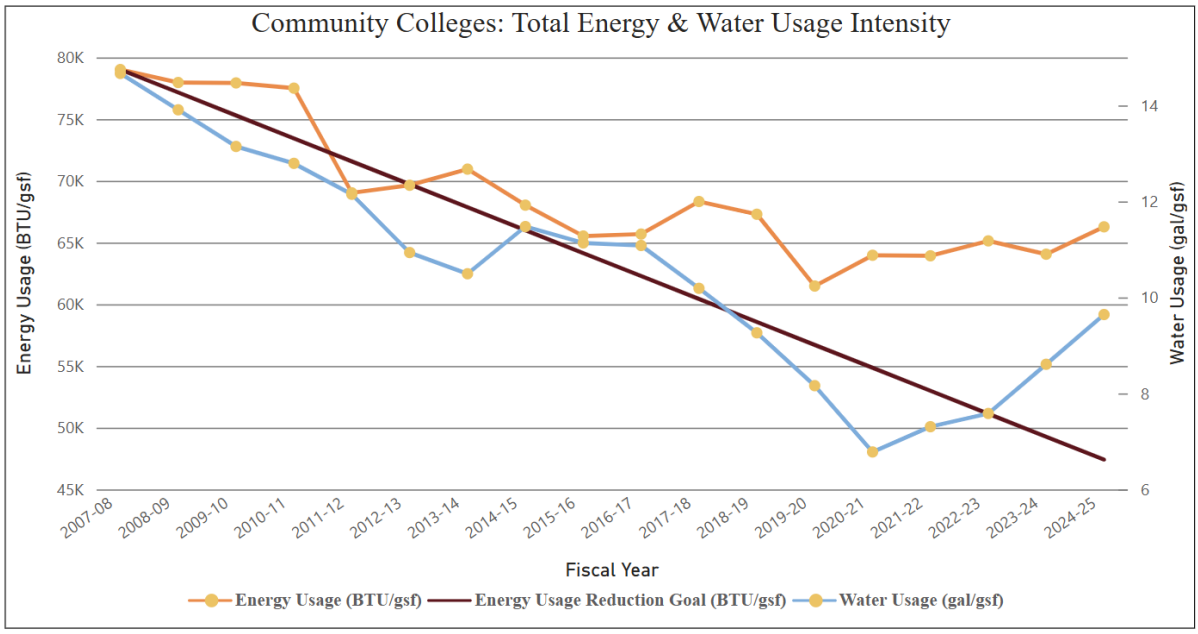


Figure 8: Community Colleges Utility Usage Over Time

4.3 Suggested Revisions to General Law

GS §143-64.12(j)(2): [The report shall contain:] *"Any new measures that could be taken by State agencies and State institutions of higher learning to achieve greater efficiency gains, including any changes in general law that might be needed."*

Appendix E of this report contains more detail regarding these suggested revisions to general law.

The USI program emphasizes the importance of transparency and accountability in fund allocations by recommending annual reports from governmental agencies and universities regarding the expenditure of funds for review by the OSBM. While energy management plans have traditionally been submitted biennially, aligning with utility usage reports in September, the introduction of the carry forward program (Session Law 2010-196) has led to the reporting of project details, costs, energy savings, and completion dates on an annual spreadsheet and project tracking log. To ensure the accuracy and integrity of quoted energy savings, USI suggests modifying the submission to an annual requirement, underscoring the program's dedication to thorough assessment and validation of reported metrics.

Reporting Intervals

In the past, the state governmental units were mandated to annually report their energy, water, and other utility usage to the USI program. This practice enabled USI's staff to efficiently identify anomalies, offer best practices, and recommend strategies to lower energy consumption and expenses. However, with the implementation of Session Law 2014-120, this reporting requirement was transitioned to a biennial schedule, posing challenges for USI's staff in obtaining comprehensive data to aid governmental units in energy management. Advocating for a return to

the annual reporting requirement, the USI program emphasizes the importance of governmental units submitting detailed reports on their utility usage as outlined in GS 143-64.12(a). Furthermore, within the same provision, the program advocates for the clarification that utility reports must be submitted by state agencies, institutions of higher learning, and community colleges by September 1st annually. With the current conflict between GS 116-30.3B(c) and GS 143-64.12(a) directives regarding reporting schedules, the need for alignment and clarity in reporting obligations becomes paramount for efficient energy management and resource allocation.

Energy Reduction Goal

Due to insufficient support for energy initiatives, inflation, rising energy costs, and financial constraints, it is proposed that the EO80 objective of reducing Energy Use Intensity (EUI) by 40% from FY2002-03 levels by 2025 be revised. This revision is informed by comparisons to ongoing performance contracts and energy projects designed to deliver both energy and guaranteed cost savings needed to achieve this goal. Transitioning to a more sustainable energy model requires strategic planning, focused investments, and a culture of innovation to maximize existing resources and reduce both energy use and related expenses.

Through a detailed analysis outlined in this report, it becomes evident that achieving the 2025 target demands a concerted effort toward embracing forward-thinking approaches. The USI program advocates for revising the due date for the 40% reduction goal, as this move promises substantial environmental advantages and long-term energy cost savings for future generations. The known shortfalls of the EO80 goal primarily due to challenges related to funding constraints, inadequate representation of energy managers, cost overruns and lack of backing for energy efficiency initiatives. By addressing these hurdles and fostering a supportive environment for sustainable practices, we can propel state-owned buildings towards a more energy-efficient and financially prudent future.

5.0 Recommendations for State Governmental Units to Reduce Energy Consumption

In addition to achieving continued reductions in existing buildings' energy and water use, new buildings should be constructed to the most up-to-date energy efficient standards. As new buildings are constructed, governmental units have greater ability to operate and to monitor building performance thereby ensuring energy efficiency goals are met. Sectors that have aging buildings and infrastructure continue to experience difficulties in optimizing building operations and with monitoring energy usage. Transitioning from old, out of date technology to new technology and more sophisticated systems better enables buildings to meet energy goals. These improvements will also improve building comfort and indoor air quality. USI continues to recognize achievements and promotes best practices through programmatic and legislative means.

5.1 Best Practices for Energy Management in State-Owned Buildings

The following concepts and principles are recommended as best practices in energy management for both leased and state-owned buildings:

Dedicated Energy Manager

Every successful energy program must have a champion. That is a person who is fully committed to and consistently works to further the program goals. An energy manager serves this role, and the importance cannot be overstated. A full-time, dedicated energy manager is an important asset and can recover energy savings and costs that exceed their salary multiple times. As such, USI has advocated for several years that every agency, university, and community college hire at least one full-time, dedicated energy manager. The UNC System has adopted this philosophy as evidenced by the fact that most UNC System universities currently employ at least one full-time energy manager, and several have whole dedicated energy management teams. As a result, the UNC System leads all public sectors in reducing their energy consumption from baseline levels. Governor Cooper also recognized the importance of energy managers and directed through EO80 that all cabinet agencies appoint energy managers. While energy managers are needed, most state agencies complied by appointing an existing employee who already had another full-time position. Energy management was added as an additional duty on top of the employee's existing workload. Without being able to dedicate full-time efforts, these employees are not able to be as effective nor achieve the energy efficiency results a full-time energy manager could. DAC is the only state agency who currently has a full-time, dedicated energy manager. We hope that agencies follow this leadership and will be able to find funding mechanisms for these positions. Senior management needs to perceive energy management as part of the organization's core business and overarching involvement in each facet of the business line, to realize success and sustainability.

Organizations with energy programs that achieve results have senior-level support, sufficient energy program staff, and management structures that empower staff to address energy efficiency issues directly. It is imperative that our State divisions enable and provide a management structure for their organizations to follow in developing a strategy for achieving sustained performance. Forming an energy team, led by an Energy Manager, is one of the first steps in this framework. The energy team is responsible for planning, implementing, benchmarking, monitoring, and evaluating the organizational energy management program. The team's duties also include delivering training, communicating results, and providing recognition. Management of energy is solid strategic business alignment because it strengthens the efficiency and stewardship of revenues and funding. In many sectors, well-run energy programs may reduce energy costs by 7 to 10 percent annually. By improving financial performance, superior energy practices can create a competitive edge.

Once a full-time energy manager is hired, other factors must also be considered in order to help this position succeed. First, leadership can assist by prioritizing the need for energy efficiency goals to be met within the organization. (see Effective Strategic Energy Planning section below) When upper management prioritizes and supports the importance of energy conservation, the rest of the organization will respond accordingly. This sets the tone and expectation for everyone to participate. Second, the energy manager must be positioned strategically within the organization. They are typically located within a facilities department but have close ties to the business office. That is because they need to know about the equipment and building projects being planned but also be aware of budgets and utility spending. Every project from a stand-alone HVAC package unit to new building construction should be reviewed by the energy manager. Third, they should have the authority to influence and direct these projects for the selection of energy efficient equipment and other energy conservation design considerations. This involvement helps to ensure

that a complete life cycle cost is weighed against the upfront costs. Often equipment which might be the cheapest to purchase will cost more in operation over the long run. Fourth, the energy manager could have a dedicated source of funding to implement conservation measures. Ideally, documented savings from energy efficiency measures can be tracked and those funds returned so that additional measures can be implemented. In this manner, the overall savings begins to grow and cascades as an organization becomes more efficient. That is a key indicator of a successful energy management program.

Utility Data Collection

Once an energy manager is hired, utility data is an essential part of their energy management program. Utility data is the key to determining which buildings are the highest energy users, which utilities cost the most, where conservation efforts should be focused, have savings been achieved, and whether there are leaks and slippage occurring. Without data providing measurements of utility usage, an energy manager is working without guidance and cannot properly manage the energy usage of an organization. However, some organizations receive thousands of utility bills from a multitude of providers every month. Merely collecting and compiling all these bills into a usable format can be an arduous task that subtracts from the goal and active work of managing energy. That's why several organizations have turned to third party data collection services to manage and to provide data from all their utility bills. This third party collects, verifies, reconciles, and records all bills so that the energy manager can access the data with ease. Formatted reports are available with up-to-date information so that energy managers can track utility usage from month to month and analyze fluctuations which can signal potential issues. This type of regular and consistent analysis is imperative to understanding and managing the utility consumption for an organization.

There is third party software available for any entity to use for utility consumption tracking as well as utility cost tracking. If interested in additional information about this service, the SEO can put government entities in touch with someone for more information.

HVAC Optimization

The HVAC system is the main energy consumer within a building, utilizing these systems leads to substantial monthly costs. Neglecting its maintenance can lead to reduced indoor comfort, higher energy consumption, increased repair costs, and the need for premature equipment replacements. Therefore, it is crucial to engage a reputable contractor for routine inspections and servicing HVAC systems. Ensuring the HVAC system is functioning correctly is crucial for creating a comfortable and healthy indoor environment for occupants. By implementing operations & maintenance (O&M) best practices, organizations have the potential to save 5-20% annually on energy bills, as estimated by the U.S. Department of Energy. In addition to regular maintenance, periodic commissioning is essential to maintain the HVAC system's ability to meet thermal and air quality management standards. Retrofitting components and updating control sequences can help enhance the performance of HVAC systems. When selecting a contractor, it is important to understand the range of maintenance plans available, which can vary from wide-ranging packages to basic inspection and filter change services. To effectively compare different contractors' offerings, it is essential to first identify the key components included in their maintenance plans.

Effective Strategic Energy Planning

Creating an effective strategic energy plan (SEP) is a critical element of effective energy management. SEPs provide a clear roadmap to achieving energy reduction goals that are important to a governmental unit and help support the goals of EO80, while also providing buy-in from multiple stakeholders, implementation support, and accountability by identifying responsible parties within an organization. Setting reasonable yet dynamic goals and targets for energy and water efficiency that reflect the governmental unit's priorities and vision for the future helps set the stage for the unit's approach to these important initiatives, while also providing support for implementation to reach these goals. SEPs provide a focused pathway and strategies to better manage utility costs and consumption over time.

The following steps should be taken to begin the process of establishing a strategic energy plan[12]:

- Step 1: Establish and Charge a Leadership Team
- Step 2: Identify and Engage Stakeholders
- Step 3: Develop an Energy Vision
- Step 4: Assess the Current Energy Profile
- Step 5: Develop Energy Goals and Strategies
- Step 6: Identify and Prioritize Actions
- Step 7: Put Together a Funding and Financing Strategy
- Step 8: Develop a Blueprint for Implementation
- Step 9: Plan to Evaluate
- Step 10: Develop, Adopt, and Publicize the SEP

A strong and effective SEP should generally include, but is not limited to, the following elements:

- Include historical utility consumption and cost data and describe the organization's method for future data collection efforts;
- An organizational chart illustrating the makeup of the team, including specific names and titles, responsible for the SEP's success;
- Identify specific energy and water efficiency goals/mandates important to the organization using SMART goal metrics (**S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-Bound);
- List specific projects and strategies that will be used to achieve these goals, including a discussion of the source of funding for these projects, as well as individuals or teams responsible for the success of each goal;
- Identify Key Performance Indicators (KPIs) that will be used to measure the progress and success of the goals/mandates identified;
- A training plan for staff to better understand and implement the goals within the SEP;
- Outline a specific plan for revisions and updates to the SEP; and

[12] https://www.energy.gov/sites/prod/files/2014/05/f15/cesp_guide.pdf

- Signature page that shows upper management acknowledgment and buy-in.

The USI team is prepared and able to provide guidance and technical assistance as state governmental units revise, or develop for the first time, their SEP. SEPs are due every two years and were due in FY2024-25. One of our best performers included the following in their SEP:

- Description of existing facilities, equipment, and energy/water consumption histories
    - Campus-wide upgrades include HVAC, chillers, LED lighting, and water systems.
- Description of roles and responsibilities of existing personnel/positions as they relate to energy management
    - Role of the Energy Manager
    - Role of the Operations Director
- Energy efficiency projects recently completed or in progress
    - Major upgrades at Belk Library, Convocation Center, Anne Belk Hall, and more.
    - LED retrofits, HVAC controls, chilled water systems, and EV chargers.
    - Belk Library alone saw a 37% energy reduction and $15K/month savings.
- Energy management goals / focus areas for 2025-2026 fiscal year
    - Targets: 2% reduction in energy and water use.
    - Focus Areas:
        - Recommissioning program
        - 1292-funded efficiency projects
        - Renewable energy expansion
        - Innovation District energy systems
        - Demand management and student engagement
- Leadership buy-in
    - Plan signed by COO J.J. Brown.
    - Emphasizes strategic investment and operational excellence.

State governmental units are encouraged to learn from their peers and use other SEP examples as a source of inspiration and ideas for their own SEPs; the USI team can and does facilitate these discussions to encourage peer exchange. Energy efficiency projects require planning, coordination, ownership, approvals, and funding. Acknowledgement and support of energy priorities must be documented and communicated to the entire organization. By incorporating all of the critical elements outlined above, the SEP has a higher likelihood of success in achieving the stated goals and objectives, bringing the organization closer to a strong foundation of, and commitment to, robust energy efficiency and energy management practices.

Energy Efficiency Assessments

Conducting a thorough energy efficiency assessment offers valuable insights into the strengths and weaknesses of a building, aiding in a deeper understanding of its performance. It evaluates both immediate and future chances to conserve energy and costs within buildings. Conducting a comprehensive energy assessment not only supports the energy reduction targets set by EO80 but also demonstrates a strong dedication to achieving the entity's energy goals. This assessment

examines the yearly energy usage of the building and pinpoints any possible opportunities for enhancing operations and upgrading equipment. Assessments are advantageous for facilities of any scale and should be considered as a vital component of the strategic energy plan (SEP). To initiate an assessment, start with a plan. This plan should consist of reinforced recommendations stated in the SEP that include but are not limited to:

- Planned Activities: The actions to be carried out.
- Schedule: The timing for executing the activities.
- Essential Personnel: The key individuals involved in the project.
- Resource Needs: Financial and technical requirements.
- Risk Analysis: Identification of potential risks and strategies to manage them.
- Projected Outcomes: Expected results and deliverables.
- Reporting Procedures: Procedures for post-assessment reporting.
- Monitoring Timelines: Timelines for tracking progress, reviewing performance, and scheduling future assessments.

Understanding the essential details of energy-consuming machinery and its operation is crucial for the efficient functioning of a facility. Utilize assessment software tools that offer dependable, up-to-date, and precise data on facility energy flow. These tools are capable of gathering and assessing data on any system driven by motors including steam, pumps, compressed air, and process heating. Collecting new data usually starts with easily accessible high-level data. For instance, invoice data can provide insights into the types of energy used at various sites and processes, presented as a percentage of total energy consumption. Such details are commonly found in financial or greenhouse gas accounting systems. Verify that the measurement frequency and timeframe are appropriate to capture a representative operational period. It may be necessary to measure intraday, daily, monthly, or seasonal variations. Facilities with robust energy management programs currently established can potentially achieve additional savings by implementing the best practices of conducting energy assessments.

Collaborating with stakeholders across all levels of the organization is essential. It is important to recognize that the required skill sets may already be present in various departments, highlighting the importance of utilizing both a team based and organization-wide strategy. Depending on the organization's size and resources, it may be beneficial to establish dedicated full-time roles for energy efficiency (Energy Manager) or assign staff to specialized assessment responsibilities. In certain cases, organizations may find it imperative to seek external technical assistance. Energy Services Companies (ESCO's) are able to assist with various aspects of an evaluation, such as data collection, opportunity identification, analysis, facilitation, and reporting.

Conducting a preliminary high-level analysis of the data at hand can help identify any missing data in critical high energy-consumption areas or processes that require further detailed scrutiny. By analyzing energy data, the entity can determine an energy baseline that will help establish the correlation between energy utilization and business operations. This baseline will link energy costs with business performance over a specific period. Sharing the findings of this analysis with a diverse group of individuals can lead to the generation of additional ideas and perspectives. Oftentimes, workshops are utilized to convene subject matter experts to review the data collected in the assessment and brainstorm potential opportunities. It is essential to document all identified

opportunities in a register or similar document. This will serve as a persistent record to monitor ideas and results, and to reassess potential opportunities in case of changes in operating conditions or energy prices.

After receiving the findings from an energy efficiency assessment, determine the key areas that you will focus on and present them to predetermined decision makers identified in the SEP. Utilize the payback period or cost savings associated with each enhancement as a primary consideration. The business proposal should clearly outline the financial implications and advantages of each initiative, enabling decision-makers to make well-informed choices for the entity.

Building Envelope Improvements

Improving and maintaining the building envelope is crucial for enhancing energy efficiency, comfort, health and durability. An energy audit can help identify and prioritize specific areas for efficiency improvement. Additionally, consider the age, deferred maintenance, life cycle viability and uses for buildings that may be considered for obsolescence and/or replacement. Here are several key focus strategies:

Insulation Upgrades:

- **Add or Upgrade Insulation**: Improve the thermal resistance of walls, roofs, and floors. Consider spray foam insulation applications.
- **Use Insulated Panels**: Consider structural insulated panels (SIPs) or insulated concrete forms (ICFs) for better insulation.

Air Sealing:

- **Seal Gaps and Cracks**: Use caulking, weatherstripping, or foam sealants to reduce air leaks and infiltration.
- **Blower Door Testing**: Conduct tests to identify leaks and areas needing improvement.
- **'Smoke' testing:** Consider retaining specialty firms that provide simulated, non-toxic 'smoke' to identify envelope voids and pathways.

Windows and Doors:

- **Energy-Efficient Windows**: Install high performance double or triple-glazed windows with low-E coatings and other new technologies in fenestration.
- **Upgrade Doors**: Replace old doors with energy-efficient models that have good insulation properties and improved gaskets and sealing.

Efficient Roofing:

- **Cool Roofs**: Consider the use of reflective roofing materials to reduce heat absorption and improve indoor comfort.
- Restrict the use of dark heat absorbing roof coverings, in new or retro fit applications, to decrease solar gain. (warmer climates)

- **Built-up Roofing:** Consider additional rigid panel roof insulation, to enhance the thermal performance.

Exterior Walls:

- **Cladding**: Consider adding or upgrading cladding materials that provide insulation and weather resistance.
- **Moisture Barriers**: Ensure proper moisture barriers are in place to prevent water intrusion.
- **Drainage:** Ensure the effectiveness of and provisions to expel and transfer moisture and site water away from exterior.

Heat/ Cooling and Ventilation Improvements:

- **Dedicated Outside Air Systems (DOAS):** Implement mechanical ventilation systems that provide fresh air while minimizing energy loss and establish balanced ventilation with improved internal air quality.

- **Energy Recovery Ventilators (ERVs)**: These systems can improve indoor air quality while recovering energy from exhaust air, often to be utilized for alternate purposes.

- **High Performance Systems:** consider upgrades for high-performing HVAC system composed of efficient equipment that is also right sized for the use and building type.

Smart Technology:

- **Building Management Systems / Building Automation Systems**: Utilize smart thermostats, sensors and advanced meters to optimize energy use based on occupancy and weather. These programs can be visualized and adjusted in real time, often reducing costly overrides, enhancing efficiency and improved maintenance, in addition to facilitating trend analysis.

Operations and Maintenance:

- **Inspect**: Conduct routine inspections, cleaning, and repairs to keep buildings operating properly. Regularly check for damage or wear in the building envelope and components to ensure efficiency performance.

- **Maintain**: The need and benefits of a robust maintenance program cannot be overstated. Improve operations and maintenance practices by regularly checking and maintaining equipment to ensure that it functions efficiently.

Implementing these improvements can lead to significant energy savings, thus reducing EUI, contribute to enhanced comfort and health, and a reduced environmental footprint.

LED Lighting and Controls

Light Emitting Diodes (LED) are now the standard to which all lighting is compared. The market offers a wide range of white LED lighting products, with the selection continually expanding as new generations of devices are introduced. Although many of these products deliver impressive performance, their energy efficiency and color accuracy may vary. LED lighting products are well-known for their longevity compared to traditional lighting options. The useful life of an LED luminaire or lamp is commonly measured as the number of operating hours until it emits 70% of its initial light output. Premium white LED lighting products are projected to have a useful life ranging from 30,000 to 50,000 hours, surpassing many conventional lighting sources. This extended lifespan not only reduces the frequency of replacements but also offers significant energy savings and maintenance costs over time. Choosing high-quality LED lighting products can provide both efficiency and durability, making them a reliable and long-lasting investment for various applications. LED lighting products vary in price depending on several key factors related to lighting performance features. These differences in price often reflect varying levels of color quality, lifetime, optical performance, and other varying factors within the products. As consumers navigate the market for LED lighting, it is crucial to strike a balance between price and performance to ensure their needs are met effectively. The LED lighting platform offers a spectrum of performance levels at different price points, allowing consumers to choose products that align with both their budget and desired lighting capabilities. By understanding these distinctions and making informed decisions, consumers can optimize their lighting solutions for both functionality and cost efficiency in professional settings.

Integrating lighting controls such as occupancy sensors, vacancy sensors, and daylight sensors in a project can significantly improve energy savings. These sensors can be connected to the fixture through hardwiring or operate wirelessly with battery power, allowing for greater flexibility during installation. In today's market, many LED manufacturers incorporate various controls into their products, simplifying the process for users. However, it is important to recognize that not all sensors may be compatible with every product. It is crucial for professionals to diligently assess compatibility to ensure the smooth integration of lighting controls and maximize energy efficiency in projects. Below are various types of controls that not only enhance efficiency and cut costs, but also enable maintenance staff to focus on other tasks:

- Occupancy sensors play a pivotal role in energy efficiency by automatically turning lights on and off based on occupancy levels to optimize energy usage;
- Vacancy sensors are ideal for small private spaces, offering manual activation and automatic shutoff to cater to areas consistently utilized throughout the day;
- Daylighting sensors are equally essential, ensuring electric lights are dimmed or switched off when natural light is sufficient;
- Multiple sensor strategies is a smart approach, although it's crucial to note that energy savings from various tactics are not simply cumulative;
- Dimming controls provide further energy efficiency by adjusting light intensity as per occupants' preferences, timers, or daylight levels. It is worth noting that not all LED products support dimming capabilities;
- Task tuning, characterized by dimming to tailor light output to occupants' needs, enhances both comfort and efficiency in lighting environments. This comprehensive approach to sensor deployment and control mechanisms underscores the importance of professional practices in creating sustainable and efficient lighting solutions.

Retrofit kits offer greater energy savings potential through lighting controls compared to tubular LEDs (TLEDs). The body of the retrofit kit allows for easy installation of sensors. They can be used for small projects with stand-alone wireless controls, or larger whole-building retrofits with more complex systems. Retrofit kits can be wired during installation of new lighting systems for maximum efficiency.

While all of the projects listed in Section 5.0 could help to achieve energy efficiency at state agencies, universities and community colleges, there are a few main barriers to implementation that impact all project types:

- A lack of staff time to review energy usage data and develop, implement and oversee energy efficiency projects;
- Training, staff time, and support for needed building commissioning and decommissioning, and regular building and systems maintenance;
- Education and training for new and existing staff on energy usage, tools for energy efficiency, and how to maximize existing building and system technology; and
- Funding for energy efficiency projects. Funding pathways are discussed further in the following section.

5.2 Funding Pathways

The following funding sources have been awarded to the SEO. For updates to any funding sources the SEO is awarded in the future, be sure to check our website at: The NC State Energy Office.

IRA & IIJA Funding Updates

A. **Inflation Reduction Act**

Section 60114 of the Inflation Reduction Act authorized the Climate Pollution Reduction Grants (CPRG) program under the EPA, providing $5 billion in grants to states, local governments, tribes, and territories to develop, strategize, and implement plans for reducing greenhouse gas emissions and other harmful sources of air pollution. North Carolina received a $3 million award for planning activities. The Priority Climate Action Plan (PCAP) was developed after extensive stakeholder engagement. The PCAP identified the priority areas in NC for greenhouse gases, while ensuring equitable implementation. To view the PCAP, you can click on this website: PCAP. North Carolina is in the process of developing a Comprehensive Climate Action Plan (CCAP). The CCAP, due December 1, 2025, will update and expand upon North Carolina's existing climate strategies, ensuring that these documents align with the latest available science, modeling, and best practices and will also be available online.

The SEO was not awarded CPRG implementation funding in 2024. Given changes at the federal level, additional funding opportunities are not available at this time. Should federal funding opportunities arise in the future, they will be sought.

B. **Infrastructure Investments and Jobs Act**

The bipartisan Infrastructure Investments and Jobs Act (IIJA) was signed into law on November 15th, 2021, allocating $1.2 trillion to create opportunities for states, tribes, and local governments to invest in infrastructure towards green energy, energy equity, and climate resiliency. Under Section 40552 of H.R. 3684, the Energy Efficiency and Conservation Block Grant (EECBG) program provides $550 million nationally to improve transportation and building infrastructure. The SEO was awarded approximately $2.9 million in EECBG funding from the Department of Energy to provide grants to government entities to implement energy efficiency measures and renewable energy system installations.

The SEO applied for and has been awarded the Preventing Outages and Enhancing the Resilience of the Electric Grid grant under the IIJA Grid Resilience Formula Grant Program Section 40101(d). The Grid Resilience grant has provided over $27 million in funding support for the deployment of grid modernization technologies, diversification of distributed generation assets, and hardening and improving adaptivity of transmission infrastructure to strengthen the resiliency of the electric grid against disruptions from extreme weather-related events and outages. Over $18 million in funding from years one and two of the program have been awarded to seven sub-grantees for projects that are soon to break ground; an additional $9 million in funding from year three has been issued to the state and a request for proposals will be forthcoming.

Potential projects from eligible entities, including electric grid operators, distribution providers, and others, all submitted proposals are prioritized based on North Carolina's objectives of grid modernization, equitable access to resilient and reliable energy, and equitable workforce development initiatives. Selected projects will reduce the likelihood and consequences of grid failure due to natural disasters.

Guaranteed Energy Savings Contracts (GESC)

Since 2002, General Statute (G.S.) §143-64 allows for state agencies and universities to utilize a Guaranteed Energy Savings Performance Contract (GESPC) process to implement major facility upgrades. These contracts ensure that the cost of improvements is paid for entirely through verified energy savings, with no upfront capital required. Under this law, energy savings resulting from the performance of the contract must equal or exceed the total cost of the contract. Additionally, contracts may not exceed a term of 20 years from the date of the installation and acceptance by the state governmental unit (i.e., state agencies or the University of North Carolina (UNC) System). This legislative authority has resulted in 24 total GESPCs executed among governmental agencies and private energy service providers since 2005. As of FY2024-25, 19 active GESPCs are underway across state agencies and UNC institutions, while five projects have completed their contract terms collectively exceeding guaranteed savings by over $2 million. The total guaranteed savings across all active contracts amounts to approximately $440 million, with $240 million already achieved to date. This represents over $30 million above the guaranteed amount to date, demonstrating the continued effectiveness of performance contracting in delivering cost savings and infrastructure improvements.

Based on these results, performance contracting continues to stand out as a cost-effective financing method for implementing energy efficiency and infrastructure upgrades at state-owned facilities. Momentum for performance contracting remains strong across the state, with two new RFPs issued

after the close of FY2024-25 and additional solicitations under development. Through expanded outreach including State Energy Conference presentations, webinars, university, community college and agency briefings the SEO continues to increase awareness and adoption of GESPCs. North Carolina also remains an active DOE ESPC Campaign Leader, both receiving and providing technical assistance, and contributing to national case studies and webinars that showcase the state's leadership and innovation in public-sector energy management.

Energy Efficiency Repair and Renovation Funds

Each agency makes annual requests for repair and renovation (R&R) budgets. These requests contain a variety of requests including capital projects, maintenance issues, aging equipment, and infrastructure necessary to maintain the current use of existing facilities. USI and OSBM have worked together to ensure that agencies target a portion of these funds for energy efficiency measures. For example, during FY2023-24, cabinet agencies collectively leveraged up to $25 million in much needed funding for energy projects that were pre-approved by USI's technical staff. In the most recent 2024-25 North Carolina budget, $140 million remains from the previous year's budget for repairs and renovations for both state agencies and UNC System facilities. USI will continue to work with OSBM to ensure that agencies target a portion of these funds for energy efficiency improvements. Overall, this is a positive step towards achieving greater efficiency gains and providing stewardship of taxpayer funds.

Utility Program Offerings

Opt-In Utility Programs offer customers the choice to partake in demand side management (DSM) and energy efficiency (EE) initiatives. The key aim is to decrease energy consumption and enhance the efficiency of electrical appliances. Participants typically pay a slightly higher amount on their monthly bills but gain access to discounted high-efficiency equipment or lighting through rebates. By engaging in these programs, participants receive incentives that offset the added costs of energy-efficient installations and maintenance. On the other hand, customers who opt-out have the option to receive a bill credit, which they are encouraged to use for implementing their own efficiency measures. However, some customers may not utilize these savings for energy efficiency purposes as intended. If governmental entities opt-out, it is crucial that they redirect the funds they would have spent otherwise into consistent energy efficiency enhancements at their facilities. Tracking a monthly "would-be" spend amount within existing internal mechanisms for utility expenses can ensure these funds are earmarked for energy efficiency projects, promoting sustainable practices and accountability.

In North Carolina, there are utility programs offering financial assistance to eligible commercial customers with an average annual demand of 180 kilowatts or less for energy efficiency improvements. A dedicated contractor provides free energy assessments and makes recommendations for improvements in lighting, refrigeration, heating and cooling, and water efficiency. The process is streamlined, with the contractor calculating savings and payback, and handling installation. Participants receive upfront discounts from the energy provider to encourage the purchase and installation of high-efficiency equipment for their businesses.

Duke Energy offers in-home assessment programs that have been expanded to include new virtual, phone, and online options for customers. Customers can choose to have a virtual assessment conducted with energy advisors using their device's camera, a phone assessment with energy advisors, or a self-guided online assessment. Energy specialists will analyze customers' total home energy usage and check the efficiency of their appliances and heating/cooling systems during the virtual and phone assessments. The online assessment generates customized savings recommendations based on customer responses. Customers will receive a customized report detailing steps they can take to increase efficiency and lower their energy bill, along with free energy-saving recommendations. Customers will also receive a free energy efficiency kit in the mail, containing bathroom aerators, weatherstripping, water heater insulation pipe wrap, and a furnace filter whistle. These items can be self-installed to provide immediate energy savings. The program aims to help customers reduce energy usage and lower their bills.

Carry Forward Funds

One barrier all state governmental units face is a lack of funding for energy efficiency improvement projects. In this regard, the UNC System and affiliates benefit from a statutory provision that was created under SL 2010-196, Sections 1 and 2 (NCGS 116-30.3B), also known as carry forward funds. This provision allows the UNC System and affiliates to retain funds annually left over in their utility accounts by measuring and receiving third-party verification on energy savings associated with utility saving projects completed during the same fiscal year. These funds are credited into the next fiscal year's budget with the requirement that at least 60% of those funds must be used for more energy related projects. This provides an incentive to install projects which generate energy savings because a portion of the funds are credited back and can then be used for more energy efficiency projects. Over time, projects become larger thereby resulting in greater savings. A more recent legislation, The Department of Adult Correction (DAC) submitted their first request for carry forward funds under § 143B-1445 during FY2023-24, totaling $3,631,974. Energy efficiency projects included Small Business Energy Savers (SBES) projects through Duke Energy, water leak repairs, interior and exterior LED lighting projects, opt-out credits through Duke Energy, and energy savings during construction of the Thousand Cell Performance Contract with Schneider Electric. If other cabinet agencies had a carry forward mechanism like DAC has under § 143B-1445, they too could utilize this funding pathway to fund additional energy efficiency projects across their portfolios, furthering the energy reduction goal of EO80.

During FY 2024-25, twelve UNC System schools asked to carry forward nearly $20.8 million in utility savings and reported spending an additional $23 million for new energy efficiency projects. Figure 9 represents the previous fiscal year's estimated avoided energy costs of the top agencies that totaled more than $53.1 million. If these agencies had a more permanent, clear, and reliable mechanism like NCGS 116-30.3B (i.e., outside the dedicated energy efficiency R&R funds), some of these avoided costs could have been utilized to self-fund additional energy efficiency projects similar to the UNC System and its affiliates. USI recommends cabinet agencies have access to similar self-funding energy efficiency improvement funds as the UNC System has under NCGS 116-30.3B and as DAC has under NCGS 143B-1445; these funds would be significant and would provide a clear pathway to increased implementation of valuable energy efficiency projects.

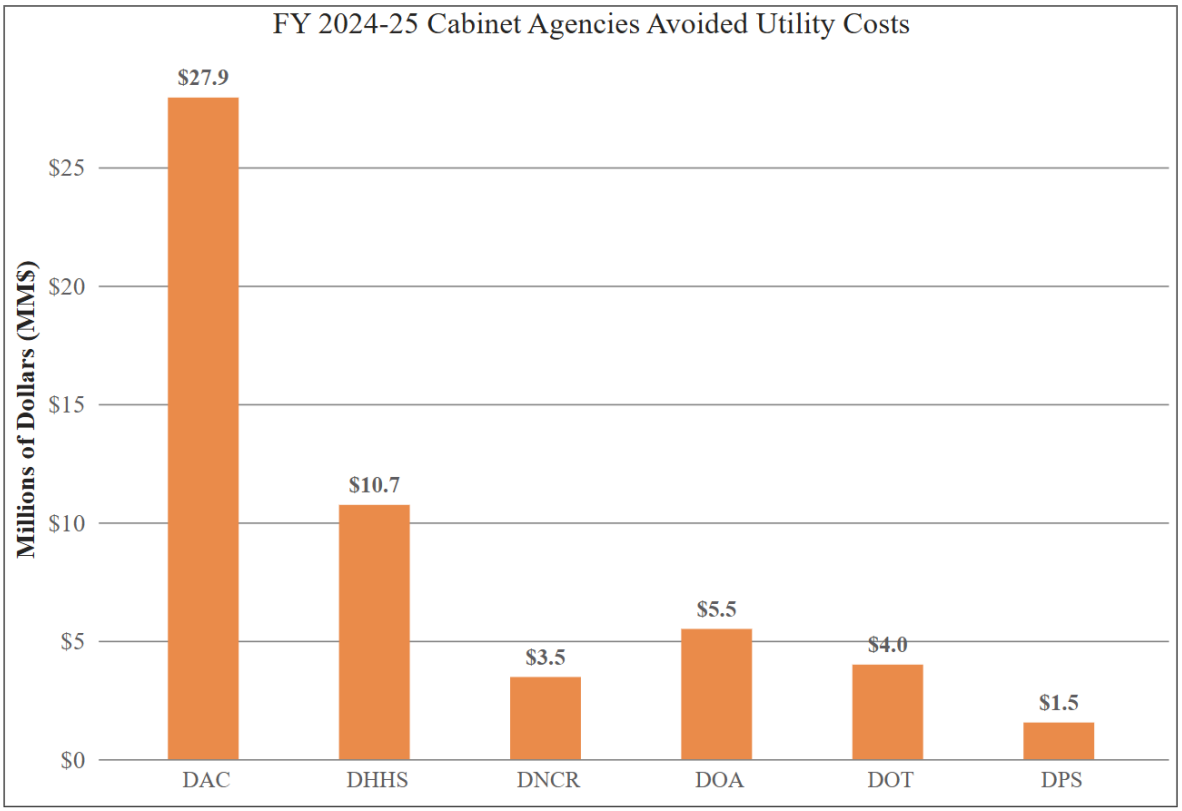


Figure 9: Cabinet Agencies Avoided Utility Costs

6.0 Conclusion

This report emphasizes the need for significant energy conservation measures and resources by all governmental units to achieve the EO80 40% EUI reduction goal by 2025. If substantial measures and resources are not implemented in FY2025-26, the EO80 40% EUI goal will likely not be achieved.

Hiring full-time dedicated energy managers with decision-making authority and access to specific funding for energy improvements would help substantially in this effort. Management can empower these energy managers and fully support EUI reduction initiatives both by communicating energy efficiency goals, providing staff time to address them, and by providing leadership in making sure the goals are achieved. Energy managers and contacts within governmental units must engage and communicate with the USI team at the SEO consistently, who are there to provide technical assistance and guidance in all EUI reduction initiatives.

Improved data collection efforts are underway within several state agencies, but all governmental units would benefit from a more sophisticated and centralized utility data collection system; this would reduce the risk of human error in data collection efforts, thereby increasing the accuracy and effectiveness of the data and allowing energy managers to more easily identify facilities that would benefit the most from energy efficiency efforts.

Similarly, all governmental units need to consider alternative financing mechanisms for energy efficiency projects such as GESPCs. A comprehensive and thoughtful utility management plan is also necessary for all governmental units to provide a long-term vision and structure for incorporating energy efficiency practices and principles into business decisions.

Additionally, directives should be implemented to prevent purchasing non-LED lamps or fixtures throughout all government sectors, unless an exception is required for specialty circumstances or situations.

As the data shows, the EUI has decreased, and the State is further from its 40% energy reduction goal this year when compared to FY2023-24. The SEO recommends the following overall improvements and capital investment as it relates to energy efficiency for state-owned buildings:

- Invest in more sophisticated, state-of-the-art data collection tools and/or mechanisms to streamline and standardize utility data collection and increase the accuracy of the SEO's data collection efforts;
- Appoint a full-time energy manager, particularly for the top five largest agencies, where energy management is their sole responsibility;
- Buy-in from executive management and additional funding for energy manager positions in state cabinet agencies;
- Maintain consistent and frequent communication with the SEO so we can better understand and support USI entities' struggles and successes;
- Participate in energy efficiency assessments for state-owned facilities at least once every 3-5 years in order to identify and prioritize energy efficiency projects, and communicate these findings to the SEO;
- Explore and be creative with the various funding pathways for energy efficiency projects as outlined in Section 5.2, particularly with Guaranteed Energy Savings Performance Contracts;
- Implement a directive against purchasing new non-LED bulbs and/or fixtures, unless an exception is required for specialty circumstances or situations;
- The North Carolina General Assembly should consider establishing carry-forward funds for cabinet agencies as they have with UNC System institutions as a means of increasing funding, implementing energy efficiency projects, and achieving savings.

Overall, cabinet agencies, other agencies, and the UNC System spent over $380M on utilities in FY 2024-25. Proper stewardship of these funds requires robust energy conservation measures and an intentional focus on energy efficiency. This message should come directly from leadership and filter through all levels of governmental sectors. Now more than ever, an investment in energy efficiency is necessary for North Carolina to continue to lead-by-example both within our state and nationally. The USI team at the State Energy Office is prepared to support and assist with all energy efficiency efforts and to drive future energy savings across the state. We must continue to work together to conserve our valuable resources for the benefit of all North Carolinians.

Appendix A

Agency Summaries, Data, and Graphs

Department of Administration (DOA)

The Department of Administration acts as the business manager for North Carolina State government and was established in 1957. The Department oversees Government Operations, which includes the maintenance of state-owned buildings and grounds. The DOA Division of Facility Management has been tracking electrical and natural gas consumption data for buildings owned and maintained by DOA monthly since 1998. The Division is also responsible for operating and maintaining DOA buildings, including paying the water, electric, and natural gas utility bills. DOA operates a central steam heating plant, two chilled water plants, and chilled water storage tanks. Most large DOA buildings are in the Downtown Government Complex with the majority being offices but also includes the steam and chilled water plant. The buildings are mostly occupied by agencies other than DOA with DOA serving as landlord. DOA deducts the Legislative Building and Legislative Office Building chilled water and steam usage from their totals because DOA does not report on these buildings. Brittany Quinn and Ralph Taylor work together to improve the energy efficiency and sustainability of DOA facilities. DOA accounts for 12% of overall cabinet agencies' energy consumption impact; DOA has seen a 36% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03.

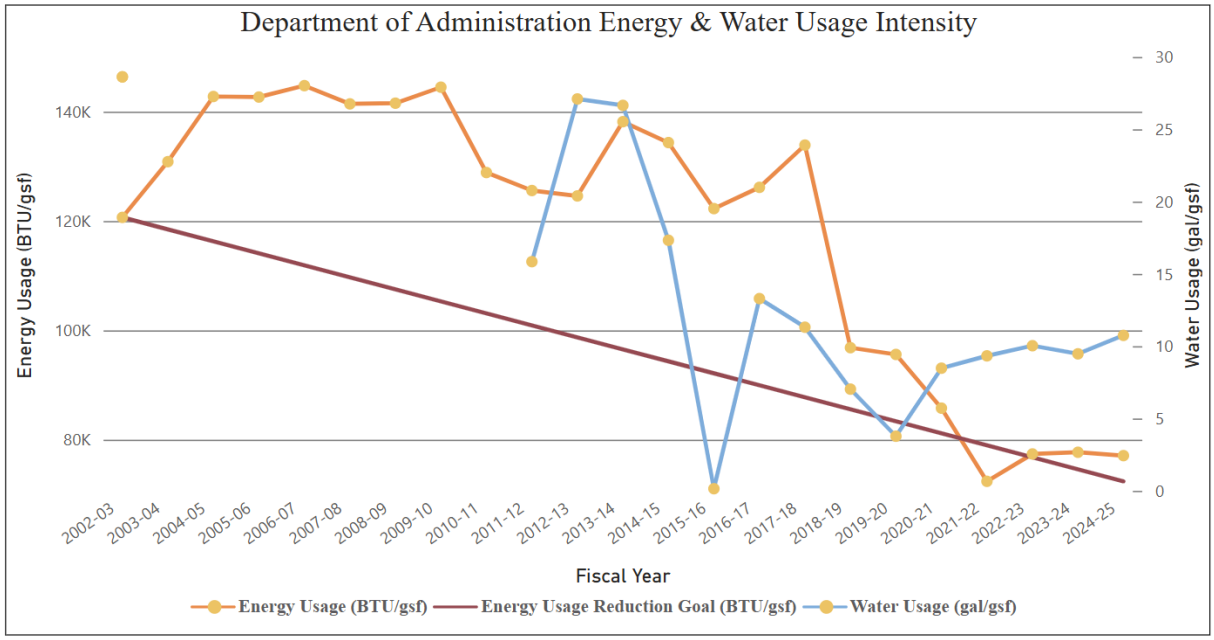


Figure A.1: DOA Utility Usage Over Time

Table A.1: DOA Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	4,798,719	5,374,594	+12%
Total Utility Cost	$7,491,785	$8,431,640	+13%
Energy Usage (Btu/gsf)	120,663	77,090	-36%
Energy Cost ($/MMBtu)	$12.41	$18.73	+51%
Water Usage (gal/gsf)	29	11	-62%
Water Cost ($/kgal)	$2.23	$11.60	+421%

Department of Commerce (DOC)

The Department of Commerce was founded in 1971, and their mission is to *"work closely with local, regional, national, and international organizations to propel economic, community, and workforce development in the State."* To accomplish this task, the DOC is comprised of several divisions and programs that assist businesses with siting and workforce requirements, connecting the community with funding opportunities to attract new businesses, and publishing analytical reports for those interested in investing in North Carolina's economy. Except for the Division of Employment Security's (DES) Central Office, all business operations are housed in properties that are owned or leased by the Department of Administration (DOA). Therefore, the DES is the only entity that is required to report utility consumption through the DOC in accordance with GS §143-64.12 and EO80, Section 8. Joe Katzberg is the Support Services Director and is designated as the agency's energy manager. DOC accounts for less than 1% of overall cabinet agencies' energy consumption impact; DOC has seen a 15% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03. Water consumption (in kgals) was not reported untilFY2006-07, therefore here is no baseline water data available for DOC.

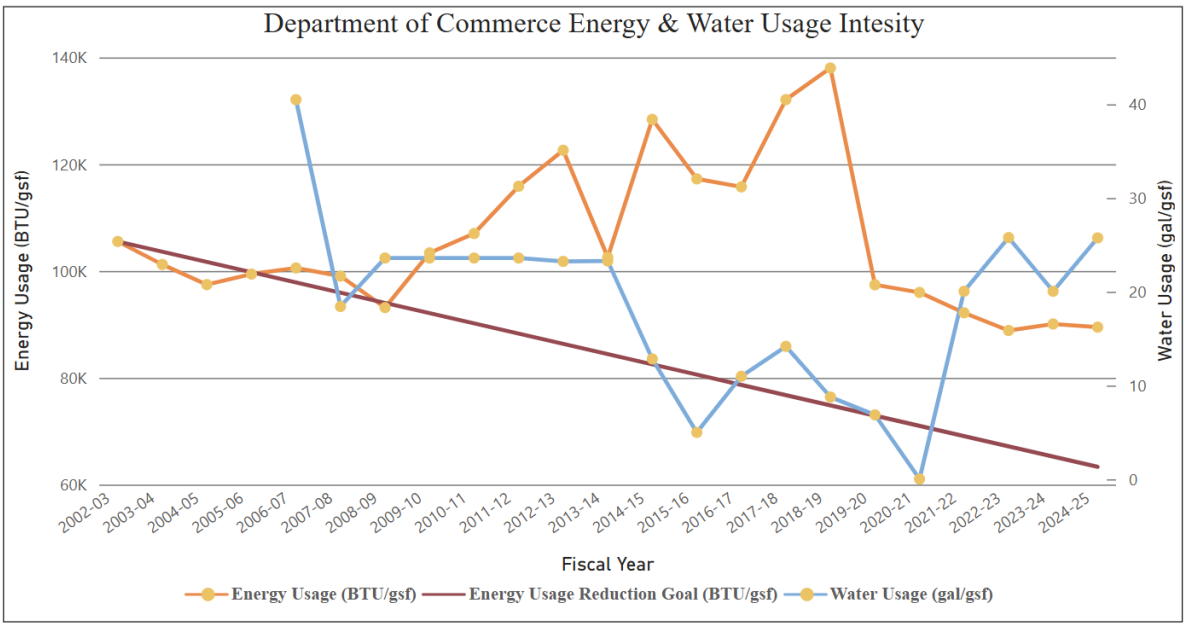


Figure A.2: DOC Utility Usage Over Time

Table A.2: DOC Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	261,091	261,091	0%
Total Utility Cost	$398,568	$394,863	-1%
Energy Usage (Btu/gsf)	105,532	89,481	-15%
Energy Cost ($/MMBtu)	$14.47	$15.94	+10%
Water Usage (gal/gsf)	0	26	
Water Cost ($/kgal)	$0.00	$3.34	

Department of Environmental Quality (DEQ)

The DEQ was formed in 2015 and was preceded by the Department of Environmental and Natural Resources, which was formed in 1971. The DEQ is the lead stewardship agency for the protection of North Carolina's environmental resources and has offices from the mountains to the coast. Chief responsibilities include administering regulatory programs designed to protect air quality, water quality, and the public's health along with advancing energy efficiency. The majority of DEQ employees work in buildings owned by the DOA or in leased buildings which are not included in the utility data of this report. Only the state-owned facilities currently managed by DEQ are measured and tracked for the DEQ utility data, which include the Reedy Creek complex located in Raleigh primarily occupied by the Division of Air Quality, and Water Resources along with the Division of Marine Fisheries (DMF) located in Morehead City. Eric Turon is the Division Director for DEQ's Division of Facilities Health & Safety. 2002-03 baseline data was estimated for DEQ

to track EO80 progress, but this exercise could not be done for every year between 2002-03 and 2010-11 due to data availability limitations. DEQ accounts for less than 1% of overall cabinet agencies' energy consumption impact. At the time of drafting this report, data was not received from DEQ. Data for 2024-2025 for DEQ was estimated based on data from 2022-2023 and 2023-2024. The most recent water use data was submitted in 2022-2023.

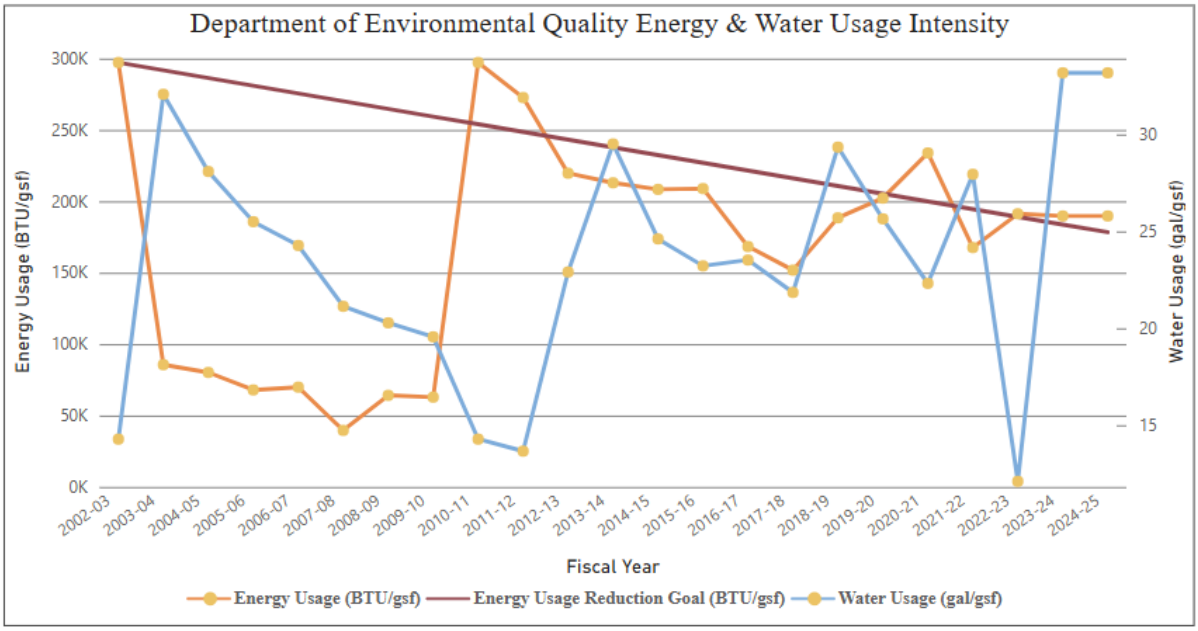


Figure A.3: DEQ Utility Usage Over Time

Table A.3: DEQ Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	105,527	95,182	-10%
Total Utility Cost	$572,246	$543,523	-5%
Energy Usage (Btu/gsf)	297,243	189,757	-36%
Energy Cost ($/MMBtu)	$17.56	$27.94	+59%
Water Usage (gal/gsf)	14	33	+132%
Water Cost ($/kgal)	$14.21	$12.34	-13%

Department of Health and Human Services (DHHS)

The DHHS, founded in 1971, manages the delivery of health and human-related services for all North Carolinians, especially our most vulnerable citizens; children, elderly, disabled and low-income families. The Department works closely with health care professionals, community leaders and advocacy groups; local, State, and federal entities; and many other stakeholders to make this happen. The Department is divided into 30 divisions and offices. DHHS divisions and offices fall under four broad service areas: (1) health; (2) human services; (3) administrative; and (4) support

functions. DHHS has approximately 635 buildings at 14 different institutions across the State encompassing roughly 7.8 million square feet of space. These institutions include psychiatric hospitals, neuro-medical treatment centers, alcohol and drug abuse treatment centers, developmental centers, and vocational rehabilitation centers. The Energy Managers for DHHS are Greg Johnson, Luke Hoff, and Bill Stevens within the Division of Property and Construction. DHHS accounts for 22% of overall cabinet agencies' energy consumption impact; DHHS has seen a 34% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03.

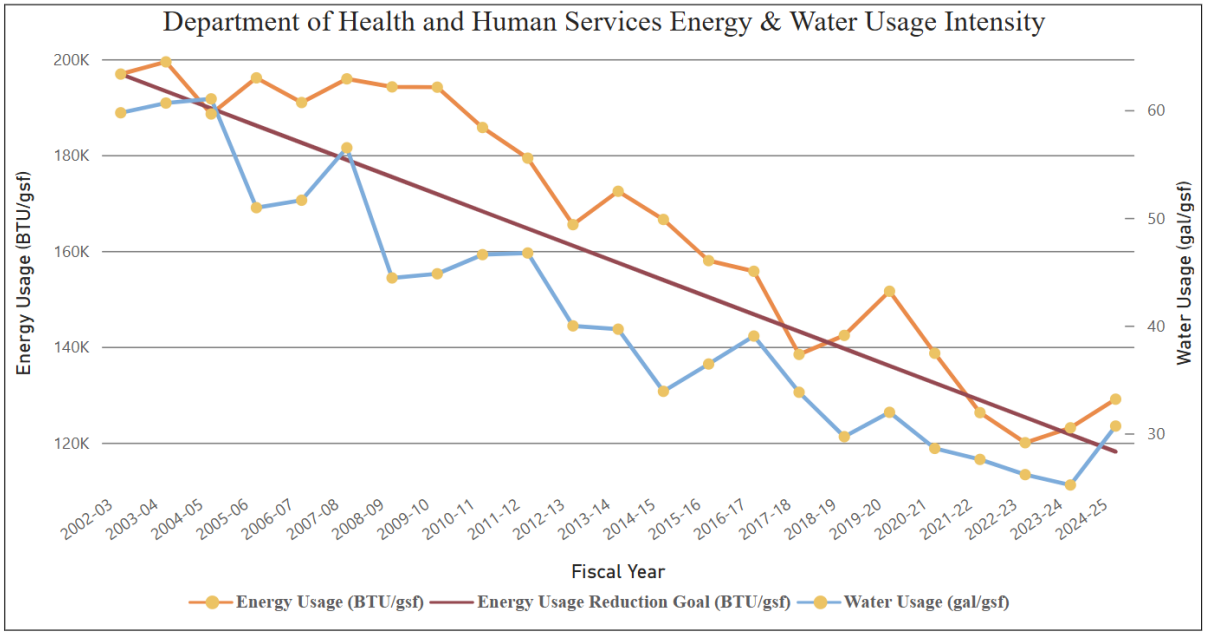


Figure A.4: DHHS Utility Usage Over Time

Table A.4: DHHS Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	6,381,007	7,724,442	+21%
Total Utility Cost	$12,834,405	$18,249,500	+42%
Energy Usage (Btu/gsf)	196,896	129,077	-34%
Energy Cost ($/MMBtu)	$9.23	$15.57	+69%
Water Usage (gal/gsf)	60	31	-49%
Water Cost ($/kgal)	$3.25	$11.52	+254%

Department of Information Technology (DIT)

DIT, founded in 2015, has two data centers totaling approximately 164,000 square feet. The Eastern Data Center (EDC) located at 3700 Wake Forest Road in Raleigh has operated for roughly

36 years. The Western Data Center (WDC) located in Forest City has been in operation for approximately 15 years. The nature of DIT's Data center facilities differs from most State buildings since their energy consumption is constantly variable depending on the number of servers, network, and other types of IT equipment in use at any given time. DIT offers numerous IT services supported by the Data centers to other state agencies. Floor hosted options are also offered to the agencies where they can utilize a spot on the Data floor with a DIT supplied rack, power, and cooling. As state agency's IT requirements change over time, there is a general upward trend in the power consumption needed. The Energy Manager for DIT is Tony Brackett, Workplace Services Director. DIT accounts for less than 1% of overall cabinet agencies' energy consumption impact; for the reasons explained above, DIT has seen a 31% increase in EUI (BTUs per square foot) since the baseline year of 2002-03.

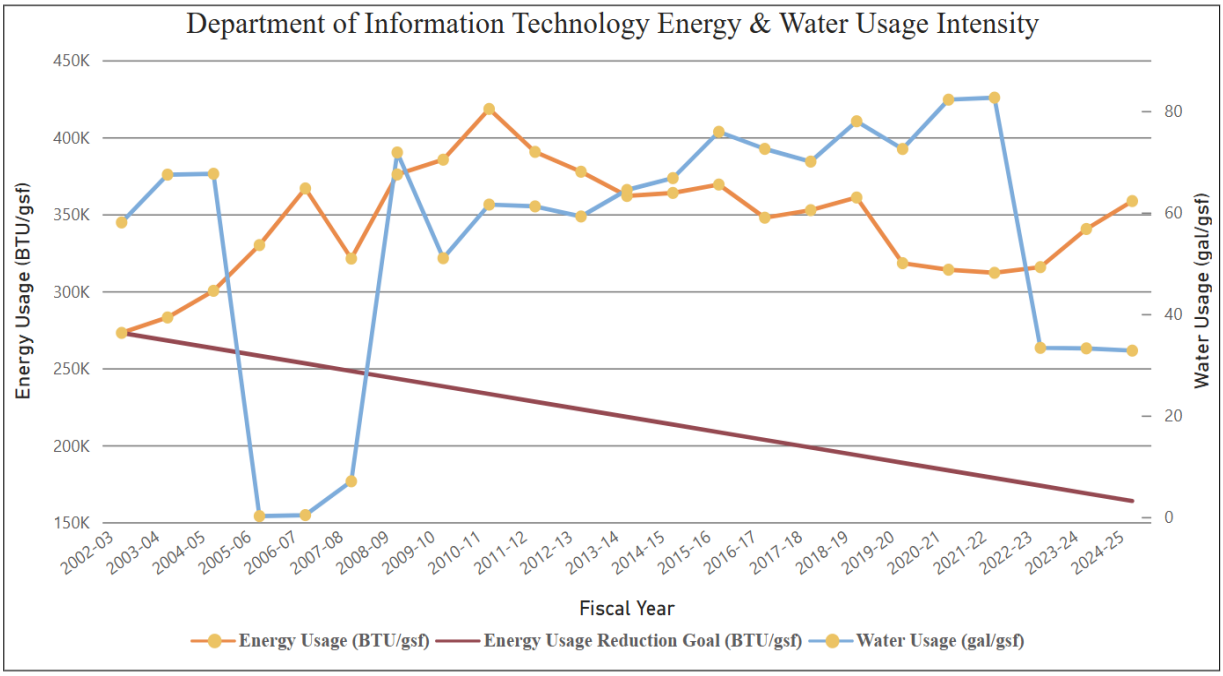


Figure A.5: DIT Utility Usage Over Time

Table A.5: DIT Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	94,343	163,866	+74%
Total Utility Cost	$362,255	$1,472,930	+307%
Energy Usage (Btu/gsf)	272,914	358,532	+31%
Energy Cost ($/MMBtu)	$13.67	$23.80	+74%
Water Usage (gal/gsf)	58	33	-44%
Water Cost ($/kgal)	$1.90	$13.94	+633%

Department of Military and Veteran's Affairs (DMVA)

The DMVA, founded in 2015, is the newest of the State agencies dedicated to helping veterans and active-duty men and women access the programs, benefits, and resources that they have earned. DMVA staff are committed to providing the highest level of service, responsiveness, and integrity in keeping the principles and values of this State and nation that military personnel and their families deserve. DMVA assists with the management of four military Skilled Care Nursing Homes housing almost 450 veterans and is in the construction phase of a 120-bed home with plans to build a sixth home. NC has one of the largest military footprints of any State, representing three out of the four branches. Military and defense industries are the second largest employers in our State, and the military has an economic impact of over $66 billion annually. The current designated energy managers are Joy John, Accounting Technician III, and Brian Pierce, Chief Deputy Secretary.

Previous reports indicated that DMVA utilities are paid through federal funds and therefore they did not have utility graphs/tables to report; however, the SEO was informed in late June 2023 that DMVA nursing homes and cemeteries *are* paid with state funds and therefore should be included in reporting efforts. DMVA accounts for roughly 1% of overall cabinet agencies' energy consumption impact. SEO received incomplete energy consumption data from DMVA in FY2022-23; we were able to successfully collect FY2024-25. 2002-03 baseline data was estimated for DMVA to track EO80 progress, but this exercise could not be done for every year between 2002-03 and 2010-11 due to data availability limitations. DMVA has seen a 3% decrease in EUI (BTUs per square foot) since the baseline year of 2002-03.

Table A.6: DMVA Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	404,969	516,269	+27%
Total Utility Cost	$971,174	$1,256,510	+29%
Energy Usage (Btu/gsf)	93,902	91,058	-3%
Energy Cost ($/MMBtu)	$20.76	$21.45	+3%
Water Usage (gal/gsf)	190	650	+242%
Water Cost ($/kgal)	$2.36	$0.74	-69%

Department of Natural and Cultural Resources (DNCR)

The NC Department of Natural and Cultural Resources, founded in 1971, oversees the State's resources for the arts, history, libraries and nature. This includes 27 historic sites, seven history museums, two art museums, two science museums, three aquariums, 39 State parks and recreation areas, the NC Zoo, the NC Symphony, the State Library, the State Archives, the NC Arts Council, State Preservation Office, Office of State Archaeology, the African American Heritage Commission, and the Office of Land and Water Stewardship. This comprises approximately 1,825 buildings across the State which account for over 3.6 million gross square feet. The Energy Managers for DNCR are Tony Romaine, Erin Lawrence, and Shannon Riley. 2002-03 baseline data was estimated for DNCR to track EO80 progress, but this exercise could not be done for every year between 2002-03 and 2010-11 due to data availability limitations. DNCR accounts for 7% of overall cabinet agencies' energy consumption impact; DNCR has seen a 36% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03.

DNCR was working with Siemens to establish a performance contract at nine of their facilities across the state, however this contract was not approved during the last part of the review process in May 2024. If approved, this performance contract would have contributed towards reaching the EO80 40% EUI reduction goal this year.

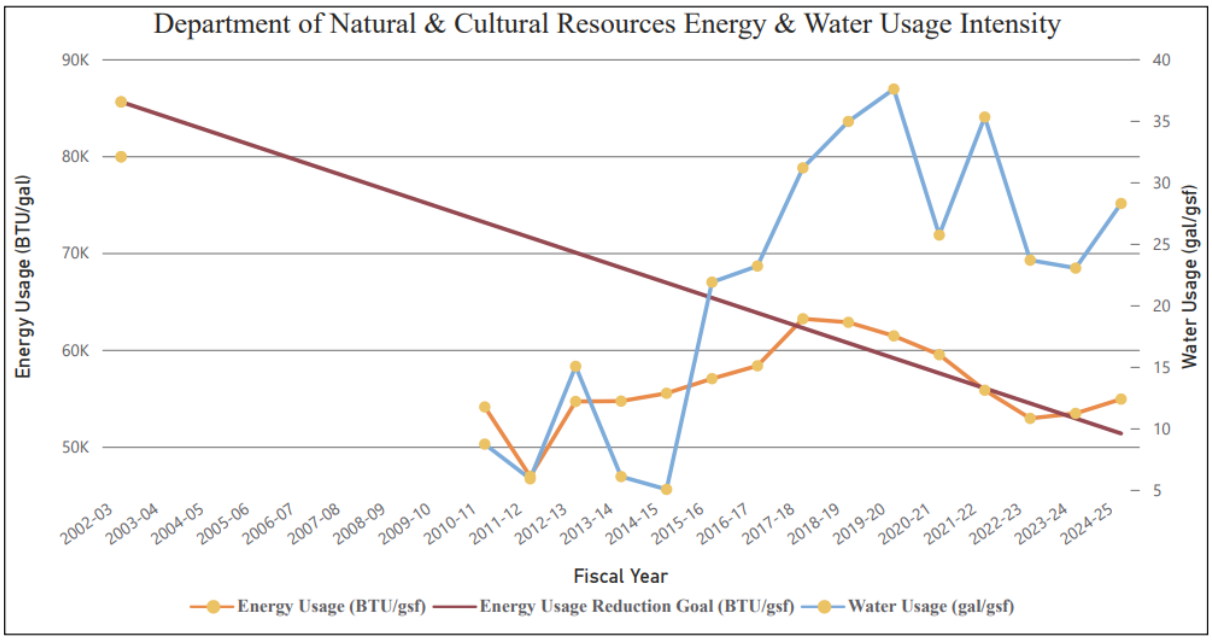


Figure A.7: DNCR Utility Usage Over Time

Table A.7: DNCR Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	2,291,088	3,650,179	+59%
Total Utility Cost	$3,808,442	$7,266,920	+91%
Energy Usage (Btu/gsf)	85,595	54,907	-36%
Energy Cost ($/MMBtu)	$17.08	$29.32	+72%
Water Usage (gal/gsf)	32	28	-12%
Water Cost ($/kgal)	$6.25	$13.47	+115%

Department of Transportation (DOT)

The NC Department of Transportation was formed in 1979 and was formerly known as the State Highway Commission, which was founded in 1915. The DOT is responsible for all modes of transportation in North Carolina. This includes highways, rail, aviation, ferries, public transit, and bicycle and pedestrian transportation. The department also oversees the State's Division of Motor Vehicles and the Governor's Highway Safety Program, which promotes safety awareness to reduce highway crashes and fatalities. Additionally, DOT helps expand economic growth opportunities through oversight of the NC State Port Authority (NCSPA), NC Global TransPark and NC Turnpike Authority. DOT combined with the NCSPA occupies a total of 2,382 buildings which amount to more than 9.5 million gross square feet spread throughout the State. The energy manager for DOT is Eric Frazier whose primary job title is Energy Management Engineer for the Facilities

Management Unit. DOT accounts for 16% of overall cabinet agencies' energy consumption impact. DOT has seen a 30% decrease in EUI (BTUs per square foot) since the baseline year of 2002-03.

The SEO did <u>not</u> receive any utility data from DOT for FY2022-23 or FY2023-24. Energy and water consumption data was duplicated from FY2021-22 to carry forward their approximate usage in order to make reasonable assumptions based on their contribution to agency totals.

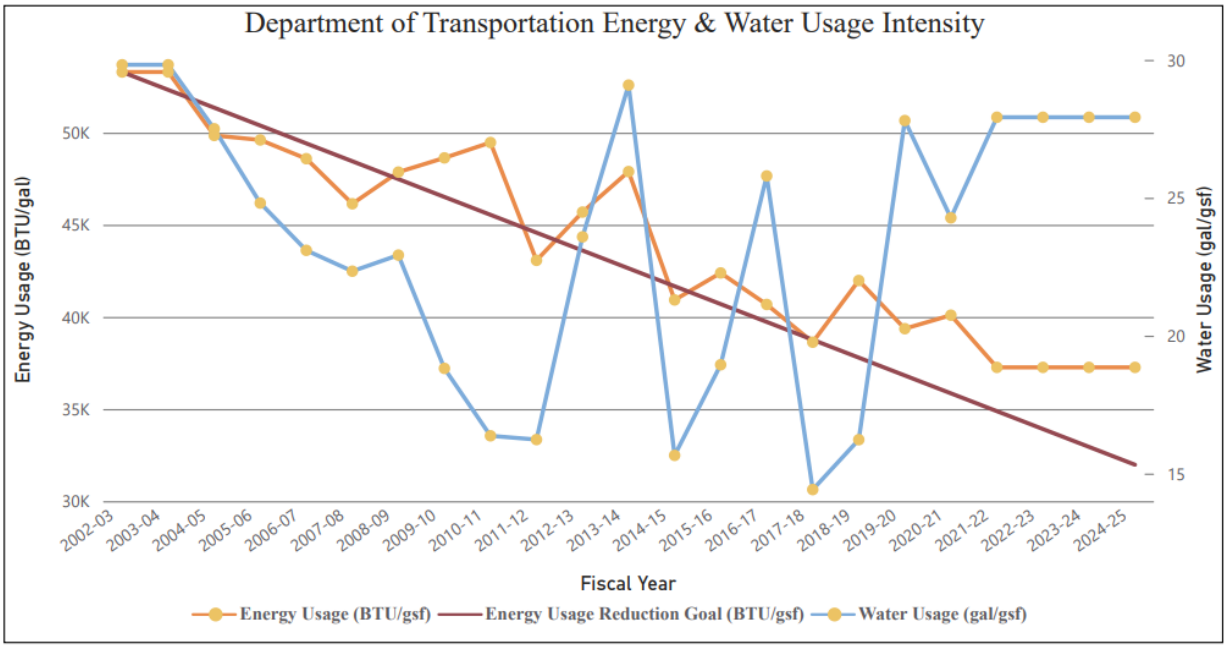


Figure A.8: DOT Utility Usage Over Time

Table A.8: DOT Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	8,784,848	9,628,207	+10%
Total Utility Cost	$9,341,426	$11,411,289	+22%
Energy Usage (Btu/gsf)	53,296	37,263	-30%
Energy Cost ($/MMBtu)	$17.02	$24.76	+45%
Water Usage (gal/gsf)	30	28	-6%
Water Cost ($/kgal)	$5.24	$9.40	+79%

Department of Revenue (DOR)

The DOR, founded in 1921, is tasked with administering tax laws and collecting tax revenue to fund public services for the citizens of North Carolina. The tax-funded public services include items such as schools, universities, roads, and public safety. To fulfill these tasks, the Department's vision is to protect customer information, maintain an expert workforce, achieve a high-level of

understanding and compliance, respond with accurate information through innovative services, and to treat taxpayers fairly. The main DOR office building is located at 501 North Wilmington Street in Raleigh. This building is currently owned by the DOA, and utilities are reported through that agency. The DOR also occupies thirteen remote offices across the State that are housed in leased spaces, so those utilities are not included in this report. Matthew King is designated as the energy manager for DOR, his primary role serving as Business Operations Facilities Manager.

No agency-specific utility graphs/tables are included below since the DOR reports utilities through the DOA.

Department of Public Safety (DPS)

The Department of Public Safety (DPS), formed in 2012, manages facilities across the State that include juvenile detention centers, law enforcement support services, emergency management headquarters, and motor vehicle division sites. Also housed within DPS are the departments of Homeland Security and the National Guard. The designated energy manager for DPS is Robert Gron, Regional Engineer with Central Engineering. DPS accounts for about 6% of overall cabinet agencies' energy consumption impact, a large reduction from the 43% it previously accounted for when DPS and DAC were joined as DPS; prior to this split, DPS was the largest user of utilities among all state agencies. DPS has seen an approximate 26% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03, however the following items should be noted[13]:

- DPS data has been updated back to 2023. Prior years of data were obtained from DAC Engineering. The accuracy of the pre-2023 data cannot be verified due to incomplete/missing information and numerous organization changes both before and after the creation of DPS in 2011; USI staff are currently disaggregating the historic agency data and will include that data in the 2025-2026 report
- This data does not contain information for the North Carolina National Guard, as they report separately;
- This data does contain information for the State Bureau of Investigation (SBI). Beginning next fiscal year, the SBI will report separately. DPS will partner with SBI to assist in their initial independent report;
- This data does contain information for the State Highway Patrol / State Bureau of Investigation Campus in Raleigh, which is maintained by DOA.
- Energy and water reduction initiatives have slowed tremendously since the separation of DAC from DPS. DAC retained the entirety of Energy Management staff, leaving DPS without dedicated professional staff. To address this challenge, DPS has requested additional permanent staff to address both utility management and utility reduction project implementation. Despite requests and inclusion into the Governor's Budget, staffing resources have not been authorized by the legislature.

[13] *These items were mentioned in a memo from NCDPS dated 8/28/2024 to the State Energy Office.*

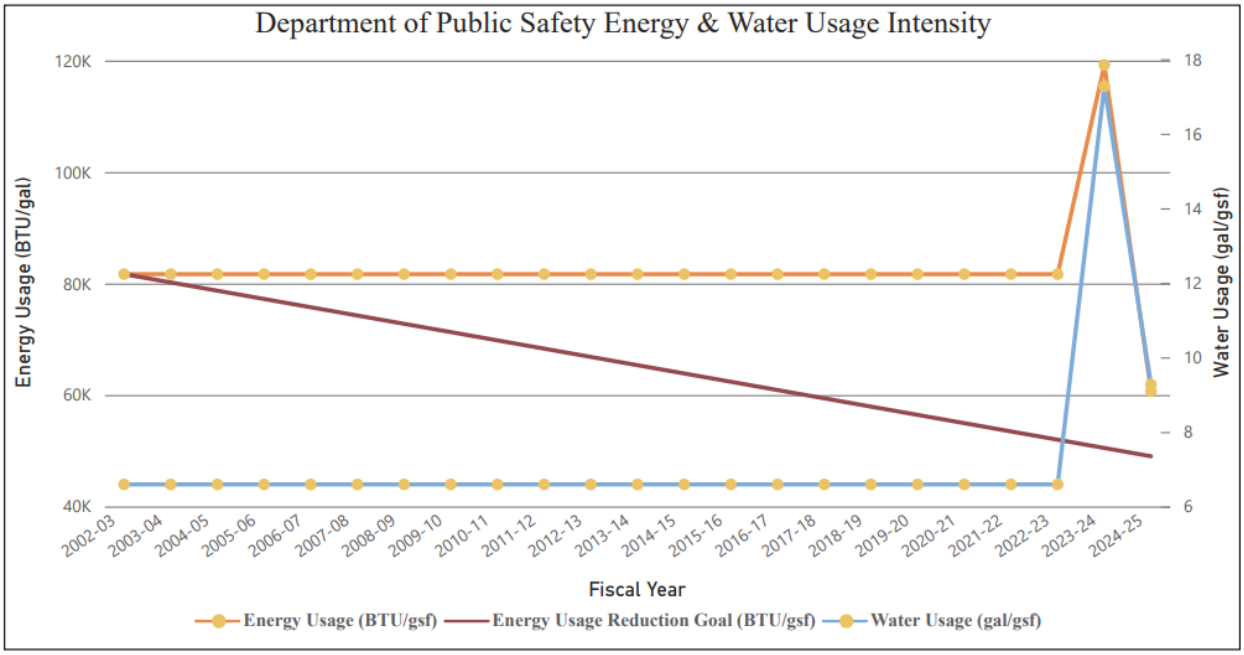


Figure A.9: DPS Utility Usage Over Time

Table A.9: DPS Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	3,744,663	4,148,945	+11%
Total Utility Cost	$7,279,230	$5,920,960	-19%
Energy Usage (Btu/gsf)	81,681	60,680	-26%
Energy Cost ($/MMBtu)	$21.85	$20.38	-7%
Water Usage (gal/gsf)	7	9	+41%
Water Cost ($/kgal)	$24.08	$20.51	-15%

Department of Adult Correction (DAC)

The Department of Adult Correction (DAC) was launched as a standalone Cabinet agency on January 1, 2023; prior to this date, DAC was a division within the Department of Public Safety (DPS) and was founded in 1925. DAC oversees the operation of 54 prison facilities in three custody levels (minimum, medium, and close) as well as three Confinement in Response to Violation centers and two substance use disorder treatment facilities. DAC also manages Community Supervision Judicial District offices in all 100 North Carolina counties. DAC's operational divisions and sections include Institutions, Community Supervision, Comprehensive Health Services, Education Services, Rehabilitation and Reentry, Special Operations and Intelligence Unit, and Correction Enterprises. All divisions work collaboratively to create a safer

North Carolina[14]. DAC's designated energy manager is Paul Braese; Mr. Braese is the Sustainability, Efficiency & Resilience Services Manager within the Division of Engineering, Construction and Maintenance. DPS is the only agency that has a dedicated department and staff focused exclusively on energy management. DAC is the largest user of utilities among all the state agencies and accounts for 35% of overall cabinet agencies' energy consumption impact; DAC has seen a 41% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03.

DAC was approved for their $38.7 million performance contract with Schneider Electric in September 2023; the project is currently in construction, and its first performance year is expected to begin in FY2025-26. This GESPC is expected to provide guaranteed savings of more than $60 million over the life of its twenty-year performance period.

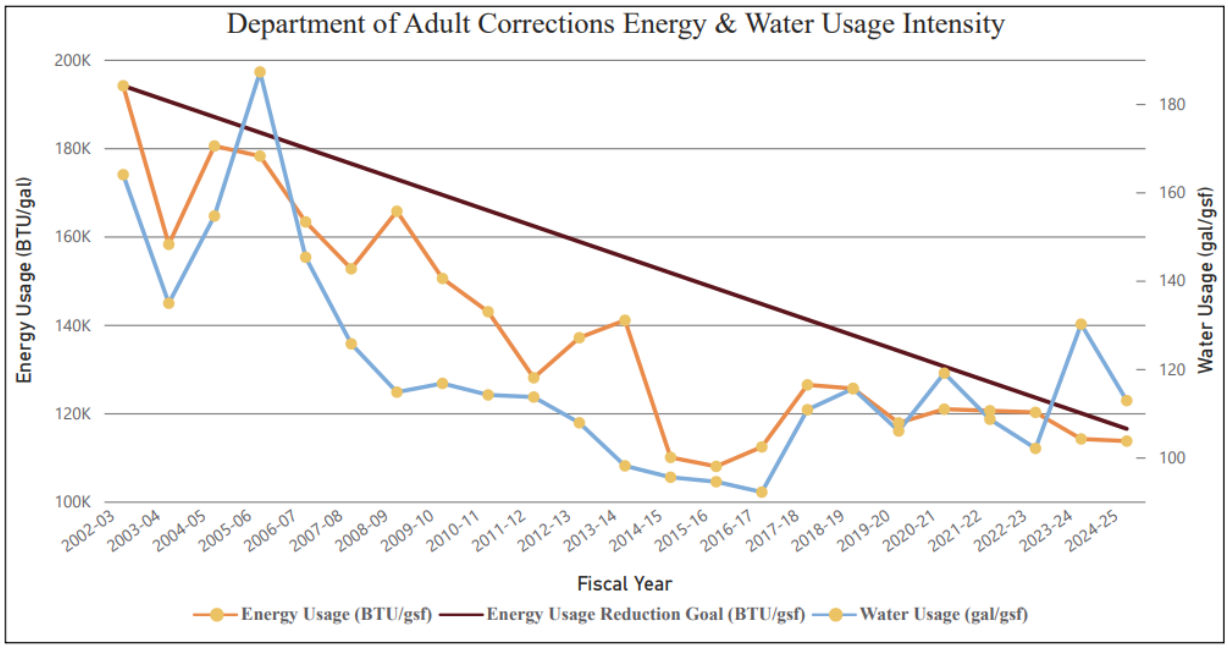


Figure A.10: DAC Utility Usage Over Time

[14] https://public.powerdms.com/NCDAC/documents/2732328

Table A.10: DAC Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	7,836,472	13,090,020	+67%
Total Utility Cost	$25,005,500	$47,855,800	+91%
Energy Usage (Btu/gsf)	194,086	113,672	-41%
Energy Cost ($/MMBtu)	$10.53	$16.54	+57%
Water Usage (gal/gsf)	164	113	-31%
Water Cost ($/kgal)	$6.99	$15.74	+125%

Voluntary EUI Reduction Progress for Other State Agencies

Per EO80, the State of North Carolina strives to reduce energy consumption per square foot in state-owned buildings by at least 40% from fiscal year 2002-2003 levels. While the executive order applies directly to cabinet agencies, other state agencies are strongly encouraged to adopt the same goal. These other state agencies are the Department of Agriculture and Consumer Services (DA&CS), the Department of Justice (DOJ), the Department of Public Instruction (DPI), and the Wildlife Resources Commission (WRC). Also, these agencies were not required under EO80 to appoint an energy manager.

Department of Agriculture and Consumer Services (DA&CS)

The North Carolina Department of Agriculture and Consumer Services, founded in 1877 and formerly known as the Board of Agriculture, provides services that promote and improve agriculture, agribusiness and forests; protect consumers and businesses; and conserve farmland and natural resources for the prosperity of all North Carolinians. DA&CS has facilities across the State that include offices, storage, animal housing, chiller plants, food service, shops, housing, arenas, laboratories, greenhouses, and museums. In 2011, the department underwent major restructuring along with the Department of Natural Resources. The designated energy manager for DA&CS is Wendy Dudka, whose title is Real Property Agent. DA&CS has seen a 7% increase in EUI (BTUs per square foot) since the baseline year of 2002-03.

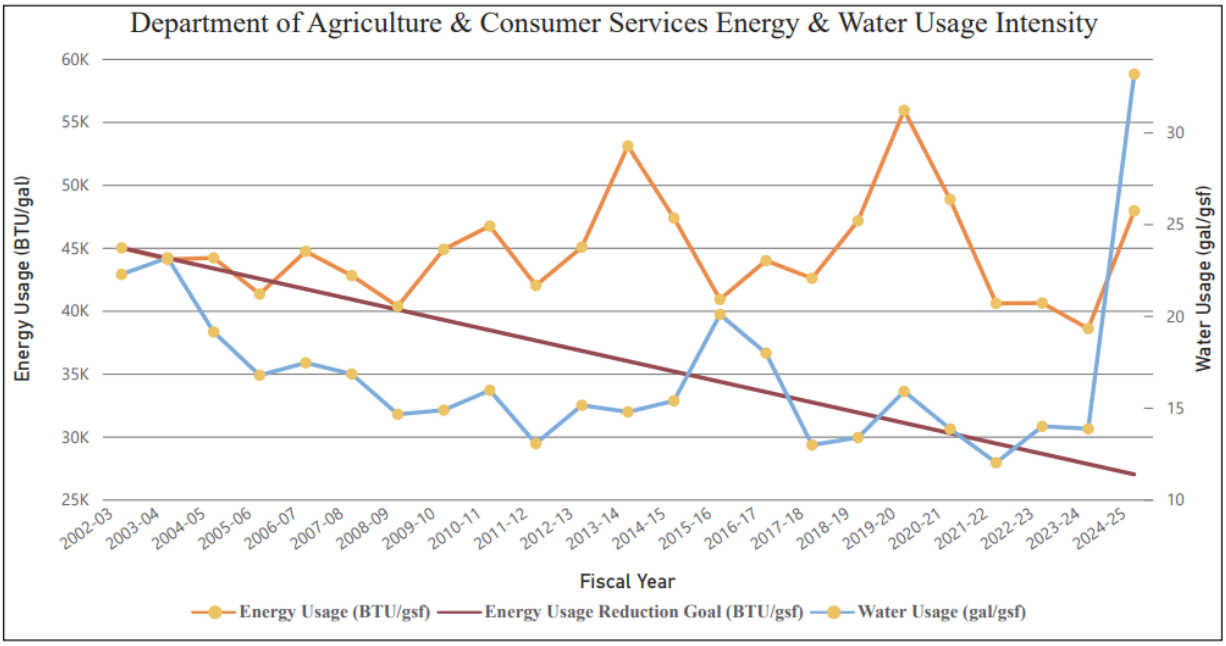


Figure A.11: DA&CS Utility Usage Over Time

Table A.11: DA&CS Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	2,995,262	4,057,501	+35%
Total Utility Cost	$2,374,024	$6,197,050	+161%
Energy Usage (Btu/gsf)	44,976	47,917	+7%
Energy Cost ($/MMBtu)	$15.41	$22.19	+44%
Water Usage (gal/gsf)	22	33	+49%
Water Cost ($/kgal)	$4.47	$13.99	+213%

Department of Justice (DOJ)

The DOJ, founded around 1870, has two training academies that provide training for law enforcement personnel. The NC Justice Academies (NCJA) are in Salemburg and Edneyville totaling almost 300,000 square feet. These academies provide basic, intermediate, and advanced training for law enforcement officers (LEOs) on topics including anti-terrorism, community-oriented policing, criminal investigation, traffic crash investigation, firearms, self-defense, and management and supervision. The Western Crime Lab is also located at the Edneyville campus. The designated energy manager for DOJ is Greg Raynor; Mr. Raynor's title is Operations Manager. DOJ has seen a 28% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03.

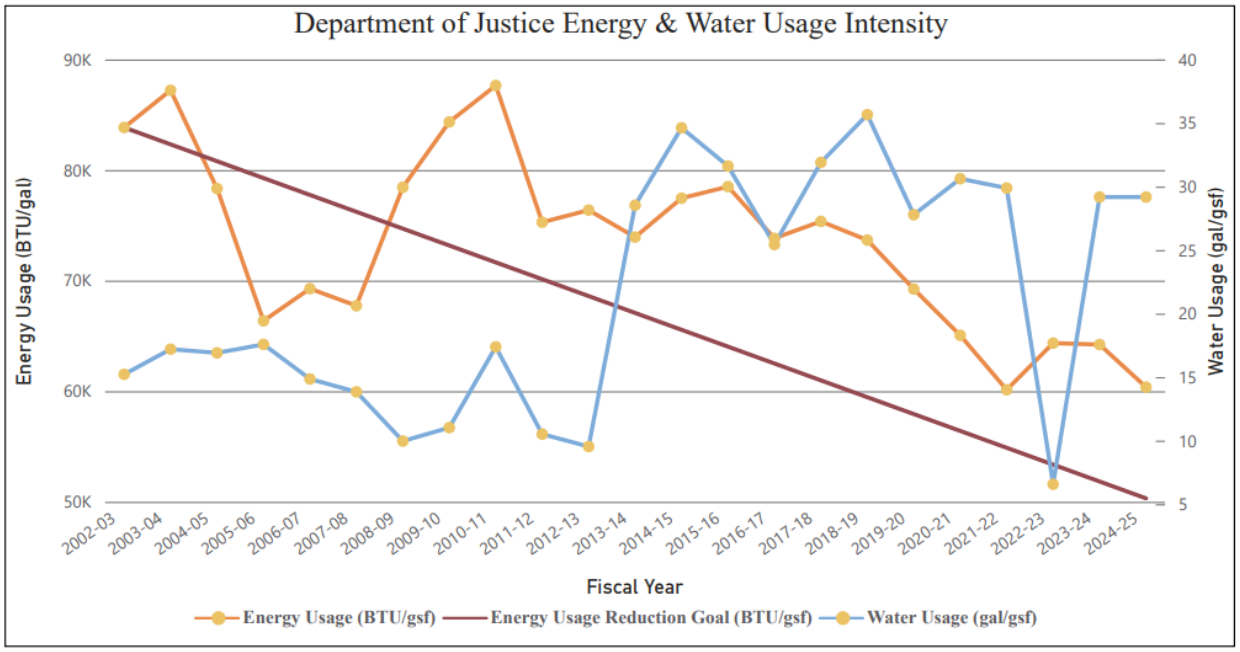


Figure A.12: DOJ Utility Usage Over Time

Table A.12: DOJ Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	204,206	298,220	+46%
Total Utility Cost	$269,833	$593,822	+120%
Energy Usage (Btu/gsf)	83,848	60,368	-28%
Energy Cost ($/MMBtu)	$15.09	$28.01	+86%
Water Usage (gal/gsf)	15	29	+92%
Water Cost ($/kgal)	$3.71	$10.29	+178%

Department of Public Instruction (DPI)

The DPI, founded in 1868, administers educational funding, oversees the licensure of teachers and administrators, provides curriculum support, and evaluates student success for public schools. North Carolina's public school system encompasses approximately 2,500 district schools and 180 charter schools that prepare students for the modern workforce and further education. Currently, the department's administrative staff are housed in the Central Office in Raleigh as well as four regional licensing centers in Catawba, Concord, Elm City, and Fayetteville. Furthermore, the department leads two North Carolina Centers for the Advancement of Teaching (NCCAT) in Cullowhee and Ocracoke Island that are designed to professionally-develop and improve the classroom effectiveness of teachers.

In FY23-24, a fundamental component of DPI is management of the Western School of the Deaf

in Cullowhee, Morehead Governor's School in Raleigh, and the Eastern School of the Deaf in Wilson. All three facilities are designed to be residential or day learning institutions for visually or hearing-impaired children. However, in accordance with Senate Bill 593 (2021) which includes updates to G.S. 115C-83.15 and G.S. 115C-105.35, *"the schools for the deaf and blind shall be housed administratively within the Department of Public Instruction for purposes of distribution of State funds, but each school for the deaf and blind shall operate independently with a board of trustees as the governing body."* For FY24-25, we have included their data under DPI, but future utility data submissions for all three facilities will be submitted and analyzed independently. William Putnam is the designated energy manager for the NCCAT locations; Tammy Ward is the designated energy manager for the Eastern NC School for the Deaf; Nathan Maune, Frankie Sykes, and Jon Long are the designated energy managers for other campuses / School Facilities. DPI has seen a 45% reduction in EUI (BTUs per square foot) since the baseline year of 2002-03.

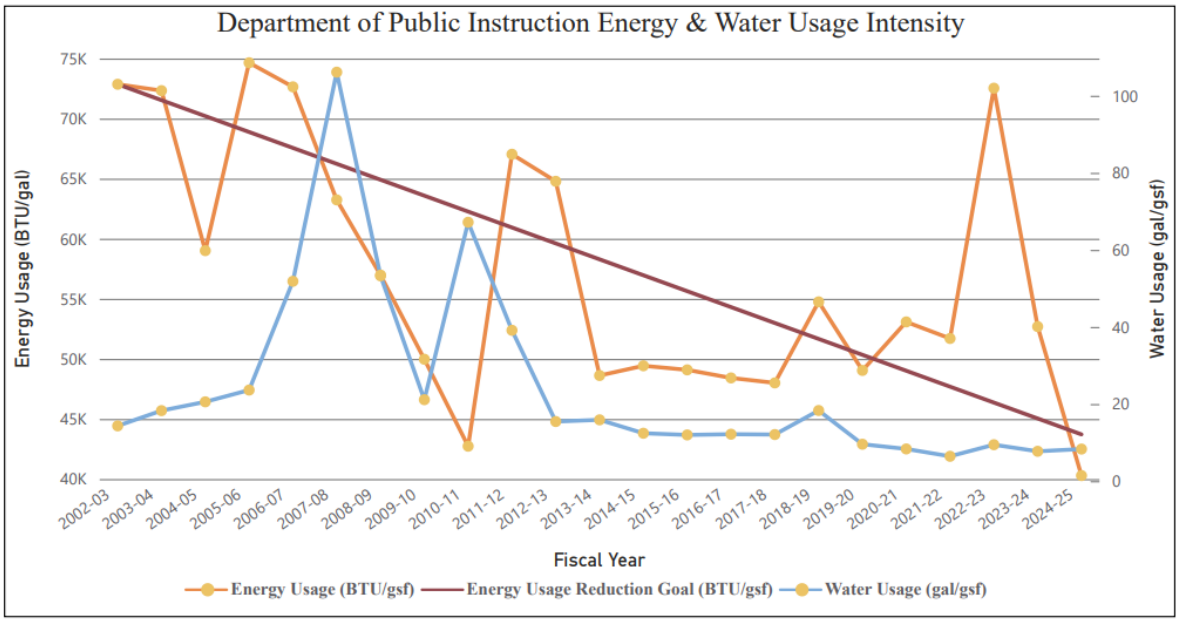


Figure A.13: DPI Utility Usage Over Time

Table A.13: DPI Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	713,347	497,300	-30%
Total Utility Cost	$747,574	$700,676	-6%
Energy Usage (Btu/gsf)	72,860	40,288	-45%
Energy Cost ($/MMBtu)	$12.91	$33.03	+156%
Water Usage (gal/gsf)	14	8	-42%
Water Cost ($/kgal)	$7.47	$9.39	+26%

Wildlife Resources Commission (WRC)

The NC Wildlife Resources Commission, founded in Raleigh, NC in 1947, conserves and sustains the State's fish and wildlife resources through research, scientific management, wise use, and public input. The Commission is the regulatory agency responsible for the enforcement of fishing, hunting, trapping, and boating laws. Commission buildings are located across the State and include offices, pole barns, equipment storage, workshops, garages, residences, barns, animal housing, and laboratories. The designated energy manager for WRC is Brandon Davis, whose title is Facility Maintenance Supervisor. WRC has seen an 89% increase in EUI (BTUs per square foot) since the baseline year of 2005-06.

Data is only available for WRC dating back to the 2005-06 fiscal year.

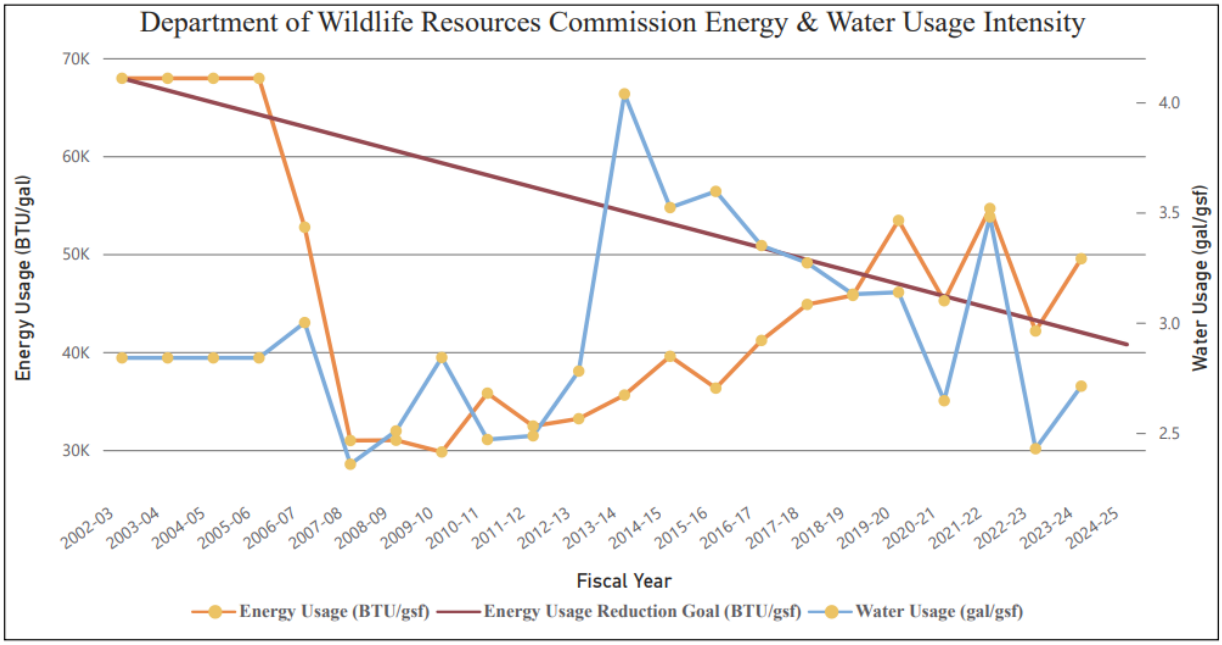


Figure A.14: WRC Utility Usage Over Time

Table A.14: WRC Utility Statistics to Date

Metric	FY 2002-03	FY 2024-25	% Change
Total Gross Square Feet	161,093	317,633	+97%
Total Utility Cost	$222,601	$401,089	+80%
Energy Usage (Btu/gsf)	67,939	128,189	+89%
Energy Cost ($/MMBtu)	$20.00	$9.37	-53%
Water Usage (gal/gsf)	3	2	-20%
Water Cost ($/kgal)	$8.18	$27.06	+231%

Appendix B

Sources and Assumptions Used to Calculate Greenhouse Gas Offsets

Sources and Assumptions Used to Calculate Avoided Greenhouse Gas Emissions

Introduction and Scope

This appendix documents the process to revise the avoided greenhouse gas emissions contained in the December 1, 2024, version of the report titled *"Comprehensive Program to Manage Energy, Water, and Other Utility Use for State Agencies and State Institutions of Higher Learning"*. The emissions were revised by utilizing the latest emission factors presented in the *"State Inventory and Projection Tool"*[15] (SIT) and the *"Emissions & Generation Resource Integrated Database"*[16] (eGRID) developed by the United States Environmental Protection Agency (USEPA). Additionally, equivalency results to translate emissions measurements into relatable terms were calculated by utilizing the *"Greenhouse Gas Equivalencies Calculator"*[17] developed by the USEPA.

Please note that prior to the December 1, 2021 report, the USI program historically applied one constant kilowatt-hour (kWh) emission factor for all fiscal years based on the most recent *"Emissions & Generation Resource Integrated Database"* (eGRID) data. However, it was later determined that this methodology was incorrect since the average generation mix changes over time for fossil fuel-fired electricity generating units. As such, the old methodology in addition to omitted chilled water and steam efficiency factors for the UNC System *(in previous reports)* significantly underestimated greenhouse gas emissions reductions.

Quality Assurance Measures

Staff from the USI program applied quality assurance measures to ensure that the data meets indicator goals and objectives. For example, all raw utility consumption data utilized to calculate avoided emissions were checked for reasonableness against historical data from the same data category and geographic area (i.e., county, city, or state). In addition, all automated calculations and data processing operations performed by spreadsheet macros and database queries were validated by comparing to hand-calculated results.

Methodology to Calculate Avoided Greenhouse Gas Emissions

To generate the emission calculation conversion factors Table 1, the USI program utilized the following methodology:

1) **Kilowatt hours (kWh):** Prior to last year's report, the USI program historically applied one constant kWh emission factor for all fiscal years based on eGRID data. However, it was later determined that this methodology was incorrect since the average generation mix changes over time for fossil fuel-fired electricity generating units. As such, the old methodology significantly underestimated greenhouse gas emissions reductions from the electricity sector.

   Based on these findings, the USI program utilized the following general formula to develop updated emission factors in for the electricity sector for each fiscal year:

   $MTCO_{2e}$ per kWh by Year = (eGRID Emission Rate by Year (lb CO2e/kWh)) / (2204.62 lb/metric ton)

[15] https://www.epa.gov/statelocalenergy/download-state-inventory-and-projection-tool
[16] https://www.epa.gov/egrid/download-data
[17] https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator

Please note: 2005, 2007, 2009, 2010, 2012, 2014, 2016, 2018, 2019, 2020, 2021, and 2022 emission rate values *(lb/kWh)* were taken from eGRID data files released by the USEPA *(which is typically updated every two years)*. Based on these values, emission factors are interpolated for intermediate years *(i.e., (base + future year) / 2))* and held constant for the beginning and end of the time series *(i.e., 2002 through 2004; and 2021 through 2022).*

2) **Therms:** The USI program utilized the SIT tool *(see Table 2)* and the following general formula to create the emission factors for the *"residential/commercial"* sector for natural gas:

> **Total CO_{2e} Emission Factor for Therms** = *(((SIT Tool's $MTCO_{2e}$/Btu * 1.00E-05 therm/Btu conversion factor)) + (((SIT Tool's $MTCH_4$/BBtu) / (1,000,000,000 Btu/BBtu conversion factor) / (1.00E-05 therm/Btu conversion factor)) * (25 global warming potential factor for CH_4)) + (((SIT Tool's MTN_2O/BBtu) / (1,000,000,000 Btu/BBtu conversion factor) / (1.00E-05 therm/Btu conversion factor)) * (298 global warming potential factor for N_2O)))*
>
> *-Or Simply-*
>
> **Total CO_{2e} Emission Factor for Therms** = *($MTCO_{2e}$/therm for CO_2) + ($MTCO_{2e}$/therm for CH_4) + ($MTCO_{2e}$/therm for N_2O)*

Please note: The same emission factor for therms was applied to all fiscal years since emissions from natural gas were assumed to remain relatively constant over time.

3) **Number 2 Distillate Oil:** The USI program utilized the SIT tool *(see Table 2)* and the following general formula to create the emission factors for the *"residential/commercial"* sector for distillate oil:

> **Total CO_{2e} Emission Factor for Number 2 Distillate Oil** = *(((SIT Tool's $MTCO_{2e}$/Btu * 138,690 Btu/gal conversion factor)) + (((SIT Tool's $MTCH_4$/BBtu) * (25 global warming potential factor for CH_4) * (138,690 Btu/gal conversion factor)) / (1,000,000,000 Btu/BBtu conversion factor)) + (((SIT Tool's MTN_2O/BBtu) * (298 global warming potential factor for N_2O) * (138,690 Btu/gal conversion factor)) / (1,000,000,000 Btu/BBtu conversion factor)))*
>
> *-Or Simply-*
>
> **Total CO_{2e} Emission Factor for Number 2 Distillate Oil** = *($MTCO_{2e}$/gal distillate oil for CO_2) + ($MTCO_{2e}$/gal distillate oil for CH_4) + ($MTCO_{2e}$/gal distillate oil for N_2O)*

Please note: The same emission factor for fuel oil was applied to all fiscal years since emissions were assumed to remain relatively constant over time.

4) **Number 6 Residual Oil:** The USI program utilized the SIT tool *(see Table 2)* and the following general formula to create the emission factors for the *"residential/commercial"* sector for residual oil:

> **Total CO_{2e} Emission Factor for Number 6 Residual Oil** = *(((SIT Tool's $MTCO_{2e}$/Btu * 149,690 Btu/gal conversion factor)) + (((SIT Tool's $MTCH_4$/BBtu) * (25 global warming potential factor for CH_4) * (149,690 Btu/gal conversion factor)) / (1,000,000,000 Btu/BBtu conversion factor)) + (((SIT Tool's MTN_2O/BBtu) * (298 global warming potential factor for N_2O) * (149,690 Btu/gal conversion factor)) / (1,000,000,000 Btu/BBtu conversion factor)))*
>
> *-Or Simply-*
>
> **Total CO_{2e} Emission Factor for Number 6 Residual Oil** = *($MTCO_{2e}$/gal residual oil for CO_2) + ($MTCO_{2e}$/gal residual oil for CH_4) + ($MTCO_{2e}$/gal residual oil for N_2O)*

Please note: The same emission factor for residual oil was applied to all fiscal years since emissions were assumed to remain relatively constant over time.

5) **Propane:** The USI program utilized the SIT tool *(see Table 2)* and the following general formula to create the emission factors for propane:

> **Total CO_{2e} Emission Factor for Propane** = *(((SIT Tool's $MTCO_{2e}$/Btu * 91,648 Btu/gal conversion factor)) + (((SIT Tool's $MTCH_4$/BBtu) * (25 global warming potential factor for CH_4) * (91,648 Btu/gal conversion factor)) / (1,000,000,000 Btu/BBtu conversion factor)) + (((SIT Tool's MTN_2O/BBtu) * (298 global warming potential factor for N_2O) * (91,648 Btu/gal conversion factor)) / (1,000,000,000 Btu/BBtu conversion factor)))*
>
> *-Or Simply-*
>
> **Total CO_{2e} Emission Factor for Propane** = *($MTCO_{2e}$/gal propane for CO_2) + ($MTCO_{2e}$/gal propane for CH_4) + ($MTCO_{2e}$/gal propane for N_2O)*

Please note: The same emission factor for propane was applied to all fiscal years since emissions were assumed to remain relatively constant over time.

Table B.1: Emission Calculation Conversion Factors

Fiscal Year	$MTCO_{2e}$/kWh	$MTCO_{2e}$/Therm	$MTCO_{2e}$/Gal 2 Oil	$MTCO_{2e}$/Gal 6 Oil	$MTCO_{2e}$/Gal Propane
2002-03	0.000555763	0.00531877	0.010317173	0.011305	0.005706
2003-04	0.000555763	0.00531877	0.010317173	0.011305	0.005706
2004-05	0.000555763	0.00531877	0.010317173	0.011305	0.005706
2005-06	0.00055765	0.00531877	0.010317173	0.011305	0.005706

2006-07	0.000561424	0.00531877	0.010317173	0.011305	0.005706
2007-08	0.000554367	0.00531877	0.010317173	0.011305	0.005706
2008-09	0.000536479	0.00531877	0.010317173	0.011305	0.005706
2009-10	0.000533099	0.00531877	0.010317173	0.011305	0.005706
2010-11	0.000524392	0.00531877	0.010317173	0.011305	0.005706
*2011-12	0.000495851	0.00531877	0.010317173	0.011305	0.005706
2012-13	0.000473062	0.00531877	0.010317173	0.011305	0.005706
2013-14	0.000456026	0.00531877	0.010317173	0.011305	0.005706
2014-15	0.000434589	0.00531877	0.010317173	0.011305	0.005706
2015-16	0.000408751	0.00531877	0.010317173	0.011305	0.005706
2016-17	0.000387544	0.00531877	0.010317173	0.011305	0.005706
2017-18	0.000370968	0.00531877	0.010317173	0.011305	0.005706
2018-19	0.000358137	0.00531877	0.010317173	0.011305	0.005706
2019-20	0.000324215	0.00531877	0.010317173	0.011305	0.005706
2020-21	0.000299371	0.00531877	0.010317173	0.011305	0.005706
2021-22	0.000303907	0.00531877	0.010317173	0.011305	0.005706
2022-23	0.000303907	0.00531877	0.010317173	0.011305	0.005706
2023-24	0.000303907	0.00531877	0.010317173	0.011305	0.005706
2024-25	0.000303907[18]	0.00531877	0.010317173	0.011305	0.005706

Table B.2: State Inventory and Projection Tool Emission Factors[19]

Fuel Type	Carbon Dioxide		Methane		Nitrous Oxide	
Natural Gas (Res/Comm)	5.30549E-08	MTCO2e/ Btu	0.00475	MTCH4/ BBtu	0.00009	MTN2O/ BBtu
Natural Gas (Res/Comm)	5.30E-03	MTCO2e/therm	1.19E-05	MTCO2e/therm	2.68E-06	MTCO2e /therm
No. 2 Fuel Oil (Res/comm)	7.39609E-08	MTCO2e/ Btu	0.01002	MTCH4/ BBtu	0.0006	MTN2O/ BBtu
No. 2 Fuel Oil (Res/comm)	0.010257634	MTCO2e/gal	3.47418E-05	MTCO2e/ gal	2.47978E-05	MTCO2e /gal
No. 6 Dist Oil (Res/comm)	7.50918E-08	MTCO2e/ Btu	0.01002	MTCH4/ BBtu	0.0006	MTN2O/ BBtu
No. 6 Dist Oil (Res/comm)	0.011240531	MTCO2e/gal	3.74975E-05	MTCO2e/ gal	2.67647E-05	MTCO2e /gal
Propane	6.18334E-08	MTCO2e/ Btu	0.01002	MTCH4/ BBtu	0.0006	MTN2O/ BBtu
Propane	0.005666907	MTCO2e/gal	2.29578E-05	MTCO2e/ gal	1.63867E-05	MTCO2e /gal

Collective Avoided Greenhouse Gas Emissions

By utilizing the methodology described in the previous section, Table 3 and Table 4 represent the avoided greenhouse gas emissions for state agencies and the UNC System (i.e., state-owned buildings). Table B.3 provides avoided greenhouse gas emissions since the FY2002-03 baseline.

[18] *eGRID has published updated emissions conversion factors for kWh based on 2023 data that will be used for 2025-06 report*
[19] https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool

In addition, Table B.4 provides a snapshot of avoided greenhouse gas emissions data to show the program's effectiveness during the most recent fiscal year (FY2024-25).

Table B.3: FY2002-03 to FY2023-25 Avoided Greenhouse Gas Totals

Fuel Source Usage	Cabinet Agencies (MTCO2e)	Other Agencies (MTCO2e)	UNC System (MTCO2e)	All State Government Units (MTCO2e)
Electricity	2,827,586	117,310	7,289,539	10,234,434
Natural Gas	-119,312	20,921	-432,381	-530,771
Fuel Oil	745,979	-77	1,697,571	2,443,473
Propane	102,602	2,396	6,131	111,128
Total	**3,556,854**	**140,550**	**8,560,860**	**12,258,264**

Table B.4: FY2024-2025 Avoided Greenhouse Gas Totals

Fuel Source Usage	Cabinet Agencies (MTCO2e)	Other Agencies (MTCO2e)	UNC System (MTCO2e)	All State Government Units (MTCO2e)
Electricity	252,360	10,997	672,321	935,677
Natural Gas	12,958	-257	-28,867	-16,166
Fuel Oil	48,629	107	86,775	135,511
Propane	11,446	-187	383	11,642
Total	**325,394**	**10,659**	**730,612**	**1,066,665**

Greenhouse Gas Equivalencies

Figure 1 contains a screenshot of the USEPA's greenhouse gas equivalencies calculator[20] based on total avoided emissions since the 2002-03 baseline for state-owned buildings. As shown, the figure provides relatable terms for the program's environmental success.

Figure B.1: EPA Greenhouse Gas Equivalencies Calculator

[20] *EPA Greenhouse Gas Equivalencies Calculator; https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator*

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Appendix C

Executive Order No. 80

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State of North Carolina

ROY COOPER
GOVERNOR

October 29, 2018

EXECUTIVE ORDER NO. 80

NORTH CAROLINA'S COMMITMENT TO ADDRESS CLIMATE CHANGE AND TRANSITION TO A CLEAN ENERGY ECONOMY

WHEREAS, North Carolina residents deserve to be better educated, healthier, and more financially secure so that they may live purposeful and abundant lives; and

WHEREAS, N.C. Const. art. XIV, § 5 requires the conservation, protection, and preservation of state lands and waters in public trust; and

WHEREAS, North Carolina is well positioned to take advantage of its technology and research and development sectors, along with its skilled workforce, to promote clean energy technology solutions and a modernized electric grid; and

WHEREAS, public-private partnerships in North Carolina foster market innovations and develop clean energy technology solutions that grow the state's economy; and

WHEREAS, the effects of more frequent and intense hurricanes, flooding, extreme temperatures, droughts, saltwater intrusion, and beach erosion have already impacted and will continue to impact North Carolina's economy; and

WHEREAS, climate-related environmental disruptions pose significant health risks to North Carolinians, including waterborne disease outbreaks, compromised drinking water, increases in disease-spreading organisms, and exposure to air pollution, among other issues; and

WHEREAS, to maintain economic growth and development and to provide responsible environmental stewardship, we must build resilient communities and develop strategies to mitigate and prepare for climate-related impacts in North Carolina.

NOW, THEREFORE, by the authority vested in me as Governor by the Constitution and the laws of the State of North Carolina, **IT IS ORDERED**:

1. The State of North Carolina will support the 2015 Paris Agreement goals and honor the state's commitments to the United States Climate Alliance.

   The State of North Carolina will strive to accomplish the following by 2025:

   a. Reduce statewide greenhouse gas emissions to 40% below 2005 levels;
   b. Increase the number of registered, zero-emission vehicles ("ZEVs"; individually, "ZEV") to at least 80,000;
   c. Reduce energy consumption per square foot in state-owned buildings by at least 40% from fiscal year 2002-2003 levels.

2. Cabinet agencies shall evaluate the impacts of climate change on their programs and operations and integrate climate change mitigation and adaptation practices into their programs and operations. Council of State members, higher education institutions, local governments, private businesses, and other North Carolina entities are encouraged to address climate change and provide input on climate change mitigation and adaptation measures developed through the implementation of this Executive Order. Consistent with applicable law, cabinet agencies shall actively support such actions.

3. The Secretary or designee of each cabinet agency and a representative from the Governor's Office shall serve on the North Carolina Climate Change Interagency Council ("Council"), which is hereby established. The Secretary of the North Carolina Department of Environmental Quality, or the Secretary's designee, shall serve as the Council Chair. The North Carolina Department of Environmental Quality shall lead the Council by providing strategic direction, scheduling and planning Council meetings, determining the prioritization of activities, facilitating stakeholder engagement, and assisting in the implementation of pathways to achieve the goals provided in Section 1 of this Executive Order.

   The duties of the Council shall include the following:

   a. Recommend new and updated goals and actions to meaningfully address climate change;
   b. Develop, implement, and evaluate programs and activities that support statewide climate mitigation and adaptation practices;
   c. Establish workgroups, as appropriate, to assist the Council in its duties;
   d. Consider stakeholder input when developing recommendations, programs, and other actions and activities;
   e. Schedule, monitor, and provide input on the preparation and development of the plans and assessments required by this Executive Order;
   f. Review and submit to the Governor the plans and assessments required by this Executive Order.

4. The North Carolina Department of Environmental Quality ("DEQ") shall develop a North Carolina Clean Energy Plan ("Clean Energy Plan") that fosters and encourages the utilization of clean energy resources, including energy efficiency, solar, wind, energy storage, and other innovative technologies in the public and private sectors, and the integration of those resources to facilitate the development of a modern and resilient electric grid. DEQ shall collaborate with businesses, industries, power providers, technology developers, North Carolina residents, local governments, and other interested stakeholders to increase the utilization of clean energy technologies, energy efficiency measures, and clean transportation solutions. DEQ shall complete the Clean Energy Plan for the Council to submit to the Governor by October 1, 2019.

5. The North Carolina Department of Transportation ("DOT"), in coordination with DEQ, shall develop a North Carolina ZEV Plan ("ZEV Plan") designed to increase the number of registered ZEVs in the state to at least 80,000 by 2025. The ZEV Plan shall help establish interstate and intrastate ZEV corridors, coordinate and increase the installation of ZEV infrastructure, and incorporate, where appropriate, additional best practices for increasing ZEV adoption. DOT shall complete the ZEV Plan for the Council to submit to the Governor by October 1, 2019.

6. The North Carolina Department of Commerce ("DOC") and other cabinet agencies shall take actions supporting the expansion of clean energy businesses and service providers, clean technology investment, and companies with a commitment to procuring renewable energy. In addition, DOC shall develop clean energy and clean transportation workforce assessments for the Council to submit to the Governor by October 1, 2019. These assessments shall evaluate the current and projected workforce demands in North Carolina's clean energy and clean transportation sectors, assess the skills and education required for employment in those sectors, and recommend actions to help North Carolinians develop such skills and education.

7. Cabinet agencies shall prioritize ZEVs in the purchase or lease of new vehicles and shall use ZEVs for agency business travel when feasible. When ZEV use is not feasible, cabinet agencies shall prioritize cost-effective, low-emission alternatives. To support implementation of this directive, the North Carolina Department of Administration ("DOA") shall develop a North

Carolina Motor Fleet ZEV Plan ("Motor Fleet ZEV Plan") that identifies the types of trips for which a ZEV is feasible, recommends infrastructure necessary to support ZEV use, develops procurement options and strategies to increase the purchase and utilization of ZEVs, and addresses other key topics. DOA shall complete the Motor Fleet ZEV Plan and provide an accounting of each agency's ZEVs and miles driven by vehicle type for the Council to submit to the Governor by October 1, 2019, and annually thereafter.

8. Building on the energy, water, and utility use conservation measures taken pursuant to N.C. Gen. Stat. § 143-64.12(a), DEQ shall update and amend, where applicable, a Comprehensive Energy, Water, and Utility Use Conservation Program ("Comprehensive Program") by February 1, 2019, and biennially beginning December 1, 2019, to further reduce energy consumption per gross square foot in state buildings consistent with Section 1 of this Executive Order. The Comprehensive Program shall include best practices for state government building energy efficiency, training for agency staff, cost estimation methodologies, financing options, and reporting requirements for cabinet agencies. DEQ and cabinet agencies shall encourage and assist, as requested, higher education institutions, K-12 schools, and local governments in reducing energy consumption. To achieve the required energy consumption reductions:

    a. By January 15, 2019, each cabinet agency shall designate an Agency Energy Manager, who shall serve as the agency point of contact.
    b. Each cabinet agency shall develop and submit an Agency Utility Management Plan to DEQ by March 1, 2019, and biennially thereafter, and implement strategies to support the energy consumption reduction goal set forth in Section 1 of this Executive Order. DEQ shall assess the adequacy of these plans and their compliance with this Executive Order.
    c. By September 1, 2019, and annually thereafter, each cabinet agency shall submit to DEQ an Agency Utility Report detailing its utility consumption, utility costs, and progress in reducing energy consumption.
    d. DEQ shall develop an annual report that describes the Comprehensive Program and summarizes each cabinet agency's utility consumption, utility costs, and achieved reductions in energy consumption. DEQ shall complete this report for publication on its website and for the Council to submit to the Governor by February 1, 2019, and annually thereafter beginning December 1, 2019.

9. Cabinet agencies shall integrate climate adaptation and resiliency planning into their policies, programs, and operations (i) to support communities and sectors of the economy that are vulnerable to the effects of climate change and (ii) to enhance the agencies' ability to protect human life and health, property, natural and built infrastructure, cultural resources, and other public and private assets of value to North Carolinians.

    a. DEQ, with the support of cabinet agencies and informed by stakeholder engagement, shall prepare a North Carolina Climate Risk Assessment and Resiliency Plan for the Council to submit to the Governor by March 1, 2020.
    b. The Council shall support communities that are interested in assessing risks and vulnerabilities to natural and built infrastructure and in developing community-level adaptation and resiliency plans.

10. DEQ shall prepare and manage a publicly accessible Web-based portal detailing the Council's actions and the steps taken to address climate-related impacts in North Carolina. Cabinet agencies shall submit data, information, and status reports as specified by the Council to be published on the portal. In addition, DEQ shall develop, publish on the portal, and periodically update an inventory of the state's greenhouse gas emissions that, among other things, tracks emissions trends statewide by sector and identifies opportunities for additional emissions reductions.

11. By October 15, 2019, and annually thereafter, the Council shall provide to the Governor a status report on the implementation of this Executive Order.

12. This Executive Order is consistent with and does not otherwise abrogate existing state law.

13. This Order is effective October 29, 2018 and shall remain in effect until rescinded or superseded by another applicable Executive Order.

IN WITNESS WHEREOF, I have hereunto signed my name and affixed the Great Seal of the State of North Carolina at the Capitol in the City of Raleigh, this the 29th day of October, in the year of our Lord two thousand eighteen.

Roy Cooper
Governor

ATTEST:

Rodney S. Maddox
Chief Deputy Secretary of State

Appendix D

General Statute Chapter 143-64.12, *Authority and Duties of the Department; State Agencies and State Institutions of Higher Learning*

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§ 143-64.12. Authority and duties of the Department; State agencies and State institutions of higher learning.

(a) The Department of Environmental Quality through the State Energy Office shall develop a comprehensive program to manage energy, water, and other utility use for State agencies and State institutions of higher learning and shall update this program annually. Each State agency and State institution of higher learning shall develop and implement a management plan that is consistent with the State's comprehensive program under this subsection to manage energy, water, and other utility use, and that addresses any findings or recommendations resulting from the energy audit required by subsection (b1) of this section. The energy consumption per gross square foot for all State buildings in total shall be reduced by twenty percent (20%) by 2010 and thirty percent (30%) by 2015 based on energy consumption for the 2002-2003 fiscal year. Each State agency and State institution of higher learning shall update its management plan biennially and include strategies for supporting the energy consumption reduction requirements under this subsection. Each community college shall submit to the State Energy Office a biennial written report of utility consumption and costs. Management plans submitted biennially by State institutions of higher learning shall include all of the following:

(1) Estimates of all costs associated with implementing energy conservation measures, including pre-installation and post-installation costs.
(2) The cost of analyzing the projected energy savings.
(3) Design costs, engineering costs, pre-installation costs, post-installation costs, debt service, and any costs for converting to an alternative energy source.
(4) An analysis that identifies projected annual energy savings and estimated payback periods.

(a1) State agencies and State institutions of higher learning shall carry out the construction and renovation of facilities in such a manner as to further the policy set forth under this section and to ensure the use of life-cycle cost analyses and practices to conserve energy, water, and other utilities.

(b) The Department of Administration shall develop and implement policies, procedures, and standards to ensure that State purchasing practices improve efficiency regarding energy, water, and other utility use and take the cost of the product over the economic life of the product into consideration. The Department of Administration shall adopt and implement Building Energy Design Guidelines. These guidelines shall include energy-use goals and standards, economic assumptions for life-cycle cost analysis, and other criteria on building systems and technologies. The Department of Administration shall modify the design criteria for construction and renovation of facilities of State buildings and State institutions of higher learning buildings to require that a life-cycle cost analysis be conducted pursuant to G.S. 143-64.15.

(b1) The Department of Administration, as part of the Facilities Condition and Assessment Program, shall identify and recommend energy conservation maintenance and operating procedures that are designed to reduce energy consumption within the facility of a State agency or a State institution of higher learning and that require no significant expenditure of funds. Every State agency or State institution of higher learning shall implement these recommendations. Where energy management equipment is proposed for any facility of a State agency or of a State institution of higher learning, the maximum interchangeability and compatibility of equipment components shall be required. As part of the Facilities Condition and Assessment Program under this section, the Department of Administration, in consultation with the State Energy Office, shall develop an energy audit and a procedure for conducting energy audits. Every five years the Department shall conduct an energy audit for each State agency or State institution of higher learning, and the energy audits conducted shall serve as a

preliminary energy survey. The State Energy Office shall be responsible for system-level detailed surveys.

(b2) The Department of Administration shall submit a report of the energy audit required by subsection (b1) of this section to the affected State agency or State institution of higher learning and to the State Energy Office. The State Energy Office shall review each audit and, in consultation with the affected State agency or State institution of higher learning, incorporate the audit findings and recommendations into the management plan required by subsection (a) of this section.

(c) through (g) Repealed by Session Laws 1993, c. 334, s. 4.

(h) When conducting a facilities condition and assessment under this section, the Department of Administration shall identify and recommend to the State Energy Office any facility of a State agency or State institution of higher learning as suitable for building commissioning to reduce energy consumption within the facility or as suitable for installing an energy savings measure pursuant to a guaranteed energy savings contract under Part 2 of this Article.

(i) Consistent with G.S. 150B-2(8a)h., the Department of Administration may adopt architectural and engineering standards to implement this section.

(j) The State Energy Office shall submit a report by December 1 of every odd-numbered year to the Joint Legislative Energy Policy Commission, the Joint Legislative Oversight Committee on Agriculture and Natural and Economic Resources, and the Fiscal Research Division describing the comprehensive program to manage energy, water, and other utility use for State agencies and State institutions of higher learning required by subsection (a) of this section. The report shall also contain the following:

(1) A comprehensive overview of how State agencies and State institutions of higher learning are managing energy, water, and other utility use and achieving efficiency gains.

(2) Any new measures that could be taken by State agencies and State institutions of higher learning to achieve greater efficiency gains, including any changes in general law that might be needed.

(3) A summary of the State agency and State institutions of higher learning management plans required by subsection (a) of this section and the energy audits required by subsection (b1) of this section.

(4) A list of the State agencies and State institutions of higher learning that did and did not submit management plans required by subsection (a) of this section and a list of the State agencies and State institutions of higher learning that received an energy audit.

(5) Any recommendations on how management plans can be better managed and implemented. (1975, c. 434, s. 3; 1993, c. 334, s. 4; 2000-140, s. 76(f); 2001-415, s. 3; 2006-190, s. 12; 2007-546, s. 3.1(a); 2008-198, s. 11.1; 2009-446, s. 1(e); 2010-31, s. 14.3; 2010-196, s. 2; 2013-360, s. 15.22(p); 2014-120, s. 55; 2015-241, s. 14.30(u); 2017-57, s. 14.1(f).)

Appendix E

Suggested Revisions to General Law

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PART I. SAVE NORTH CAROLINA TAXPAYER DOLLARS BY REQUIRING REDUCTIONS IN ENERGY AND WATER CONSUMPTION IN PUBLIC BUILDINGS BY 2025.

Section 1. G.S. 143-64.12(a) reads as rewritten:

"§ 143-64.12. Authority and duties of the Department; State agencies and State institutions of higher learning.

(a) The Department of Environmental Quality through the State Energy Office shall develop a comprehensive program to manage energy, water, and other utility use for State agencies and State institutions of higher learning and shall update this program annually. Each State agency and State institution of higher learning shall develop and implement a management plan that is consistent with the State's comprehensive program under this subsection to manage energy, water, and other utility use, and that addresses any findings or recommendations resulting from the energy audit required by subsection (b1) of this section. The energy consumption per gross square foot for all State buildings in total shall be reduced by twenty percent (20%) by ~~2010~~ 2010, and thirty percent (30%) by ~~2015~~ 2015, and forty percent (40%) by 2025 based on energy consumption for the 2002-2003 fiscal year. Each State agency and State institution of higher learning shall update its management plan biennially by September 1st of odd-numbered years and include strategies for supporting the energy consumption reduction requirements under this subsection. Each State agency, State institution of higher learning, and community college shall submit to the State Energy Office ~~a biennial~~ an annual written report of utility consumption and ~~costs.~~ costs by September 1st. Management plans submitted biennially by State agencies and State institutions of higher learning shall ~~include all of the following:~~ contain:

~~(1) Estimates of all costs associated with implementing energy conservation measures, including pre-installation and post-installation costs.~~

~~(2) The cost of analyzing the projected energy savings.~~

~~(3) Design costs, engineering costs, pre-installation costs, post-installation costs, debt service, and any costs for converting to an alternative energy source.~~

~~(4) An analysis that identifies projected annual energy savings and estimated payback periods.~~

(1) Total utility consumption, costs, and efficiency gains.

(2) Findings or recommendations resulting from an energy audit to determine potential energy conservation measures.

(3) An analysis of energy conservation measures that may be implemented to reduce energy, water, and other utility use, including but not limited to:

a. Total design costs, engineering costs, pre-installation costs, post-installation costs, debt service, and any costs for converting to an alternative energy source;

b. Projected annual energy savings and estimated payback periods;

c. Finance options; and

d. Defined roles, responsibilities, and training needs for staff that manage energy, water, or other utility use.

(4) A signature from senior leadership, or an appropriate designee, of a State agency or State institution of higher learning.

PART II. EFFECTIVE DATE

Section 2. Except as otherwise provided, Section 1 of this act is effective when it becomes law.

§ 116-30.3B. Energy conservation savings.

(a) In addition to the funds carried forward under G.S. 116-30.3, the General Fund current operations appropriations credit balance remaining at the end of each fiscal year for utilities of a constituent institution that is energy savings realized from implementing an energy conservation measure shall be carried forward by the institution to the next fiscal year. Sixty percent (60%) of the energy savings realized shall be utilized for energy conservation measures by that institution. The use of funds under this section shall be limited to onetime capital and operating expenditures that will not impose additional financial obligations on the State. The Director of the Budget, under the authority set forth in G.S. 143C-6-2, shall establish the General Fund current operations credit balance remaining in each budget code of each institution.

(b) It is the intent of the General Assembly that appropriations to the Board of Governors on behalf of a constituent institution not be reduced as a result of the institution's realization of energy savings. Instead, the General Assembly intends that the amount of appropriations be determined as if no energy savings had been realized. The Director of the Budget shall not decrease the recommended base budget requirements for utilities for constituent institutions by the amount of energy savings realized from implementing energy conservation measures, including savings achieved through a guaranteed energy savings contract.

(c) Constituent institutions shall submit ~~biennial~~ annual documentation reports on the use of funds authorized pursuant to this section ~~as required under G.S. 143-64.12~~.

(d) As used in this section, "energy savings," "guaranteed energy savings contract," and "energy conservation measure" have the same meaning as in G.S. 143-64.17. (2010-196, s. 1; 2011-145, s. 9.6D(c); 2014-100, s. 6.4(e).)

Appendix F

Utility Management Plans

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Appendix F Table of Contents

Utility Management Plan Submissions

NC Department of Revenue

Agency Utility Management Plan

Fiscal Years 2020-2026

Prepared by Business Services and Support
September 2025

NCDOR NORTH CAROLINA DEPARTMENT OF REVENUE

Executive Summary

The Department of Revenue (DOR) administers the tax laws and collects taxes due in an impartial, consistent, secure and efficient manner to fund public services benefitting the people of North Carolina. As a cabinet agency, the Department is fully committed to supporting Executive Order 80 and working with other agencies to meet the established goals:

- Reduce statewide greenhouse gas emissions to 40% below 2005 levels
- Increase the number of registered, zero-emission vehicles to at least 80,000
- Reduce energy consumption per square foot in state-owned buildings by at least 40% from fiscal year 2002-2003 levels

This document outlines the agency's Utility Management Plan in support these goals.

Background

The main DOR facility is state-owned and maintained by the Department of Administration (DOA). The DOR also has 12 remote offices across the state which are leased facilities. Actions identified in the utility management plan address initiatives associated with the main building as well as the remote offices. Operationally, the agency will evaluate impacts of climate change on programs with the intention of integrating climate change mitigation and adaption practices into our operations. Participating as a member of the North Carolina Climate Change Interagency Council will provide an opportunity to collaborate and share ideas across agencies to enhance DOR programs and initiatives associated with the executive order.

NCDOR NORTH CAROLINA DEPARTMENT OF REVENUE

Utility Management Plan
2020 - 2025

Focus Area 1: Comprehensive Plan	
Strategy 1.	Provide energy saving project recommendations in the DOR Repair and Renovations Request to DOA
Strategy 2.	Update internal plans to reflect energy efficiency strategy and support for Executive Order 80
Strategy 3.	Work with the State Energy Office (SEO) to assist with review of strategy and timeline
Strategy 4.	Continue to provide internal education and update existing marketing plan to support the strategy
Strategy 5.	Implement Plan

2020-2025 Planned Activities	**Expected Measurement**	**Assigned To**	**Occurrence**
Meet with SEO to develop content for the plan	Discuss the Utility Management Plan content and focus areas	Agency Designee, Energy Manager and SEO staff	As needed
Evaluate operations to identify potential energy savings initiatives	Create list of planned and potential future initiatives to be included in the Utility Management Plan	Agency Designee, Energy Manager and Agency Staff	Annually
Update Utility Management Plan	Complete the plan and timeline for the agency and submit plan to SEO	Agency Designee, Energy Manager and staff	Due September 1, 2023
Participate in Energy Manager meetings with other State Agency's	Attend monthly meetings and provide updates on Utility Management Plan progress	Energy Manager	Monthly
Meet with stakeholders and internal teams to implement initiatives included in the plan	Designate a team or teams to implement portions on the plan	Agency Designee, Energy Manager and staff	Quarterly
Update existing marketing and communication program	Continue to improve and implement program	Agency Designee, Energy Manager and staff	Annually
Review Utility Management Plan progress	Review plan; revise and adjust initiatives and timelines as needed	Agency Designee, Energy Manager and staff	Quarterly
Update R&R Requests to recommend energy saving projects to support Executive Order 80	Work with DOA to help prioritize recommended energy saving projects.	Energy Manager and DOA	Annually

NCDOR NORTH CAROLINA DEPARTMENT OF REVENUE

Focus Area 2: Initiatives to Implement	
Strategy 1.	Review opportunities with staff to determine high priority initiatives
Strategy 2.	Work with staff to determine the best timeframe to implement initiatives
Strategy 3.	Create a schedule for planned initiatives
Strategy 4.	Communicate initiatives to staff
Strategy 5.	Implement initiatives

2020-2025 Planned Activities	Expected Measurement	Assigned To	Occurrence
HVAC improvements	Support DOA in installing new fans in primary air handling units	Energy Manager and DOA	Complete
Evaluate aging equipment in various areas and develop a master plan for replacement	Replacement of aging equipment based on funding availability (CRAC Units replaced in Scan Room and UPS replacement)	Energy Manager, DOA and staff	FY23 – CRAC Units FY25 – UPS Replacement
Downsize Headquarters Data Center footprint	Continue consolidating server equipment to save energy in our Data Center	Energy Manager and staff	Ongoing through FY23
LED Lighting Upgrades	Work with DOA to have lighting switched to LED's in our HQ facility. Some lighting has already been switched over to LED in our Elevator corridors, loading dock, warehouse, and our restrooms.	Energy Manager and DOA	Ongoing
Elevator Upgrades	Work with DOA to replace existing obsolete elevators with new, more energy efficient elevators.	Energy Manager and DOA	FY26
Promote teleworking; review and revise agency telework policy	Updated telework policy; Continued replacement of desktops with laptops	Agency Designee and staff	Annually
Continue to evaluate potential use of ZEVs	Review use of long-term lease and motor fleet vehicles; Review and update internal policies	Agency Designee and staff	Annually
Promote electronic filing	Increase in electronic filing, reduction in time scanners operate	Agency Designee and staff	Annually

Focus Area 3: Marketing and Communication Plan	
Strategy 1.	Identify marketing and communication initiatives
Strategy 2.	Work with team to identify delivery methods
Strategy 3.	Create a schedule for marketing and communications
Strategy 4.	Develop and Implement initiatives

2020-2025 Planned Activities	Expected Measurement	Assigned To	Occurrence
Maintain internal employee education campaign	Employee awareness of Executive Order 80 and opportunities to support energy efficiency	Agency staff	Annually
Update marketing plan for electronic filing	Identification of action items to support increased electronic filing	Agency staff	Annually

Focus Area 4: Remote Office Energy Savings (Leased Facilities)	
Strategy 1.	Identify opportunities to downsize leased space
Strategy 2.	Work to identify jobs eligible for permanent teleworking
Strategy 3.	Develop and Implement Initiatives

2020-2025 Planned Activities	Expected Measurement	Assigned To	Occurrence
Downsize the footprint of Charlotte Office	Move from occupying 24,000 square feet to less than 10,000 square feet.	Agency Designee and staff	Complete
Close Service Center in Winston Salem	Transition employees from the Winston Salem office to other offices or move employees to permanent teleworking.	Agency Designee and staff	Complete
Downsize the footprint of Wilmington Office	Move from occupying 8,774 square feet to 6,290 square feet.	Agency Designee and staff	FY23 - Complete
Downsize the footprint of our Raleigh Service Center	Move from occupying 25,730 square feet to 17,728 square feet.	Agency Designee and staff	FY25
Analyze space needs for remaining remote offices to identify opportunities to reduce footprint	Reduction in square footage for remote offices as leases expire	Agency Designee and staff	Annually

NCDOR | NORTH CAROLINA DEPARTMENT OF REVENUE

Agency Accomplishments

- In 2022-2023, the Department of Revenue supported the Department of Administration (DOA) in making HVAC upgrades to the main DOR building. The project included replacement of fans that makes our HVAC system more efficient. This project supports the Executive order by making the HVAC system more energy efficient as well as make it easier to control temperature throughout the facility.
- The most significant impact this thus far has been the agency's increase in teleworking. A new policy was created and implemented. In March 2020, an estimated 5% of the agency was part-time or full time teleworking. As a result of Covid-19, the agency quickly took action to move employees to teleworking while maintaining agency operations and service levels. To date, approximately 90% of employees are teleworking. Due to the number of employees able to telework, overall power usage in the main facility has been reduced.
- The Department of Revenue has been able to transfer the majority of long term rental vehicles to hybrid vehicles and continues focusing on switching out the remaining vehicles.
- The Department of Revenue has successfully downsized our Charlotte Service Center. We were able to downsize more than 14,000 square feet, which reduces energy usage at this location.
- The Department of Revenue has successfully downsized our Wilmington Service Center. We were able to downsize almost 2,500 square feet, which reduces energy usage at this location.
- The Department of Revenue is funding a project to replace outdated computer room air conditioning (CRAC) units located inside of our Scan Room, which is critical to processing tax documents. With the assistance of DOA, we plan to downsize both units with the result being better utilization and efficiency of air flow. We plan to have a digital network connection that can turn off or slow down the speed in which the CRAC units cool (not always running at 100% cooling). The older units did not have the ability to regulate the temperature in the same way. The new equipment is helping save energy while still accommodating temperature requirements inside the Scan Room. We plan to have these units replaced and operational by the end of FY26.
- The Department of Revenue funded and worked with DOA electrical shop to make upgrades to LED lighting in our Loading Dock area. DOA funded and DOR worked with DOA's vendor to upgraded lighting in the restrooms, main lobby, and elevator corridors throughout the main facility. (Upgrades pictured on next page) These changes included moving from high energy use lighting to LED lighting on each floor. Also, DOR funded an upgrade in our Warehouse to move to LED lighting. The agency continues working with DOA to move towards replacing lights in other areas of our main building with LED lighting.

NCDOR NORTH CAROLINA DEPARTMENT OF REVENUE

NC Department of Revenue
Agency Utility Management Plan

- The NC Department of Revenue recognizes that energy and water consumption can be managed for the benefit of our agency. Energy and water management is impacted by all employees and the responsibility of the Energy Manager for Department of Revenue with support from the Department of Administration.
- The Department of Revenue has developed an Agency Utility Management Plan. The Director of Business Operations is responsible for the success of the program for Department of Revenue.
- The Agency Utility Management Plan outlines the activities identified to support reduction in energy and water consumption goals with support from the Department of Administration.

Agency Utility Management Plan Goals

- As required in Executive Order 80, NC Department of Revenue will support efforts to reduce energy consumption per square foot in state owned buildings by at least 40% below fiscal year 2002-2003 levels and reduce state-wide greenhouse gas emissions to 40% below 2005 levels.

Strategic Energy and Water Plan Mandate – Commitment

I have read the Agency Utility Management Plan for the NC Department of Revenue. The plan, as presented, supports the reduction goals in Executive Order 80.

Implemented this 28th day of February 2019
Updated this 5th day of September 2025

Matthew King — 9/5/2025
Agency Energy Manager — Date

Samuel Tucker — 9/5/2025
Director of Business Operations — Date

McKinley Wooten, Jr. — 9/5/2025
Secretary, Department of Revenue — Date

STRATEGIC ENERGY MANAGEMENT PLAN

for

NC DEPARTMENT OF AGRICULTURE

&

CONSUMER SERVICES

September 2025

Prepared By:

Property & Construction Division

1001 Mail Service Center

Raleigh, NC 27699-1001

EXECUTIVE SUMMARY Past Status

The North Carolina Department of Agriculture & Consumer Services (NCDA&CS) has been using an excel spreadsheet to track utility usage since 2002. In 2011, the NC Forest Service and Soil & Water Divisions were transferred from what was at that time the NC Department of Environment and Natural Resources (NCDENR) to NCDA&CS. Energy utilization for these divisions was incorporated into the existing data maintained by NCDA&CS. Because the information from the prior periods was not available for the additional buildings, a new benchmark for data tracking and energy usage was created.

NCDA&CS manages over 300 locations across the state with a total of approximately 1125 state owned buildings with an approximate gross square footage of 4,437,478. The range in size of the facilities varies from 1 office building to a 400-acre research station with 87 buildings, to a facility with 40 buildings allocated to the NC State Fairgrounds, which supports 500 year-round events. Seventy-two percent (72%) of the buildings are less than 2,500 square feet and used as a field office for 1 – 4 employees or for storage. The leased total count is approximately 47 locations in North Carolina. The diversity of sites from size, use, number, and type of building, presents a challenge in monitoring utilities and identifying energy savings initiatives.

Prior to November of 2016, NCDA&CS utilities were submitted directly to Accounts Payable for payment. Invoices were scanned and sent to Divisions for review. Either throughout the year or annually when requested, Divisions would gather energy usage and cost information to be submitted for the Annual Energy Report. This system provided inconsistencies in the reporting because data collection was completed at the site level. In November of 2016, NCDA&CS transitioned to a 3rd party service for utility data collection. The first full year of data collection was 2017-18 and after reviewing the report for 2018-2019, data from the energy evaluation had a significant decrease from the prior years. In 2019-2020 there was also a decrease in energy consumption with COVID19 and less people in the workplace, this was an extremely difficult year to assess energy evaluation because of the decrease in office space usage, the utilities had to remain on even though employees were working remotely. Many employees started returning to work in 2022-2023 which generated an influx in usage.

NCDA&CS will continue to work to develop and implement efforts to improve energy and water conservation at all locations. The initial step being to create, implement and follow an effective Strategic Energy/Water Conservation Plan. The objective of the Strategic Energy/ Water Conservation Plan is to foster economically and environmentally responsible usage of valuable resources in accordance with State legislation.

FOCUS AREAS Focus #1 – Data Management 2017 – 18 Past Activities

Overview**:** In November of 2016, NCDA&CS transitioned to a 3rd party utility billing system. The new system will provide consistency in collection and reporting of key elements from each

invoice. Accounting Staff will monitor the system for expenditures, changes in service and late fees.
Responsible Groups: Accounting Clerk
Funding Source: General Operations and Salary
Metric: Notification of late fees, recording of necessary data; fewer disruptions in service

2017-18 Past Planned Activities
Overview: Using the 3rd party utility billing system identify a revised baseline and benchmark for assessing energy and water usage by Division down to site level.
Responsible Groups: Division staff – positions to be determined
Funding Source: Salaries
Metrics: Benchmarks established for each Division

Past Planned Activities

- Identify baseline data and benchmarks for each location with an emphasis on large energy consumers such as labs, greenhouses and animal facilities

Focus #2 – Facility Management

2016-17 Past Activity
Overview: Upgrading of lighting at NCDA&CS facilities through Duke Energy Incentives. Initiate upgrades at the Farmers Markets & Agriculture Event Centers
Responsible Groups: Property & Construction Division staff & site managers **Funding Source:** General Appropriations & Receipts
Metric: Reduction in energy usage tracked through Capturis.

2017-18 Past Activities
Overview: In 2016, NCDA&CS initiated a project to identify all state-owned buildings. The project has been useful in verify building existence, utilization, and square footage. The project is scheduled to be completed no later than June 30, 2018. **Responsible Groups:** Property & Construction Division staff **Funding Source:** General Appropriations and Salaries **Metric:** Accurate & Up-to-date building inventory.
Focus #2 – Facility Management

2017-18 Past Activities
Overview: Assessment of energy and water usage for each NCDA&CS managed site using the reports and graphs from the 3rd party billing system.

Responsible Group: Site Managers **Funding**
Source: Salaries
Metric: List of energy savings projected by site

Future Planned Activities

- Identify low or no cost initiatives
- Evaluate energy savings from lighting upgrade project at Farmer's Markets and Ag Center, evaluate other sites for lighting upgrades
- Identify unused and underutilized buildings; disconnect utilities and demolish
- Design new buildings to be energy efficient, utilizing green technology if applicable

Focus #3 – Organizational Communication and Outreach

2017-18 Past Activities
Overview: Notify all site managers and administrative staff of the 3rd party utility billing system; provide access information; identify training opportunities
Responsible Groups: Accounts Payable staff
Funding Source: General Appropriations and Salaries
Metric: Site staff accessing the system and running reports to track energy and water usage

Focus for Future Planned Activities 2019-2021

- Identify training modules for all NCDA&CS staff to be assigned through LMS to aid in identification of no cost and low cost savings opportunities.
- Pilot program through State Property Fire Insurance to allow sensors on equipment such as Hot Water Heaters, Pipes and condenser Units to notify staff about freezing pipes or differential temperatures.
- Demolition and severance of multiple hazardous Buildings to eliminate current utility bills.
- Roof replacement and repairs on approximately 53 Buildings throughout NCDA & CS sites to minimize excessive energy consumption.
- The Completion of the NCDA & CS new Agricultural Science Center Lab in Raleigh which will house 5 existing Laboratories into 1 shared building complex. Estimated completion time to be end of October 2020. This will be more cost effective and energy efficient because the currently used aged buildings do not have upgraded mechanical/electrical/ components that aren't using today's standards in construction.

Past Activities & updates for 2020-2021:

Overview: In March 2020, the COVID 19 pandemic hit the Country, most employees worked remotely throughout the year which has contributed to a reduction in savings and energy consumption. At this time many of the employees are still working remotely throughout the Department across the State. The Governor placed an Executive order on the State, therefore reducing many work and in person activities to be put on hold. During this time NCDA & CS's IT team implemented the Team's software which allowed many employees to have virtual meetings which conserved gas, utilities, and travel time.

- July 2020- June 30th-2021 there have been approximately 15 new roofs replaced

- July 2020- June 30th 2021 there have been approximately 10 Buildings that have been demolished and many more planned in the future.

- The New Steve Troxler Agriculture Science Center was completed with a move in date of August 2021.

The new Agriculture Science Center will accommodate approximately 200 employees in one large facility consisting of 223,000 sq. ft. The move will combine many offices into cubicles, therefore eliminating the use of many buildings and even rented space. We will surplus 2 NCDA Buildings (at this time) consisting of over 70,000 q. ft.

Features of the new Agriculture Science Facility

- Ultraviolet Lighting
- Bipolar Ionization
- R-19 Insulation in Walls
- R-56 Roofing (the expected was R-30 resulting in more savings

Overview for July 1, 2021- June 30, 2023: The NCDA & CS Administrative employees started returning back to offices in a remote/hybrid scenario in July 2021. Most of the Division employees were reporting to work 2-3 days per week and this is still the norm at the end of June 30, 2023. With the uptick in returning to work, the Energy Consumption slightly increased from 2021-2023. The significant cost increase was also due to inflation across the nation of fuel, oil, propane, and electricity contributed to higher Energy Consumption and dollars spent this physical year.

- There have been Approximately 11 Buildings demolished belonging to multiple Divisions within NCDA, the funding for these projects came from Capital Repair and Renovation fund.
- There have been “approximately” seventeen buildings added to the inventory consisting of small storage sheds to large Hangars ranging from 600 sq. ft up to 24,000 square ft. Funding has been approved through the Capital Funding Account approved by Legislature.
- There have been 11 buildings allocated to Several different Agencies which will eliminate future repairs needed on these facilities.
- Numerous buildings are being up fitted with new roofs, new HVAC systems, and new ventilation systems, which will also come from the Capital repair and renovation fund.

The new buildings that have recently been added to NCDA inventory will be more energy efficient, if utilities are included, however; not all these buildings require electricity and water. The new buildings will not be constructed in a FEMA hazard area or watershed areas.

NCDA & CS no longer pays the City of Raleigh water utilities through the Capturis Software, they are not input into the system, so this information is recorded separately. In 2024, there will be a new Accounting System implemented which will include a new software for billing and recordkeeping which is currently be evaluated within all state Agencies.

The new Ag Science Center has added an additional Boiler/Chiller and cooling tower which is more efficient than the expected 0.55KW/ ton resulting in more savings. Currently, this building is saving 14% compared to the baseline of the original estimates.

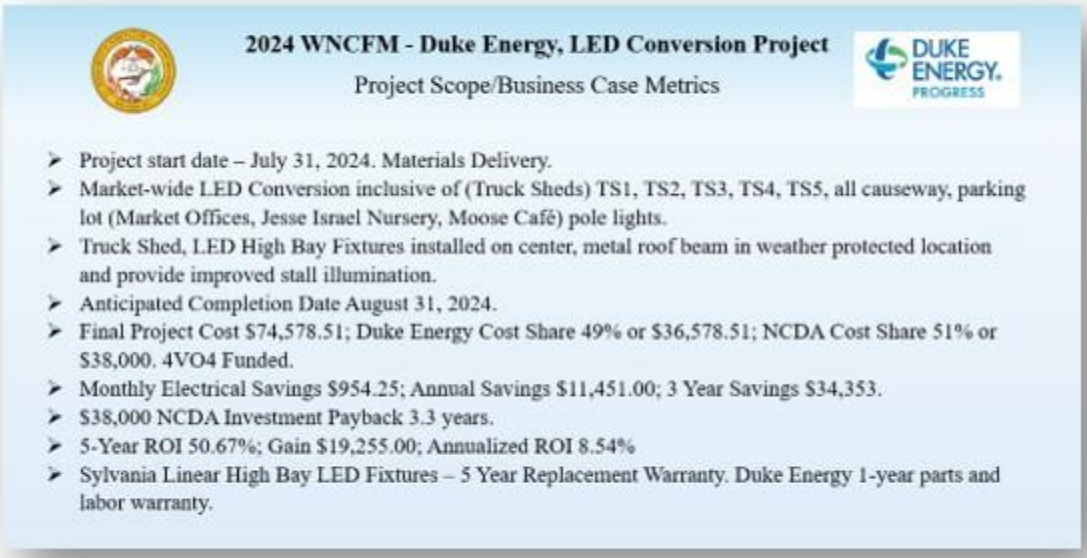
Based on the Utility Consumption report, the findings are consistent with last year's report with a slight increase in Total Energy dollars and BTUs. The North Carolina Department of Agriculture and Consumer Service will continue to do its part in the overall success of energy conservation.

OVERVIEW FOR JULY 1, 2023- JUNE 2025

The NCDA & CS Administrative employees have been continuing working in a remote/hybrid scenario in July 2023-July 2025. Most of the Division employees were reporting to work 2-3 days per week and this is still the norm at the end of June 30, 2025, which will be changing August 2025.
Based on the Utility report from July 1, 2023-June 30, 2024 The Energy consumption decreased, measuring total BTU and KWH, however in years 2024- June 2025, the BTU increased slightly. The water usage has increased in 2025 in which will be researched.

- Between July 1, 2023 and June 30 2025- NCDA & CS has demolished approximately 10 buildings that were considered safety hazards or no longer useful.
- From July 2023- June 2024- 5 New Buildings were constructed
- From July 2024- June 2025, 7 new Buildings have been constructed.

The Markets Division has been steadily trying to improve and update their outdated lighting to create a new LED project. Using the comparison billing approach, the YTD savings from September 2024- June 2025 at the Western NC Farmers Market have saved the Market $6,475.69 compared to the same month's prior billing period. (Info in Chart below Provided by Phil Jacobus)



ALL LED lighting has also been updated at the State Farmers Market, Charlotte Farmer's Market, Piedmont Triad Farmers Market, Southeastern Agricultural Center and all outdoor lighting, and Coliseum lighting has been updated at Senator Bob Martin Agricultural Center.

In August 2024 an Energy Assessment Report was performed by Waste Reduction Partners at the NC State Farmers Market, the building assessed was the NC State Farmers Market Restaurant Building. The summary included the individual energy usage for the building and recommended updates that were needed to be more energy efficient. One of the recommendations was to replace the HVAC Chiller, which is currently being replaced. A new Carrier chiller would have an EER of 10.4 and contain only 73 pounds for refrigerant. In addition to removing 110 pounds of R-22 from service, the new unit would save 7,893 kWh of electricity and provide an annual energy cost savings of $847. The cost of a new chiller and the simple payback are TBD. The 7,893 kwh of energy savings will reduce energy usage by 27 million Btus per year and provide air emission reductions of: CO_2e = 5,310 pounds per year, SO_2= 0 pounds per year, and NOx = 3 pound per year.

Future Projects- Electric Vehicle Charging Stations will be implemented at Several Facilities over the upcoming years.

Between July 2024- June 2025 The NC State Fair has completed the following:

- LED lighting upgrades in the Comm-Ed, Dorton Arena, Graham Building, and Scott Building exhibit hall areas. LED light upgrades to the Main Horse Arena and all 5 horse barns.
- LED exterior lighting upgrades in multiple locations across the Fairgrounds for area lighting. Exterior building lighting upgrades on the Maintenance Building, Admin Building, and Martin Building.
- LED exterior lighting upgrades for street lighting along Campground Road.
- Replaced 11 electrical transformers across the Fairgrounds and HHC with new energy efficient units.
- Replaced 7 HVAC units on the Comm-Ed Building with new energy efficient units.

The NC State Fairgrounds complex does not have sub-metering, so it is difficult to assess any monetary energy savings per building due to improvements.

In Conclusion, for Years 23-25, the NCDA & CS has been very diligent in the replacement of lighting at most Facilities and Complexes and has replaced numerous HVAC Units. As you can see from the Energy Evaluation report, the Total cost of the Utility expenditures decreased along with the Kilowatt usage and dollar amounts. The cost of natural gas increased, most likely based on the economy, with an increase in inflation and the cost of Energy in the United States. NCDA & CS will continue to be vigilant in replacing outdated mechanical systems, up-fitting older buildings, and retiring buildings that are no longer useful. NCDA & CS will also continue constructing more energy-efficient buildings to accommodate the employees of the Department.

Appalachian
STATE UNIVERSITY

2025 – 2026 Strategic Energy & Water Management Plan

August 2025

Contents

Note from the Chief Operating Officer and Executive Vice Chancellor

Appalachian State University is pleased to share its Strategic Energy and Water Management Plan for the 2025–26 academic year. Efficient use of energy and water is essential to reducing utility costs, maintaining reliable building operations, and enhancing campus resilience. This plan outlines the university's efforts to improve system performance, extend equipment life, and make data-driven investments that support the core mission of education and research.

We welcome students, faculty, staff, and members of the public to review the plan and reach out to energymanager@appstate.edu with questions, feedback, or requests for additional information.

J.J. Brown,
Chief Operating Officer and Executive Vice Chancellor

Executive Summary

Appalachian State University continues to make steady progress toward a more efficient and cost-effective campus. Despite the addition of 214,000 square feet of new building space and increased heating and cooling demands, the university reduced per-square-foot energy and water consumption in fiscal year (FY) 2024–25.

At year end, campus energy costs were down 12.9% ($1.06 million) compared to the previous year and 13% below the three-year average. Energy use intensity (EUI) declined by 2.3%, and overall water use dropped by 7.1%. Electricity usage rose slightly by 3%, while natural gas and propane use remained nearly flat at 0.4%. These outcomes reflect the impact of targeted building upgrades, optimizing existing campus systems, and reinvestment of utility savings into system improvements.

With support from North Carolina House Bill 1292, App State reinvested over $625,000 in utility savings and leveraged an additional $310,000 from grants and partners, including the Renewable Energy Initiative and the Office of Planning, Design & Construction. These efforts are projected to save the university nearly $189,000 annually in future utility costs.

Notable projects this year included controls and HVAC upgrades at John E. Thomas Hall, chilled water system improvements at Anne Belk Hall, phase-one chiller work at the Convocation Center, and LED Upgrades at Rankin West and the Human Resources building. Success stories like the recently completed Belk Library energy retrofit highlight the impact energy management can have on a building, delivering a 37% energy reduction and nearly $15,000 in monthly utility savings.

As App State enters FY 2025–26, the university remains committed to advancing practical, data-driven strategies that reduce operational risk, improve efficiency, and extend the life of campus infrastructure. Each year brings measurable progress that lowers costs, strengthens system reliability, and reinforces the value of proactive energy and water management.

Strategic Importance of Energy & Water Management

Appalachian State's approach to energy and water management is focused on enhancing campus reliability, controlling costs, and preparing for a more resilient future. As utility markets fluctuate and building requirements grow more complex, effective energy management has become critical to meeting academic and financial priorities alike.

Why It Matters

Campus utility costs totaled $8.7 million in FY 25 and are increasingly shaped by external volatility and internal demands. Simultaneously, expectations for indoor comfort, digital learning environments, and research infrastructure continue to grow. By investing in efficiency, the university mitigates financial risk, improves building reliability, and reduces its environmental impact.

The benefits extend beyond operations. Comfortable classrooms, consistent lab environments, and reliable infrastructure support the broader academic mission of reinforcing student success, faculty engagement, and App State's reputation for responsible stewardship.

Investing Strategically with 1292

House Bill 1292 has allowed the university to reinvest utility savings into high-impact projects that deliver ongoing operational and financial returns. In FY25, App State allocated over $625,000 through 1292 and leveraged $310,000 more from grants and campus partnerships. Combined, these projects are expected to save the university nearly $189,000 per year in avoided utility costs.

Due to the relatively short budget window of August to April, projects are often phased across multiple fiscal years to maximize impact. For example, John E. Thomas Hall controls upgrades and the Convocation Center chiller work are in process, multi-year efforts already delivering results.

The Belk Library retrofit demonstrates the impact of strategic energy investments at App State, achieving a 37% reduction in energy use and nearly $15,000 in monthly utility savings.
These results were driven by a comprehensive HVAC controls upgrade that optimized AHU fan speeds and significantly reduced reheat demand, aerosolized duct sealing, and a building-wide LED lighting retrofit.

For more information on additional 1292-funded projects, see Appendix A: 1292 Energy Savings Carryforward Impact Summary.

Leveraging Partnerships for Greater Impact

The App State Renewable Energy Initiative (ASUREI) and the Energy Management Internship Program continue to play vital roles in advancing campus energy goals. These partnerships bring hands-on student involvement to energy audits, data analysis, and project implementation—reinforcing the university's role as a living laboratory for applied learning.

External partnerships are also extending App State's impact. The university recently secured a $105,000 NCDEQ grant to install EV chargers at the Hickory campus, leveraging 1292 funds as the required match. In addition, the Energy Management team received a $100,000 grant to implement lighting upgrades, HVAC controls, and window film improvements at the Turchin Center for the Visual Arts. These improvements are already generating measurable energy savings with a total combined energy reduction of 40%.

As the campus continues to grow in scale and complexity, opportunities like these will be essential for delivering high-impact, cost-effective improvements.

Building Highlights

By strategically combining funding sources, App State is seeing clear, measurable results from its targeted approach to energy management. While these are just a few examples, they illustrate how upgrading HVAC controls, installing LED lighting, applying window film, and optimizing building operations can deliver substantial performance gains. These successes provide a strong foundation for replicating similar outcomes across the broader campus portfolio. Examples include:

- Belk Library – 37% reduction in total energy use
- D.D. Dougherty – 51% reduction in total energy use
- Turchin Center – 40% reduction in total energy

A Leadership Opportunity

Recent achievements reflect the strong support Facilities Operations and Energy Management have received from university leadership. Sustained progress will require continued investment, especially in cost effective energy and water upgrades, staffing, recommissioning efforts, and advanced data analytics.

Energy and water management is more than a facilities responsibility. It is a strategic priority that underpins App State's commitment to operational excellence, financial stewardship, and long-term reliability.

Year in Review

FY 2024–25 was an important year for energy and water management at Appalachian State University. Despite added square footage, extreme weather events, and staffing limitations, the university reduced energy and water use intensity, cut costs, and expanded its renewable energy footprint. These results reflect continued reinvestment of savings into high-impact projects, increased reliance on data-driven decision making, and a strong culture of collaboration.

Table 1. Annual Campus Wide Consumption Figures

	2024/25 Totals	2023/24 Totals	2022/23 Totals
Energy Use Intensity	76.3 kBTU / sq.ft.	77.6 kBTU / sq.ft.	80 kBTU / sq.ft.
Water Use Intensity	14.3 gal / sq. ft.	16 gal / sq. ft.	16.3 gal / sq. ft.
University Energy Expense	$7.27 million	$8.25 million	$9.13 million
Water and Sewer Expense	$1.36 million	$1.41 million	$1.53 million

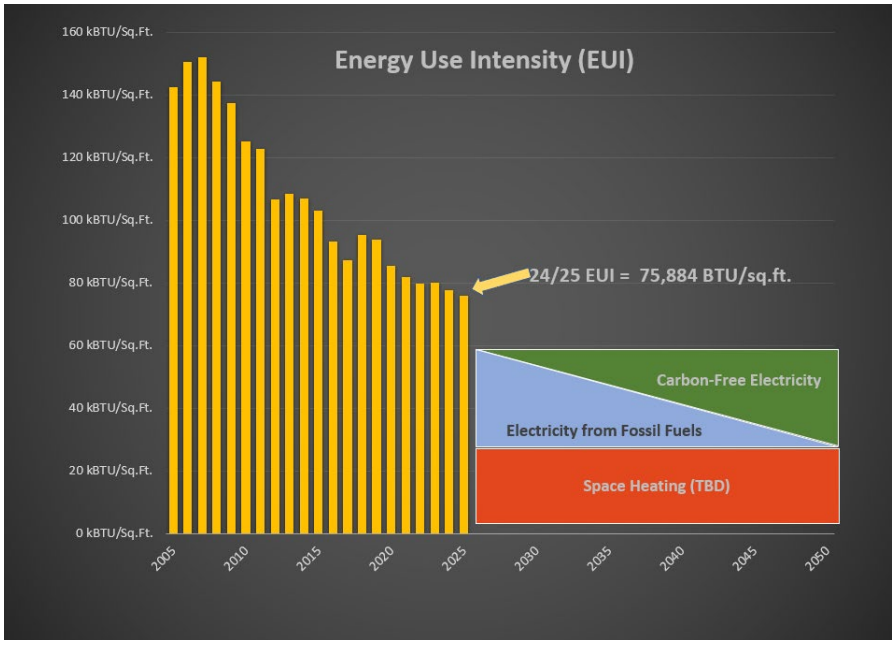
Energy and Water Use Performance

Despite the addition of 214,000 square feet of building space this year, energy use intensity (EUI) was reduced by 2.3%, and overall water use by 7.1%. Electricity use increased slightly by 3%, while natural gas and propane use remained flat, increasing by just 0.4%.

Table 2. FY25 Raw Energy Use

Utility	FY 24/25 Consumption	Percent Change from FY23/24
Electricity	55,430,561 kWh	2.98 % increase
Natural Gas	2,829,889 Therms	0.17 % reduction
Gallons of Water	89,518,217 gallons	7.12 % reduction

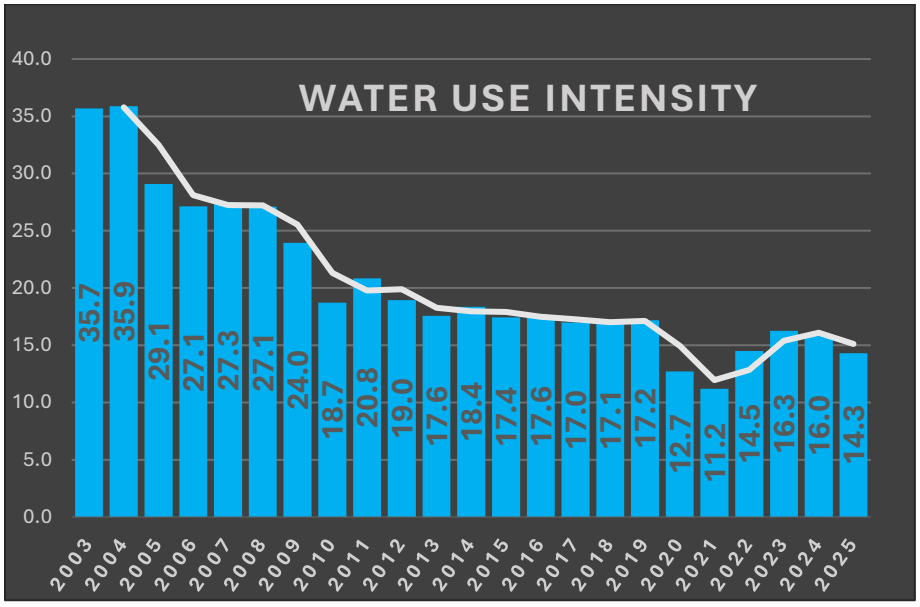
Figure 1. Energy Use Intensity



Efficiency gains came during a year with above-average heating and cooling demand. The Boone area experienced 8% more cooling degree days, and 9% more heating degree days compared to the previous year. Lighting upgrades, recommissioning, and optimized controls helped maintain performance.

Similarly, App State's water use intensity, the number of gallons used per square foot in a building, has continued to make significant progress. As outlined in Figure 2, the university's water use intensity was 14.3 gallons per square foot in FY 25.

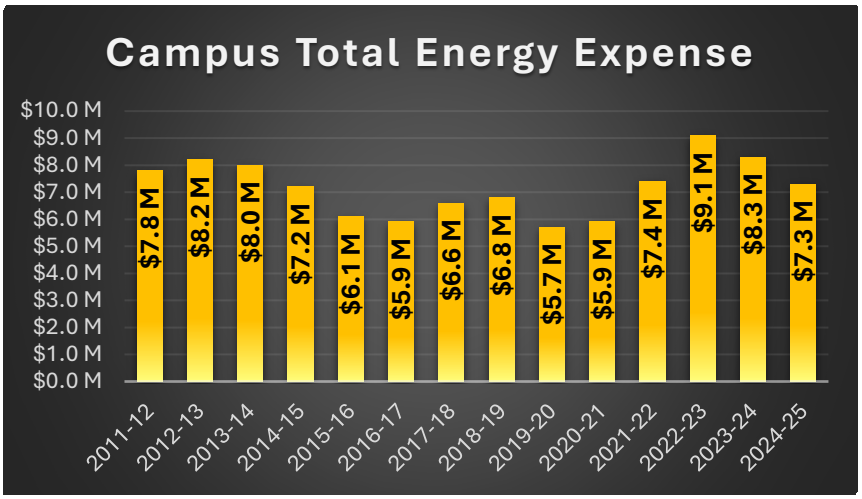
Figure 2. Water Use Intensity



Utility Costs

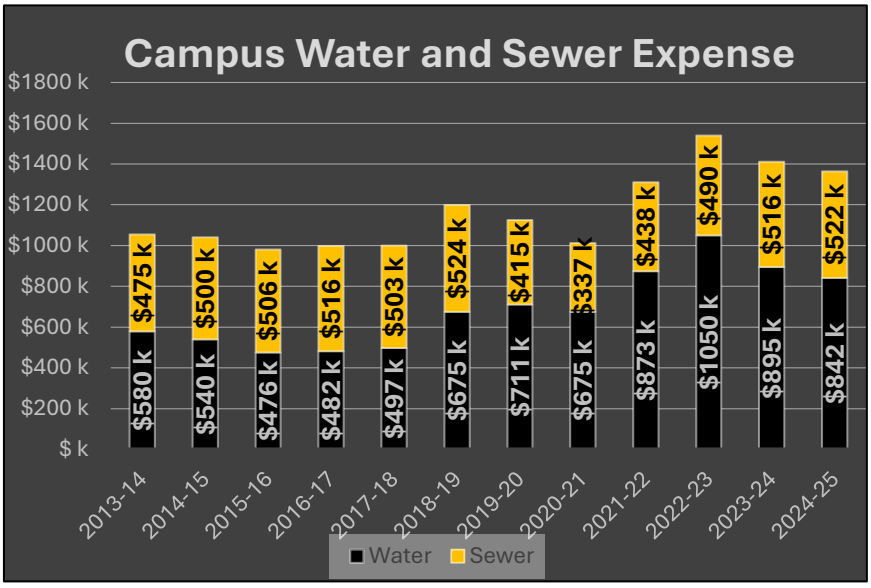
Utility expense reductions were among the most visible outcomes of the university's energy strategy this year. Total energy costs dropped by $1.06 million, representing a 12.9% decrease compared to the previous year and a 13% drop from the three-year average.

Figure 3. Annual Energy Expense



In FY25, Appalachian State University spent $7.3 million on energy and $1.4 million on water and sewer services. While these costs reflect year-over-year reductions of 12.9% and 3.3%, respectively, rising natural gas futures are expected to drive higher energy expenses in FY26. Proactive cost management and strategic procurement will be critical to maintaining budget stability in the face of market volatility.

Figure 4. Water and Sewer Expense



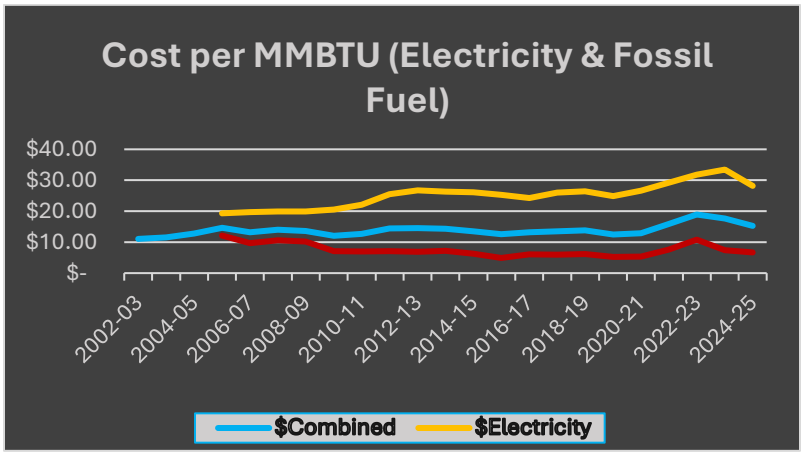
Cost of Energy

Energy costs directly affect the university's utility budget. Although overall consumption has declined, the cost per MMBTU for electricity and natural gas has fluctuated with no clear long-term trend. FY 23 marked a peak, with electricity rising 9.7% per kWh and natural gas up 42.9% per therm. Since then, prices have moderated, with natural gas stabilizing near $4 per dekatherm.

Figure 3 illustrates this recovery and highlights the cost gap between electricity and natural gas—$28.02 per MMBTU for electricity versus $6.72 for natural gas and propane. While energy planning should consider more than just unit cost, this disparity reinforces the importance of careful evaluation as the university considers the future of campus heating and its district steam system.

Forecasting energy prices remains challenging given the influence of fuel supply, weather, and global events. Although long-term costs are generally expected to rise, the increasing role of renewables and resource variability add uncertainty to future pricing.

Figure 5. Cost of Energy per MMBTU



Renewable Energy at App State

App State continues to advance its renewable energy goals through a combination of on-campus installations and the purchase of renewable electricity. On-campus renewable efforts have been largely driven by the student-funded and student-led ASUREI, which has supported every installation to date. In FY25, campus photovoltaic (PV) and wind systems generated 423,464 kWh, with significant output from the Data Center PV array, the original Broyhill Wind Turbine, and the Leone Levine PV system.

Table 3. On-Campus Renewable Energy Production

	Annual Production
Broyhill Wind Turbine	100,480 kWh
Data Center PV	172,338 kWh
Library Traffic Circle PV	18,404 kWh
Frank Hall PV	47,697 kWh
Legends Electric Vehicle Charging Station PV	6,925 kWh
Leon Levine PV	77,620 kWh
Plemmons Student Union Solar Thermal	25.5 MMBTU

Looking ahead, the university's Innovation District will mark a major expansion of on-site renewable infrastructure. Once fully operational, it will add approximately 500 kW of solar PV, two new 445 kW wind turbines, and 90 geothermal wells to provide year-round heating and cooling to the district. These systems will serve both the new residential units, designed to offer affordable housing for faculty and staff, and a future STEM academic building.

The addition of these assets is made possible through a combination of state-allocated funding and public-private partnerships, reinforcing App State's commitment to energy resilience, operational reliability, and long-term cost effectiveness.

Table 4. University Commitments to Purchased Renewable Energy

Building	Renewable Energy Provider	Funded By	Annual Electricity
10% Campus-Wide	New River Light and Power	Appalachian State University	5,000,000 kWh
5% Campus-Wide	New River Light and Power	Renewable Energy Initiative	2,500,000 kWh
Leone Levine	Blue Ridge Energy	Appalachian State University	1,610,793 kWh
		Total Annual Commitment	**9,110,793 kWh**

Through New River Light and Power (NRLP) and Blue Ridge Energy, approximately 17% of App State's electricity comes from purchased renewable sources. This includes a 10% institutional commitment and an additional 5% purchased by the ASUREI through NRLP's Green Power Program. App State also continues to offset the electricity use for the Leon Levine Hall through Blue Ridge Energy's Brighter Future solar program.

Setbacks and Challenges

Hurricane Helene caused damage in several buildings. In Rankin Science West, flooding disrupted a newly completed chiller optimization effort. From July to September, the building had achieved a 12% reduction in electricity use vs. its three-year average. The full benefit will be reassessed post-recovery.

Staffing limitations also continue to constrain progress. The Controls Shop remains heavily engaged in supporting daily operations and capital construction, leaving limited bandwidth for proactive optimization or recommissioning. While the value of recommissioning is increasingly evident, scaling this work across more buildings will require additional capacity either through dedicated hires or strategic use of contracted support. Without expanded resources, the university risks leaving savings on the table and falling short of its operational efficiency potential.

FY 26 Goals and Strategic Priorities

Appalachian State University's FY26 energy and water strategy builds on recent momentum through targeted reductions and strategic investments that strengthen reliability, control costs, and support environmental goals.

Performance Targets

In the face of growing campus demands, the university is setting achievable but meaningful goals:

Table 5. FY25/26 Performance Targets

Performance Metric	FY24/25 Actual	FY25/26 Goal
Energy Use Intensity (EUI)	76.3 kBTU / sq.ft.	2% reduction
Water Use Intensity (WUI)	14.3 gal / sq. ft.	2% reduction
Energy Costs	$7.27 million	Maintain current levels
Water & Sewer Costs	$1.36 million	2% reduction

Containing energy costs remains a top priority, especially with rising natural gas prices. App State is rejoining the state natural gas contract after two years of successful independent procurement that avoided over $520,000 annually in excessive transportation basis fees. The revised contract structure offers a more balanced approach to cost and risk while insulating the university from costly Operational Flow Orders (OFOs).

Strategic Priorities

While performance targets remain incremental, App State is pursuing several high-impact strategies to drive long-term results.

1. **Recommissioning: From Pilot to Program** - Recommissioning remains one of the most effective tools for saving energy and extending system life. The coming year will focus on scaling this work across more buildings, standardizing documentation of savings, and demonstrating value to support the hiring of a dedicated recommissioning technician. With Controls Shop resources stretched across both operations and capital projects, expanding recommissioning capacity is a strategic necessity.

2. **1292-Funded Efficiency Projects** - Energy savings from North Carolina House Bill 1292 are being reinvested into critical upgrades, including:

    - **HVAC and Chiller Improvements** (Convocation Center, Garwood, Schaefer, College Street)
    - **Advanced Controls and Monitoring** (JET Building, Events2HVAC platform, substation metering)
    - **Lighting & Envelope** (LED retrofits in three campus buildings, window film)
    - **Water and Systems Studies** (Net Positive Water, Garwood distilled water system)
    - **Reliability Upgrades** (Sanford Hall, Rankin South)

    These projects focus on systems with strong potential for operational and financial returns, aiming for a 5 to 7-year payback period depending on the long-term viability of the equipment being upgraded.

3. **Renewable Energy and ASUREI Partnership** - Continue collaborating with ASUREI to advance campus-facing renewable and efficiency projects like LED retrofits in high-occupancy student housing. Planning is also underway for the next solar or renewable pilot system that balances demand reduction and load avoidance with cost effective utilization of design-build contracting.

4. **District Energy and Innovation District Support** – Energy Management will work closely with campus partners to monitor and support new geothermal, solar, wind, and high-efficiency systems in the Innovation District. This includes benchmarking against existing infrastructure and preparing for the data needs of a modern district energy system.

5. **Demand Management and Grid Awareness** - To manage peak electrical demand and prepare for future flexibility opportunities, App State will:
    - Install a campus-wide power meter for better real-time visibility.
    - Explore load-shifting, battery storage, and automation strategies to reduce peak charges.
6. **Grants and External Funding** – Energy Management is actively pursuing new grant opportunities to complement 1292 funds. Target areas include HVAC retrofits, advanced controls, and integration of clean energy systems. The goal is to identify shovel-ready projects that can attract outside investment while addressing core infrastructure needs.

7. **Student Engagement and Workforce Development** - App State will continue supporting the Energy Management Internship Program and new energy management focused coursework. Student interns contribute to data analysis, project tracking, and energy audits, with new opportunities this year to align classroom learning with real-world energy work.

Looking Ahead

As buildings age, utility costs shift, and expectations grow, maintaining efficient, reliable, and cost-effective operations depends on sustained commitment and smart investment. From deep efficiency retrofits in receipt-supported buildings to high-impact building envelope upgrades like recladding the Hickory Campus and large-scale solar projects, opportunities for continued progress remain strong. Less visible efforts like daily recommissioning and system adjustments also deliver lasting value and are central to App State's strategy.

This year's plan builds on proven approaches: system optimization, infrastructure upgrades, student engagement, and strategic funding.

Appalachian State is positioned to lead by example. With continued support from university leadership, additional staffing, and access to tools like 1292 reinvestment and external grant funding, the Energy Management team stands ready to deliver more than incremental gains. Together, these efforts can position App State as a national model for campus-scale energy management in a rapidly evolving landscape.

1292 Energy Savings Carry Forward Impact Summary – FY25

Total FY25 1292 Budget: $625,478

Additional Funds Leveraged: $310,905

Annual Utility Cost Savings: $188,909

Focus: Projects focus on improving campus system reliability and reducing operational costs, while also supporting App State's mission of academic excellence. To maximize impact, 1292 funds were strategically combined with grants, support from the Renewable Energy Initiative, and Design & Construction funding. Due to the short August-to-April budget window, larger projects are occasionally phased across multiple fiscal years to ensure successful and meaningful implementation.

Key Projects and Outcomes

John E. Thomas HVAC Controls Upgrade
- Annual Savings: $49,679
- Replaced outdated N2 controls with BACnet, a critical upgrade as N2 is being phased out. All materials have been purchased, with half installed. Remaining work is planned for FY26.

Convocation Center Chiller Controls
- Annual Savings: $34,844
- Upgraded chillers with VFDs, automated valves, and controls. Phase 2 planned for FY26.

Anne Belk Chilled Water System Overhaul
- Annual Savings: $53,012
- R'newal, new VFD, head pressure controls, and BAS integration. Avoided costly replacement. Serves four academic buildings, including critical lab space in Rankin North.

Academic Building LED Upgrades
- Annual Savings: $23,049 (combined)
- Rankin West, Human Resources Building, and the Living Learning Center Academic Wing (materials only, LLC-A install in FY26).

John E. Thomas Window Film
- Annual Savings: $7,145
- Reduced solar heat gain in south and east-facing offices. Enhances comfort and reduces HVAC load.

Chancellor's House Air Sealing
- Annual Savings: $1,980
- Blower door-guided attic and crawlspace air sealing reduced leakage by 30%.

Beasley Media IT Room Mini-Split
- Annual Savings: $2,100
- Reduced 24/7 RTU runtime. In combination with HVAC/BAS retuning efforts, building-wide April energy use down 23% from 3 year-average.

Student Rec AHU3 Reheat Coil
- Annual Savings: $16,100
- Funded 69% by 1292 and 31% by ASUREI. Improved dehumidification process for basketball courts.

Magnetic Bearing Chiller Maintenance
- Annual Savings: N/A
- Prevents failure of high-efficiency chillers still in operation at key sites.

Hickory EV Chargers
- Annual Savings: N/A
- $105K grant from NCDEQ - 1292 served as required match.

Blackburn Vannoy Greenhouse – Variable Speed Fans
- Annual Savings: $1,000
- Reduced energy use while integrating academic collaboration and student involvement.

ECU Strategic Energy & Water Plan (2025-2026)

TABLE OF CONTENTS

EXECUTIVE SUMMARY

General

The preparation of the 2025 - 2026 ECU Strategic Energy and Water Plan involved consolidating responses by the departments in Campus Operations related to procedural changes or projects that contributed to the conservation of energy or water. This year's plan documents Campus Operations' successes related to energy and water conservation based on the availability of funding sources, be they operating, repair and renovation, or energy savings carry forward.

Analysis

Through the continued efforts of Campus Operations and the East Carolina University community, the institution has realized a 32% decrease in its energy consumption and a 49% reduction in water consumption in 2024-2025 from the FY 2003 baseline. When compared to the previous year, electrical consumption increased 0.6% per gross square foot while natural gas usage decreased by 3%.

"The institution has realized a 33% decrease in its energy consumption and a 53% reduction in water consumption since our FY 2003 baseline."

The energy consumption data included in this report is "raw" metered data (i.e., it does not take temperature variations into account). To better appreciate ECU's effort to improve energy efficiency, the top chart on page 4, "ECU Annual Energy Consumption" includes a weather-normalized view of the total energy usage per square foot. The weather-normalized EUI (Energy Utilization Index) shows a decrease of 27.9% since our 2002-2003 baseline. Over this same period, we experienced an increase in the campus gross square footage of 60.5%.

"When compared to the previous year, electrical consumption increased 0.6% per gross square foot, while natural gas usage saw a 3% decrease."

During FY 2025, ECU completed ASHRAE Level I/Level II audits on 4 buildings as well the Steam Plant on the Health Sciences Campus. These audits will provide us with projects to implement with HB 1292 funds in future years. For Fiscal Year 2026, we plan to conduct ASHRAE Level I and Level II audits on additional buildings.

ECU remained at 7,446,421 GFS this year. We did not expand our Rain Bird Smart Irrigation coverage area last year, as Grounds Services was still backfilling vacant positions from the pandemic. We hope to add another coverage zone in a future fiscal year, which will enable our grounds team to optimize the irrigation program as this system utilizes weather and evapotranspiration data to automate the irrigation schedules.

"ECU maintained nearly the exact same water usage in total and per gross square foot as the previous fiscal year, which is still a reduction of 53% since the 2002-2003 baseline."

East Carolina University (ECU) is in the process of deploying SmartCoil, an intelligent HVAC cooling coil monitoring system designed to enhance operational efficiency and predictive maintenance. SmartCoil utilizes real-time sensor data and advanced analytics to continuously assess the thermal performance and fouling levels of cooling coils. By identifying degradation trends and forecasting optimal cleaning intervals, ECU can reduce unnecessary coil cleanings, improve heat exchange efficiency, and extend equipment lifespan. This data-driven approach supports enhanced system reliability, lower energy consumption, and reduced maintenance overhead.

Now that the ECU Sustainability Outreach Specialist has been on the job for two years, we have started making our energy consumption data more visible to students, staff, and faculty. Beginning in spring 2025, we started including energy consumption data for our Main Campus and Health Sciences Campus in our monthly newsletter. We present a chart of consumption for each campus and a link to our website where we host monthly consumption data in more detail. Hopefully, this will make some people think more about the energy they consume while working and learning on campus. In addition, we also restarted the ECU Energy Challenge this past year, which is a competition to see which Residence Hall on campus can reduce energy the most during the month of October each year. In fall 2024, Legacy Residence Hall won the competition by reducing energy consumption nearly 25%

compared to the baseline measurements. In total, the residence halls reduced energy consumption on average 17.25% and avoided over $34,000 in energy costs.

On October 29, 2018, Governor Roy Cooper issued Executive Order No. 80 establishing targets for Greenhouse Gas (GHG) emission reductions throughout North Carolina. One of the order's specific actions directs a 40% reduction in energy consumption (per square foot) of state-owned buildings by the end of fiscal year 2025. The baseline continues to be our FY 2003 level. More recently, in January of 2022, Governor Roy Cooper issued Executive Order No. 246, affirming North Carolina's commitment to a clean energy economy, and directing next steps in the state's plan to achieve net-zero GHG emissions and create economic opportunities across the state of North Carolina. This increased the statewide goal to a 50% reduction from the 2005 levels by 2030 and achieving net-zero GHG emissions by 2050.

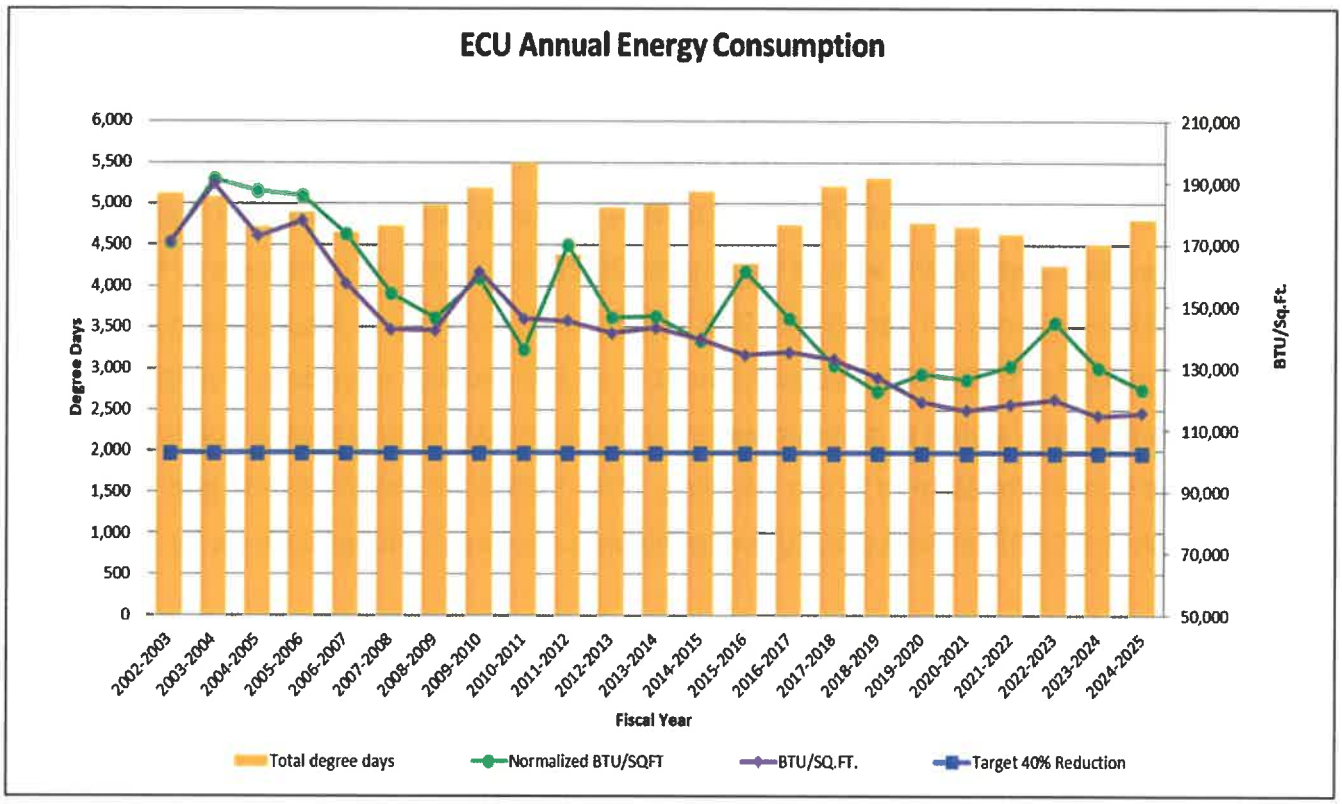
For ECU to achieve targeted energy consumption goals, substantial reductions must still be realized. These reductions will require both the continued replacement of less efficient equipment utilized on campus as well as making behavioral changes in how campus facilities are occupied and operated. Over the next twelve months, ECU will continue to pursue equipment upgrades, retrofits, and conversions, while also ensuring the campus is operated as efficiently as possible. These endeavors will be undertaken without compromising our primary missions of education and research. This will include such actions as continuing to establish and maintain building operating schedules and defining optimal building operating parameters for energy intensive locations, such as research labs. These efforts, combined with continued campus community education and involvement, will continue to allow ECU to move closer to targeted reductions.

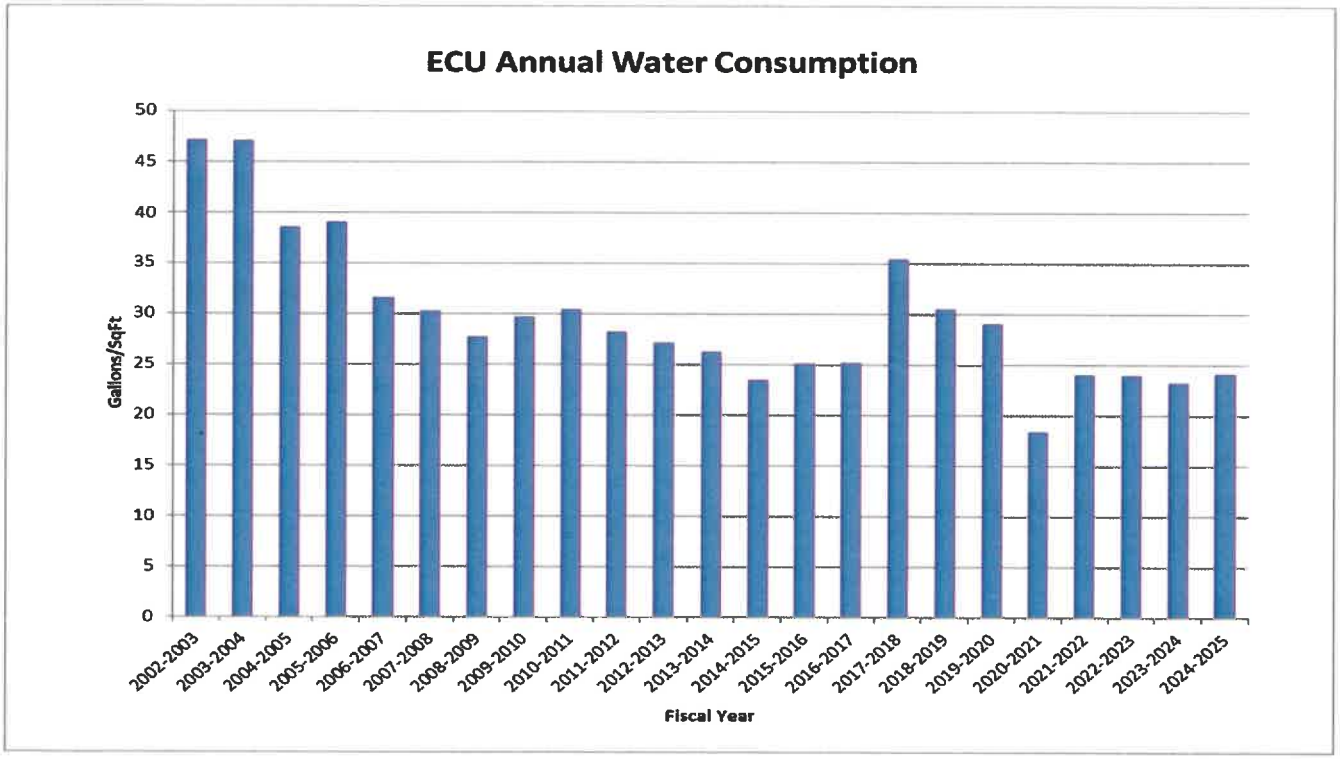
Griffin Avin
Chief Sustainability Officer

Chad Carwein
University Sustainability Manager

Sammy Snead
University Energy Manager

Summary of Referenced Data:





ENERGY PERFORMANCE SUMMARY

(Data is not weather-normalized)

Fiscal Year	Total Utility Costs	Cost / MMBTU	Cost / GSF	BTU / GSF	% Change from 2003
2002-2003	$11,021,822	$12.50	$2.13	170,724	-
2003-2004	$12,661,561	$12.32	$2.33	189,287	10.9%
2004-2005	$14,277,138	$14.29	$2.47	172,569	1.1%
2005-2006	$17,129,124	$16.66	$2.96	177,567	4.0%
2006-2007	$17,297,153	$16.30	$2.56	157,404	-7.8%
2007-2008	$17,569,897	$17.14	$2.44	142,573	-16.5%
2008-2009	$18,924,248	$19.16	$2.72	142,207	-16.7%
2009-2010	$19,658,784	$17.71	$2.86	161,238	-5.6%
2010-2011	$18,392,943	$17.84	$2.61	146,059	-14.4%
2011-2012	$18,151,180	$17.58	$2.56	145,433	-14.8%
2012-2013	$17,942,582	$17.15	$2.42	141,416	-17.2%
2013-2014	$17,883,685	$17.13	$2.43	141,752	-17.0%
2014-2015	$18,628,334	$17.97	$2.51	139,480	-18.3%
2015-2016	$16,361,605	$15.93	$2.14	134,410	-21.3%
2016-2017	$15,864,576	$15.35	$2.08	135,262	-20.8%
2017-2018	$15,364,652	$14.88	$1.98	133,158	-22.0%
2018-2019	$16,022,036	$15.18	$1.93	127,096	-26.0%
2019-2020	$15,604,175	$15.50	$1.85	119,270	-30.1%
2020-2021	$14,372,208	$14.96	$1.72	116,452	-31.8%
2021-2022	$17,037,778	$16.66	$1.97	118,377	-30.7%
2022-2023	$17,213,868	$16.55	$1.98	119,914	-29.8%
2023-2024	$16,542,964	$17.09	$1.96	114,678	-33.0%
2024-2025	$16,864,347	$17.21	$1.99	115,614	-32.4%

SUPPLY

Strategies

- Continue to implement programs and initiatives to make University's energy management more effective.
- Strive to obtain reasonable cost of interruptible natural gas from local provider.

Tactics

PAST 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Schneider Electric PME Technical Support	Subscription renewed	Subscription renewed	$0	$0	$25,000	0	Griffin Avin	HB1292 Funds
Brightly Energy Management Software Technical Support	Subscription renewed	Subscription renewed	$0	$0	$29,912	0	Griffin Avin	HB 1292 Funds
Installed two 3.6kW solar trees	Trees Installed	Project Complete	$766	Ongoing M&V	$147,296	0	Chad Carwein	HB1292 Funds

SUPPLY

Strategies

- Continue to implement programs and initiatives to make University's energy management more effective.
- Strive to obtain reasonable cost of interruptible natural gas from local provider.

NEXT 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Schneider Electric PME Technical Support	Subscription renewed	Renewal in process	$0	0	$25,000	0	Sammy Snead	HB1292 Funds
Brightly Utility Manager utility data collection	Subscription renewed	Renewal in process	$0	0	$31,500	0	Sammy Snead	HB1292 Funds

DEMAND

Strategies

- Continue to implement programs and initiatives, install equipment, and renovate buildings to make University buildings more efficient.

Tactics

PAST 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Install Blankets on Steam Equipment in in 6 Buildings	Project Complete	Completed June-24	$20,000	Ongoing M&V	$40,000	0	Sammy Snead	HB1292 Funds
Occupancy Schedule Resets/Economizer Function-Carol Belk	Project Complete	Completed July-24	$19,302	$8,740	0	0	Chris Brown	N/A
Lighting Performance Contract surplus savings	Project Complete			$1,104,181	0	0	Griffin Avin	N/A
ASHRAE Level II Audits of 4 buildings with high EUI relative to benchmarks	Final Reports	Rec Reports		0	$89,800	0	Sammy Snead	HB 1292 Funds
Perform Feasibility Study on reducing the Health Sciences Campus Steam Distribution Pressure from 100PSI to 80PSI	Project Complete	Completed June-25	$27,000	Ongoing M&V	$48,000	0	Sammy Snead	HB1292 Funds
Replacement of Inefficient Heat Pump-Taylor Slaughter	Project Complete	Completed June-24	$508	$508	$26,795	0	Chris Phelps	N/A
Replacement of Inefficient Heat Pump-Eller House	Project Complete	Completed June-24	$127	$127	$8,866	0	Chris Phelps	N/A
Replacement of Inefficient Heat Pump-Minges Pool Office	Project Complete	Completed June-24	$254	$254	$10,900	0	Chris Phelps	N/A
Replacement of Inefficient Heat Pump-Minges Office Area	Project Complete	Completed June-24	$175	$175	$9,800	0	Chris Phelps	N/A
Replacement of Inefficient Heat Pump-Minges Office Area	Project Complete	Completed June-24	$175	$175	$9,800	0	Chris Phelps	N/A
Replacement of Inefficient Heat Pump-Willis Bldg	Project Complete	Completed June-24	$90	$90	$1,812	0	Chris Phelps	N/A
Replacement of Inefficient Heat Pump-Howard House	Project Complete	Completed June-24	$84	$84	$1,370	0	Chris Phelps	N/A
Replacement of Inefficient Heat Pump-Bldg 123	Project Complete	Completed June-24	$725	$725	$24,600	0	Chris Phelps	N/A

DEMAND

Strategies

- Continue to implement programs and initiatives, install equipment, and renovate buildings to make University buildings more efficient.

Tactics

PAST 12 Months' Activities (cont.)	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Update Occupancy Schedule Updates- Willis	Project Complete	Completed Aug-24	$12,303	$3,679	0	0	Sammy Snead	N/A
Occupancy Schedule Reset- AHU-A1- Ross Hall	Project Complete	Completed Aug-24	$9,606	$3,195	0	0	Gray Hamill	N/A
Occupancy Schedule Resets - Speight	Project Complete	Completed June-25	$15,631	$2,839	0	0	Sammy Snead	HB1292 Funds
Occupancy Setback-Student Union	Project Complete	Completed July-24	$5,000	$16,145	0	0	Chris Brown	N/A
Occupancy Schedule Resets/Economizer Function-Carol Belk	Project Complete	Completed July-24	$19,302	$8,740	0	0	Chris Brown	N/A
Occupancy Schedule Resets-Austin	Project Complete	Completed July-24	$5,000	$15,241	0	0	Chris Brown	N/A
Occupancy Schedule Resets-Rivers	Project Complete	Completed Aug-24	$21,236	$6,298	0	0	Chris Brown	N/A
Ward Sports AHU-2 Occupancy Schedule	Project Complete	Completed March-25	$15,253	$911	0	0	Chris Phelps	N/A
Occupancy Schedule Reset-Old Cafeteria	Project Complete	Completed July-24	$21,236	$5,605	0	0	Chris Brown	N/A
Update Occupancy Schedule Updates- Willis	Project Complete	Completed Aug-24	$12,303	$3,679	0	0	Sammy Snead	N/A
Occupancy Schedule Reset- AHU-A1- Ross Hall	Project Complete	Completed Aug-24	$9,606	$3,195	0	0	Gray Hamill	N/A
Occupancy Schedule Resets - Speight	Project Complete	Completed June-25	$15,631	$2,839	0	0	Sammy Snead	HB1292 Funds
Occupancy Setback-Student Union	Project Complete	Completed July-24	$5,000	$46,145	0	0	Chris Brown	N/A

DEMAND

Strategies

- Continue to implement programs and initiatives, install equipment, and renovate buildings to make University buildings more efficient.

Tactics

NEXT 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Remove Steam Coils & Replace with Heating Hot Water Coils in 8 AHUs - Science & Tech	Energy Savings	In Process	$54,755	TBD	$510,000	0	Sammy Snead	HB1292 Funds
Install Advanced Heat Recover in AHU-Warren Life Sciences	Energy Savings	In Process	TBD	TBD	$382,400	0	Sammy Snead	HB1292 Funds
Install Blankets on Steam Equipment in 10-20 Buildings	Energy Savings	In Process	$35,000	TBD	$70,000	0	Sammy Snead	HB1292 Funds
Reduce Airflow in Health Sciences Building Mechanical Spaces	Energy Savings	In Process	$21,000	TBD	0	0	Gray Hamill	NA
Replace degraded Insulation on the Main Campus Steam Distribution System	Energy Savings	In process	TBD	TBD	$14,200	0	Joe Bryant	HB1292 Funds
Install AHU Cooling Coil Performance Monitoring System	Energy Savings	In Process	TBD	TBD	$11,900	0	David Skinner	HB1292 Funds
Perform Stem Trap Audit on Health Sciences Campus	Energy Savings	In Process	TBD	TBD	$9,800	0	David Skinner	HB1292 Funds
Replace Degraded/Inefficient Duct-Ross place	Increase Operational Efficiency	In Process	TBD	TBD	$19,000	0	Chris Brown	HB1292 Funds
Replacement of Inefficient Haet Pump-Epps	Energy Savings	In Process	TBD	TBD	$20,000	0	Gary Able	HB1292 Funds
Replace Feedwater Pump Stack-Steam Plant	Energy Savings	In Process	$6,608	TBD	$14,000	0	Joe Bryant	HB1292 Funds
Upgrade/Repair Lighting Controls-Life Sciences & Biotech	Energy Savings	In Process	TBD	TBD	$6,900	0	Kevin Summerlin	HB1292 Funds
Upgrade Building Automation Controls-Greenville Center	Increase Operational Efficiency	In Process	TBD	TBD	$275,000	0	Chris Brown	HB1292 Funds
Upgrade HVAC VAVs-Ward	Increase Operational Efficiency	In Process	TBD	TBD	$300,000	0	Chris Brown	HB1292 Funds
Upgrade Building Automation Controls-	Increase Operational Efficiency	In Process	TBD	TBD	$400,000	0	Chris Brown	HB1292 Funds
Upgrade Building Automation Controls-	Increase Operational Efficiency	In Process	TBD	TBD	$480,000	0	Chris Brown	HB1292 Funds
Upgrade Building Automation Controls-	Increase Operational Efficiency	In Process	TBD	TBD	$650,000	0	Chris Brown	HB1292 Funds

AWARENESS & TRAINING

Strategies

- Continue to focus efforts on developing and expanding resources of the ECU Sustainability Committee. Expand efforts to recognize and document efforts to reduce energy consumption and realize savings.

Tactics

PAST 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
Participated in the Appalachian Energy Summit	Attend Energy Summit	Energy Summit attended by faculty, staff, and students in June 2025.	N/A	N/A	$0	0	Chad Carwein / Griffin Avin / Sammy Snead	N/A
Participated in the UNC Sustainability Alliance meeting	Attend Alliance Meeting	Participated in Alliance Annual Meeting during the App Energy Summit	N/A	N/A	$0	0	Chad Carwein / Griff Avin	N/A
Attended Collegiate Sports Sustainability Conference	Attend conference in July 2025	Attended in person at Duke University	N/A	N/A	$500	0	Chad Carwein	State Funds - HSC Sustainability
Hosted the Southeast Sustainability Network 2025 Summer Summit	Host Conference in June 2025	Hosted 25 Sustainability Managers/Directors/Coordinators at ECU from June 15-18.	N/A	N/A	$0	0	Chad Carwein	N/A
Hosted Campus Sustainability Day Fair	Hosted by ECU Sustainability Program and Student Clubs	Over 300 students, staff, faculty, and community members stopped by and learned about campus sustainability efforts	N/A	N/A	$500	0	Kim Fox	State Funds - HSC Sustainability
Hosted Earth Day Festival	Hosted by ECU Sustainability Program, Campus Departments, and Student Clubs	Over 500 students, staff, faculty, and community members stopped by and learned about campus sustainability efforts	N/A	N/A	$800	0	Kim Fox	State Funds - HSC Sustainability
Hosted 9th Annual Sustainability Film and Discussion Series	Monthly screenings in fall 2024 and spring 2025	~ 30 attendees at each event on average	N/A	N/A	$500	0	Kim Fox	State Funds - HSC Sustainability
Sustainability Outreach Specialist gave guest lectures and group presentations	About 10-12 presentations per semester	Guest Lectures reached over 700 students last year	N/A	N/A	$0	0	Kim Fox	N/A
Continued implementation of the ECU Sustainability Plan	Continued implementation	In process	N/A	N/A	$0	0	Chad Carwein	N/A
Completed Greenhouse Gas (GHG) Emissions Inventory	Complete FY 2023-24 Report	Completed in Fall 2024	N/A	N/A	$400	0	Chad Carwein	State Funds - HSC Sustainability
Update Green Office Program	Update Green Office Program to Version 3.0	Launched Lunch and Learn Events to promote Green Office Program Version 3.0	N/A	N/A	TBD	1 (intern)	Kim Fox	State Funds - HSC Sustainability
Reviewed new Technical Manual for AASHE STARS Report under new Version 3.0	Maintain STARS Silver	STARS Silver earned in February 2023	N/A	N/A	$600	1 (intern)	Chad Carwein	State Funds - HSC Sustainability
Increased ECU presence on social media	Weekly activity on Facebook, Twitter & Instagram	Increased followers	N/A	N/A	$0	0	Kim Fox / Interns	N/A
Distributed ECU Sustainability Program monthly newsletter	Monthly newsletter sent with Energy Consumption Data	Received by over 2,500 subscribers	N/A	N/A	$0	0	Kim Fox	N/A

AWARENESS & TRAINING

Strategies

- Continue to focus efforts on developing and expanding resources of the ECU Sustainability Committee. Expand efforts to recognize and document efforts to reduce energy consumption and realize savings.

Tactics

NEXT 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				
University - Participate in the Appalachian Energy Summit	Attend Energy Summit in 2026	TBD	N/A	N/A	N/A	0	Chad Carwein / Sammy Snead / Griffin Avin / Kim Fox	State Funds - HSC Sustainability
University - Participate in the UNC Sustainability Alliance meeting	Attend Alliance Meeting in 2026	TBD	N/A	N/A	N/A	0	Chad Carwein / Sammy Snead / Griff Avin	State Funds - HSC Sustainability
Attend AASHE Conference	Sustainability Manager will 6 attend in Minneapolis in October 2025	TBD	N/A	N/A	$2,000	0	Chad Carwein	State Funds - HSC Sustainability
Attend 2026 SESN Summer Summit	Sustainability Manager to attend at the University of South Carolina	TBD	N/A	N/A	$500	0	Chad Carwein	State Funds - HSC Sustainability
Host Campus Sustainability Day Fair	Hosted by ECU Sustainability Program, Campus Departments, and Student Clubs	TBD	N/A	N/A	$500	0	Chad Carwein / Kim Fox	State Funds - HSC Sustainability
Host Earth Day Festival	Hosted by ECU Sustainability Program, Campus Departments, Student Clubs	TBD	N/A	N/A	$800	0	Chad Carwein / Kim Fox	State Funds - HSC Sustainability
Host 10th Annual Sustainability Film and Discussion Series	Monthly screenings will be held in fall 2025 and spring 2026	TBD	N/A	N/A	$500	0	Kim Fox	State Funds - HSC Sustainability
Sustainability Outreach Specialist will give guest lectures and group presentations	About 10-12 presentations per semester	TBD	N/A	N/A	N/A	0	Kim Fox	N/A
Update ECU Sustainability Plan	Update goals and strategies for 2026-2031	TBD	N/A	N/A	TBD	0	Chad Carwein	State Funds - HSC Sustainability
Complete Greenhouse Gas Emissions Inventory	Complete FY 2023-24 Report in Fall 2024	TBD	N/A	N/A	$300	0	Chad Carwein	State Funds - HSC Sustainability
Continue Green Office Program	Certify 1-2 Departments per Semester	TBD	N/A	N/A	$0	1 (intern)	Kim Fox / Intern	State Funds - HSC Sustainability
Submit AASHE STARS Report under new Version 3.0	Maintain STARS Silver	TBD	N/A	N/A	$600	1 (intern)	Chad Carwein / Kim Fox / Intern	State Funds - HSC Sustainability
Increase ECU presence on social media	Weekly activity on Facebook, Twitter & Instagram	TBD	N/A	N/A	$0	0	Kim Fox / Interns	N/A
Distribute ECU Sustainability Program monthly newsletter	Increase subscriptions and continue to send monthly newsletter with Energy Consumption Data	TBD	N/A	N/A	$0	0	Kim Fox	N/A

Water Management

Strategies

- Continue to implement programs, initiatives, and equipment that conserve water resources.

Tactics

PAST 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				

NEXT 12 Months' Activities	Measurement		Savings		Cost	Jobs	Assigned to	Funding Source
	Expected	Actual	Expected	Actual				

DECLARATION

I have read the 2025-2026 Strategic Energy & Water Plan for East Carolina University. The plan, as presented, supports the reductions required in Senate Bill 668.

William E. Bagnell 8/19/25

William E. Bagnell
Associate Vice Chancellor for Campus Operations

FAYETTEVILLE STATE UNIVERSITY™

STRATEGIC ENERGY & WATER PLAN

2025 - 2026

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Fayetteville State University continues to develop and maintain its efforts towards conservation of energy and water resources within all campus facilities. We are creating, implementing, and following an effective Strategic Energy/Water Conservation Plan. The Strategic Energy/Water Conservation Plan aims to foster economically and environmentally responsible usage of valuable resources per state legislation, while providing a positive and comfortable learning environment for students, faculty, staff, and visitors.

Key Elements of the plan include:

- Educate and engage faculty, staff, and students in energy and water conservation through presentations, emails, events, web pages, and other effective forms of communication that help in understanding that effective energy conservation supports the primary mission of the university and the environment.
- Continue accurate measurements and analysis of electricity, fossil-based fuels, and water usage. Yearly reviews of consumption, trends, and costs will be submitted to the State Energy Office and available for review to the campus and community.
- Continue to conduct annual reviews of utility billing rates with each supplier and audits of each utility invoice by our energy management efforts.
- Implement up-to-date training for Facility Operations staff to perform planned services and upgrades that improve the performance of all facility equipment and university-owned vehicles to reduce energy waste.
- Continue to benchmark and develop KPIs (key performance indicators) that clearly measure real energy and water conservation progress while factoring for facility and student growth.
- Continue finding ways to reduce energy consumption throughout the campus to reach the goal of 40% reduction of energy consumption per square foot by 2025 from the fiscal year 2002-2003 levels.
- Reinstitute single-stream recycling practices on FSU's campus and carry out the necessary work to maintain recycling standards and educate the campus community on recycling practices

NORTH CAROLINA LEGISLATIVE BASIS FOR PLAN

GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 2007 / SENATE BILL 668
RATIFIED BILL

AN ACT TO PROMOTE THE CONSERVATION OF ENERGY AND WATER

SECTION 3.1.(a) G.S. **143-64.12. Authority and duties of State agencies. The Department; State agencies and State institutions of higher learning.**

(a) The Department of Administration through the State Energy Office shall develop a comprehensive program to manage energy, water, and other utility use for State agencies and State institutions of higher learning and shall update this program annually. Each State agency and State institution of higher learning shall develop and implement a management plan that is consistent with the State's comprehensive program under this subsection to manage energy, water, and other utility use. The energy consumption per gross square foot for all State buildings in total shall be reduced by twenty percent (20%) by 2010 and thirty percent (30%) by 2015 based on energy consumption for the 2002-2003 fiscal year. Each State agency and State institution of higher learning shall update its management plan annually and include strategies for supporting the energy consumption reduction requirements under this subsection. Each community college shall submit to the State Energy Office an annual written report of utility consumption and costs.

NORTH CAROLINA EXECUTIVE ORDER 80

NORTH CAROLINA'S COMMITMENT TO ADDRESS CLIMATE CHANGE AND TRANSITION TO A CLEAN ENERGY ECONOMY

c. The State of North Carolina will support the 2015 Paris Agreement goals and honor the state's commitments to the United States Climate Alliance.

The State of North Carolina will strive to accomplish the following by 2025:

a. Reduce statewide greenhouse gas emissions to 40% below 2005 levels:

b. Increase the number of registered, zero-emission vehicles ("ZEVs"; individually, "ZEV") to at least 80,000;

c. Reduce energy consumption per square foot in state-owned buildings by at least 40% from fiscal year 2002-2003 levels.

EXECUTIVE SUPPORT FOR ENERGY CULTURE CHANGE

a) Maintain work with key members of Senior Administration Staff to develop and publicize Strategic Energy & Water Management Policies that define:

   i. The University's commitment to a fiscally and environmentally responsible Energy and Water Management Plan.

   ii. Measurable and achievable goals and objectives with reasonable timelines.

   iii. Accountability and resources for plan implementation

   iv. Continuous improvement efforts after initial implementation.

b) Expand our comprehensive Strategic Energy and Water Management Plan to guide:

   1. Working on the identification of energy and water conservation opportunities, concept development of projects and process changes, and prioritization of improvement efforts.

   2. Provide funding and staff resources to define, develop, and execute approved energy and water-related capital projects, expense projects and process improvements.

   3. Schedule reviews of conservation efforts and regular updates to the plan.

c) Continue to educate faculty, staff, and students through scheduled presentations, emails, and other effective forms of communication about the Strategic Energy and Water Management Plan. This will provide guidance into conservation measures and techniques they can implement in our daily campus environment and within home activities.

d) Include Strategic Energy and Water Management Plan presentations in appropriate campus and department meetings.

e) Create a "sustainability focused" community culture through education, campus engagement, partnerships with student and campus groups, and creating visible changes on campus to draw the focus of faculty, staff, and students toward sustainable improvement.

BASELINE ENERGY COST & KEY PERFORMANCE INDICATORS FY 24/25

a. Financial Evaluation Detailed Cost and Total Expenditures

Fiscal Year	Electricity	Natural Gas	Water/Sewer	LP Gas	Heat Oil #2	Total Utility Expenditures	BTU Consumption
02-03 Baseline	$1,036,961	$420,311	$69,462	$1,507	$0	$1,528,241	119,035,052,160
10-11	$2,059,524	$509,947	$308,838	$966	$0	$2,879,276	176,533,820,697
11-12	$1,927,923	$371,057	$285,651	$3,000	$0	$2,587,632	149,401,495,732
12-13	$1,908,332	$383,133	$277,440	$3,300	$0	$2,572,205	147,649,813,088
13-14	$1,949,570	$439,331	$286,039	$3,500	$0	$2,678,440	153,309,033,096
14-15	$1,976,612	$308,233	$228,751	$3,336	$0	$2,516,932	139,448,247,412
15-16	$1,874,349	$257,589	$222,201	$1,845	$0	$2,355,984	128,329,237,032
16-17	$1,902,833	$325,142	$247,301	$3,204	$0	$2,478,479	126,957,172,948
17-18	$1,990,050	$367,177	$288,791	$2,242	$0	$2,648,261	138,431,283,759
18-19	$1,948,010	$393,293	$308,952	$3,477	$0	$2,653,732	140,475,017,329
19-20	$1,995,444	$324,582	$276,009	$1,530	$0	$2,597,564	137,042,279,543
20-21	$1,809,808	$316,066	$295,808	$1,553	$0	$2,423,235	127,492,565,763
21-22	$1,920,540	$472,039	$330,075	$2,351	$0	$2,725,005	129,756,634,876
22-23	$1,791,003	$566,540	$347,839	$2,215	$0	$2,707,597	135,113,960,046
23-24	$2,240,837	$457,016	$422,126	$1,842	$0	$3,121,822	147,274,827,052
24-25	$2,297,798	$401,896	$474,813	$2,169	$0	$3,176,676	151,610,282,917

b. Utility Cost per SF.

Fiscal Year	Electrical	Natural Gas	Water/Sewage	LP Gas	Heat Oil #2	Total Utility/SF
2002-03 Baseline	$1.25	$0.51	$0.08	$0.0018	$0.00	$1.84
2010-11	$1.55	$0.38	$0.23	$0.0007	$0.00	$2.16
2011-12	$1.44	$0.28	$0.21	$0.0022	$0.00	$1.93
2012-13	$1.29	$0.26	$0.19	$0.0022	$0.00	$1.74
2013-14	$1.31	$0.30	$0.19	$0.0024	$0.00	$1.80
2014-15	$1.31	$0.20	$0.15	$0.0022	$0.00	$1.66
2015-16	$1.24	$0.17	$0.15	$0.0012	$0.00	$1.56
2016-17	$1.26	$0.22	$0.16	$0.0021	$0.00	$1.64
2017-18	$1.32	$0.24	$0.19	$0.0015	$0.00	$1.75
2018-19	$1.29	$0.26	$0.21	$0.0023	$0.00	$1.76
2019-20	$1.32	$0.22	$0.18	$0.0010	$0.00	$1.72
2020-21	$1.20	$0.21	$0.20	$0.0010	$0.00	$1.61
2021-22	$1.28	$0.31	$0.22	$0.0016	$0.00	$1.81
2022-23	$1.27	$0.40	$0.25	$0.0016	$0.00	$1.92
2023-24	$1.49	$0.30	$0.28	$0.0012	$0.00	$2.07
2024-25	$1.51	$0.26	$0.31	$0.0014	$0.00	$2.08

a. Fiscal Year's Energy Evaluations via State Energy Office Annual Report

	ENERGY EVALUATION					
Year	Energy $ Avoided	Energy $/GSF	$/MMBtu	$/MMBtu %Change from BLY	Btu/Sf	Btu/Sf % Change from BLY
2003-04		$1.76	$12.26		143,218	
2008-09	$48,524	$2.01	$14.31	17%	140,475	-2%
2009-10	-$297,441	$1.72	$10.39	-15%	165,324	15%
2010-11	$208,236	$1.93	$14.56	19%	132,485	-7%
2011-12	$650,022	$1.72	$15.41	26%	111,682	-22%
2012-13	$1,009,592	$1.55	$15.54	27%	99,460	-31%
2013-14	$925,381	$1.61	$15.61	27%	103,272	-28%
2014-15	$1,266,997	$1.51	$16.41	34%	92,178	-36%
2015-16	$1,468,755	$1.41	$16.63	36%	84,828	-41%
2016-17	$1,573,869	$1.48	$17.57	43%	83,979	-41%
2017-18	$1,317,015	$1.57	$17.04	39%	91,913	-36%
2018-19	$1,255,660	$1.56	$16.69	36%	93,270	-35%
2019-20	$1,332,516	$1.54	$16.94	38%	90,991	-36%
2020-21	$1,471,909	$1.41	$16.69	36%	84,650	-41%
2021-22	$1,586,287	$1.59	$18.46	51%	86,154	-40%
2022-23	$1,165,627	$1.67	$17.46	43%	95,865	-33%
2023-24	$1,255,519	$1.79	$18.33	50%	97,756	-32%
2024-25	$1,185,524	$1.77	$17.82	45%	99,541	-30%

b. Fiscal Year's Water/Sewer Evaluations via State Energy Office Annual Report

	WATER/SEWER EVALUATION				
Year	Water $ Avoided	$/KGal	$/KGal %Change from BLY	Gal/Sf	Gal/Sf %Change from BLY
2003-04 (Baseline)		$4.68		17.88	
2008-09	-$116,293	$6.44	38%	32.47	82%
2009-10	-$112,641	$6.66	42%	30.93	73%
2010-11	-$138,735	$7.14	53%	32.45	82%
2011-12	-$114,723	$7.15	53%	29.87	67%
2012-13	-$75,651	$7.60	63%	24.58	37%
2013-14	-$83,462	$7.63	63%	25.24	41%
2014-15	-$41,922	$6.91	48%	21.89	22%
2015-16	-$24,752	$7.30	56%	20.12	13%
2016-17	-$51,298	$7.25	55%	22.55	26%
2017-18	-$77,155	$7.86	68%	24.39	36%
2018-19	-$97,421	$7.86	68%	26.11	46%
2019-20	-$11	$10.25	119%	17.88	0%
2020-21	-$33,060	$9.76	109%	20.12	13%
2021-22	-$41,230	$10.73	129%	20.43	14%
2022-23	-$46,338	$11.97	156%	20.62	15%
2023-24	-$84,912	$12.52	168%	22.38	25%
2024-25	-$100,789	$13.74	194%	22.69	27%

UPCOMING ACTION PLANS FY '25-26

Because utility consumption is impacted and consumed in some manner by everyone interacting with the campus facilities we will continue to expand and implement the following actions:

a) Through the renovation of the campus' East Quad, FSU will be installing 12 new solar picnic tables and 8 solar benches to provide students with more outdoor opportunities for studying and engagement while still providing access to power for items such as their laptops through the solar generation of electricity.

b) Installation of 30 new trees and planting of rain gardens on campus to help reduce runoff and add further green spaces to the campus environment.

c) The University has plans to continue upgrades in lighting in the following locations:

   a. G.L. Butler Learning Center

   b. Rosenthal Building

   c. Helen T. Chick Building

   d. University Place Apartments

   e. Center for Continuing Education (Future Police and Public Safety Office)

   f. H.L. Cook Hall

d) The installation of two dual port electric vehicle charging stations is underway for the current fiscal year. One of the stations will be in lot Z across from the FSU Student Center providing charging access for two parking spots. The second station will be in lot H between Lily Gym and Williams Hall providing charging for two parking spots as well. The station in lot Z will be complete before the end of FY '26 with hopes to also complete the station in lot H before the end of FY '26. The stations will be accessible through an app that will allow individuals to manage their charging while parked at the spots. We will have access to data collection for these stations to determine how often they are used as well as the about of energy used to charge vehicles. These stations will be the first of several more to come in our upcoming parking deck construction project.

e) The University is in the process of implementing single-stream recycling on campus. Acquiring the necessary receptacles for this implementation is underway as well as educating staff on the proper handling of the recycling for pick up. We are also working directly with our waste management vendor as well as helpful insight from the Recycling and Materials Management section of the NC Department of Environmental Quality.

EFFICIENCY MEASURES COMPLETED FY '24-25

Energy Awareness Campaign & Strategy

a) Over 35% percent of energy consumption was avoided with the assistance of Trane's Guaranteed Savings Program, employee and student awareness, and conservation choices.

- We spent **$3,162,305.99** and saved **$1,112,320** on energy in the 2024-25 Fiscal Year.

b) We continue to calculate the yearly impact of utilities based on campus-wide consumption and cost.

- We have reduced our energy use per square foot by 30.5% from the 2002-03 baseline as of 2025.

c) Calculate and report our HB 1292 energy savings from conservation projects to the State Energy Office.

- Our calculated HB 1292 savings for FY '24-25 were **$319,153.23.**

d) The following projects were completed during the 2024-2025 Fiscal Year:

Natural Gas Procurement

1. Through the procurement change of natural gas through Piedmont Natural Gas and moving away from Texican as our provider the University reduced the average cost per Therm by $0.09 resulting in savings of about **$61,644.06** in FY '25.

Waste Management

2. FSU completed the procurement process of acquiring a new waste management contractor to service the needs of campus.

Backflow Prevention

1. Backflow prevention testing was conducted on each backflow preventer that was due for inspection to ensure safe water is available to the campus community.

University Place Apartments

1. LED lighting upgrades to all interior fixtures.

Capel Arena

1. Previous chiller was replaced with a newer more efficient model.

FAYETTEVILLE STATE UNIVERSITY™

SIGNATURE PAGE

Strategic Energy & Water Plan

I have read and support this Strategic Energy & Water Plan for my Organization

Allen Hearon, *Director of Operations and Maintenance*

Signed: Allen Hearon (Sep 4, 2025 08:01:33 EDT) **Date:** 09/04/2025

Gene Cottrell, *Director of Facilities Budget & Administration*

Signed: Gene Cottrell **Date:** 09/03/2025

Hector Molina, *Chief Operating Officer*

Signed: Hector M. Molina **Date:** 09/04/2025

This Strategic Energy & Water Mandate serves as a Memorandum of Agreement to support Strategic Energy & Water Plans for the state Utility Savings Initiative.

Director State Energy Office **Date**

FSU Strategic Energy and Water Plan

Final Audit Report 2025-09-04

Created:	2025-09-03 (Eastern Daylight Time)
By:	Courtney Page (cpage11@uncfsu.edu)
Status:	Signed
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2025-09-04 - 8:04:10 AM EDT- IP address: 104.47.58.126

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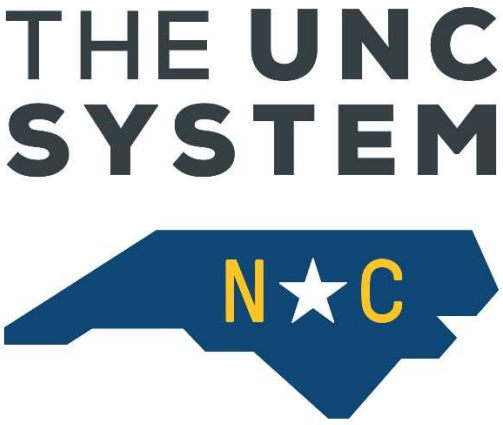
The University of North Carolina System Office



Strategic Energy and Water Management Plan

September 2025

Executive Summary

Since the UNC System Office relocated to leased office space in Raleigh at the end of 2022, it has continued to reduce its footprint of state-owned facilities. Previously identified as among its least energy efficient buildings, the North Carolina State Education Assistance Authority (NCSEAA) building's failing and inefficient HVAC equipment contributed to an increase in energy usage last year, an increase that will be eliminated with building demolition scheduled this fall. The president's residence will then remain the only facility administered by the UNC System Office.

As an office tenant, the System Office will not be directly engaged in day-to-day energy management of the facility it occupies but will continue to impact energy and water use through occupant behavior.

Energy Supply

The System Office's energy needs are now supplied under its office lease agreement with no insight into monthly billing or usage patterns. Services to NCSEAA have been provided by the local utility companies serving Research Triangle Park and are being terminated in preparation for demolition.

Energy Demand

The current leased space includes energy management devices often considered standard in modern office buildings. Occupancy sensors throughout the building and HVAC controls that automate adjustments to temperature and fan speeds during unoccupied times contribute to energy efficiency without any System Office intervention.

Water Resources

Irrigation accounted for more than half of the water used last fiscal year and is indicative of periods of drought in early July 2024 which was relieved by rains from tropical storms late in the month but followed by a longer drought beginning in October that persisted until March 2025. Irrigation supports grounds maintenance at the president's residence where public events and meetings are hosted.

Communications and Training

As a tenant, the impact of behavior on energy and water use will not be as apparent to System Office staff as previously, but the behaviors of good energy and environmental stewardship are expected to continue. The System Office will also continue to facilitate the sharing of best practices among the institutions throughout the system, engaging capital planning, facilities operations, and energy management staff in discussing how best to construct, operate, and maintain facilities in ways that contribute to long-term cost effectiveness, including energy efficiency.

Exhibit 1
UNC System Office Utilities Data

	energy evaluation						water/sewer evaluation				
year	energy $ avoided	energy $/gsf	$/mmbtu	$/mmbtu %change	btu/sf	btu/sf %change	water $ avoided	$/kgal	$/kgal %change	gal/sf	gal/sf %change
2002-03		$3.49	$15.07		231,932			$7.27		22.41	
2003-04	$36,361	$2.52	$13.12	-13%	191,787	-17%	$2,300	$7.52	3%	17.98	-20%
2004-05	$35,251	$2.52	$13.07	-13%	192,857	-17%	$2,307	$8.15	12%	18.31	-18%
2005-06	$36,185	$3.02	$15.27	1%	197,608	-15%	$1,564	$8.74	20%	19.82	-12%
2006-07	$27,851	$2.89	$14.19	-6%	203,508	-12%	$2,960	$9.55	31%	17.92	-20%
2007-08	$31,159	$3.06	$15.16	1%	202,156	-13%	$3,295	$10.53	45%	17.88	-20%
2008-09	$33,572	$3.33	$16.44	9%	202,354	-13%	$5,663	$12.00	65%	15.57	-31%
2009-10	$40,262	$3.05	$15.68	4%	194,746	-16%	$7,362	$13.61	87%	14.57	-35%
2010-11	$64,007	$2.82	$16.15	7%	174,523	-25%	$8,430	$14.48	99%	13.98	-38%
2011-12	$260,955	$2.42	$18.55	23%	130,738	-44%	$11,294	$14.74	103%	16.90	-25%
2012-13	$270,479	$2.82	$20.56	36%	137,330	-41%	$34,109	$18.53	155%	9.17	-59%
2013-14	$242,335	$3.13	$21.00	39%	148,928	-36%	$39,956	$20.11	177%	8.12	-64%
2014-15	$263,447	$2.94	$20.83	38%	140,955	-39%	$35,894	$19.00	161%	8.82	-61%
2015-16	$317,293	$2.65	$21.27	41%	124,671	-46%	$32,967	$18.72	157%	9.75	-57%
2016-17	$332,294	$2.44	$20.82	38%	117,177	-49%	$34,788	$18.53	155%	8.91	-60%
2017-18	$296,002	$2.19	$18.64	24%	117,709	-49%	$32,714	$17.83	145%	9.21	-59%
2018-19	$275,697	$2.45	$19.13	27%	128,261	-45%	$34,676	$18.24	151%	8.74	-61%
2019-20	$311,150	$2.32	$19.66	30%	118,106	-49%	$30,946	$18.09	149%	10.11	-55%
2020-21	$260,024	$2.34	$18.16	21%	128,965	-44%	$51,565	$22.60	211%	6.00	-73%
2021-22	$295,400	$2.53	$20.05	33%	126,001	-46%	$54,843	$23.49	223%	5.62	-75%
2022-23	$121,804	$3.47	$21.65	44%	160,088	-31%	$13,982	$16.70	130%	11.72	-48%
2023-24	$137,247	$1.07	$25.49	69%	41,816	-82%	$5,027	$16.47	127%	11.63	-48%
2024-25	$136,149	$1.38	$26.68	77%	51,727	-78%	$2,079	$11.97	65%	16.28	-27%

year	total utility $	total energy $	total btu	kwh	kwh $	ng therms	ng $	chw tons	chw $	kgal water	water sewer $	gsf
2002-03	$252,484	$241,234	16,010,927,596	1,763,783	$90,282	99,929	$150,952	0	$0	1,547	$11,250	69,033
2003-04	$183,040	$173,713	13,239,648,160	1,869,680	$94,880	68,603	$78,833	0	$0	1,241	$9,327	69,033
2004-05	$184,289	$173,987	13,313,486,784	1,854,832	$100,497	69,848	$73,490	0	$0	1,264	$10,302	69,033
2005-06	$220,279	$208,324	13,641,449,888	1,889,024	$100,397	71,961	$107,927	0	$0	1,368	$11,955	69,033
2006-07	$211,220	$199,409	14,048,781,620	1,739,385	$101,616	81,140	$97,793	0	$0	1,237	$11,811	69,033
2007-08	$224,541	$211,550	13,955,435,692	1,857,191	$118,268	76,187	$93,282	0	$0	1,234	$12,991	69,033
2008-09	$242,581	$229,684	13,969,102,924	1,870,927	$139,048	75,855	$90,636	0	$0	1,075	$12,897	69,033
2009-10	$224,546	$210,855	13,443,894,620	1,769,635	$144,263	74,059	$66,593	0	$0	1,006	$13,690	69,033
2010-11	$208,557	$194,580	12,047,815,584	1,752,232	$140,683	60,692	$53,897	0	$0	965	$13,977	69,033
2011-12	$371,788	$337,144	18,179,394,934	2,884,426	$231,448	78,906	$64,239	195,593	$41,457	2,350	$34,644	139,052
2012-13	$416,266	$392,645	19,096,001,297	2,464,312	$194,525	94,494	$80,634	595,969	$117,486	1,275	$23,621	139,052
2013-14	$457,505	$434,805	20,708,696,921	2,507,821	$207,515	107,371	$93,349	657,190	$133,941	1,129	$22,700	139,052
2014-15	$431,491	$408,175	19,600,110,226	2,450,732	$195,943	99,275	$76,892	622,606	$135,339	1,227	$23,316	139,052
2015-16	$394,172	$368,796	17,335,743,908	2,219,322	$174,785	83,578	$55,416	633,789	$138,595	1,355	$25,376	139,052
2016-17	$362,271	$339,309	16,293,702,576	1,970,242	$154,995	81,299	$58,035	653,919	$126,279	1,239	$22,962	139,052
2017-18	$327,875	$305,039	16,367,737,128	1,958,783	$149,576	84,532	$48,860	555,131	$106,603	1,281	$22,836	139,052
2018-19	$363,257	$341,095	17,835,003,880	1,897,286	$148,631	99,470	$72,470	637,778	$119,993	1,215	$22,162	139,052
2019-20	$348,266	$322,850	16,422,843,918	1,935,751	$150,856	85,238	$57,636	583,579	$114,357	1,405	$25,416	139,052
2020-21	$344,549	$325,676	17,932,792,502	1,918,842	$149,822	102,318	$67,092	520,292	$108,763	835	$18,872	139,052
2021-22	$369,713	$351,370	17,520,715,410	1,783,145	$143,541	100,169	$86,196	640,150	$121,633	781	$18,343	139,052
2022-23	$286,747	$271,414	12,538,239,132	1,111,099	$107,099	73,970	$76,528	395,712	$87,787	918	$15,332	78,321**
2023-24	$35,615	$30,188	1,184,283,860	258,905	$26,668	3,009	$3,520	0	$0	329	$5,427	28,321
2024-25	$44,599	$39,081	1,464,953,860	356,405	$36,195	2,489	$2,886	0	$0	461	$5,519	28,321

**Square footage as of 6/30/2023 was 78,321, reduced by 60,373 as of 12/1/2022, another 50,000 by 3/1/2023, and finally to 28,321 gsf as of 8/22/2023.

Strategic

Energy Plan

2025 UPDATE

August, 2025

Contents

Executive Summary

Campus Energy Overview

Size and Growth

UNC Charlotte is an urban research-intensive university, located primarily on a 1,000-acre campus in the state's largest city. In the Summer of 2025, the University had a campus community (students, faculty, and staff) of approximately 34,000 with over ten (10.4) million gross square feet (GSF) of built space, including parking decks. Plans continue for an enrollment increase to approximately 35,000 students in the next (5) years. Additional Academic / Research, Auxiliary Services and Residence Life space continue to be built to support campus population growth.

Since 2003, the full time equivalent (FTE) Faculty / Staff campus population has grown to 3,700 and built space has more than doubled. In that same period, energy consumption has grown by 51%, and energy costs have grown by 137%; however, energy consumption per GSF has fallen by 38.3%.

Energy Conservation Challenges, Accomplishments and Goals

Accomplishments and Goals

UNC Charlotte's energy use reduction of 38% per building GSF provided an avoided cost of approximately $8 million this year alone over the 2003 baseline. New buildings continue to have energy recovery and high efficiency equipment / systems installed.

UNC Charlottes energy management program is structured around the key areas below:

- Monthly Monitoring of Energy Usage
- Building Energy Audits & Retro Commissioning
- Capturing Energy Savings from Repair Work
- Facility LED Lighting Upgrades
- Organization Integration & Awareness Training

The University is now in Year 11 of its "Guaranteed Energy Savings Performance Contract" w/ Year 10 M&V verifying $74,017 and Year 11 M&V non-verified $71,783 in excess savings. The "Performance Contracts" through Ameresco and JCI (UNC – Gen. Admin. Lighting) continue to provide energy savings through the energy related capital improvements to roughly twenty-eight (28) different campus facilities.

Planned Activities 2025-2027	Measurement	Savings Estimated	Cost	Funding Source	Area
Continue to monitor all utility bills, BAS, and submeter data for billing errors and areas of high energy usage.	kWh, Therms	$150k	N/A	FM	Monthly Monitoring of Energy Usage
Complete Facility Energy Audits & Retro Commissioning for (4) University buildings.	kWh, Therms	TBD	TBD	Utility Carry Forward	Building Energy Audits & Retro Commissioning
Monitor Work Order System for Energy Savings Opportunities	kWh, Therms	$140k	TBD	Utility Carry Forward / FM	Capturing Energy Savings from Repair Work
Facility LED Lighting Upgrades	kWh, Therms	TBD	TBD	Utility Carry Forward / FM	Facility LED Lighting Upgrades
Project Development for a Solar PV System	Design for one Facility	TBD	TBD	Utility Carry Forward	Renewables
Energy Efficiency Goals for BAS technicians	kWh, Therms	$105k	TBD	FM	Organization Integration & Awareness Training
Energy Tours of a Utility Plant and a Green Building – for the Sustainability Ambassador program for staff education.		TBD	TBD	FM	Organization Integration & Awareness Training
Energy Conservation Badge offered in Green Workplace Program		TBD	TBD	FM	Organization Integration & Awareness Training

2024 & 2025 Accomplishments	Measurement	Savings Estimated	Cost	Funding Source	Area
Continue to monitor all utility bills, BAS, and submeter data for billing errors and areas of high energy usage. This includes meter replacements and expanding the system as needed.	kWh, Therms	$221k	$192k	Utility Carry Forward	Monthly Monitoring of Energy Usage
Complete Facility Energy Audits for (20) university buildings. Identified savings opportunities noted.	kWh, Therms	$900k	TBD	Utility Carry Forward	Internal Facility Energy Audits
Implement ten (10) findings from the ASHRAE Level II Energy Audits conducted.	kWh, Therms	$763k	$642k	Utility Carry Forward	Internal Facility Energy Audits
Monitor Work Order System for Energy Savings Opportunities	kWh, Therms	$192k	TBD	Utility Carry Forward / FM	Capturing Energy Savings from Repair Work
Energy Efficiency Goals for BAS technicians	kWh, Therms	$193k	TBD	FM	Organization Integration & Awareness Training
Grant to print “Please Turn off the Lights” stickers for 7,000 switch plates (installed by janitorial staff)	kWh	**TBD**	$500	Student green fund	Organization Integration & Awareness Training
Energy Tours of a Utility Plant and a Green Building – for the Sustainability Ambassador program for staff education		TBD	TBD	FM	Organization Integration & Awareness Training

North Carolina G.S. 143-64.12 and LEED principles for sustainability, particularly relating to energy and water use, are included in the UNC Charlotte Design Standards and Guidelines (https://facilities.charlotte.edu/vendor-opportunities/design-standards-and-guidelines/). The university pursues LEED Gold certification for new buildings or major renovations >20,000 s.f. UNC Charlotte has (12) certified green buildings to date (5 LEED, 7 Green Globes) and is currently pursuing LEED certification for the new Burson wing, expansion of the football stadium, and a residence hall renovation. Since the first campus building was certified under LEED in 2009, UNC Charlotte has certified construction and design on 77% of eligible construction based on occupied gross square feet. With smaller buildings that are not certified, the university continues to emphasize energy and water efficiency standards detailed in the UNC Charlotte Design Standards and Guidelines. Updates to the design standards were formally adopted in 2024 in areas of lighting, lighting controls, insulation, solar thermal heating systems, plumbing fixtures and construction/demolition waste diversion to align with ASHRAE 189.1 *Standard for the Design of High-Performance Buildings* and ASHRAE 90.1 *Energy Standard for Buildings*. Starting in 2020, the university has maintained a Gold-level membership in the US Green Building Council to make over 1,000 online courses available free to staff, faculty and students.

To gain an external comparisons and insights, UNC Charlotte has participated in several rounds of the USEPA Energy Star Higher Education Benchmarking Initiative. Energy data for the Main Campus for calendar year 2019 and 2021 have been submitted to EPA via Energy Star Portfolio Manager. The University was also an inaugural partner in Power Down the Crown, a voluntary energy benchmarking effort by the City of Charlotte, allowing the city access to our building-level EnergyStar Portfolio Manager data. Power Down the Crown includes energy management information sharing amongst participants, including major property owners and companies in Charlotte; UNC Charlotte has provided webinar content and participated in partner-led sessions and tours.

Energy Plan

UNC Charlotte's energy plan is structured into five (5) areas to accomplish specific goals in each of the categories below.

Monthly Monitoring of Energy Usage – The cornerstone of UNC Charlotte's energy management program is evaluating the data available from the monthly utility billing information as well as the Campus Building Automation System (BAS). With this information the team is able identify operational issues, prioritize areas of high energy usage, and compare facilities of a common use type to identify candidates for Energy Audits. This is an ongoing effort and will continue.

FY24 & 25 Project Highlights

Burson – Leaking Hot Water Valves Serving Lab Make Up Air Units

Due to higher than anticipated hot water/natural gas usage and through review of the campus BAS the energy team found that the hot water valves for LAMU 1 & 4 weren't working properly. The valves were found to be leaking by maintenance technicians and were preheating the air to the cooling coil by 40 – 50 deg on average wasting heating energy as well as providing unnecessary load on the cooling coil.

The points of failure were identified and corrected thus providing appropriate control for the system.

Estimated Cost: $1,922
Estimated Savings: $42,809
Payback: 0 Years

Center City – Water Leak

Upon reviewing water usage information from the campus BAS and comparing it to a similar facility in size and general usage, the energy team found that the water usage at this facility was 4 to 5 times what would be expected for a facility of this type.

While working with maintenance technicians it was found that a water level control system had failed associated with a cistern system for the facility. This caused the system to consistently fill and drain. Thereby wasting a significant amount of water.

The savings for this are based on repairing the water level control system and only filling the cistern system as needed.

Estimated Cost: $0
Estimated Savings: $57,168
Payback: 0 Years

Cafeteria Activities Building – Water Leak

Upon reviewing the monthly water usage information from the campus BAS, the energy team found that the water usage at this facility was significantly higher than what would be expected based on the facility's historical usage.

While working with maintenance technicians it was found that a valve associated with the main water supply to the building had failed. This caused the system to consistently drain water outside the facility in an area not typically visible.

The savings for this are based on repairing the valve so that only the water needed is supplied to the facility.

Estimated Cost: $0
Estimated Savings: $55,052
Payback: 0 Years

Building Energy Audits & Retro Commissioning – While performing energy audits for 20 facilities it became apparent that the energy team needed to expand the scope of the program to include building Retro Commissioning or "Building Tuning". With a more detailed review of facility systems would better represent the current state of a facility as well as provide greater energy reduction potential. With this information we were also able to provide input for capital project planning thereby potentially reprioritizing or expanding projects to provide better value to the University. Although the University continued performing internal energy audits, the University contracted with consultants for 3 facilities on campus below are the results of the energy findings for both efforts.

FY24 & 25 Project Highlights

Identified – Below is a sample summary of the internal energy audit results listed by building. In each facility one or more of the Energy Efficiency Measures noted in the Common Energy Efficiency section below was identified. The table notes the overall projected savings by facility.

Energy Audit Findings	% Utility Cost Red.	kWh	Therms	kGal	Est.ECM Cost	Est. Savings	Payback (Yrs)
Woodward	8%	420,306	33,063	0	$54,077	$61,280	0.9
SHC	44%	352,595	13,800	103	$37,563	$40,399	0.9
RUP1	55%	2,740,374	0	4,927	$330,000	$278,688	1.2
Fretwell	12%	203,576	5,489	674	$135,221	$30,212	4.5
Atkins	10%	194,850	45,704	0	$215,000	$55,747	3.9
SAC	31%	1,425,369	56,209	0	$350,000	$157,491	2.2
Miltimore Hall	17%	300,988	22,769	0	$202,162	$43,066	4.7
RUP2	13%	1,286,755	29,050	0	$150,000	$122,652	1.2
SVD	15%	236,483	13,585	174	$45,500	$32,553	1.4
Cone	31%	85,951	42,545	2,144	$60,000	$76,579	0.8

Identified – Below is a sample summary of the energy audit & retro commissioning results listed by building. In each facility one or more of the Energy Efficiency Measures noted in the Common Energy Efficiency section below was identified. The table notes the overall projected savings by facility.

Facility	% Utility Cost Red.	Est. Savings	Payback (Yrs)
Colvard	23%	$ 40,201	2.4
Storrs	36%	$ 37,810	3.5
Center City	43%	$140,450	1.5

Implemented – Below is a summary of energy audit/retro commissioning projects that were implemented. A description is provided below in the Common Energy Efficiency section below. The table notes the overall projected savings by EEM.

EA/RCx Completed	kWh	Therms	kGal	Est.ECM Cost	Est. Savings	Payback (Yrs)
Woodward	231,364	8,140	0	$50,411	$24,678	2.0
Colvard	0	0	1,695	$35,000	$25,176	1.4
RUP1	2,740,374	0	0	$330,000	$267,205	1.2
Fretwell	68,047	3,241	0	$17,150	$8,020	2.1
Atkins	240,209	56,630	0	$212,000	$68,983	3.1
SAC	131,590	17,320	0	$2,500	$25,457	0.1
EPIC	29,571	31,030	0	$800	$30,145	0.0
HRL	58,261	0	0	$500	$4,370	0.1
McEniry	77,921	11,868	0	$800	$16,525	0.0

Common Energy Efficiency Measures Identified/Implemented

- **AHU DAT Reset** – We've found that the common AHU supply air temperature (SAT) setpoint is cooler than needed year-round. So, we've been identifying and implementing a SAT reset strategy based on the actual demand of the building.
- **HW & CHW Delta T Pumping Controls** – We've found that the temperature drop on hot water and chilled water distribution loops is lower than design criteria. Typically, the loops would be designed for a 30 deg drop on hot water and a 10 deg drop on chilled water. We've been seeing much lower than this and are identifying and implementing strategies to reduce the cause which is excess pumping.
- **Cooling Tower Make Up Water Control** – It was found that the Cooling Tower Make Up Water Control system was not working properly. This led to the cooling towers continually overflowing and wasting a significant amount of water. This system is repaired reducing the excess water usage.
- **Cooling Tower Sewer Credit** – Charlotte Water offers a credit on sewer charges for Cooling Tower Water that is not discharged to the sewer. The work required is to install metering on the make up and blowdown of the towers with transmitters the utility can read each month, after being registered.
- **Economizer Control** – We've found that economizer control is either not working or set up with a more efficient strategy so that we can take advantage of free cooling from outdoor air. So, we've been identifying, implementing, and fixing economizer controls throughout campus based on a dry bulb sequence which allows for taking advantage of free cooling for longer periods of the year.

FY26 Plans

Identified – The following facilities have been selected for energy audits and retro commissioning in FY26 & FY27, with the overall goal of completing 2 facilities per fiscal year.

Robinson, McEniry, College of Education, and College of Health and Human Services.

FY24 & 25 Project Highlights

Implemented - Most of the repair work associated with the projects at Colvard and Storrs has been completed, while we are still in the planning phase for the work at Center City.

Capturing Energy Savings from Repair Work – UNC Charlottes energy management work unit has partnered with the operational trades in order to capture the energy savings associated with the ongoing work they are doing. Below is a table of repair work we were able to capture the energy savings for and a list of identified work that is planned to be completed in FY26. We plan on continuing this partnership in FY26.

FY24 & 25 Project Highlights - Implemented

Facility	Measure	kWh	Therms	CCF	Estimated Savings	1292 Funded
Reese	Remove Air Compressor	3,454	0	0	$204	No
Burson	AHU1 HW valve leak	45,435	8,520	0	$9,292	No
SHC	OA Flow Sensor Replacement	68,187	0	0	$5,046	No
BATT	TCV Valve Contrl	0	7,380	0	$5,136	No
EPIC	AHU-3 Preheat Valve Leak	0	2,200	0	$1,531	No
Football	Faulty CHW Valve	55,343	3,124	0	$6,270	No
Grigg	Girgg Hall TCVA Repair	92,122	0	0	$6,817	No
Kennedy	Kennedy CHW Valve Replacement	53,265	0	0	$3,942	No
Levine	Levine ERV-2 CHW Valve Repair	508,494	7,870	0	$43,106	No
RUP 3	RUP3 OA Lockout	24,219	0	0	$1,792	No
EPIC	EPIC CHW TCVA Programming	34,744	0	0	$2,571	No
BATT	Domestic Water Leak	0	0	0	$3,502	No
Belk Gym	TCV A Programming	89,836	0	0	$6,648	No
Colvard	CHW DP Sensor Repalcement	55,708	0	0	$4,122	No
Portal	TCV B Programming	0	22,727	0	$15,818	No
SAC	TCV B Programming	20,308	18,977	0	$14,711	No
Martin	High Water Usage	$0	0	5,876	$61,874	No

FY26 Plans

Facility	Measure	kWh	Therms	CCF	Estimated Savings	Estimated Cost	1292 Funded
Kennedy	AHU1 Leaking CHW Valve Leak	TBD	TBD	TBD	TBD	TBD	No
Robinson	Stage Air Circulation Upgrades	23,263	6,848	0	$6,488	$44,725	Yes

Facility LED Lighting Upgrades

While performing energy audits it was noted that a notable number of facilities were still utilizing fluorescent lighting systems. With LED technology being the current mainstay of the lighting industry with the ability to improve light levels while significantly reducing the amount of energy required to operate, the University has added this category to the overall Energy Management program. This new category is still in development and planning but the seven (7) facilities below have already been identified as candidates for overall lighting upgrades to LEDs. Five (5) of the facilities are still in the project development phase, while the other two (2) have nearly completed designs and are approaching the bid phase. The current goal is to complete two (2) facilities each year while completing designs on all facilities identified so that the projects are shovel ready when funding becomes available.

Friday, Atkins, Reese, FM, Robinson, College of Education, and College of Health and Human Services

Organization Integration & Awareness Training – The Energy Manager will continue to work closely with the University Sustainability Officer for various energy conservation measures and training efforts within the appropriate University departments. Since 2018, the Office of Sustainability has prioritized compliance with the UNC Sustainability Policy (600.6.1). In 2024, this became part of the University Strategic Plan under “Goal D5: Optimize sustainability solutions”, which includes an action to “Encourage all departments to prioritize sustainability actions aligned with the University of North Carolina Sustainability Policy”. Energy management is recognized in the sustainability plan as under a category of “Operational Priority” with an expectation for continuous improvement. The Energy Manager will also contribute to “Responsible Purchasing” that includes improving policies and practices regarding procurement of energy and technologies. The Energy Manager and Sustainability Officer have also collaborated on Standard Operating Procedure documents posted by Facilities Management, including updated temperature policy, and drafts for Energy Management and Indoor Air Quality. Additional training of maintenance staff is being performed in order to educate staff on building operational efficiency. More general staff education is provided through a year-long staff education program called Sustainability Ambassadors (ca. 40 per year); one of the monthly programs is focused on campus energy systems and includes a tour of a regional utility plant and a green building led by the Energy Management staff. These efforts are aimed at improving behavior and awareness in ways that contribute to the University’s continued ability to exceed the state of North Carolina's mandated conservation goals.

Appendices

A. G.S. 143-64.12(a) Declaration

B. SEO Annual Report Form FY ‘25 (Attachment)

UNC GREENSBORO
Facilities Operations

2025 Strategic

Energy and Water Annual Report

September 2025

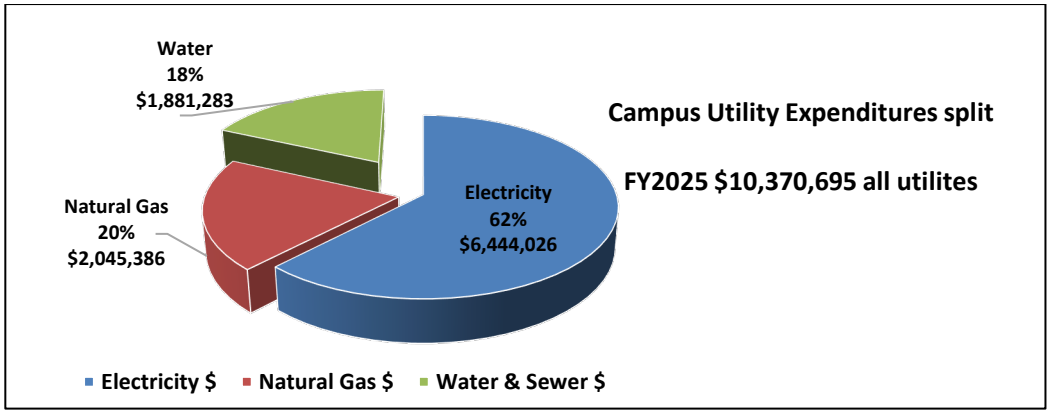
Facilities Operations Prepared by: Nihal Al Raees

Table of Contents

I. OVERVIEW

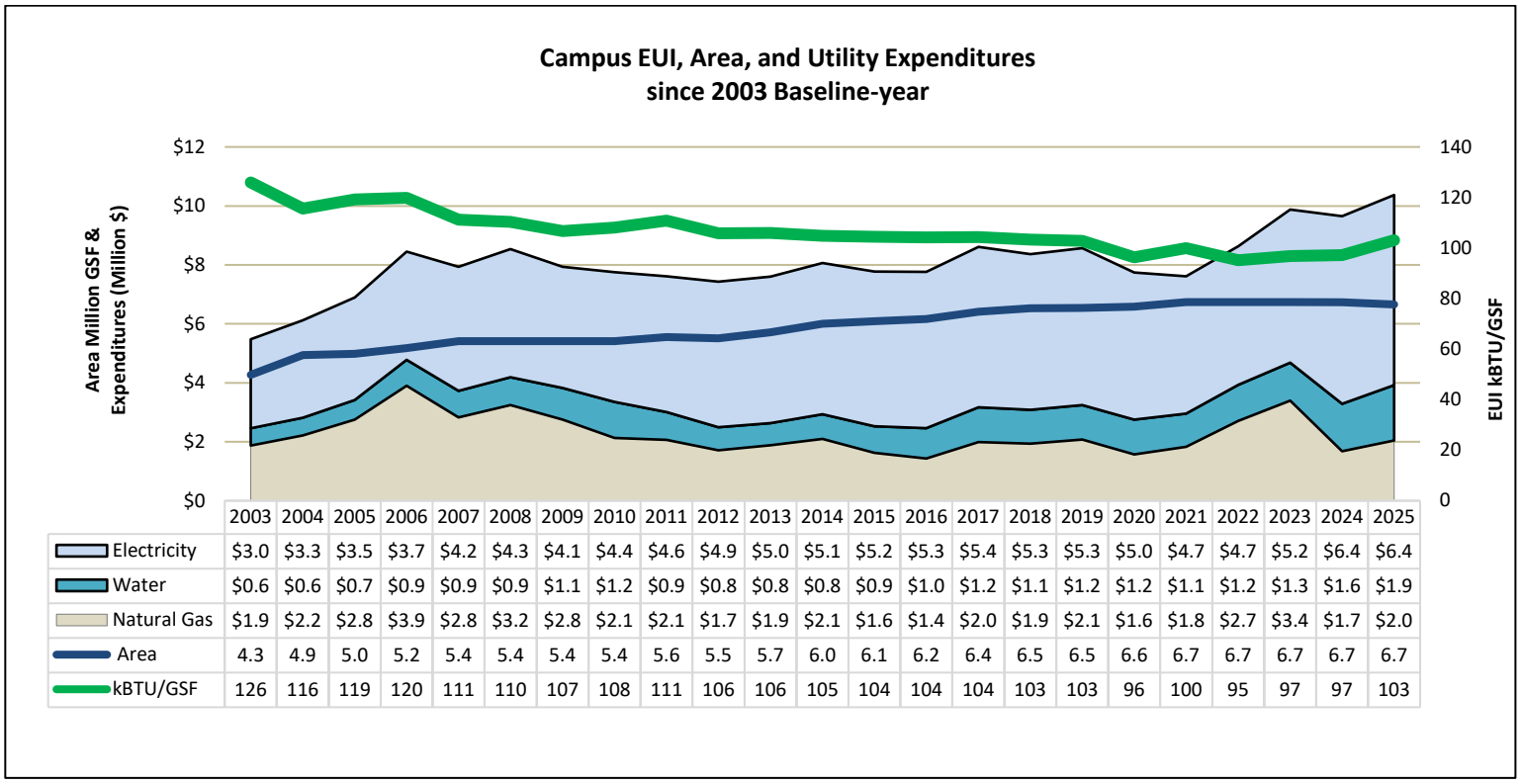
The University of North Carolina at Greensboro (UNCG) is making use of every resource that is available to it in order to lower its energy impact and improve campus energy efficiency. Through the implementation of the first performance contract for the UNC System, the installation of several new technologies, improvements to the steam and chilled water infrastructures, and education and outreach programs, UNCG has achieved a significant reduction in its energy and water consumption compared to the State-designated baseline year FY2002-2003. This report provides an overview of the campus utilities and provides an update on the University's progress toward utility reduction goals, including completed and planned initiatives.

FY2025 recorded 103,072 EUI BTU/GSF. UNCG has achieved an 18% decrease in EUI from 125,963 EUI in FY2003, the baseline year. Enrollment of Full-Time Equivalent (FTE) students has decreased both during and after the pandemic. 16,157 FTE were reported in the fall of 2024, a 31% increase from 12,345 FTE in the baseline year of 2003 and a 1% increase from the last two years enrollment figure.
The campus footprint was revised in FY2025 to accommodate major renovations in some buildings; as a result, the prorated campus area is 6.66 million GSF, which represents a 1% decrease from the previous two years, FY2023 and 2024, and a 56% increase, which is 2.4 million GSF of additional indoor space, to the baseline area from 2003.



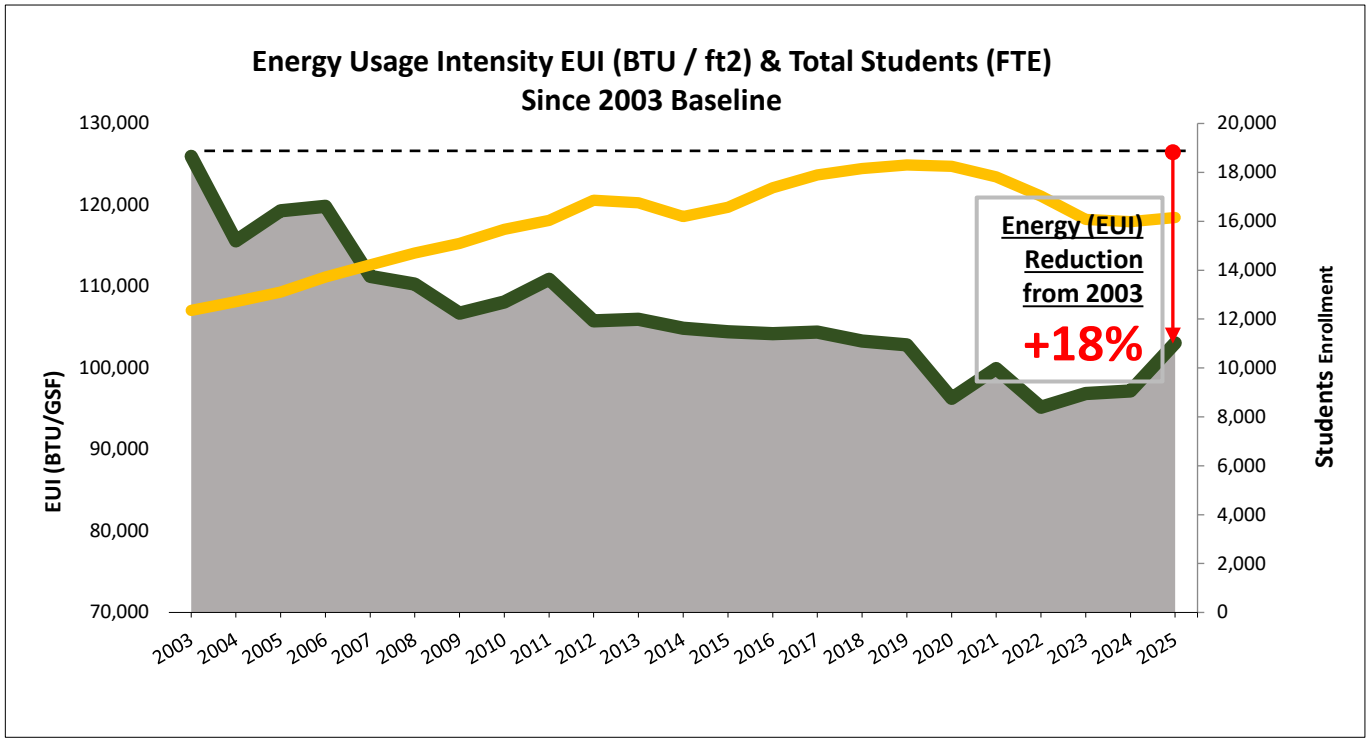
II. UTILITY EXPENDITURES FY2025 AND PERFORMANCE NARRATIVE

- **Energy Use Intensity EUI (BTU/GSF):** UNC Greensboro currently stands at 103,072 BTU/GSF overall campus Energy Use Intensity (EUI), achieving over 18% EUI reduction from the FY2003 baseline year, and a 6% increase to FY2024 and FY2023.
  In 2003, the University's baseline was 125,963 BTU/GSF/year, which is much lower than the average EUI of the UNC System started with. FY2025 is 7% lower than the average EUI of 111,030 UNC System EUI FY2024.
- **Utility Expenditures**: The University utility expenditures were $10.4 million (Electricity: $6.4 million for 79.8 million kWh; Natural Gas: $ 2.0 million for 4.1 million therms; Water: $ 1.9 million for 151.1 million gallons. Compared to FY2024, utility costs increased by 7% in FY2025, totaling more than $700,000.
- **Utility Key Performance Indicators (KPI)**: The overall cost of utilities for each GSF campus area was $1.6 and included water, natural gas, and electricity. Due mostly to reduced prorated campus square footage and higher utility expenses, this year's utility cost per area is 9% more than the $1.4 metric in 2024 and 6% higher than the $1.5 metric in FY2023. Compared to the baseline year, this measure indicates a 20% increase. The breakdown of utility expenses for water, natural gas, and electricity in FY2025 is displayed in the pie chart above. The following graph shows the historical relationship between campus utility costs, EUI performance, and campus area since the baseline year of 2003.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Electricity	$3.0	$3.3	$3.5	$3.7	$4.2	$4.3	$4.1	$4.4	$4.6	$4.9	$5.0	$5.1	$5.2	$5.3	$5.4	$5.3	$5.3	$5.0	$4.7	$4.7	$5.2	$6.4	$6.4
Water	$0.6	$0.6	$0.7	$0.9	$0.9	$0.9	$1.1	$1.2	$0.9	$0.8	$0.8	$0.8	$0.9	$1.0	$1.2	$1.1	$1.2	$1.2	$1.1	$1.2	$1.3	$1.6	$1.9
Natural Gas	$1.9	$2.2	$2.8	$3.9	$2.8	$3.2	$2.8	$2.1	$2.1	$1.7	$1.9	$2.1	$1.6	$1.4	$2.0	$1.9	$2.1	$1.6	$1.8	$2.7	$3.4	$1.7	$2.0
Area	4.3	4.9	5.0	5.2	5.4	5.4	5.4	5.4	5.6	5.5	5.7	6.0	6.1	6.2	6.4	6.5	6.5	6.6	6.7	6.7	6.7	6.7	6.7
kBTU/GSF	126	116	119	120	111	110	107	108	111	106	106	105	104	104	104	103	103	96	100	95	97	97	103

Utilities expenditures breakdown over campus area and EUI performance since 2003.



Energy Use Intensity EUI and Student FTE Full Time Equivalent Enrolment since 2003.

III. FY2025 ENERGY AND WATER USAGE AND EXPENDITURES:

- According to the NC State Climate Office's Cardinal system, Greensboro recorded 3,422 Heating Degree Days (HDD) in FY2025—a total of 203 additional degree days than the 3,219 HDDs recorded the year before using the same weather station data source. In terms of cooling, Greensboro and the campus recorded 1,662 Cooling Degree Days (CDD), which was just 27 less than the 1,689 CDDs recorded the previous summer.

- **Electricity:** 79.8 million kWh were used, and $6.44 million was paid. The costs of FY2025 increased by 1%, or about $86,000 compared to FY2024. But while only a 2% rise in use, this year's electricity costs increased by more than 24%, or $1.25 million, compared to FY2023. To accommodate the more than 56% additional campus area created during the last 22 years, FY2025 consumption has only increased by 21% compared to the baseline year of 2003.

- **Natural Gas:** Paid $2.05 million at a blended rate of $0.49 per therm for the use of 4.14 million therms. With a blended rate of $0.88 per therm recorded in September 2023, natural gas expenses are 40% lower than FY2023 and up 22%, or around $360,000, over the previous year. Over the previous two years, FY2024 and FY2023, there was an 8% increase in consumption during FY2025. The amount of natural gas used in FY2025 increased by 38% compared to the baseline year of FY2003. Since UNCG has not been curtailed during the winter for the last two years, the Steam Plant did not use any No. 2 fuel oil.

- **Water and Sewer:** 151,084 kGal of water were used, paying $1.88 million, a 17% increase over the previous year and a 46% rise over FY2023. In terms of consumption, FY2025 had a 23% increase in potable water usage over FY2023 and an 8% increase over the previous year. Water consumption is 55% lower than it was in 2003.
  The campus water KPI is 22.7 gallons/GSF, which is 71% lower than the baseline level of 78.8 gallons/GSF in 2003. Even though this year's KPI was higher than that of the previous ten years, it was still below the 24 Gal/GSF UNC System average level for FY2024. The University paid $12.45 per kGal of water in FY2025, which is a blended rate that is historically lower than the average UNC System rate, and $12.84 per kGal that was reported last year.
  Avoiding paying sewer charges for water that does not enter the sewer system is one factor contributing to this lower blended cost. By claiming 38,115 kGal of non-sewer water credits from campus irrigation and evaporative cooling towers, the University was able to avoid paying more than $248,000 in water bills.

  Although the campus area of the University grew by 56% in FY2025 compared to the 2003 baseline, the total energy BTU from electricity and natural gas required for campus operations only increased by 28%, resulting in an 18% decline in EUI to the baseline level set in 2003. The University has made tremendous progress in reducing its water use; FY2025 campus water Key Performance Indicator (KPI) of 23 Gal/GSF has decreased by 71% from 79 Gal/GSF reported for the 2003 baseline year.

Fiscal Year	*Area*	*All Utilities*	*Utility/ Area*	*Energy kWh + therms*	*Energy/ Area*	*Energy kWh + therms*	*Energy Cost*	*Water*	*Water*
	GSF	*Cost $*	*$ / GSF*	*Cost $*	*$ / GSF*	*MMBTU*	*$ / MMBTU*	*Gallons*	*$*
2003	**4,269,699**	**$5,537,461**	$1.3	**$4,990,987**	**$1.2**	**537,824**	**$9.3**	**336,408,512**	**$587,408**
2004	4,942,520	$6,085,348	$1.2	$5,527,654	$1.1	571,384	$9.7	290,356,396	$594,070
2005	4,987,544	$6,878,519	$1.4	$6,248,603	$1.3	594,916	$10.5	543,824,424	$659,042
2006	5,177,689	$8,455,503	$1.6	$7,622,474	$1.5	620,424	$12.3	175,592,520	$880,466
2007	5,415,496	$7,674,070	$1.4	$6,884,414	$1.3	602,349	$11.4	154,828,520	$895,439
2008	5,415,496	$8,500,093	$1.6	$7,593,983	$1.4	597,302	$12.7	155,922,844	$943,305
2009	5,415,496	$7,906,663	$1.5	$6,861,603	$1.3	577,867	$11.9	171,504,432	$1,074,919
2010	5,415,496	$7,713,099	$1.4	$6,530,241	$1.2	585,475	$11.2	183,458,968	$1,222,175
2011	5,551,245	$7,653,606	$1.4	$6,753,156	$1.2	615,587	$11.0	141,496,916	$940,796
2012	5,510,548	$7,402,485	$1.3	$6,663,983	$1.2	582,985	$11.4	122,794,672	$778,897
2013	5,716,735	$7,571,726	$1.3	$6,853,774	$1.2	605,897	$11.3	130,566,923	$758,603
2014	5,999,437	$8,034,092	$1.3	$7,234,731	$1.2	629,295	$11.5	123,906,620	$838,563
2015	6,086,061	$7,859,390	$1.3	$6,959,803	$1.1	635,534	$11.0	126,757,984	$899,962
2016	6,163,784	$7,776,021	$1.3	$6,783,434	$1.1	642,376	$10.6	133,052,004	$1,035,082
2017	6,408,406	$8,569,900	$1.3	$7,435,123	$1.2	668,955	$11.1	143,057,700	$1,179,220
2018	6,531,155	$8,621,691	$1.3	$7,521,794	$1.2	674,606	$11.1	132,712,640	$1,147,153
2019	6,542,163	$8,601,691	$1.3	$7,435,361	$1.1	672,766	$11.1	131,447,729	$1,166,330
2020	6,586,747	$7,739,359	$1.2	$6,554,646	$1.0	634,193	$10.3	130,134,944	$1,184,712
2021	6,737,988	$7,668,308	$1.1	$6,536,559	$1.0	673,406	$9.7	115,987,304	$1,131,749
2022	**6,737,988**	$8,874,661	$1.3	$7,646,990	$1.1	**641,316**	**$11.9**	116,586,312	$1,227,672
2023	**6,737,988**	$9,876,884	$1.5	$8,590,005	$1.3	**652,616**	**$13.2**	123,246,447	$1,286,879
2024	**6,733,972**	$9,650,650	$1.4	$8,040,645	$1.2	**654,522**	**$12.3**	139,967,500	$1,610,005
2025	**6,662,571**	$10,370,695	$1.6	$8,489,412	$1.3	**686,724**	**$12.4**	151,084,564	**$1,881,283**
% Change to FY2023	-1%	5%	6%	-1%	0%	5%	-6%	23%	46%
% Change to FY2024	-1%	7%	9%	6%	7%	5%	1%	8%	17%
% Change to Baseline	56%	87%	20%	70%	9%	28%	33%	-55%	220%

Utilities Expenditures, Campus Area, and Key Performance Indicators (KPI).

Key Performance Indicators KPI			*Energy (Electricity and Natural Gas)*				*Water*			
Fiscal Year	**Area**	**Students**	**Total Energy**	**Energy Cost**	**Energy/Area**	**Energy/FTE**	**Water**	**Water**	**Water/Area**	**Gallon/FTE**
	GSF	**Eq. FTE**	**MMBTU**	**$**	**EUI BTU/GSF**	**MMBTU/FTE**	**Gallons**	**$**	**Gal / GSF**	**Gal / FTE**
2003	**4,269,699**	**12,354**	**537,824**	**$4,990,987**	**125,963**	**44**	**336,408,512**	**$587,408**	**79**	**27,231**
2004	4,942,520	12,708	571,384	$5,527,654	115,606	45	290,356,396	$594,070	59	22,848
2005	4,987,544	13,099	594,916	$6,248,603	119,280	45	543,824,424	$659,042	109	41,516
2006	5,177,689	13,723	620,424	$7,622,474	119,827	45	175,592,520	$880,466	34	12,795
2007	5,415,496	14,219	602,349	$6,884,414	111,227	42	154,828,520	$895,439	29	10,889
2008	5,415,496	14,704	597,302	$7,593,983	110,295	41	155,922,844	$943,305	29	10,604
2009	5,415,496	15,097	577,867	$6,861,603	106,706	38	171,504,432	$1,074,919	32	11,360
2010	5,415,496	15,670	585,475	$6,530,241	108,111	37	183,458,968	$1,222,175	34	11,708
2011	5,551,245	16,036	615,587	$6,753,156	110,892	38	141,496,916	$940,796	25	8,824
2012	5,510,548	16,855	582,985	$6,663,983	105,794	35	122,794,672	$778,897	22	7,285
2013	5,716,735	16,754	605,897	$6,853,774	105,987	36	130,566,923	$758,603	23	7,793
2014	5,999,437	16,195	629,295	$7,234,731	104,892	39	123,906,620	$838,563	21	7,651
2015	6,086,061	16,568	635,534	$6,959,803	104,424	38	126,757,984	$899,962	21	7,651
2016	6,163,784	17,365	642,376	$6,783,434	104,218	37	133,052,004	$1,035,082	22	7,662
2017	6,408,406	17,891	668,955	$7,435,123	104,387	37	143,057,700	$1,179,220	22	7,996
2018	6,531,155	18,153	674,606	$7,521,794	103,290	37	132,712,640	$1,147,153	20	7,311
2019	6,542,163	18,303	672,766	$7,435,361	102,835	37	131,447,729	$1,166,330	20	7,182
2020	6,586,747	18,249	634,193	$6,554,646	96,283	35	130,134,944	$1,184,712	20	7,131
2021	6,737,988	17,811	673,406	$6,536,559	99,942	38	115,987,304	$1,131,749	17	6,512
2022	6,737,988	17,025	641,316	$7,646,990	95,179	38	116,586,312	$1,227,672	17	7,239
2023	6,737,988	16,070	652,616	$8,590,005	96,856	41	123,246,447	$1,286,879	18	7,669
2024	6,733,972	15,988	654,522	$8,040,645	97,197	41	139,967,500	$1,610,005	21	8,755
2025	6,662,571	**16,157**	686,724	$8,489,412	103,072	43	151,084,564	$1,881,283	23	9,351
% Change to 2023	-1%	1%	5%	-1%	6%	5%	23%	46%	24%	22%
% Change to 2024	-1%	1%	5%	6%	6%	4%	8%	17%	9%	7%
% Change to 2003	56%	31%	28%	70%	-18%	-2%	-55%	220%	-71%	-66%

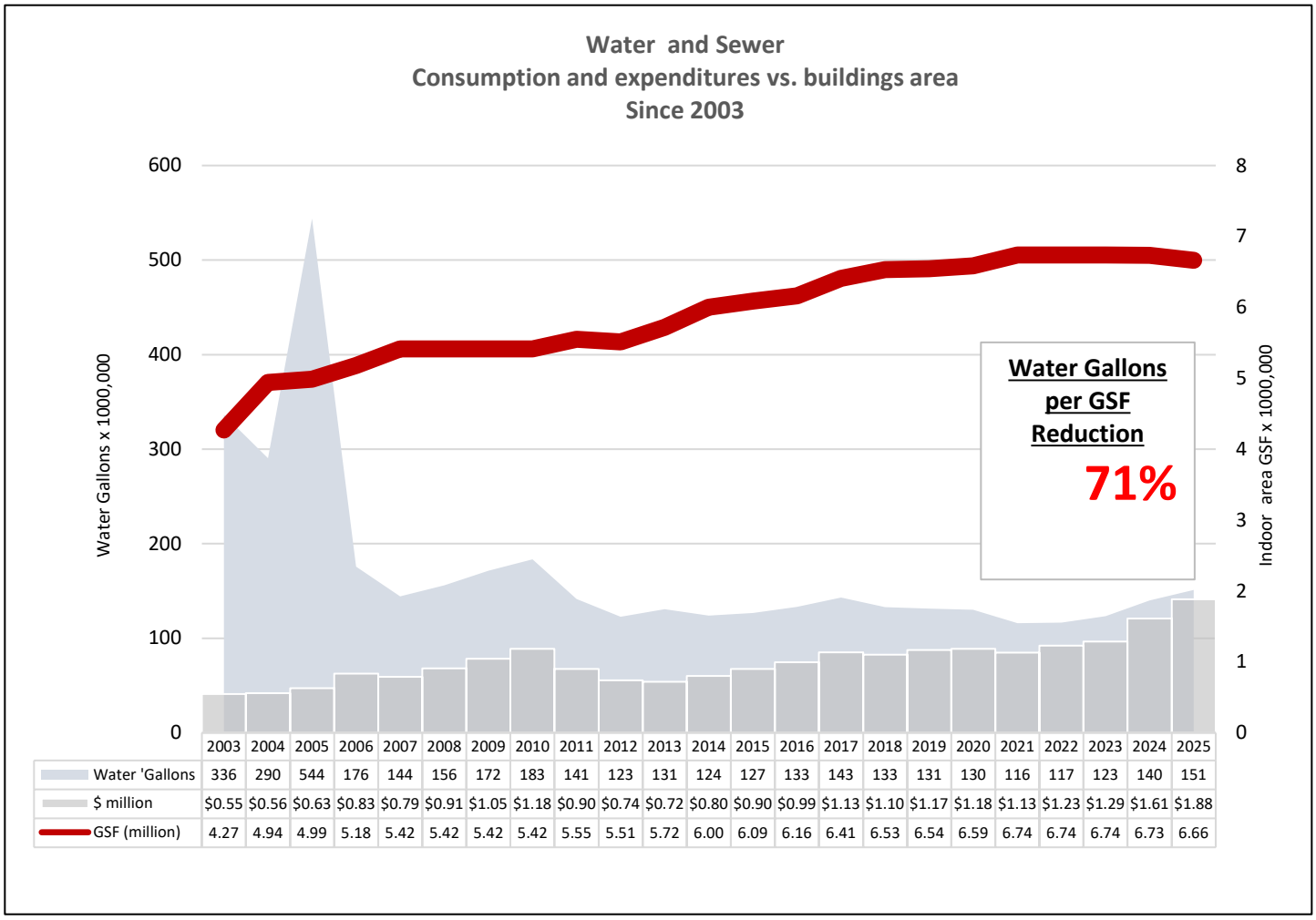
Student Enrollment, Area, Energy, and Water Expenditures, and Key Performance Indicator KPIs.

IV. BASELINE & UTILITY OVERVIEW

Water

The City of Greensboro provides water and sewer services to the University. The University owns and operates a distribution system that supplies water to more than 60 buildings after receiving it from three (3) City master meters. Additionally, the University obtains water service for a number of outlying properties from the local utility vendor. The water meters in the majority of campus buildings are owned by UNCG and are read; the information is then recorded into a database. In order for the University to obtain the proper credits from the City of Greensboro Water Resources Department, submeters have been installed where water is used for cooling towers or irrigation. This allows the University to take monthly meter readings of water that does not enter the sanitary sewer system.

UNC Greensboro has achieved significant progress in cutting back on water use. Investigating leaks, fixing underground condensate and steam, and locating and eliminating any inefficient operating procedures are all priorities for UNCG's Facilities department. Water-saving measures and technologies have also been considered during renovations and new construction. Since the 2003 baseline year, these policies have resulted in a 71% decrease in water use (per GSF), and an 8% rise over the previous fiscal year 2024.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Water 'Gallons	336	290	544	176	144	156	172	183	141	123	131	124	127	133	143	133	131	130	116	117	123	140	151
$ million	$0.55	$0.56	$0.63	$0.83	$0.79	$0.91	$1.05	$1.18	$0.90	$0.74	$0.72	$0.80	$0.90	$0.99	$1.13	$1.10	$1.17	$1.18	$1.13	$1.23	$1.29	$1.61	$1.88
GSF (million)	4.27	4.94	4.99	5.18	5.42	5.42	5.42	5.42	5.55	5.51	5.72	6.00	6.09	6.16	6.41	6.53	6.54	6.59	6.74	6.74	6.74	6.73	6.66

Decreased water consumption (Gal per GSF) by 71% compared to the baseline year FY2003.

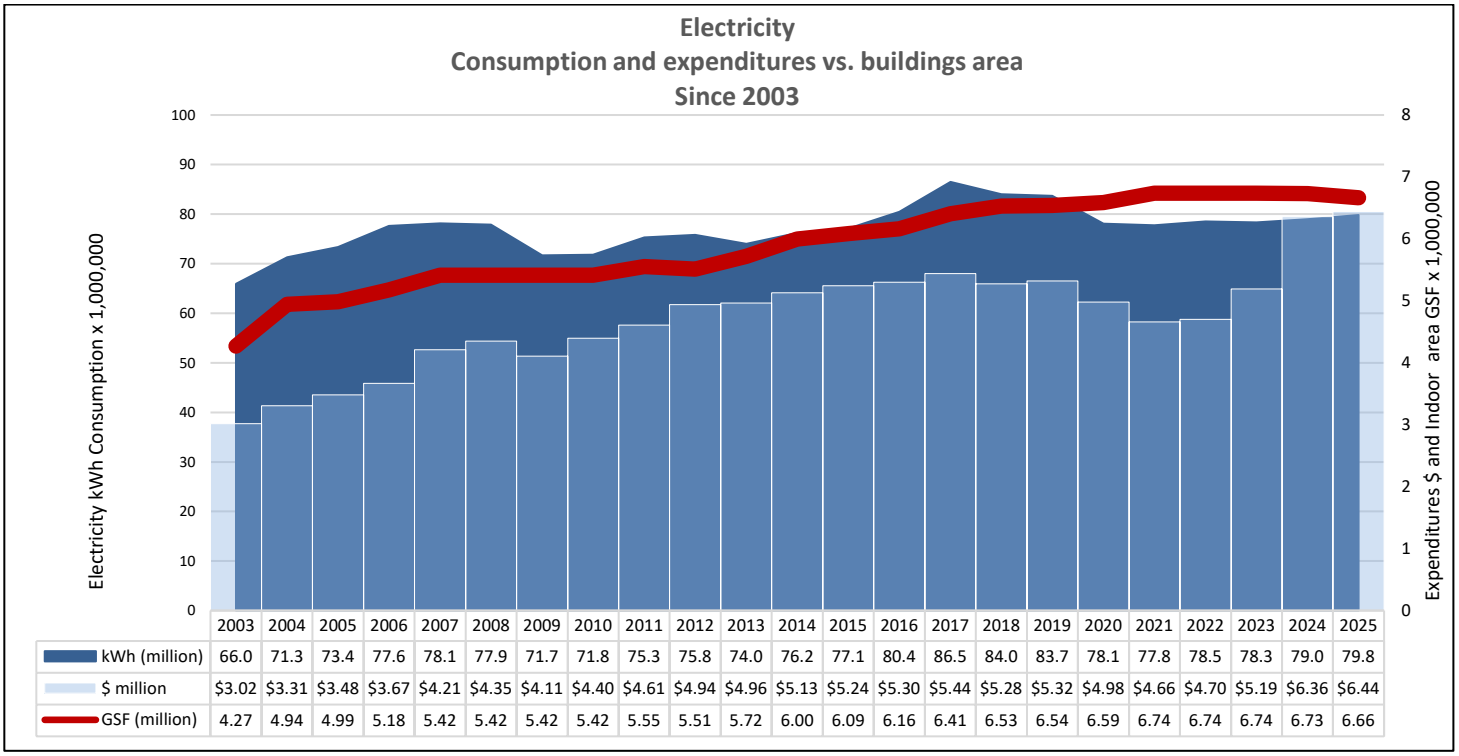
Energy

Electricity

Duke Energy supplies electricity to UNCG buildings via more than 100 accounts. The main campus substation, which supplies electricity to over 60 buildings via an underground medium voltage distribution system, is by far the largest account. Every year, the campus substation's time-of-use electricity tariff schedule is examined to determine the best rate alternatives and incentive programs that UNCG is eligible for. The main substation account is occasionally reviewed, and all other UNCG accounts with Duke Energy for best rate alternatives. Electricity submeters in every building the substation serves are read once a month, and the readings are recorded in a database.

UNCG has taken steps toward automating the UNCG-owned meter reading process by giving the UNCG meter readers a comprehensive electronic form using an iPad with a customized Google Sheet. The new approach is more efficient because it replaces using the cumbersome Logbook where the meter readers had to write down each meter reading which was subsequently manually entered by others into a spreadsheet.

In FY2025, the University's total electricity bill was $6.4 million for 79.83 million kWhs, reflecting 11.98 kWh per GSF in electricity KPI, and 4,940 kWhs per FTE student**.** FY2025 showed 2% increase compared to 11.73 kWh/GSF in FY2024 and a 22% reduction compared to 15.45 kWh/GSF 2003 baseline year KPI.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
kWh (million)	66.0	71.3	73.4	77.6	78.1	77.9	71.7	71.8	75.3	75.8	74.0	76.2	77.1	80.4	86.5	84.0	83.7	78.1	77.8	78.5	78.3	79.0	79.8
$ million	$3.02	$3.31	$3.48	$3.67	$4.21	$4.35	$4.11	$4.40	$4.61	$4.94	$4.96	$5.13	$5.24	$5.30	$5.44	$5.28	$5.32	$4.98	$4.66	$4.70	$5.19	$6.36	$6.44
GSF (million)	4.27	4.94	4.99	5.18	5.42	5.42	5.42	5.42	5.55	5.51	5.72	6.00	6.09	6.16	6.41	6.53	6.54	6.59	6.74	6.74	6.74	6.73	6.66

Electricity consumption kWh over expenditures $ and campus area GSF from baseline year FY2003.

Natural Gas

Piedmont Natural Gas (PNG) supplies service to the University via individual meters. The Steam Plant's boilers, appliances for cooking, and some of the generators are all fueled by natural gas. The majority of accounts are small enough that the gas service is supplied under PNG's small general service rate or residential rate schedules, with the exception of the Steam Plant, Kaplan Center for Wellness boilers, and a few residence hall buildings. The University's Steam Plant is responsible for more than 80% of the natural gas used on campus. In accordance with N.C. Gen. Stat. Section 105-164.13(52), which exempts State agency accounts from taxes, all University natural gas accounts are also tax-free.

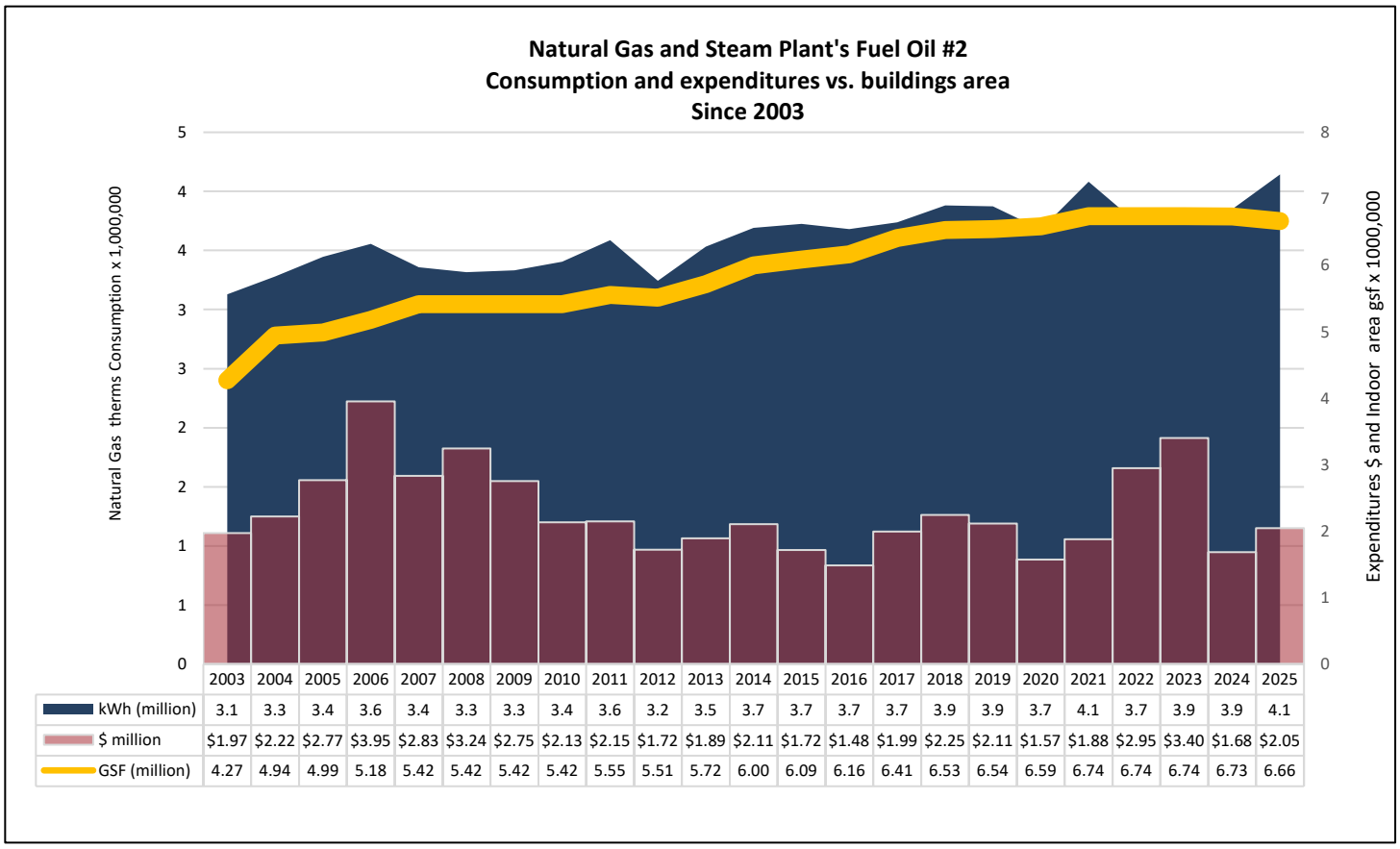
In order to take advantage of PNG's reduced prices, the University opted out of buying natural gas for the Steam Plant under State Term Contract 405N as of June 2023. Since then, the University has been able to avoid paying $2.17 million in natural gas expenditures for the campus Steam Plant for the next 25 months, from June 2023 to July 2025. This amount has not only benefited to keep utility budgets and costs under

control, but it has also been utilized to fund Utility Savings Carry Forward programs offered by the North Carolina State Energy Office/Utility Savings Initiatives program to improve campus efficiency.

In FY2025, the overall natural gas expenditures were $2.05 million for 4.14 million therms showing an 8% increase of roughly 293,000 more therms compared to FY2024, and 38% actual therms increase over the 2003 baseline year. Natural gas's KPI (BTU/GSF) for FY2025 was 62,191, up 8% from the previous year and down 11% from FY2003's 70,145 BTU/GSF. At 25.65 MMBTU/FTE, natural gas energy per student represents a 6% increase over FY2024.

No. 2 Fuel Oil

No. 2 fuel oil can be used by the UNCG Steam Plant as a natural gas backup fuel. This provides a backup fuel source for the University in the event that natural gas service is interrupted during periods of high gas demand. In the past three winters, UNCG did not experience any curtailments that necessitated the use of fuel oil as a natural gas backup. The boilers were tuned as part of the Steam Plant's yearly preventive maintenance using only a few gallons of fuel oil.



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
kWh (million)	3.1	3.3	3.4	3.6	3.4	3.3	3.3	3.4	3.6	3.2	3.5	3.7	3.7	3.7	3.7	3.9	3.9	3.7	4.1	3.7	3.9	3.9	4.1
$ million	$1.97	$2.22	$2.77	$3.95	$2.83	$3.24	$2.75	$2.13	$2.15	$1.72	$1.89	$2.11	$1.72	$1.48	$1.99	$2.25	$2.11	$1.57	$1.88	$2.95	$3.40	$1.68	$2.05
GSF (million)	4.27	4.94	4.99	5.18	5.42	5.42	5.42	5.42	5.55	5.51	5.72	6.00	6.09	6.16	6.41	6.53	6.54	6.59	6.74	6.74	6.74	6.73	6.66

Steam and Chilled Water

The University produces the chilled water and steam that are delivered to the campus using natural gas and purchased electricity. Although the majority of buildings that are connected to the steam plant and chiller plants lack steam or chilled water meters, the University has created a thorough campus metering plan that calls for the installation of these meters in every building. Facilities Operations allocates the total cost of steam and chilled water for each entity based on the gross square footage of a designated building.

Steam: To 63 buildings on the main campus, the Steam Plant sends steam through underground pipes that returns back in a condensed form. The UNCG Steam Plant has four boilers with 190,000 pounds per hour (PPH) total capacity. Steam distribution capacity covers the campus steam peak load including Nursing and Instructional Building (NIB) that came online in December 2020.

Funds from the HB 1292 Utility Savings Carry Forward (USCF) program were utilized by UNCG to maintain and enhance the operation of the Steam Plant. In FY2020, a new master controller and burner management system were installed to replace the outdated boiler controls. To improve performance, the Boiler #1 feedwater pump was reduced in size and a new variable frequency drive (VFD) was installed in FY2022, along with a new economizer for Boiler #4. In order to maintain the airside economizer's optimal efficiency, in 2023, the boiler #3 economizer was replaced. Furthermore, and the Boiler #2 Economizer was replaced with BEI model HEATSPONGE-Titan square economizer that was completed in FY2024. FY2026 USCF funds are going to be used to replace Boiler #1 economizer with a new HEATSPONGE type offering easy access for maintenance and troubleshooting; furthermore, the fund is also planned to replace the existing obsolete Softener with a new in-kind one.

Much of the campus steam infrastructure and piping system is at least 50 years old. Failures have become more frequent, especially the past two years due to the age of the piping and normal wear and tear. The system has been frequently serviced in response to failures or normal wear and tear. The current Campus Master Plan updated in 2020 by Affiliated Engineers and Sasaki prioritizes five (5) high priority areas to replace and renew critical portions of the existing steam distribution system. Using renovation and repair funds, the University has completed EUC to Bryan Building Service Drive at Theta Street in 2023. FY2025 is continuing these efforts and currently in a pre-design phase to consider section(s) in the area of Faculty Center and Alumni House, along College Ave and near Shaw Residence Hall. The current project envisioned to be in two phases for minimum campus disruption, and planned May 2026 for phase one completion time.

UNCG Steam Plant serves over 3.9 million GSF including the NIB building. FY2025 observed over 203 HDDs in additional wintery weather to the prior year, the Steam Plant produced over 304 million pounds of steam, an 11% increase of over 30 million to 273 million pounds used in FY2024. Steam makeup water was 11.7 million gallons, a 68% increase of about 4.7 million additional gallons of water used in 2024. The steam production energy and water consumption and costs can be further controlled if the University has the funds to move forward with replacing the critical portions of the steam and condensate distribution system.

Chilled Water: UNCG McIver Chiller Plant (4 chillers 6,000-ton total capacity) and South Chiller Plant (2 chillers 3,000-ton current capacity) produce chilled water to serve HVAC needs in 43 buildings including the Nursing and Instructional Building (NIB). The two chiller plants both serve over 2.8 million GSF including NIB and Ragsdale Mendenhall Residence Hall which were in FY 2020 connected to the campus chilled water loop.

In FY2024-2025, the University has continued on the efforts to complete the campus chilled water loop, adding more buildings to the loop, and abandon the dedicated chiller plants after being served by the campus loop for more efficient and reliable chilled water distribution infrastructure. The construction work has been completed to add four (4) more major buildings to be fed by campus chilled water loop, in addition to the Parking Operations and Campus Access Management (POCAM) offices at Walker Parking Deck. The three major buildings totaling 394,000 square feet was added Mossman Building (56,000 square feet), Elliott University Center (194,000 square feet), Alumni House (24,000 square feet), and Bryan Building (121,000 square feet).

In FY2025, for the campus chilled water loop infrastructure and equipment improvement project, a Phase Two is under design to address the remaining chilled water needs identified in our 2020 master plan. This second phase is planned to replace a 750-ton chiller with a new 1500-ton chiller considering all supporting infrastructure in the McIver Chiller Plant and to replace cooling tower sections for additional capacities.

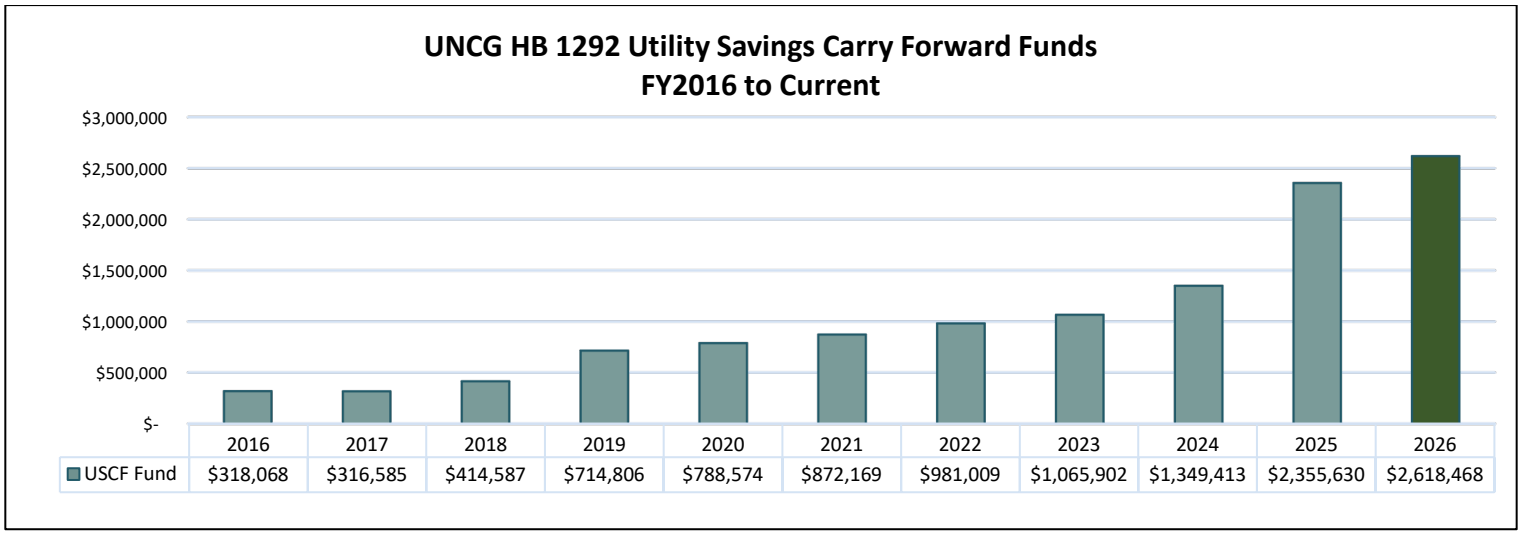
Energy Data Management & BAS

UNCG collects energy consumption and billing information on a monthly basis for all buildings and facilities not served directly by utility companies. Currently, meters are still read manually, and the data is analyzed via MS Excel. This data are used to discover trends in energy consumption and identify facilities that warrant more detailed evaluations. UNCG Facilities Operations staff also examine the monthly data to find and correct billing errors and to identify any anomalies in the energy and water consumption of specific facilities.
Currently, UNCG has 65 buildings on the Tridium Niagara AX JACEs Building Automation System (BAS). In FY2021, when Tridium alert stop supporting Niagara AX Supervisor licenses, UNCG contracted with Schneider Electric to migrate Niagara AX to Niagara 4 licensing model to maintain Tridium BAS on campus. UNCG is looking into having a plan for replacing the old JACEs and upgrading them to Niagara 4 as funds allow.

V. PROJECTS AND ENERGY SAVINGS

To achieve energy consumption and utilities cost reduction goals, UNC Greensboro focuses first on low- and no-cost energy conservation measures (ECMs) considering the available resources. The HB 1292 Utility Savings Carry Forward (USCF) program supported by Utility Savings Initiatives (USI) group is greatly utilized for energy-saving projects and ECMs as the main supportive resource.

The University had only one energy savings contract (ESCO), a $7.2 million performance contract in 2008. In FY2011, UNCG started reporting/requesting the USCF credits. FY2012 funds were around $232,000 since the guaranteed energy savings contract pre-dated the HB 1292 legislation. All the way to FY2018, the approved/executed funds stayed below half a million dollars per year. Starting in FY2019, the funds continued to increase at a faster pace all the way to hit over a million dollars carried forward in FY2023 and 2024. Last fiscal year FY2025 and approved for FY2026 have hit $2 million. The last two years significant increase was due to a lower cost purchasing natural gas for the Steam Plant discussed in the Natural Gas section in this report.



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
USCF Fund	$318,068	$316,585	$414,587	$714,806	$788,574	$872,169	$981,009	$1,065,902	$1,349,413	$2,355,630	$2,618,468

VI. PROJECTS SUMMARY

In FY2025, the University used approximately $2,355,000 of Utility Savings Carry Forward HB 1292 (USCF) funds for different projects on campus to improve efficiency and to back up Repairs & Renovation (R&R) funds when needed. All projects were managed in-house by Facilities Operations using USCF year-end funds to keep costs and time under control, with the exception of a contributed fund for the major Jackson Library Renovation project. Beyond the basic scope of the renovation project, the USCF contribution funds will to provide Owner Furnished Contractor Installed (OFCI) for LED lighting fixtures to upgrade six floors of the tower portion of the Jackson Library facility.

Projects implemented in FY2024 and FY2025 Using Carry Forward Funds:

- For the Steam Plant: replace with new Boiler #2 Economizer originally installed in 1989 and replaced in 2014. Repaired/replaced the English Boiler #4, and Boiler # 1 refractory walls. Forced Draft Combustion Air Fans Upgrade was done for three boilers.
- Contract Retro-commissioning by Schneider Electric for $50,000 spent on three buildings on campus which verified proper HVAC systems operation, including economizer cycles, identifying controls-based energy conservation measures, and calibrating sensors & controls equipment.
- Curry Building new motors and VFDs for Air Handling Units.
- Campuswide chilled water systems Cx commissioning to verify proper flowing of chiller water in into the loop after adding the more buildings to the loop.
- Stone Building Nutrition Labs generator replacement capital project currently ongoing.
- POCAM VAV boxes replacement & 1605 Spring Garden HVAC rooftop units' replacements.
- LED progress on campus:
  - Mossman Building, Moore Humanities, and Stone Building LED Retrofit.
  - Fleming and Practice Gymnasiums LED Retrofit in Coleman Building.
  - Softball Field LED upgrade capital project of one-for-one replacement of fifty-seven (57) fixtures on 6 poles serving the field.

Projects Planned FY2026 Using Carry Forward Funds:

Facilities Operations prioritizes projects based on urgency, higher savings, and the shortest potential payback in order to increase campus efficiency.

- For the Steam Plant: replace with new Boiler #1 Economizer HEATSPONGE-Titan square economizer. Continue on Forced Draft Combustion Air Fans Upgrade on the fourth boiler in the Steam Plant. Install and replace new condensate sensors, flowmeters, and blowdown meter for better control and troubleshooting. Softener replacement of the obsolete existing one.
- Continue on contract retro-commissioning for various buildings on campus.
- Stone 1951 Wing and Ferguson Buildings new motors and VFDs for Air Handling Units. Probably this would include Eberhart Building.
- New HVAC system to replace the aged existing unit in Gray Home Management House.
- LED progress on campus:
  - Petty Building, and Gray Home Management House.

Potential Future Projects.

- Pneumatic to DDC HVAC system upgrade a couple of academic/administrative buildings on campus such as Curry Building, Ferguson Building, Eberhart Building, Coleman Building, Stone building, and Petty Building.
- Eberhart Building HVAC system, infrastructure, and lighting systems replacement.
- Continue upgrading campus lighting to LEDs including controls for more sustainable and efficient facilities.
- and controls for academic and administration buildings on campus.
- Polisher for the Steam Plant to improve makeup water quality before entering the system.
- Continue lighting upgrade to LED on campus for more efficiency and sustainable facilities.

VII. SUSTAINABILITY AND ENERGY

UNCG Sustainability Office provided the following update on greenhouse gas emissions, solar, and electric vehicle EV charging stations on campus.

UNC Greensboro's greenhouse gas emissions, including Scopes 1, 2, and 3, measured 69,141 MTeCO2 for fiscal year 2025, a 4% increase from fiscal year 2024's measure of 66,723 MTeCO2. Scope 1 emissions increased by 9% compared to the previous year, with an increase of 29,307 MMBtu in natural gas usage. Scope 2 emissions increased 3% compared to the previous year, with an increase of 848,705 kWh consumed and an increase in Duke Energy Carolina's supplier specific emission factors from the grid energy mix being the contributing factors. Scope 3 emissions remained stable compared to 2024.

Compared to 2009, UNCG's baseline measurement, the university has decreased its GHG emissions by 14%, from 80,365 MTeCO2 in FY2009 to 69,141 MTeCO2 in FY2025. Scope 1 emissions have climbed 26% in that time, with an increase of 381,251 MMBtu in natural gas usage over that period. Meanwhile, Scope 2 and Scope 3 emissions have decreased by 29% and 23%, respectively. Although the university has grown in overall square footage and in student enrollment since 2009, UNCG has achieved a reduction of 32% in emissions per 1000 GSF and an 11% reduction in emissions per weighted campus user.

UNCG PV Solar

On the PV Solar side, UNCG produced 48,739 kWh from solar generation in fiscal year 2025. 41,168 kWh was produced by the array on the Nursing and Instructional Building, approximately .031% of that building's total energy needs. Another 3,571 kWh is produced annually by a small array on a storage shed used by the grounds crew. UNCG has recently received an in-kind grant from NC Greenpower as part of the Solar+Schools program for the installation of the 20-kWh system on the roof of 1510 Walker Ave. Building, the location for the Middle College at UNCG. Installation is expected to happen in December of 2025.

UNCG Electric Vehicle EV Charging Stations

The University has a total of 18 university owned electric vehicle charging stations on campus for commuters who drive EVs or plug-in hybrids. In 2023, the university was selected as a charging site for Duke Energy's Park & Plug program and signed a site hosting agreement for an additional 5 charging stations located on McCormick St. in UNCG's Spartan Village mixed-used residential section of campus. The charging stations at McCormick St were used 605 times from October 2023 through October 2024.

UNCG has applied for a grant from the Clean Fuels Advanced Technologies program administered by the Clean Energy Technology Center at NC State and is awaiting a contract to support the installation of 4 charging stations in the Walker parking deck that will include data monitoring to assist the university with determining potential future needs.

VIII. UNCG ENERGY MANAGEMENT

UNC Greensboro's energy management group consists of an Energy Team and an Energy Committee working together to closely monitor campus energy performance, identify anomalies, implement energy-related projects, and recognize gaps for improvements to achieve the University's energy and sustainability goals while supporting education and research requirements.

The Energy Committee is led by the Associate Vice Chancellor for Facilities, the Director of Facilities Operations, the Sustainability Office, and the Energy Team. The Energy Team includes the Campus Mechanical Engineer, the Energy Management Engineer, the Utilities Manager, and the Electric Shop Supervisor, the HVAC Shop Supervisor, and the Steam Plant Supervisor. The Energy Team is the working group that operates and maintains campus facilities, manages and implements the carry-forward projects, tracks performance, identifies anomalies and areas of improvement, and provides recommendations to the committee. The group meets on a monthly basis to review and monitor campus energy performance and establish plans to improve campus infrastructure and progress toward goals.

On an annual basis, members of the Energy group attend State Energy Conference, Appalachian Energy Summit, and NC APPA conference. Both the Campus Mechanical Engineer and the Energy Management Engineer have completed Energy Management Diploma and obtained a certificate.

IX. GOALS

UNC Greensboro continues to grow including the increase in the campus indoor footprint. Since the baseline year, FY2003, the campus GSF has increased by 56%. However, during that same time period, UNCG decreased its Energy Use Intensity by 18%. As of FY2025, the University has achieved a 71% reduction in water gallons/GSF surpassing the State water reduction mandate.

UNCG will continue to support the Executive Order 80, State Energy Office and UNC System energy goals in spite of resource limitations and the inability to meet the 2015 energy reduction mandate. State-funded campus facilities will continue to invest in energy-saving measures using Utility Savings Carry Forward monies (HB1292 / General Statute 143-64.12(a)). Under the direction of the UNCG Climate Action Plan and the Facilities Operations Energy Management Team's responsible stewardship strategy, UNCG aims to reduce campus energy usage per square foot EUI by at least 1% every fiscal year.

The University of North Carolina Greensboro

We have read the Strategic Energy & Water Annual Report for our University. The plan, as presented, supports the reductions required in Executive Order 80 (EO80) and G.S. 143-64.12(a).

Implemented August 2025.

Energy Management Engineer	Director of Facilities Operations	Associate Vice Chancellor for Facilities
Nihal Al Rawi		

UNC Hospitals
Chapel Hill, NC

Strategic Energy and Water Plan

September 2025

Executive Summary

During fiscal year 2025, UNC Hospitals at Chapel Hill, NC continued it's commitment towards energy conservation and utility cost avoidance. This past year's primary focus was the recommissioning of the chiller plants' operations. These plants consume a lot of electricity and water. Many parameters and sequences are utilized to ensure the plants' reliable and efficient operations. Over time, some of these parameters may be overridden or changed to address operational issues within the plants. This can create inefficiencies in energy use. The recommissioning process will help identify and correct these situations.

UNC Hospitals continues to maintain a program of facility maintenance, improvements, and renovations that has a significant effect on controlling overall energy consumption and costs. As interior building renovations are completed, the latest energy codes are utilized to ensure that the equipment and systems being installed are compliant. In addition, Life Cycle Cost analysis and performance guidelines complying with the State Building Code, the NCAC, and the State Construction Office Construction Manual are utilized to achieve the best cost and energy performance on these projects as applicable.

The following tables summarize UNC Hospitals' performance: (1) Table 1 – Net Energy Performance, (2) Table 2 – Water/Sewer Performance, and (3) Table 3 - Energy Cost Avoidance since 2002-2003.

Table 1: Net Energy Performance (Excludes Water, Sewer, Non-potable) Fiscal Year 2002/03 to 2022/23

Fiscal Year	*Total Fiscal Year Energy Cost ($)*	*$/MMBTU*	*$/GSF*	*BTU/SQFT*	*Change in BTU/SQFT (Compared to 2002-2003)*
2002-2003	$8,089,456	$12.74	$4.18	327,754	-
2003-2004	$7,341,105	$11.75	$3.79	322,415	-2%
2004-2005	$8,247,839	$11.22	$4.26	379,383	+16%
2005-2006	$9,943,314	$14.88	$5.13	344,912	+5%
2006-2007	$10,072,484	$16.53	$5.20	314,520	-4%
2007-2008	$11,098,732	$22.16	$5.73	258,574	-21%
2008-2009	$12,369,412	$23.45	$6.39	272,312	-17%
2009-2010	$14,933,832	$24.19	$6.51	269,296	-18%
2010-2011	$15,724,242	$26.07	$6.76	259,123	-21%
2011-2012	$16,301,419	$28.44	$7.00	246,331	-25%
2012-2013	$15,580,123	$26.04	$6.69	257,094	-22%
2013-2014	$17,095,789	$27.84	$7.35	263,887	-19%
2014-2015	$16,231,427	$26.80	$6.97	260,289	-21%
2015-2016	$15,537,130	$26.68	$6.68	250,205	-24%
2016-2017	$15,342,884	$26.74	$6.59	246,508	-25%
2017-2018	$14,844,728	$28.55	$6.38	223,432	-32%
2018-2019	$14,652,897	$27.78	$6.30	226,681	-31%
2019-2020	$15,185,924	$28.45	$6.53	229,354	-30%
2020-2021	$15,102,753	$28.38	$6.49	228,647	-30%
2021-2022	$15,516,292	$29.29	$6.67	227,662	-31%
2022-2023	$19,363,817	$36.78	$8.32	226,242	-31%
2023-2024	$19,428,219	$33.67	$8.35	247,940	-24%
2024-2025	$21,415,335	$34.36	$7.97	231,955	-29%

Table 2: Water/Sewer/Non-potable Consumption Performance Fiscal Year 2002/03 to 2022/23

Fiscal Year	*Total Fiscal Year Cost ($)* *[Water + Sewer + Non-potable]*	*$/1,000 Gallons*	*Gallons/SQFT*	*Gallons/SQFT % Change* *(Compared to 2002-2003)*
2002-2003	$601,556	$5.61	55.39	-
2003-2004	$758,021	$6.19	63.24	+14%
2004-2005	$814,305	$6.01	69.94	+26%
2005-2006	$912,412	$6.51	72.31	+31%
2006-2007	$947,363	$7.19	68.00	+23%
2007-2008	$939,363	$7.79	62.27	+12%
2008-2009	$1,019,309	$8.47	62.15	+12%
2009-2010	$1,244,033	$9.73	55.77	+1%
2010-2011	$1,355,235	$6.61	88.13	+59%
2011-2012	$1,389,014	$10.22	58.39	+5%
2012-2013	$1,192,381	$9.40	54.49	-2%
2013-2014	$1,438,305	$11.38	54.33	-2%
2014-2015	$1,378,546	$11.09	53.42	-4%
2015-2016	$1,347,634	$10.83	53.48	-3%
2016-2017	$1,321,025	$11.02	51.52	-7%
2017-2018	$1,437,922	$11.01	56.11	+1%
2018-2019	$1,377,440	$11.77	50.31	-9%
2019-2020	$1,304,625	$12.10	46.32	-16%
2020-2021	$1,475,234	$13.62	46.55	-16%
2021-2022	$1,535,647	$13.30	49.61	-10%
2022-2023	$1,683,922	$14.71	49.17	-11%
2023-2024	$1,761,818	$15.25	49.66	-10%
2024-2025	$1,898,139	$16.13	43.80	-21%

Table 3: Energy Cost Avoidance (Excludes Water, Sewer, Non-potable), Fiscal Year 2002/03 to 2022/23

Fiscal Year	*Cost Avoidance*
2002-2003	$0 (Baseline Set)
2003-2004	$121,573
2004-2005	-$1,122,418
2005-2006	-$494,632
2006-2007	$423,842
2007-2008	$2,969,439
2008-2009	$2,518,375
2009-2010	$3,241,790
2010-2011	$4,164,737
2011-2012	$5,388,389
2012-2013	$4,282,085
2013-2014	$4,137,616
2014-2015	$4,207,090
2015-2016	$4,815,635
2016-2017	$5,056,887
2017-2018	$6,931,126
2018-2019	$6,533,517
2019-2020	$6,515,232
2020-2021	$6,546,289
2021-2022	$6,821,808
2022-2023	$8,688,358
2023-2024	$6,254,117
2024-2025	$8,844,706

Total Energy Costs Avoided =$96,845,561

A. Accomplishments

1. The renovation of one of our chiller plants has been completed which has improved our energy consumption.
2. A fourth high-efficiency chiller has been added to this plant to complete its build-out.
3. Replacement of three cooling towers in chiller plant 2 with higher efficiency cooling towers has been completed.
4. Implementation of the use of Reuse Water has been completed.
5. Yearly tracking of energy consumption is now being performed by Plant Engineering for determining budgeting needs and for tracking usage levels overall.

6. Replaced the inefficient single pane windows located in our Bed Tower section of the Hospital.
7. Replaced exterior building seals on our APCF building to ensure that the building's exterior envelope is intact.
8. Replaced our liquid ring (water based) medical air compressors with oil-less scroll medical air compressors.
9. Replaced two MRI chillers that were at the end of their life cycle.
10. Replaced portions of the Ambulatory Patient Care Facility's North and South side roofing systems that were at the end of their life cycle.
11. Replaced one domestic water booster pump that was at the end of its life cycle.
12. Contracted with American Energy Assets, LLC in 2016 to provide energy savings through operational optimization.
13. Completed operational optimization contract with American Energy Assets, LLC at the end of fiscal year 2019.
14. Replaced the custom fluorescent tube lighting throughout the Women's & Children's Hospital with CFL and LED lighting. This project was spread across multiple years and was completed in FY2019.
15. Entered a monitoring and maintaining agreement with American Energy Assets, LLC in fiscal year 2020 to monitor optimization.
16. Completed redesign and implementation of variable flow for chillers in both chiller plants to optimize chiller loading and minimize chilled water flow thus increasing actual chilled water delta loading and off peak loads in FY2020.
17. In FY2022, implemented a renewable annual maintenance agreement with Optimum Energy LLC for diagnostic and analytic services and energy management services for maximizing central chilled water system energy efficiency under the CPO-30 control platform.
18. In FY2022, implemented a renewable annual maintenance agreement with Siemens Controls for trend-based data analytics and energy management services for HVAC systems under the Siemens Desigo platform.
19. In FY2022, implemented ongoing semi-annual factory calibration program of master outdoor air temperature/humidity sensor used by all air-handler controllers for outdoor air economizer controls.
20. Began project in FY2022 to replace liquid ring vacuum pumps with electro-mechanical vacuum pumps requiring no water.
21. In FY23, continued to replace existing lighting with LED lighting.
22. In FY23, completed the project to replace liquid ring vacuum pumps with electro-mechanical vacuum pumps which require no water use.
23. In FY24 and FY25, continued to replace existing lighting with LED lighting.
24. In FY25, began recommissioning of the chiller plant operations.

Energy Supply Management

1. The University of North Carolina at Chapel Hill's Energy Services Group is the provider of electrical, steam, and some chilled water services to the Hospital.
2. Orange Water and Sewer Authority is the provider of water and sewer service to the Hospital.
3. Dominion Energy is the provider of natural gas service to the Hospital.

B. Energy Use in Facilities

The hospital utilizes a state-of-the-art Building Automation System for monitoring, tuning, and calibrating the Hospital's mechanical systems to maintain optimum control and energy efficiency.

C. Equipment Efficiency

Major new equipment purchases are based on Life Cycle Cost Analysis and replacement equipment is selected based on current efficiency guidelines.

D. Goals

1. Finish the construction of the NC Surgical Hospital and place into operation. This project is spread across multiple years. Patient use is tentatively to begin in May 2024.
2. Continued recommissioning of the chiller plant to identify and correct inefficiencies and improve energy savings.

Date of Report: *September 4, 2025*

I have read the Strategic Energy & Water plan for my organization. The plan aligns with the reductions set forth in Senate Bill 668.

Michael S. Elks

Michael S. Elks, Director, Plant Engineering
UNC Hospitals

The University of North Carolina at Chapel Hill

Strategic Energy & Water Plan 2025-26

Prepared by:

Facilities Services - Energy Management

UNC Chapel Hill

9/4/25

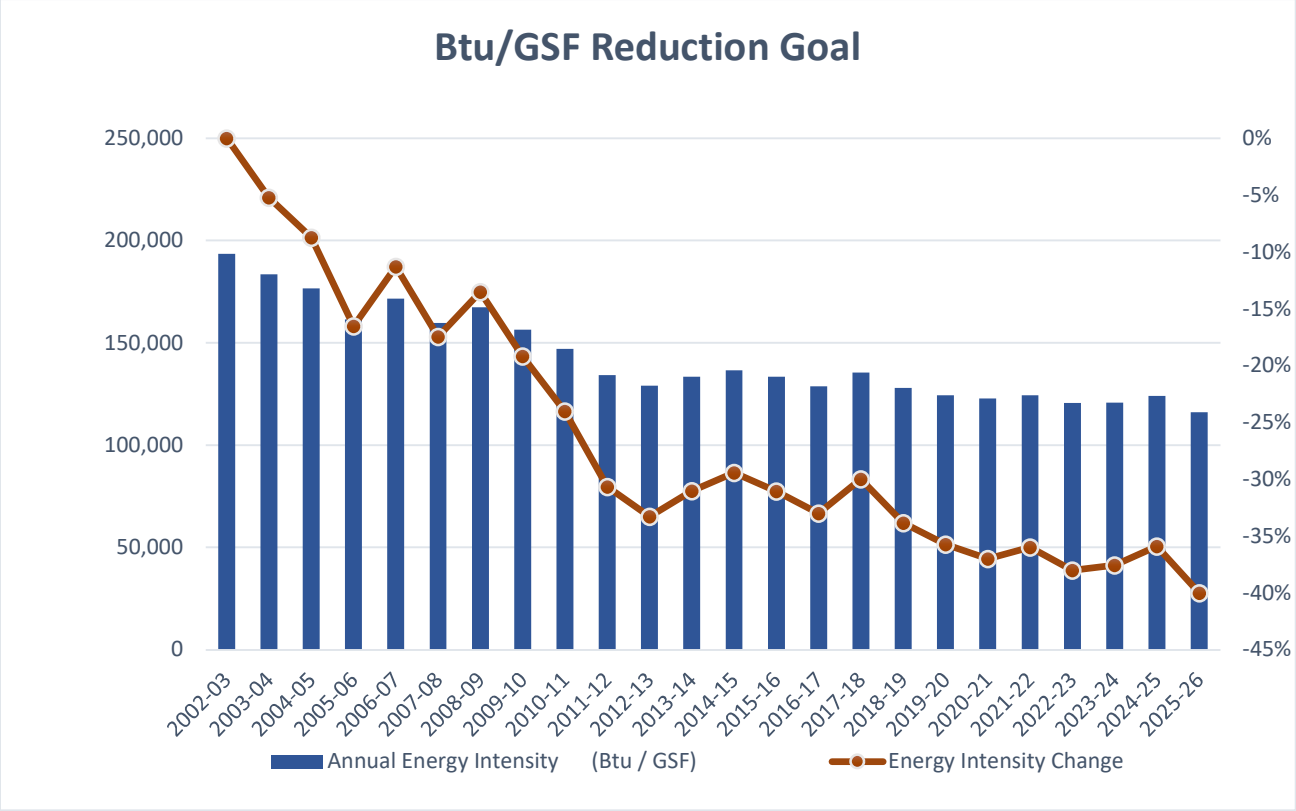
THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

Overview

The Strategic Energy and Water Plan is a requirement of NC GS 143-64.12. (a). This legislation includes a past goal of 30% reduction of energy consumption per gross square foot for all State buildings by 2015 based on energy consumption for 2002-03. UNC Chapel Hill ("UNC CH") achieved this mandated goal and has continued to show annual energy reductions ranging between 31% and 38%. These efforts have resulted in cumulative avoided energy costs in excess of $744,000,000 since 2002-03 for UNC CH.

To encourage increased energy savings, the UNC System has established a goal of 40% reduction of energy consumption per gross square foot by 2025 based on energy consumption for 2002-03. This is a voluntary goal with no current legislative requirements. This goal aligns with the Governor's Executive Order 80, requiring a 40% reduction in energy consumption for all Cabinet Agencies. The purpose of the Strategic Energy and Water Plan is to identify strategies for achieving the 40% reduction goal including outreach programs, energy conservation measures, design guidelines, and alternative energy sources. The plan also includes cost estimates and energy savings analysis.

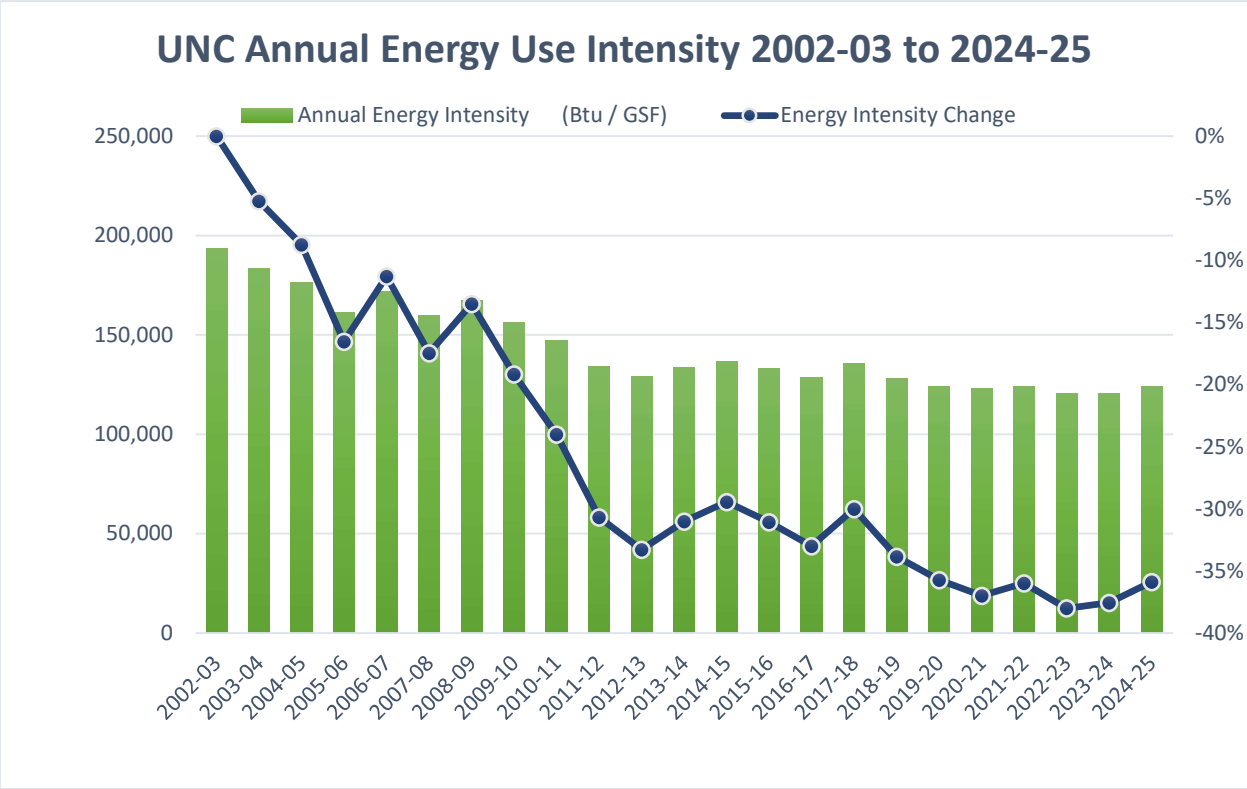
The graph below demonstrates the campus Btu/GSF to achieve the 40% reduction goal.

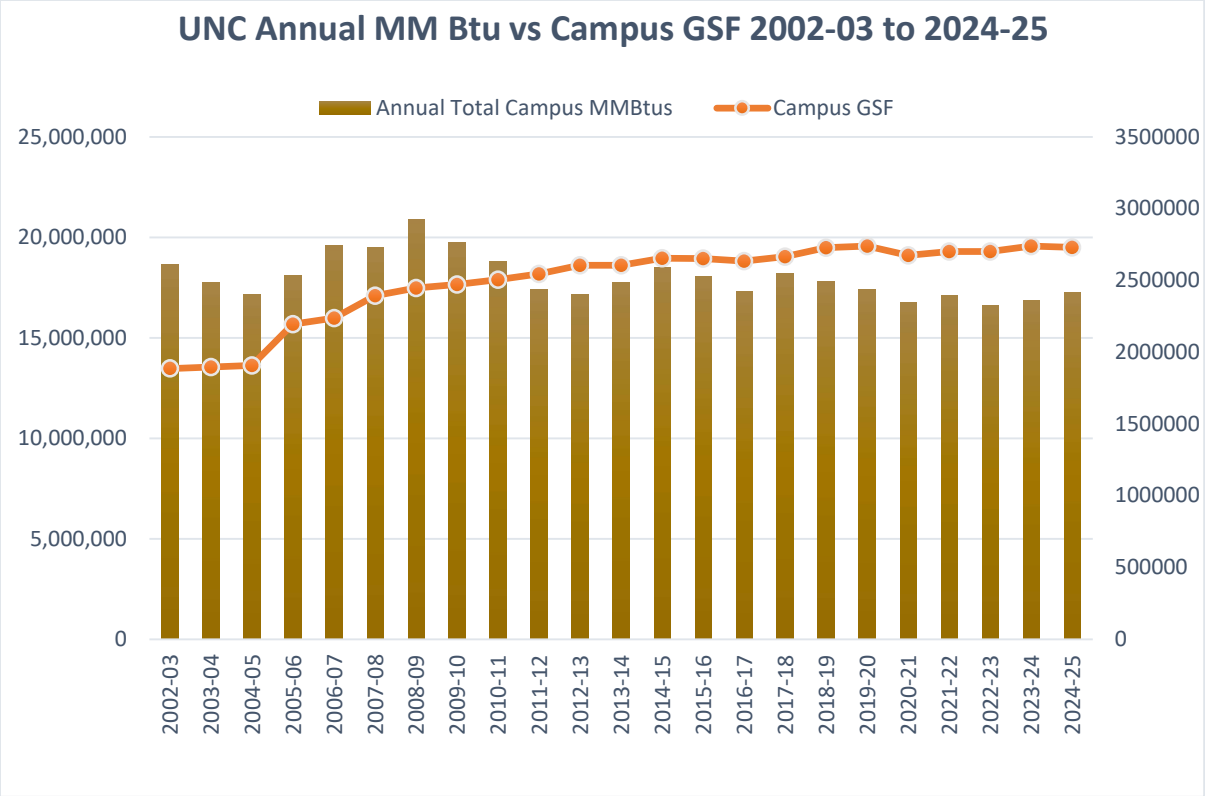


2024-25 Energy and Water Report Metrics and Trends

Energy Usage

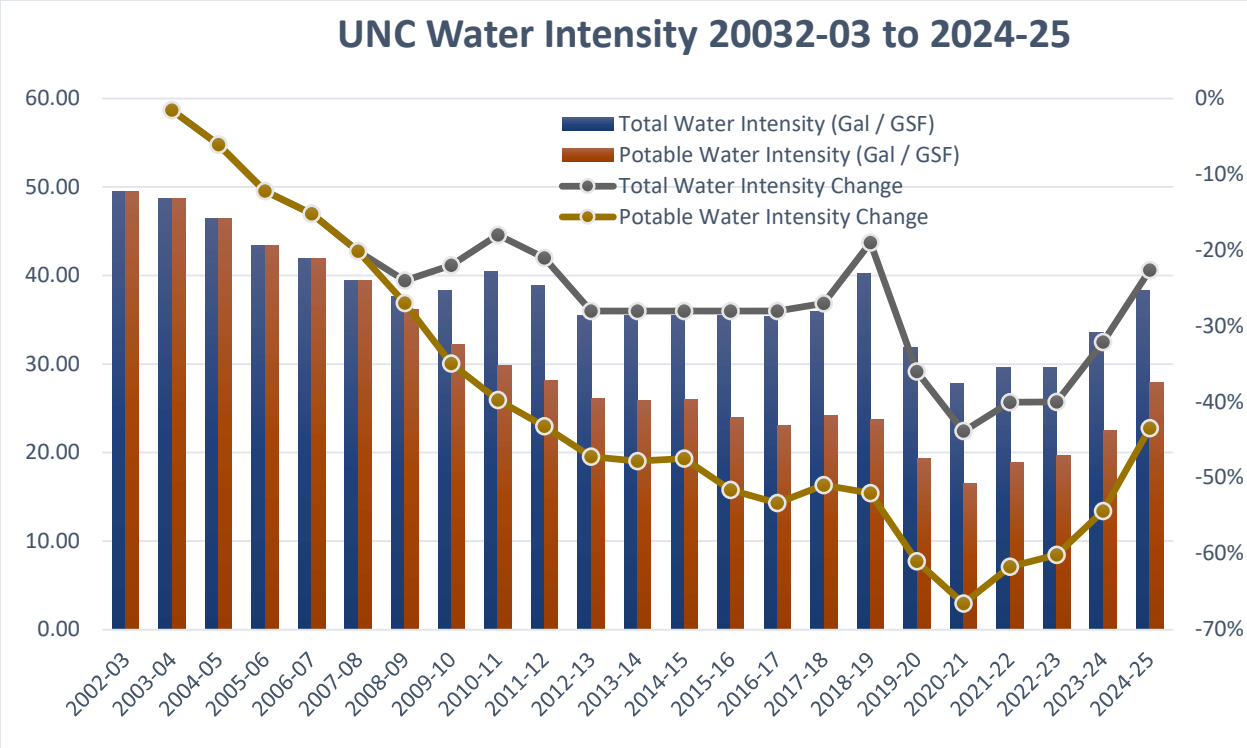
For 2024-25 Energy and Water Reporting, the University of North Carolina at Chapel Hill campus consisted of 421 buildings with a combined building area of 19,499,827 gross square feet. The total campus energy consumption is 2,420,320,074,845 Btu. Energy consumption per gross square foot is 124,041 Btu/GSF: a 36% decrease from 2002-03 energy consumption of 193,500 Btu/GSF. For base reporting year 2002-03, the total energy consumption was 2,607,938,628,500 Btu for a campus size of 13,477,719 GSF. Although the campus has experienced a building GSF growth of about 44.68% since 2002-03, the overall campus energy consumption has decreased by 7.2%.





Water Usage

Potable water usage for 2024-25 is 545,576,000 gallons. Potable water consumption per gross square foot is 27.98 gallons/GSF; a 43.4% decrease from 2002-03 potable water consumption of 49.48 gallons/GSF. The reduction in potable water use is a result of installation of low flow fixtures in restrooms, installation of domestic water cooling controls on autoclaves, replacement of domestic water cooled steam stills with RO water systems, increased use of non-potable water from the Reclaim Water utility on campus and the use of captured rainwater and condensate from cistern storage. The Reclaim Water utility became available in 2008-09 and use of this utility has increased from 27,054 gallons in 2008-09 to 203,544 in 2024-25. Post Covid Pandemic overall decreased occupancy in campus buildings has also impacted water consumption contributing to reductions in overall water use, both potable and non-potable.



2025-26 Strategies

Ongoing Initiatives

Low Cost ECMs and Monthly Monitoring of Building Energy Use. Energy Management has implemented low cost ECMs in 150 major buildings on campus. These 150 buildings represent about 12,000,000 GSF or about 62% of the total campus GSF. Energy Management generates monthly energy forecast reports for these 150 buildings to identify higher than expected energy use by utility allowing for more timely intervention. Maintenance issues are addressed through the maintenance work order system. Low performing buildings are identified for retro-commissioning opportunities, including improved control sequences, tuning of control loops, and calibration of sensors.

Winter Break. The University conducts its annual Winter Break Saving Initiative that focuses on aggressive scheduling of buildings during the 10-day campus closure (Dec 23 – Jan 1).

Target EUIs for Buildings by Type. Energy Management participated with a UNC CH capstone project in 2020 to establish target energy use intensities (EUIs) for each of the building types on campus. This will be another energy analysis tool that will help identify buildings with high EUIs (low performers) creating a more targeted and coordinated approach to defining and implementing ECMs in low performing buildings. Energy Management is also hoping this will be useful tool in selling the value of including energy improvement components in capital projects, including Repair and Renovation projects. Energy Management is planning to make greater use of this analysis during 2025-26.

New Building Construction/Major Building Renovation. New buildings and major building renovations on campus require designs to meet the Performance Standards for Sustainable, Energy-Efficient Public

Buildings (NCGS 143-135.35-40). Designers are required to model the buildings for energy performance and to evaluate life cycle costs of building/energy systems that result in energy savings over the life of the building. The UNC CH team is actively engaged with energy performance throughout the design and construction process, including comprehensive commissioning of the building envelope, building HVAC control systems, and building electrical systems. The Bingham Hall and Avery Residence Hall renovations are nearing completion and consist of energy efficient systems.

Campus Engagement. Energy Management is actively engaged in many outreach programs on campus, including participation in new student orientation, Green Labs, UNCCH Housing Sustainability, UNCCH Three Zeros, RESPC Student Green Fee Organization, student Capstone projects, and student interns through the EcoStudio program and the Sustainable Triangle Field Site (STSF) programs. The programs allow Energy Management to educate campus partners about energy savings opportunities and to assist groups with implementing changes that result in energy reduction. It would be particularly challenging to calculate energy savings specific to these efforts; however, Energy Management believes engaging with campus partners is impactful and helps gain support of other initiatives.

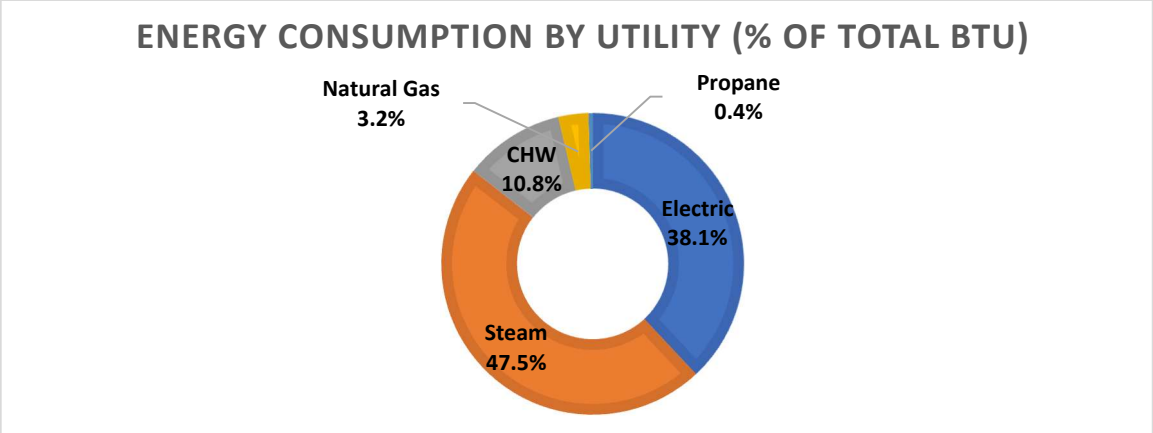
Energy Projects

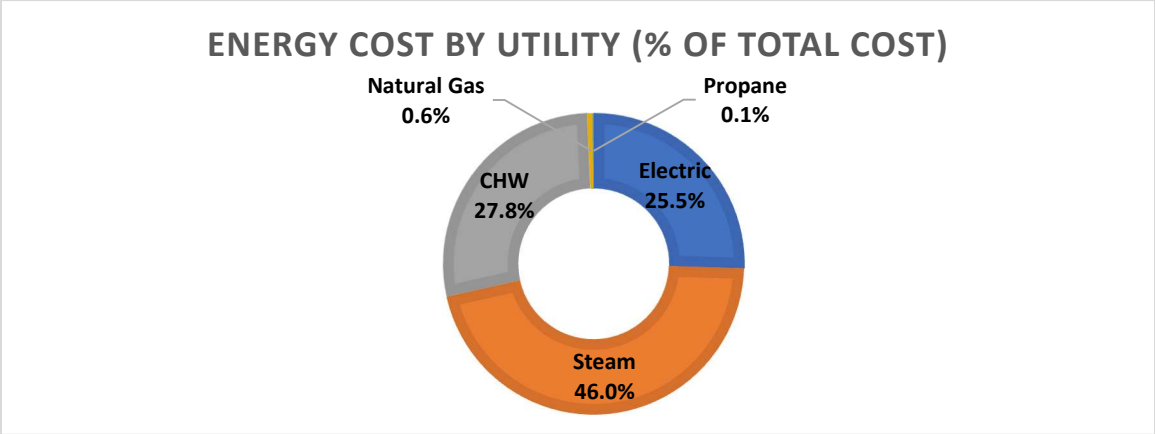
Three Air Flow Reduction projects funded by 1292 funds are being implemented at Thurston Bowles Building, Taylor Hall, and Chapman Hall. These projects are expected to bring the buildings up to current code / safety requirements while achieving energy savings.

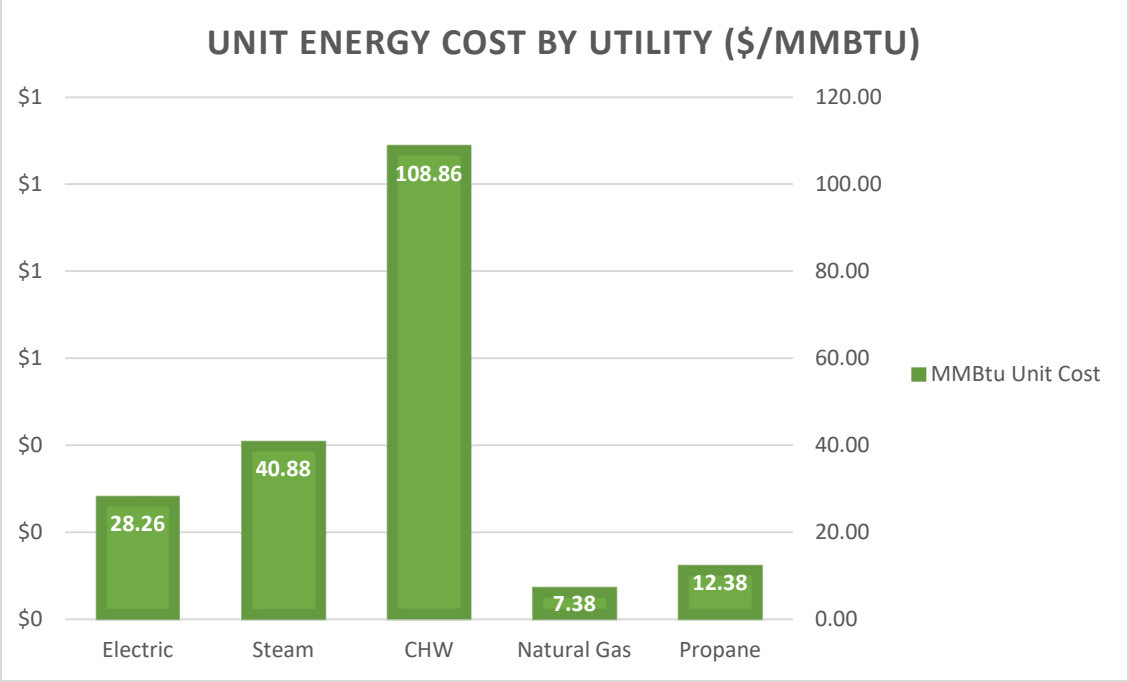
Campus Utilities

Energy *Consumption and Costs*

UNC CH Energy Services supplies all energy on the UNC CH campus including electricity, district chilled water, district steam, natural gas, and propane. About 90% of the campus electricity needs are supplied by Duke Energy Carolinas with the rest supplied by the UNC CH Co-generation plant. Each utility is metered at the building level with a few exceptions for steam to hot water converters that serve multiple buildings. UNC CH Energy Services establishes billing rates for these utilities. For 2024-25 energy consumption by category, cost, and unit cost are demonstrated in the following graphs.







Renewable Energy Projects. UNC CH Energy Services has several active renewable energy projects. The largest of these active projects is the installation of a ground mounted solar array, 320 kW DC. This project includes provisions for future battery storage. This project is located at the Carolina North campus and connected to the electric grid that supplies power to the current north campus buildings. Construction of this project is now complete and commercial operation started on Dec 31, 2024.

The other two renewable projects are rooftop solar arrays planned for Friday Center (70.7 kW DC) and the Carroll Hall Addition (25.2 kW DC) projects. These two projects are funded by RESPC, the student green fund organization. The UNC CH Kenan Flagler Business School is actively seeking renewal energy options as part of the design of the Business School Addition. The design team is pursuing an aggressive EUI target of 46.4 with expectations of further reductions from the use of rooftop solar, an estimated 484 kW combined.

Water

Water, reclaim water, and sanitary sewer utilities are provided by Orange Water and Sewer Authority (OWASA); however, UNC CH Energy Services manages these utilities and bills the campus customers. In 2019-20, OWASA provided UNC CH with the water analytics software called “Aqua Vista”, that provides interval water use data that can be trended and used for notifications, including leak detection. UNC CH Energy Services and UNC CH Energy Management have started using this analytic tool to provide earlier detection of water leaks and to identify high water consumers in different user categories. This tool appears to have high potential for providing timely information that can lead to decreased water consumption. UNC CH Energy Services and UNC CH Energy Management have partnered with student interns in the past to perform initial analysis of the data.

Goal of 40% Reduction in Energy Consumption per GSF

This section identifies specific efforts and projects to achieve the 40% reduction in energy intensity goal.

Strategies

LED Lighting Upgrades. UNC CH is continuing to convert campus lighting to LED. LED fixtures are standard for new construction, including small upfit projects across campus. Exterior lighting has been a prime focus with about 97% conversion to LED lamps. Work on a Campus LED Master Plan has been deferred because of limited staff resources although specific projects are still being pursued. UNC CH Transportation has a LED Master Plan for Parking Decks and Surface Lots, and multiple LED lighting retrofit projects in design and construction. LED lighting upgrade projects were completed at three parking decks in 2020-21 and these completed LED lighting projects have demonstrated significant energy savings of approximately 50%. Other LED lighting retrofit projects are being planned which include conversion of existing T5 fluorescent lamps to LED and conversion of existing T8 fluorescent to lamps LED.

UNC CH Energy Management has mentored several student interns that evaluated LED retrofit projects. In the current product market, their evaluation indicates that the use of LED direct replacement lamps in

new fixtures provides the shortest payback period and allows for flexibility of installation by in-house staff. Many LED retrofit projects appear in the project list across all years and more are under development.

Focus on Steam Use Reduction in Lab Buildings. Steam use on the UNC CH campus accounts for almost 50% of the campus energy consumption and about 50% of the campus energy cost by utility. Since it is also a significant contributor to GHG emissions, focusing on reducing use of this utility has good potential for energy savings and GHG emission reductions. The UNC CH campus supports significant research in energy intensive laboratories. About one-third of the campus' steam usage is at 20 of these laboratory buildings. Current efforts to reduce steam usage in these buildings include retrofitting steam sterilizers (autoclaves) with scheduling programs, identifying steam stills that can be replaced with more energy efficient Reverse Osmosis type systems, and checking for leak by on steam valves. UNC CH also operates an in-house steam trap inspection and repair program that inspects each building once per year. UNC CH Energy Management estimates these efforts will result in a 10% reduction in steam usage for twenty-two targeted lab buildings, representing about 23,770 MMBtu of steam reduction. Autoclave scheduling retrofits have been implemented at three lab buildings with a measurable impact.

Airflow Reduction in Lab Buildings. Many of the older research labs on campus are operating with air change rates exceeding nine air changes per hour (ACH). This ventilation rate requires a tremendous amount of energy to heat/cool/dehumidify the single pass outside air requirement. Current lab standards consider 6 ACH to provide for safe working environments. UNC CH Energy Management and UNC CH Environmental Health & Safety have been partnering to identify lab buildings where airflow reduction projects are feasible and result in reduced energy use. In 2023-24, UNC CH secured 1292 funds for implementing airflow reduction projects in three campus buildings: Thurston Bowles Building, Taylor Hall, and Chapman Hall. Thurston Bowles Building and Taylor Hall projects are currently under construction with completion scheduled for late 2025. The Covid Pandemic has greatly impacted manufacturing and supply chains resulting in significant project cost escalations creating continued holds on projects, including three future projects planned for Lineberger Cancer Research Center, Glaxo Research Building, and Fordham Hall. The three current projects represent an estimated energy reduction of 38,726,385 kBtu and the three planned projects an estimated reduction of 23,811,338 kBtu. The project at Lineberger Cancer Research Center has completed the design phase and the designs are under review.

Expanded HVAC Scheduling in Athletic Buildings. Athletic buildings have sporadic occupancy scheduling based on the nature of the activities occurring in these buildings. As such, it is incredibly challenging to establish fixed occupancy scheduling for HVAC equipment setbacks and shutdowns. UNC CH Energy Management is investigating opportunities to use interactive occupant scheduling tool that provide scheduling information to the BAS to establish unoccupied hours for these buildings. "Events to HVAC" is one such tool used for occupant scheduling and is being successfully used at the Student Activity Center on campus. For Fall Semester 2025, UNC CH Energy Management is collaborating with School of Data Sciences to develop energy dashboards using PowerBI. UNC CH Energy Management is also collaborating with Lambent to understand the current space occupancy rates at 15 buildings and identify opportunities to consolidate usage as well as to implement unoccupied schedules for spaces that are unused during normal business hours.

HVAC Building Controls Upgrades. A considerable number of buildings on campus have outdated HVAC control systems. The oldest of these are pneumatic control systems with no remote visibility. There is also older direct digital control (DDC) based systems that are obsolete and no longer supported by the vendor.

These older software systems are also not compatible with newer Windows operating systems and are presenting IT challenges. UNC CH has partial funding to implement this upgrade. Design work began in 2020-21, and the first phase of the project will be controls upgrades for Lineberger Cancer Research Center, McGavran-Greenberg Hall, and Aycock Family Medical Center. Construction is scheduled to begin during fourth quarter of 2025. Installation of updated controllers, gateways, and software provides expanded opportunities for energy savings through programming of the building automation system, enhanced trending, and enhanced remote graphics. As Energy Management develops more energy conservation measures and initiatives, the same will be added to the project list.

Building Controls Optimization. Utilizing in-house resources and expertise UNC CH Energy Management can assess building controls operation and strategies then implement modifications to optimize operation of building HVAC systems with respect to energy consumption.

2022-23 Project Status

2022-23	Reduction in Usage					
HVAC Projects	Steam (klbs)	CW (ton-hrs)	Electric (kWh)	Btu Reduction	Project Cost Estimate	Status
Energy Management Programs						
Building Optimization	18724	3187859	22746541	109,376,077,869	NA	on going
Steam Reduction						
10% Steam Usage Reduction - 22 Target Buildings	21,942			28,556,635,320	NA	on going
				137,932,713,189	**NA**	

2023-24 Project Status

2023-24	Reduction in Usage					
HVAC Projects	Steam (klbs)	CW (ton-hrs)	Electric (kWh)	Btu Reduction	Project Cost Estimate	Status
Thurston Bowles - Air Flow Reduction	5160	1272413	3009847	19,937,333,310	$2,477,000	on going
Taylor - Airflow Reduction	1378	339677	644967	4,782,144,272	$1,658,000	on going
Chapman - Air Flow Reduction	6965	713036	1042677	14,276,640,430	$616,700	on going
Energy Management Programs						
Building Optimization	18724	3187859	22746541	109,376,077,869	NA	on going
Steam Reduction						
Autoclave Scheduling	3,848	172,336	520108	7,182,733,743	$70,000	Funding Source TBD
10% Steam Usage Reduction - 22 Target Buildings	18,264			23,769,865,440	NA	on going
LED Lighting Projects						
Genetic Medicine: T5 Fluorescent to LED			839020	2,862,736,240	$190,000	on going
Jackson Parking Deck			241516.8	824,055,322	$500,000	Funded by Parking & Transportation
				183,011,586,627	**$5,511,700**	

2024-25 Projects

2024-25	Reduction in Usage					
HVAC Projects	**Steam (klbs)**	**CW (ton-hrs)**	**Electric (kWh)**	**Btu Reduction**	**Project Cost Estimate**	**Status**
Lineberger - Airflow Reduction	8229	439168	487405	13,391,680,227	$2,700,000	on going
Energy Management Programs						
Building Optimization	18724	3187859	22746541	109,376,077,869	NA	on going
LED Lighting Projects						
Caudill Labs: T5 Fluorescent to LED			328320	1,120,227,840	$54,300	on going
				123,887,985,936	**$2,754,300**	

2025-26 Projects

2025-26	Reduction in Usage					
HVAC Projects	**Steam (klbs)**	**CW (ton-hrs)**	**Electric (kWh)**	**Btu Reduction**	**Project Cost Estimate**	**Status**
Fordham Hall - Controls Upgrade & Airflow Reduction	875	215694	980260	4,958,846,981	$1,619,000	Funding Source TBD
Carroll Hall - VAV Zone Control Upgrades	535	182365	128773	1,537,614,755	$1,040,000	Funding Source TBD
Tate-Turner-Kuralt - Add VFDs to HW System			17141	58,485,092	$27,000	Funding Source TBD
MBRL/Glaxo - Glaxo Airflow Reduction	3128	198196	294237	5,534,749,955	$1,208,600	Funding Source TBD
Energy Management Programs						
Building Optimization	18724	3187859	22746541	109,376,077,869	NA	on going
LED Lighting Projects						
House Undergrad Library			596951	2,036,796,812	$62,300	on going
Health Sciences Library			563890	1,923,992,680	$78,400	on going
Sitterson			1566960	5,346,467,520	$410,000	on going
				130,773,031,666	**$4,445,300**	

2026-27 Projects

2026-27	Reduction in Usage					
HVAC Projects	**Steam (klbs)**	**CW (ton-hrs)**	**Electric (kWh)**	**Btu Reduction**	**Project Cost Estimate**	**Status**
McGavran Greenburg - Heat Recovery Replacement	1972	26261	-53122	2,443,110,092	$703,600	Funding Source TBD
Genome Science RetroCx	1536.2	287542.1	689685.4	4,986,295,932	TBD	Funding Source TBD
Kenan Labs - Airflow Reduction (Lower Floor)	3364	335491	223506	5,880,187,071	TBD	Funding Source TBD
Koury Oral Health RetroCx	972.1	166608.3	8330.415	1,660,802,660	TBD	Funding Source TBD
Tarrson - Controls Upgrade	147	50027	110851	685,608,876	$1,170,000	Funding Source TBD
Jackson Hall Controls Upgrade	1344	137614	87098	2,365,627,114	$364,000	Funding Source TBD
Ackland Art Museum Controls Upgrade	469	80084	262287	1,691,115,677	$199,600	on going
Burnett-Womack Duct Sealing	228	12816	79638	598,192,907	$62,357	Funding Source TBD
Energy Management Programs						
Building Optimization	18724	3187859	22746541	109,376,077,869	NA	on going
LED Lighting Projects						
Admin Office Bldg			845559	2,885,047,308	$200,000	on going
EHS			156366	533,520,792	$19,600	on going
MBRB			728791	2,486,634,892	$102,200	on going
New East			189314	645,939,368	$26,500	on going
				136,238,160,558	**$2,847,857**	

Conclusions

The Strategic Energy & Water Plan is a working document designed to provide guidance in reaching the University's goals for reduced energy use intensity and water use intensity. The plan is flexible and allows modifications in response to changes in the University's capital program and the campus operations.

With the current and future planned projects/initiatives identified in this plan, UNC CH will be close to achieving the 40% goal for 2025-26. UNC CH Energy Management is continuing to develop projects/initiatives and to seek funding approval as required to implement. In addition, UNC CH Energy Management is continuing its on-going monitoring and retro-commissioning efforts in-house to maximize low-cost opportunities for energy and water savings. The resulting energy savings from these efforts will be captured in subsequent updates to the Plan.

Energy Mandate

I have read the Strategic Energy and Water Plan for the organization. The plan, as presented, supports the reductions required in Session Law 546.

Vee Veerabhadrappa

Vee Veerabhadrappa

Director, Energy Management

Signed by:
Howard Wertheimer
9B17C5754973414...

Howard Wertheimer

Interim Associate Vice Chancellor of Facilities Services

Strategic Energy Plan

September 2025

1. Table of Contents

2. EXECUTIVE SUMMARY

Established by the N.C. General Assembly in 1963, the University of North Carolina School of the Arts was America's first state-supported arts school. It opened in Winston-Salem "The City of Arts and Innovation" in 1965 and became part of the University of North Carolina System when it was formed in 1972.

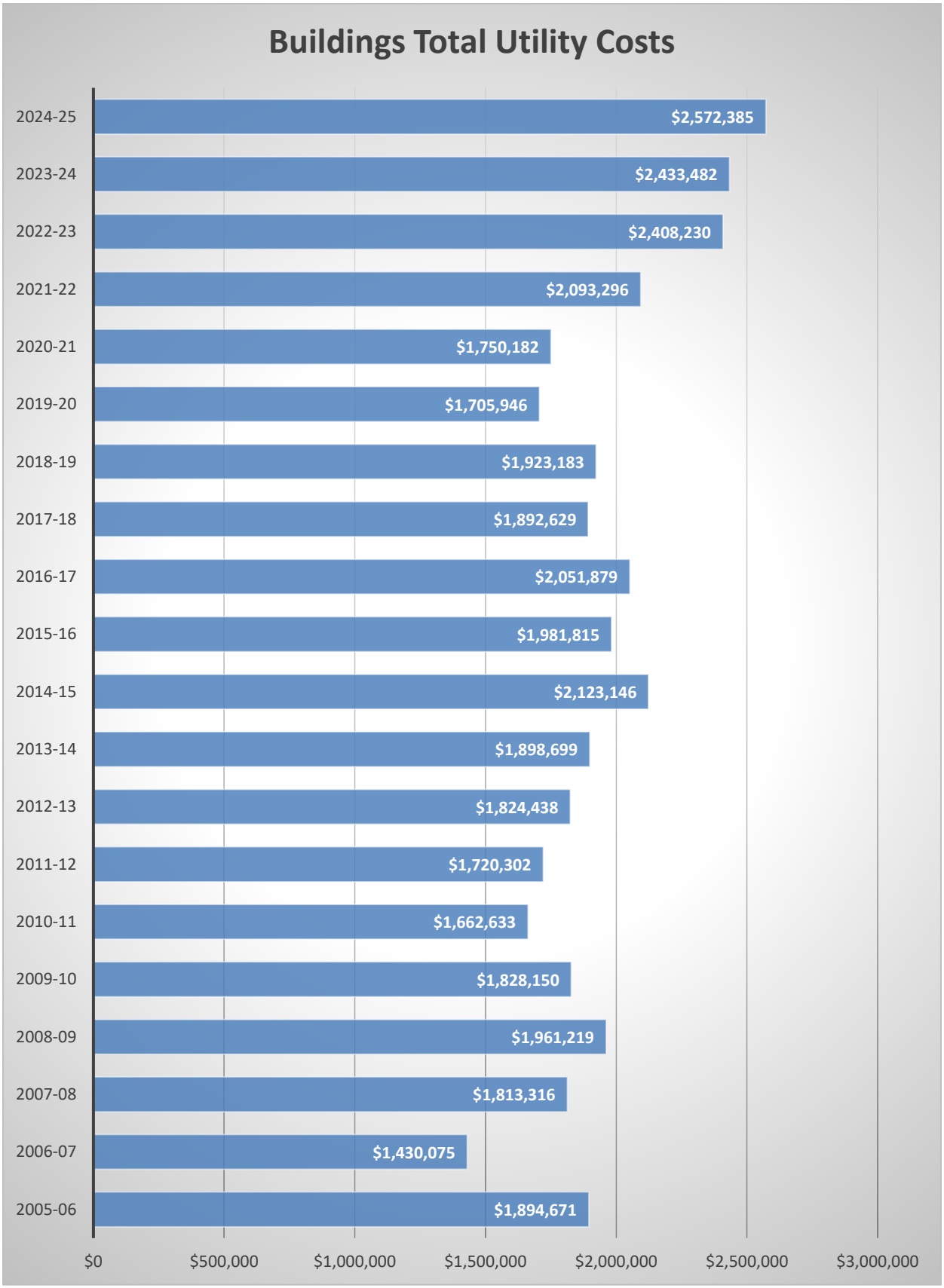
UNCSA is a unique, stand-alone public university consisting of five arts conservatories. These conservatories are Dance, Design & Production, Drama, Filmmaking, and Music. On average more than 1,300 high school, undergraduate and graduate students are enrolled annually. The campus is south of downtown Winston-Salem and is comprised of 54 buildings with 1.25 million square feet of conditioned space, nestled on 70 acres. There are approximately 600 full-time, part-time & adjunct faculty and staff members employed at UNCSA.

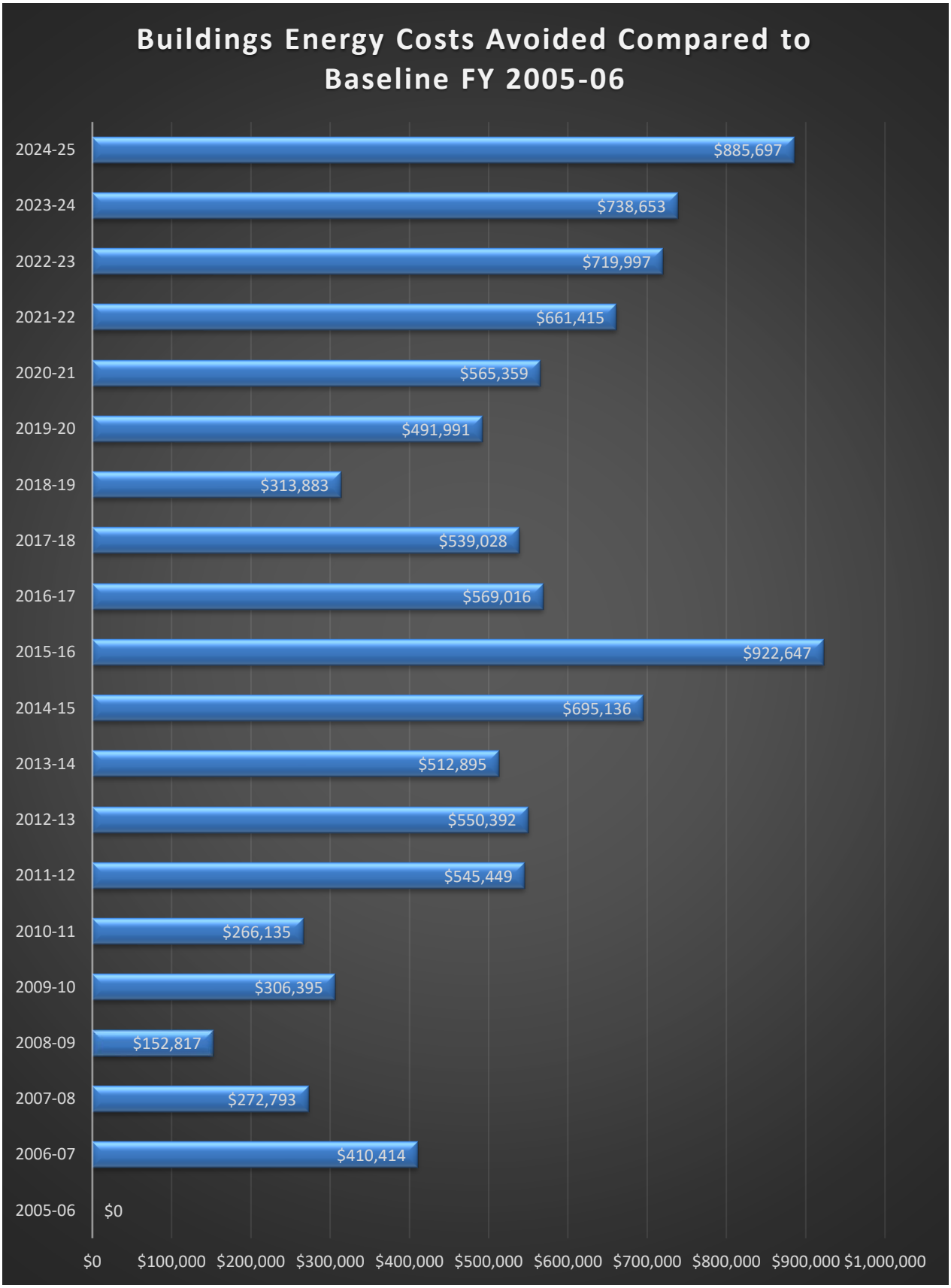
UNCSA's utility mix is approximately 65% electricity, 25% natural gas and 10% water. As compared to the baseline fiscal year of 2005-06, UNCSA was able to produce a cost avoidance of $885,697.00 in the 2024-25 fiscal year. This was due to UNCSA's ongoing approach and commitment to energy conservation methods to better manage and reduce our campus' energy usage, purchase higher efficiency HVAC equipment, striving to reduce water consumption by using low use water fixtures and continually replacing any incandescent bulbs on our campus with LED's. The University strives to replace aging and energy inefficient equipment, with higher efficiency equipment to meet our goals and be more sustainable when our operational and capital budgets allow. The Facilities Management technicians work in conjunction with contractors to progressively look for opportunities to conserve energy and be better stewards of our resources.

The combined energy dollar amounts per square foot are $1.86 this fiscal year, this is an increase of $0.10 as compared to the previous fiscal year. The increase is largely due to rate increases from our utility providers during FY

2024-25. The total energy BTUs used per square foot for FY 2024-25, were 93,200, which is 28% below our baseline FY 2005-06.

UNCSA continues to strive to lower our energy consumption per square foot, as mandated by Executive Order No. 80. While UNCSA is one of the smaller universities in the UNC System, we are on par with other universities in the system reducing our consumption per square foot and will continue to make that a top priority at UNCSA.


Buildings Total Utility Costs
2024-25
$2,572,385
2023-24
$2,433,482
2022-23
$2,408,230
2021-22
$2,093,296
2020-21
$1,750,182
2019-20
$1,705,946
2018-19
$1,923,183
2017-18
$1,892,629
2016-17
$2,051,879
2015-16
$1,981,815
2014-15
$2,123,146
2013-14
$1,898,699
2012-13
$1,824,438
2011-12
$1,720,302
2010-11
$1,662,633
2009-10
$1,828,150
2008-09
$1,961,219
2007-08
$1,813,316
2006-07
$1,430,075
2005-06
$1,894,671
$0
$500,000
$1,000,000
$1,500,000
$2,000,000
$2,500,000
$3,000,000


Buildings Energy Costs Avoided Compared to Baseline FY 2005-06
2024-25
$885,697
2023-24
$738,653
2022-23
$719,997
2021-22
$661,415
2020-21
$565,359
2019-20
$491,991
2018-19
$313,883
2017-18
$539,028
2016-17
$569,016
2015-16
$922,647
2014-15
$695,136
2013-14
$512,895
2012-13
$550,392
2011-12
$545,449
2010-11
$266,135
2009-10
$306,395
2008-09
$152,817
2007-08
$272,793
2006-07
$410,414
2005-06
$0
$0
$100,000
$200,000
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$400,000
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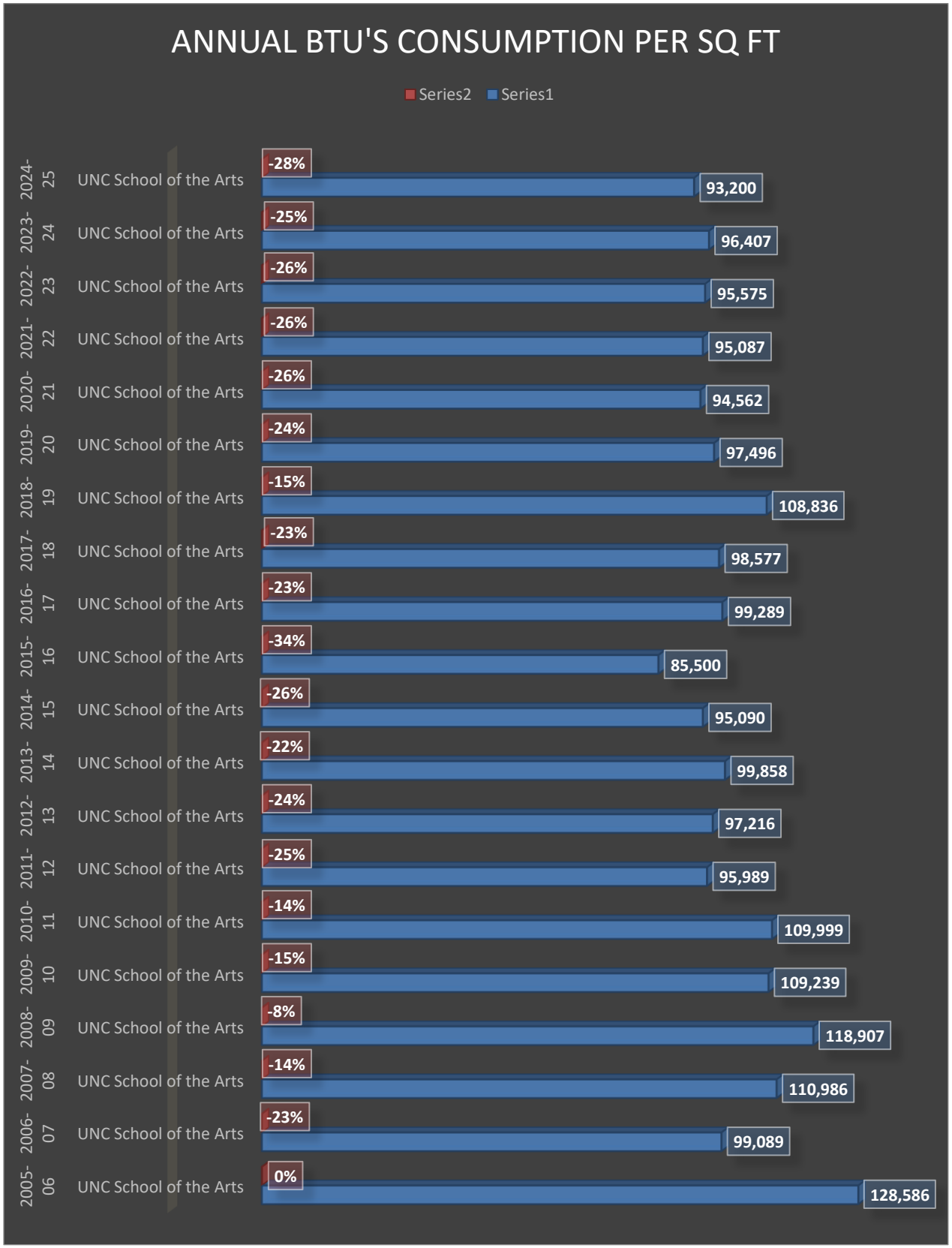
$800,000
$900,000
$1,000,000


ANNUAL BTU'S CONSUMPTION PER SQ FT
Series2
Series1
2024-25 UNC School of the Arts -28% 93,200
2023-24 UNC School of the Arts -25% 96,407
2022-23 UNC School of the Arts -26% 95,575
2021-22 UNC School of the Arts -26% 95,087
2020-21 UNC School of the Arts -26% 94,562
2019-20 UNC School of the Arts -24% 97,496
2018-19 UNC School of the Arts -15% 108,836
2017-18 UNC School of the Arts -23% 98,577
2016-17 UNC School of the Arts -23% 99,289
2015-16 UNC School of the Arts -34% 85,500
2014-15 UNC School of the Arts -26% 95,090
2013-14 UNC School of the Arts -22% 99,858
2012-13 UNC School of the Arts -24% 97,216
2011-12 UNC School of the Arts -25% 95,989
2010-11 UNC School of the Arts -14% 109,999
2009-10 UNC School of the Arts -15% 109,239
2008-09 UNC School of the Arts -8% 118,907
2007-08 UNC School of the Arts -14% 110,986
2006-07 UNC School of the Arts -23% 99,089
2005-06 UNC School of the Arts 0% 128,586

3. ENERGY PLAN, GOALS & STRATEGY

The Facilities Management Department strives to raise awareness of our energy savings initiatives on our campus. We continue to educate and inform our campus community of where we are trying to move the University in respect to energy conservation. Our focus continues to be placed on pursuing higher efficiency HVAC equipment, water heaters, low use water fixtures, lighting controls, temperature set-back scheduling of unoccupied buildings and rooms when not in use, etc. We strive to work towards lowering our energy use; measured against the comfort and health of our students, faculty, and staff learning and working in our buildings.

We had various energy efficient strategies employed to reduce our energy consumption and utilities cost this past fiscal year. We replaced several small older and less efficient HVAC systems with much more efficient equipment in mechanical, electrical, and elevator equipment rooms on campus. The HVAC Shop is continually searching for non-compliant BAS controls parts that are not functioning and then correcting them to ensure we do not waste energy. The Plumbing Shop looks for ways to save and conserve water usage, by replacing flush valves to ensure there are no leaks and monitoring water valves and backflow preventers for any leaks on campus. We replaced two 350 Ton cooling towers at our central chiller plant; this will save us not only electrical consumption but reduce the amount of water used by the makeup water system. We replaced two older non-condensing hot water boilers, with condensing hot water boilers, not only to solve maintenance issues but save natural gas consumption as well. We replaced a 50-year-old 800A motor control center with a much smaller 400A electrical panel and installed variable speed drives versus the old motor starters. In the coming fiscal year, we have four non-condensing hot water boilers to be replaced with condensing boilers in three different buildings, also we will be replacing an 18-year-old air-cooled chiller with a much more energy efficient air-cooled chiller. These projects will no doubt reduce our energy consumption now and into the future, and we will continue to look for ways to save and conserve energy usage where we can.

4. COMMITMENT STATEMENT

As a university we understand that energy and water consumption can and needs to be managed to our benefit. Energy and water management is the responsibility of the occupants at each building, led and supported by Facilities Management.

The Department Heads will review progress and results semi-annually and will support staff attendance in training within energy and water management at least annually.

Strategic Energy & Water Plan Mandate – Goals

1. Reduce energy consumption by 40% per square foot for all buildings, as compared to the baseline of 2005-06.
2. Require that lights be turned off in interior spaces of unoccupied buildings and upward-directed flood lighting on buildings from midnight to 6am unless required for safety, emergency, or insurance purposes.
3. Require a feasibility analysis for energy conservation measures with a specified schedule and target building sizes. The initial wave would cover buildings greater than 20,000 square feet, in operation for more than 10 years, which have not already been so evaluated within the last three years.

Strategic Energy & Water Plan Mandate – Commitment

I have read and support the Strategic Energy & Water Plan for my Organization Implemented this 3rd day of September in the year 2025.

Director - Mechanical Maintenance	AVC – Facilities Management	Vice Chancellor Finance & Administration

North Carolina Justice Academy

Strategic Energy Management Plan 2025-2026

Executive Summary

Existing Conditions – The North Carolina Justice Academy (NCJA) owns and operates the East and West campuses. The East Campus is in Salemburg, N.C., with 24 buildings of various ages totaling approximately 204,206 square feet. Our West Campus is in Edneyville, N.C., with six buildings of various ages totaling approximately 94,014 square feet. The NCJA maintains these facilities to research, develop, produce, and deliver training courses to public safety professionals, including law enforcement, detention officers, and telecommunicators. We also provide facilities and housing for other state and local departments to reserve for public safety training.

BTUs per Square Foot by Campus – Each campus is presented as follows:

The East Campus in Salemburg's current average energy usage is approximately 12,122,161,244 BTUs. This is an increase of 7.4% from the previous year but a 13% decrease from 2019. The East Campus BTU target goal is 11,300,000,000 from a 2023-24 starting point of 12,122,161,244 BTUs.

The West Campus in Edneyville's current average energy usage is approximately 7,030,147,379. This is an 11% decrease from 2022-23. The West Campus BTU target goal is to reduce its consumption by 30,147,379 BTUs.

Energy and Water Consumption –

East Campus in Salemburg Utilization:

2,359,485 kilowatt-hours (kWh) of electricity at a cost of $ 283,085
40,716 therms of natural gas at a cost of $45,704
0 gallons of propane at a cost of $ 0
1,060,000 gallons of water/sewer at a cost of $ 29,980.

West Campus in Edneyville Utilization:

1,113,098 kilowatt-hours (kWh) of electricity at a cost of $ 144,244.
0 therms of natural gas at a cost of $0.
3,645 gallons of propane at a cost of $4,656.
764,000 gallons of water/sewer at $50,156.08

Implementation – The NCJA will seek to institutionalize energy efficiency as a worthwhile value by: 1) Designating the Facilities Manager responsible for taking the necessary steps to attempt to meet the goals and requirements of this plan. 2) The Facilities Manager will monitor power and water consumption, report noticeable usage increases, and schedule repairs if needed. 3) NCJA Maintenance staff will quickly repair equipment and buildings to prevent energy loss. 4) Replacing old inefficient lights and equipment will be taken as funds permit. 5) NCJA will ensure that faculty, staff, and students who work with energy equipment or are involved in energy-related decisions receive training for implementing a plan and adhere to the approved energy guidelines. 6) Establish energy guidelines for the NCJA Campus to follow to conserve energy. 7) Providing training and technical resources to assist the Facilities staff in evaluating various energy-saving technologies. 8) As funding is critical to all budgets, it is imperative that NCJA strives to reduce unnecessary plug load and increase better energy reduction behavior across campus by enforcing the approved energy guidelines.

Mandate

The NCJA Director and NCJA Deputy Director (Operations) will review the progress and results annually. They will support staff training in energy and water management yearly.

Strategic Energy Management Plan Mandate- Goals
Reduce annual Total Energy Consumption by a minimum of 5 % by fiscal year 2026-2027 from a baseline fiscal year 2009-2010.

Strategic Energy Management Plan Mandate- Measures
NCJA tracking measures will be the following Key Performance Indicators (KPI):
Total Energy Use Btu per Square Foot per year

Strategic Energy Management Plan Mandate- Commitment

I have read and support the Strategic Energy Plan for my Organization Implemented this 18th day of July 2025.

Commitment

We recognize that energy and water consumption can be managed to our benefit. Energy and water management is the responsibility of the occupants at each facility, guided and supported by the Energy Manager. The attached plan outlines the activities and expenditures required to reduce energy and water consumption to achieve the program goals.

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Director of NCJA: Trevor Allen

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Deputy Director (Operations) of NCJA: Dan Worley

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Facilities Manager of NCJA: Greg Raynor

Key Performance Indicators

2002-2024

Energy Evaluation						Water/Sewer Evaluation				
energy $ avoided	energy $/gsf	$/mmbtu	$/mmbtu %change	btu/sf	btu/sf %change	water $ avoided	$/kgal	$/kgal %change	gal/sf	gal/sf %change
	$1.26	$15.09		83,848			$3.71		15.22	
-$11,046	$1.40	$16.06	6%	87,216	4%	-$1,462	$3.61	-3%	17.20	13%
$19,817	$1.38	$17.59	17%	78,330	-7%	-$1,553	$4.50	21%	16.90	11%
$75,977	$1.41	$21.28	41%	66,362	-21%	-$2,162	$4.49	21%	17.58	16%
$58,630	$1.36	$19.70	31%	69,275	-17%	$440	$5.95	60%	14.85	-2%
$69,976	$1.44	$21.26	41%	67,727	-19%	$1,854	$6.60	78%	13.84	-9%
$72,192	$1.46	$21.65	44%	67,523	-19%	$6,717	$7.64	106%	10.91	-28%
$16,226	$1.63	$20.37	35%	79,948	-5%	$4,921	$8.00	116%	12.20	-20%
$225	$1.60	$19.12	27%	83,791	0%	$7,887	$8.92	141%	10.89	-28%
$41,464	$1.47	$19.96	32%	73,678	-12%	$4,915	$8.64	133%	12.43	-18%
$35,892	$1.47	$19.65	30%	74,906	-11%	$10,071	$10.10	172%	10.33	-32%
$48,691	$1.47	$20.40	35%	72,162	-14%	$10,914	$10.41	181%	10.08	-34%
$27,771	$1.52	$19.79	31%	76,975	-8%	$5,016	$9.29	151%	12.57	-17%
$16,226	$1.57	$19.66	30%	79,806	-5%	$5,411	$10.08	172%	12.59	-17%
$47,632	$1.45	$20.02	33%	72,195	-14%	-$1,411	$8.71	135%	16.01	5%
$59,776	$1.48	$21.19	40%	70,036	-16%	-$705	$8.30	124%	15.63	3%
$67,486	$1.51	$21.96	46%	68,799	-18%	$11,706	$11.84	219%	10.37	-32%
$88,352	$1.33	$21.04	39%	63,285	-25%	$16,223	$12.59	239%	8.90	-41%
$86,313	$0.99	$16.89	12%	58,829	-30%	-$5,913	$4.36	18%	21.86	44%
$155,408	$1.10	$22.21	47%	49,576	-41%	$9,964	$11.13	200%	10.83	-29%
$147,580	$1.40	$25.29	68%	55,275	-34%	$41,489	$22.66	511%	6.25	-59%
$135,619	$1.61	$27.12	80%	59,362	-29%	$57,895	$28.28	663%	5.19	-66%
$0	$0.00	$0.00	0%	0	0%	$0	$0.00	0%	0.00	0%
$0	$0.00	$0.00	0%	0	0%	$0	$0.00	0%	0.00	0%
$0	$0.00	$0.00	0%	0	0%	$0	$0.00	0%	0.00	0%
$0	$0.00	$0.00	0%	0	0%	$0	$0.00	0%	0.00	0%
$0	$0.00	$0.00	0%	0	0%	$0	$0.00	0%	0.00	0%
$0	$0.00	$0.00	0%	0	0%	$0	$0.00	0%	0.00	0%

Focus Area 1 Data Management

Planned Activities

Bills and invoices will be received by the accounts payable staff for processing. The Accounts Payable staff member will forward the invoice to the Facility Manager, who will review, document, and enter all incoming utility bills into the NCJA energy consumption spreadsheet. The facilities manager will review entries for errors and, if necessary, take steps to resolve them.

Responsible: NCJA Accounts Payable Staff, Facility Manager

Funding source: Salary (Appropriations)

Metric: No late fees, and all necessary data recorded and reviewed

Planned Activities

Request for possible solutions for real-time building environmental controls to be installed and data collection for funding the project.

Responsible: NCJA Deputy Director (Operations) and Facilities Manager

Funding source: Salary (Appropriations) and Repair and Renovation funds

Metric: Moving forward with the issuance of a Request for Proposal of new environmental controls.

Planned Activities

The Facilities Manager will contact the utility providers and review each account to verify they are assigned to the correct rate schedule.

Responsible: NCJA Facilities Manager

Funding source: Salary (Appropriations)

Metric: Each account is reviewed for errors and corrections made.

Focus Area 2 Facility Projects

Planned Activities

Complete a survey of all buildings on both the East and West campuses to compile a list of low-cost, energy-effective projects.

Responsible: NCJA Facilities Manager and Maintenance Supervisor

Funding source: Salary (Appropriations) and Repair and Renovation

Metric: To solicit energy savings through more efficient and updated equipment.

Planned Activities

Update and replace the boiler system located in the Operations Division building, which is currently inefficient. Before the project begins, the NCJA Facilities Manager will communicate with the Capitol Project Manager to determine the level of detail and the most cost-effective and energy-efficient product to install. The Facilities Manager will validate the results and communicate energy savings and other benefits upon completion.

Responsible: NCJA Facilities Manager, NCDOJ Capitol Projects Manager, and NCJA Deputy Director (Operations)

Funding source: Salary (Appropriations); Repair and Renovation Funds and/or Capitol Project funds

Metric: To install a new, more efficient Boiler system for the Operations Division building.

Planned Activities

Replace several roofs atop campus buildings at both campuses with newer, more efficient materials. Many of the roofs are currently experiencing water leaks, leading to water intrusion of the structure and poor energy insulation.

Responsible: NCJA Deputy Director (Operations), NCDOJ Capital Projects Manager, and the NCJA Facilities Manager

Funding source: Salary (Appropriations); Repair and Renovation Funds

Metric: New roofing on multiple buildings to prevent energy loss and damage to buildings.

Planned Activities

Acquire estimates for multiple environmental systems on the NCJA Campuses. Request to replace multiple non-functioning control systems on Campus buildings.

Responsible: NCJA Facilities Manager, NCDOJ Capital Projects Manager, and the NCJA Deputy Director (Operations)

Funding Source: Salary (Appropriations), Repair and Renovation funds

Metric: Replace or repair building environmental control systems to help solicit efficient uses of our energy demands.

Focus Area 3 Water Conservation

Planned Activities

The Facilities Manager along with the Plumbing Tech will identify any unusual high meter readings. The Plumbing Tech will work with City Water Department on this issue. Once identified the plumbing department will make repairs as necessary.

Responsible: NCJA Facilities Manager, NCJA Maintenance Supervisor, and NCJA plumbing tech.

Funding source: Salary (Appropriations)

Metric: To repair leaking or inoperable backflows and solicit the conservation of water due to loss or misuse.

Planned Activities

NCJA maintenance and the NCJA plumbing technician will ensure all backflow devices are tested and that any deficiencies discovered during testing are repaired.

Responsible: NCJA plumbing technician and NCJA Maintenance Supervisor

Funding source: Salary (Appropriations) and Repair and Renovation funding

Metric: Install new backflow preventers to prevent water loss, lowering the cost of water utility bills and invoices.