

# North Carolina State University



## CUSTOMER BENEFITS

- Turnkey solution
- Reduced energy costs
- Systems interoperability and scalability
- Seamless interface and information sharing
- Customizable reporting suite

## PROJECT AT A GLANCE

Project Type:  
Performance Contract

Location:  
Raleigh, North Carolina, USA

Number of Buildings:  
13 buildings (1.6 million sq. ft.)

### Energy Conservation Measures:

- Lighting retrofit
- EMS upgrades
- Cooling tower replacement
- Solar-thermal heating system
- Water conservation fixtures
- Mechanical system modifications
- Building envelope upgrades
- Utility sub-meters

Annual Utility Savings:  
\$1.5 million

Installation:  
2011



Taking a bold step to increase energy efficiency, cut costs, and reduce its carbon footprint, this forward-thinking university signed a performance contract with guaranteed energy savings to pay for much-needed facility improvements.

### The Challenge

Established in 1887, North Carolina State University (NCSU) has earned a national reputation as a leader in education and research, and gained global recognition in the fields of science, technology, engineering, and mathematics. Located in Raleigh, the state capital, NCSU boasts an enrollment of 34,000 students and a world-class faculty of over 2,000.

By 2008, the university faced a future of funding uncertainty. At the same time, facilities staff had to contend with a backlog of \$670 million in repair and renovation projects across 400 buildings.

For years, the facilities staff struggled to maintain and operate aging equipment and buildings. In a few buildings, people complained about insulation mixed in with the air blowing from vents as a result of deteriorating ductwork. In addition, energy demand and costs continued to rise.

“Through performance contracting, we’re able to take on these projects immediately without incurring cost to the taxpayer or the students.”

**Kevin McNaughton**  
Associate Vice Chancellor for Facilities

NCSU officials decided to explore performance contracting as a way to pay for repairs and renovations. (A performance contract provides a turnkey solution that incorporates system design, construction, and commissioning along with guaranteed energy savings that pay for the improvements.)

More than a dozen state-approved ESCOs received NCSU’s request for a proposal. Schneider Electric™ was among a handful of ESCOs responding to the request. Schneider Electric conducted a preliminary audit to assess and prioritize the university’s needs, targeting 13 facilities because of their high energy use.

Ultimately, NCSU decision-makers awarded the contract to Schneider Electric because of its experience working simultaneously in many buildings and its track record for successfully addressing other NCSU projects over the years.

The \$20 million performance contract targeted improvements that included upgrading equipment and implementing energy-efficient techniques to impact energy use, operations, reliability, and comfort levels.

As the project began, Schneider Electric faced the typical challenges — working in multiple, occupied buildings with a compressed time frame to complete the work. In 2010, the Schneider Electric team got right to work.

### The Solution

This performance contract marked the first time the university financed repairs and renovations in this manner. The contract called for implementing 89 separate energy conservation measures (ECMs) ranging from direct digital controls (DDC) and LED lighting with occupancy sensors — to HVAC systems and solar-thermal heating panels.

Schneider Electric installed new utility meters to provide better real-time tracking of the energy use in

the targeted facilities. NCSU also implemented new conservation measures to improve the operating efficiency of these facilities and to lower their overall energy costs.

A new solar-thermal system installed on the roof of Carmichael Complex, the campus gym, now heats water for domestic use and two swimming pools containing one million gallons of water. The new system’s 112 solar panels can heat water to approximately 100 degrees.

Thanks to energy savings generated in other areas, Schneider Electric was also able to remedy the problem of insulation blowing through vents in a few buildings and to upgrade building envelopes where needed.

The improved operating efficiency of 111 existing fume hoods in Dabney Hall’s research labs resulted from installing six large strobic fans, flow sensors, face velocity controllers, sidewall sensors, and sash position sensors.

Today, the Schneider Electric PASS program provides remote monitoring and technical support along with a complete analysis and reporting of energy use, guaranteeing energy savings and project performance after the initial installation. In the event NCSU does not realize the guaranteed savings, Schneider Electric will pay the difference.

### The Bottom Line

In addition to helping NCSU fast-track backlogged building upgrades, this performance contract will help the university meet the requirements of Senate Bill 668 and PACE (President’s Advisory Committee on Efficiency and Effectiveness) while saving over 10 MKw hours of electricity and 68,785 Dth of natural gas annually.

The performance contract allows NCSU to pay for upgrades to heating, cooling, and lighting systems over time with savings generated by lower utility bills. These efforts also help the university to improve

air quality, save money, and address deferred maintenance projects while gaining critical insight into energy use.

NCSU expects the total energy savings to exceed the cost of the performance contract. With an annual utility bill of more than \$30 million, every bit of energy savings helps. For example, the university expects improvements in Dabney Hall's research labs to yield 20 percent in energy savings for the entire project.

In 2012, NCSU signed a new natural gas procurement and risk management contract with Summit Energy™, a subsidiary of Schneider Electric.

This contract eliminates the typically fragmented approach to energy management and sustainability issues by providing pricing visibility, procurement support, market options, and invoice audits to ensure proper billing.

Energy conservation measures for this performance contract will have a positive environmental impact over the next 20 years that translates into...

- Reducing the university's carbon footprint by 37 percent
- Removing 43,158 cars from the roads
- Planting 80,376 acres of trees to help restore the ecosystem balance



Photo by Roger Winstead, North Carolina State University

