

## Energy

### [Graphs of Energy Usage](#)

The data gathered from the electrical meters on campus help us see trends in electricity usage, such as the residence halls have lower usages in the summer months, reflecting the decreased resource demands of partial occupancy, and when students, faculty, and staff return for Fall, they bring many of their bad electricity habits with them.

Unfortunately, these numbers do not reflect the cost of providing the electricity. The same single Watt of electricity will cost more if used during peak usage times like early afternoon to evening in summer and early morning to mid-day in winter. By saving electricity during these peak times you help us save more money, which can then be diverted to our other resource conservation efforts.

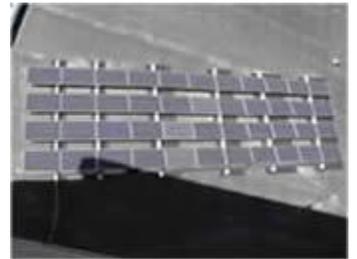
## Resource Conservation in Action

McKee Hall is a prime example of the benefits of building improvements on resource conservation. Through increased efficiency in the HVAC equipment as well as the help of faculty, staff, and student who use the building, electricity usage has steadily been decreasing since 2006. We hope to expand these results to other buildings on campus. To find out how you can help, please visit our [Commit to Conserve](#) Page. Thank you for all your help, and keep up the good work.

## Solar

UNC has invested in a small 10kw solar array on top of McKee Hall. This was installed Fall of 2008, and the cost was offset with an Xcel energy rebate of 50 percent of the \$100,000 cost and a Governors Energy Office \$10,000 grant. In the last four years this system has generated 37,250 kWh of electricity without using any fossil fuels.

[View the system status online](#) to see how much energy the McKee Hall solar array is generating right now.



## Electrical

**Controllable Breaker Panels:** UNC installed a BAS controlled breaker system at Michener Library in Spring of 2009. These breakers control the lighting circuits and turn off the lights in unoccupied conditions. Michener was originally designed without any light controls. Since we are able to shut off the lights, it is projected to save approximately \$40,000 annually.



**LED Breezeway Lights At McKee Hall:** UNC has installed new breezeway lights at McKee Hall. These are LED and only use 54 watts compared to the 250-watt lamps that were being used. The savings in energy costs plus rebates from our electric provider and reduced maintenance costs pays for the lights in just over 2 and ½ years and last for 10 years compared to the old style lasting 2 years.

**Induction Lighting Retrofits on Central Campus:** UNC has replaced all the walkway lights on Central Campus with induction type lights. By using this type of system over the high-pressure sodium style we cut the energy consumption by 65 percent. This savings, plus rebates from our electric provider, gave us a year-and-a-half simple payback on our investment.

**Variable Frequency Drives:** UNC utilizes variable frequency drives on most pumps and fans on campus. This technology allows UNC to use only the amount of power needed to accomplish the task and decreases the motor speed needed. This saves as much as 50 percent of the power over running the motors at full speed and extends the life of the equipment.

**Premium Efficiency Motors:** UNC uses only premium efficiency motors when replacing old motors and in new construction. These motors have an average return on investment of two years.



## Additional Conservation Projects

Occupancy sensors installed in classroom and other spaces, and most vending equipment is equipped with occupancy sensors to shut off the lights during unoccupied times.



More than 20 older refrigerators were replaced with more efficient [energy star](#) rated units with a grant from the Governors Energy Office. Most mechanical equipment now includes premium efficiency motors and variable frequency drives.

Dining services has replaced most ovens with Rational Combi Ovens providing increased efficiency and energy savings due to reduced cooking time.

Most lighting on campus has been upgrades to more efficient lamp types such as compact fluorescent, induction and LED. Most incandescent lamps have been eliminated.

Exterior lights are controlled by a combination of photo sensors and the building automation system.

## Heating and Cooling

UNC design standards require high efficiency centrifugal chillers, which use less energy to create one ton of cooling and releases fewer GHG emissions than other technologies. Recent installations include Butler Hancock, Campus Recreation Center and New West Campus Residence Halls North and South. Installations are planned for Kepner, Carter, Guggenheim and Crabbe halls.

## Additional Conservation Projects

Re-commissioned HVAC systems throughout campus to optimize performance.

Upgraded the Heating Plant pumping arrangement to improve efficiency.

Expanded the building automation system campus to control additional equipment and implemented additional night, weekend, and holiday temperature setbacks.

Replaced one of the original boilers at the Heating Plant with a new unit, including economizer capabilities.

Installed VFD's on most pumps and cooling towers on campus.

Pump coolant lines have been re-piped to recycle the water as condenser water rather than dumping the water down the drain.