

# Energy Savings



**Plug in to Cost Containment Measures**

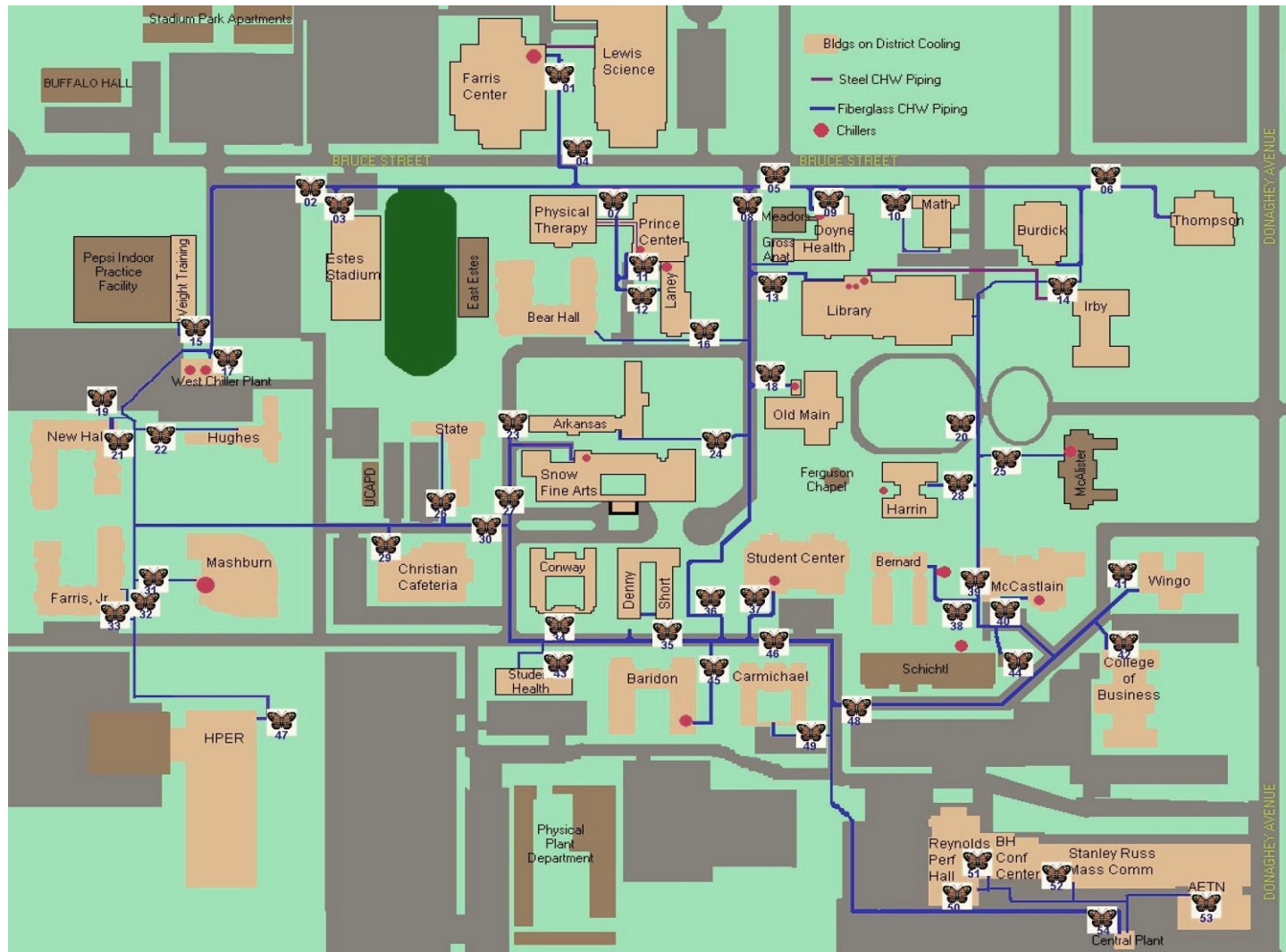
# A long, long time ago (1996)

- Every UCA building had its own chiller
- Inefficient and inappropriately sized lighting fixtures wasted electricity.
- Oversized and obsolete boilers wasted gas.
- Little attention was given to reducing water waste.
- Much HVAC equipment used archaic controls, which wasted energy and made diagnosing equipment failures difficult.

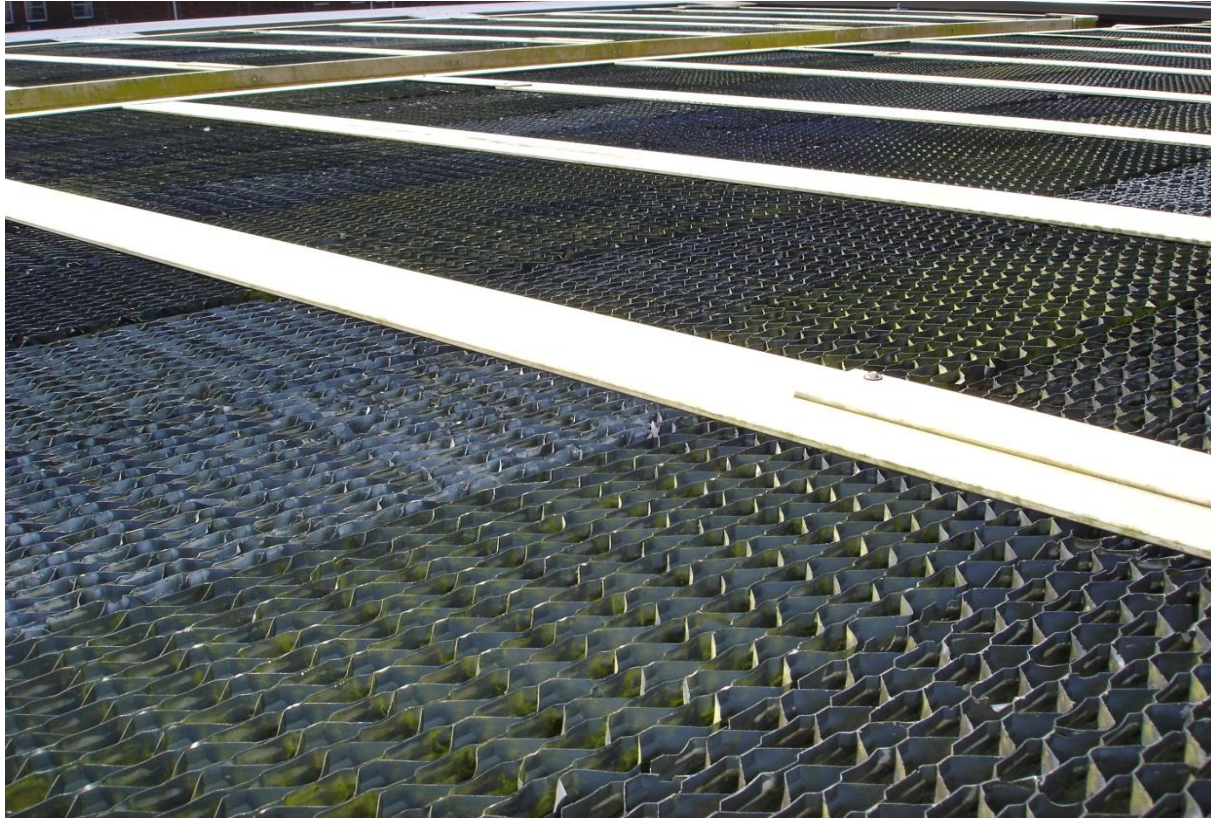
# Today (2013)

- District Cooling connects state of the art cooling equipment to almost every building on campus.
- Replacing/Retrofitting light fixtures is cutting power demand as much as 70% for lighting
- Replacing old hot water and steam boilers has produced dramatic reductions in gas energy use.
- Aerators installed by CenterPoint free of charge are reducing water and energy use.
- Sophisticated digital controls now operate almost all HVAC equipment, saving energy and increasing comfort.
- Etc!

# Meet your District Cooling System



# Chilled Water Plants



The main chilled water plants are at Farris Center (700 tons), West Plant ( 1600 tons), and South Plant (700 tons).

Located at the West Chiller Plant, the newest chiller (800 ton) is the most efficient available. It uses less than 50% as much energy as our oldest chillers.



# Why plug into a District Cooling Loop?

- Heating and Air Conditioning our buildings accounts for as much 84% of the energy use.
- Chillers on the loop were chosen for their high efficiency.
- Connecting a building to the loop requires considerably less up front capital.
- The loop is a more reliable source of cooling than a sole chiller in a building.

# Upgrade to Efficient Boilers

- Bernard Hall- Replaced steam boiler with more efficient hot water boilers.
- Doyne Health Science – Replaced obsolete steam boiler with modular condensing hot water system
- Harrin – Installed high efficiency condensing boiler
- Lewis Science – Replaced large obsolete steam boiler with modular hot water boiler system.
- Mashburn –replaced obsolete steam boiler system with high efficiency hot water system
- Baridon – Installed high efficiency condensing boilers.
- McCastlain – Installed high efficiency condensing boiler system.
- Old Main- Installed high efficiency condensing boiler system.
- President's Place – Replaced inefficient boiler heating with modern high efficiency gas furnaces.
- Prince Center – Replaced all boilers with more efficient multi-stage boilers

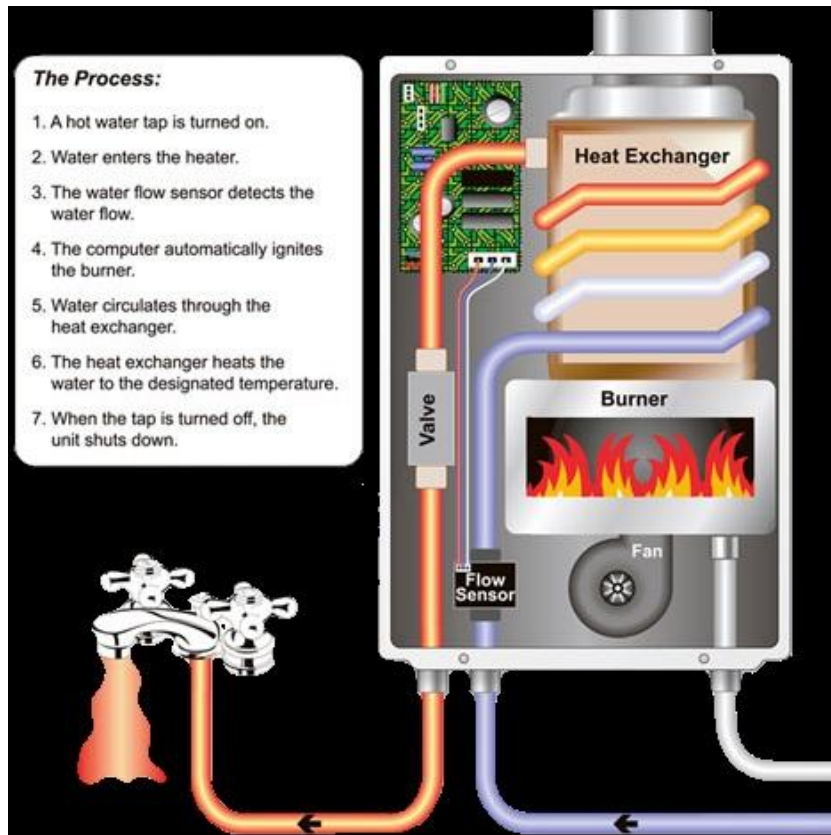


# Solar Panels at Christian Cafe

- A \$12,000 grant from SGA funded solar hot water heaters that preheat water for cleaning dishes, etc.
- This saves us about 1000 therms of energy a year or \$1000



# Tankless Water Heaters



- College Square – Tankless water heaters provide both building heat and domestic hot water for faucets and showers, saving thousands of dollars a year.
- Schichtl – Four Tankless heaters replaced a single worn-out boiler.
- Conway and New Hall – Tankless water Heaters now heat water for sinks and showers.

**Condensing Heaters can save 20-25% in energy!**

# Ferguson Chapel LEDs



# Old Main Ida Waldron Auditorium



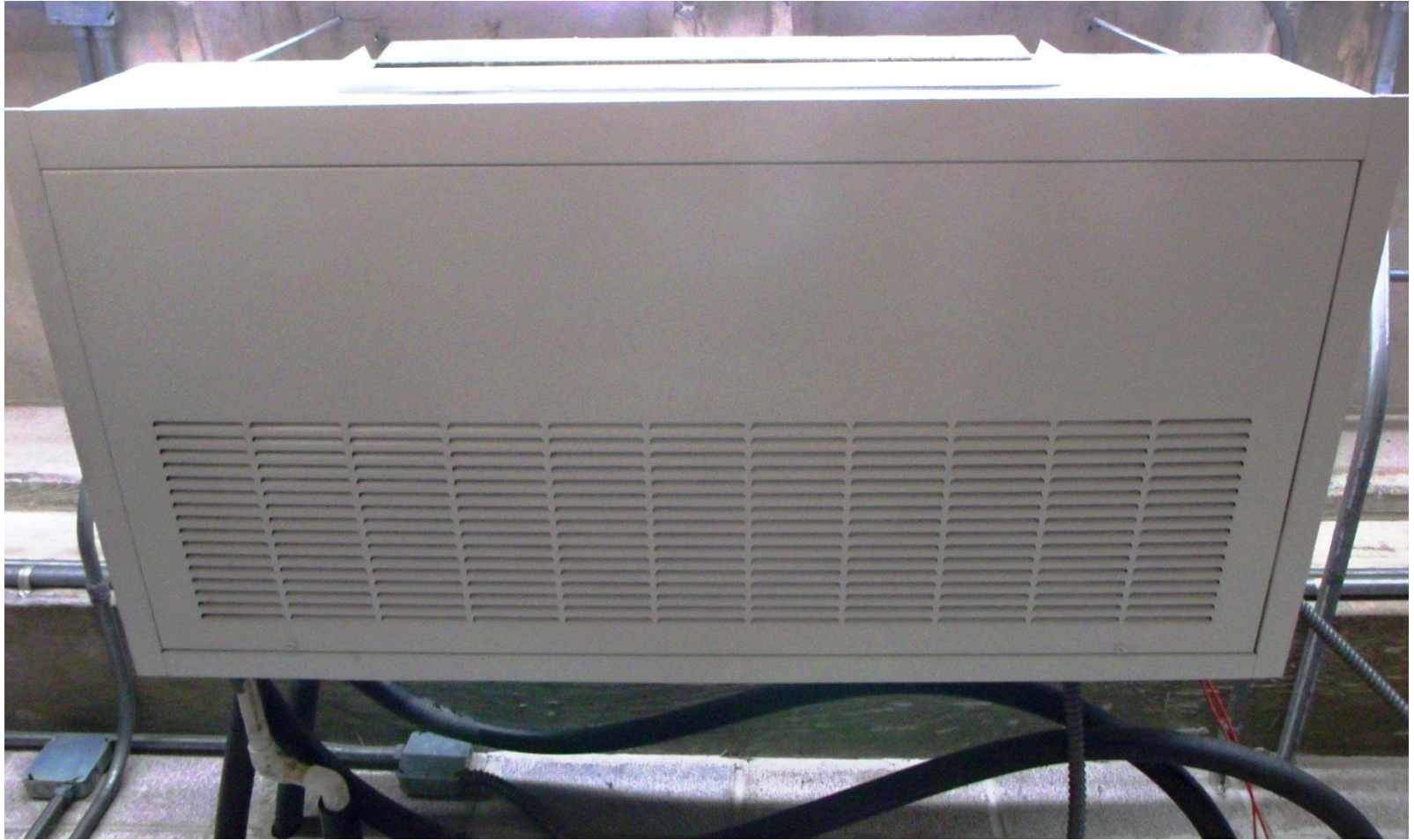
# Snow Fine Arts Recital Hall





Aerators are installed campus wide in buildings where water is heated with natural gas

# Fan Coil Units



# Laney Fume Hoods





NON-E&G/OTHER BUILDINGS TOTAL  
ENERGY USE (1000s of BTUs per SF)  
\*Shown for Info Only—not counted in UCA's Totals

|                                     | 2007      | 2012      | Change    |
|-------------------------------------|-----------|-----------|-----------|
| Christian                           | 317       | 290       | -9%       |
| AETN*                               | 81        | 108       | +34%      |
| Estes Stadium                       | 79        | 80        | +1%       |
| Pepsi Indoor Practice               | 26        | 35        | +34%      |
| HPER                                | 45        | 37        | -18%      |
| Student Center                      | 95        | 87        | -8%       |
| <b>Non-E&amp;G, Non-dorm Totals</b> | <b>88</b> | <b>89</b> | <b>2%</b> |

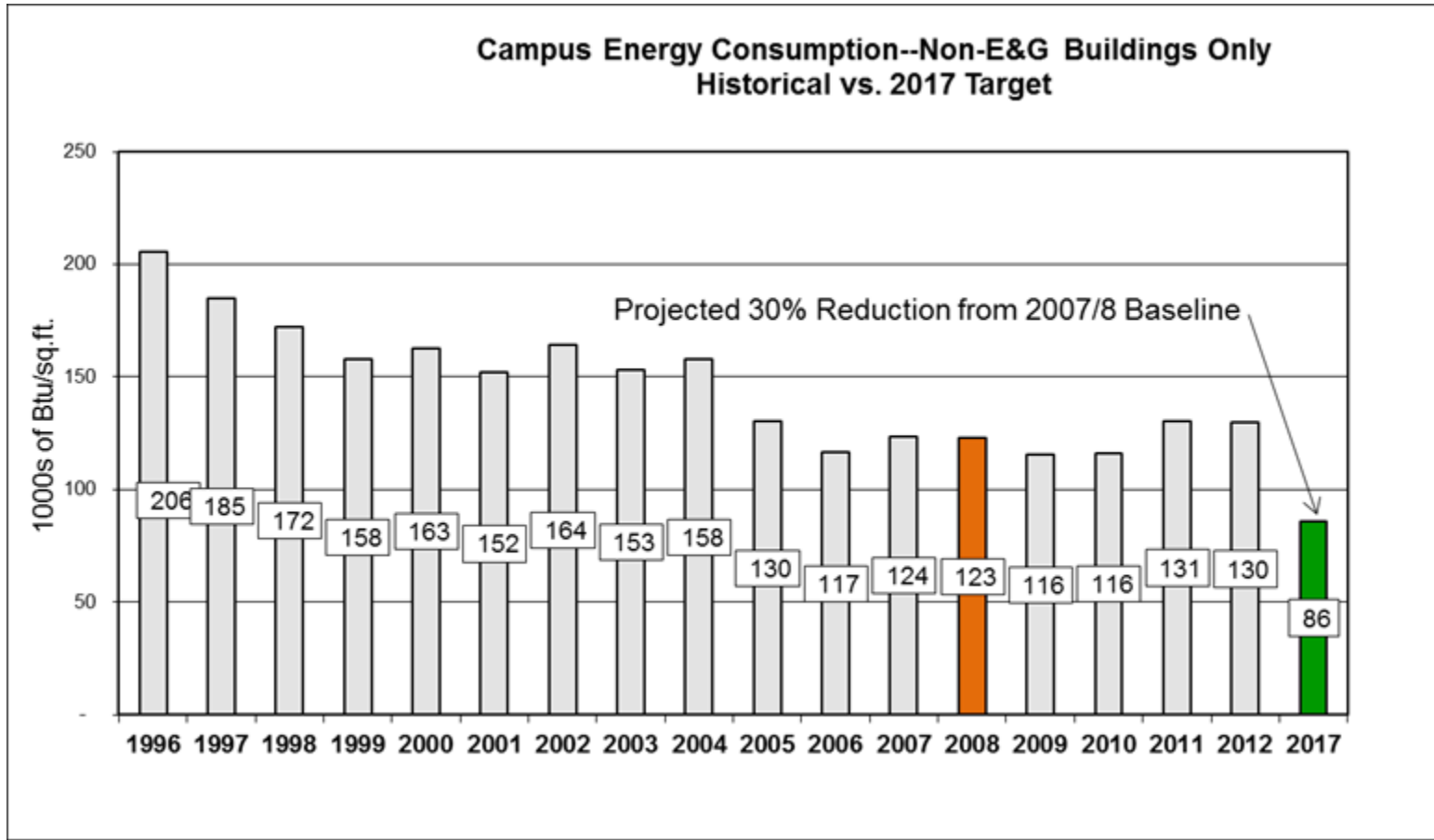
## RESIDENCE HALLS TOTAL ENERGY USE

(1000s of BTUs per Square Foot)

\*Only 4 months data in 2012

|                              | 2007      | 2012      | Change     | 2007 Rank | 2012 Rank |
|------------------------------|-----------|-----------|------------|-----------|-----------|
| Arkansas Hall                | 89        | 73        | -18%       | 12        | 11        |
| Baridon Hall                 | 75        | 61        | -18%       | 10        | 7         |
| Bear Hall *                  | -         | 21        |            | -         | 1         |
| Bernard East (Dorm)          | 75        | 75        | 0%         | 9         | 12        |
| Carmichael                   | 74        | 71        | -4%        | 7         | 10        |
| Conway Hall                  | 68        | 61        | -10%       | 6         | 6         |
| Farris, Jr                   | 51        | 45        | -13%       | 3         | 2         |
| Hughes                       | 63        | 63        | 0%         | 5         | 8         |
| Minton Hall                  | 74        |           |            | 8         | 13        |
| New Hall                     | 42        | 52        | +23%       | 1         | 3         |
| Short/Denny Halls            | 58        | 52        | -11%       | 4         | 4         |
| Stadium Park                 | 49        | 55        | +12%       | 2         | 5         |
| State Hall                   | 85        | 69        | -19%       | 11        | 9         |
| <b>Residence Hall Totals</b> | <b>53</b> | <b>49</b> | <b>-8%</b> |           |           |

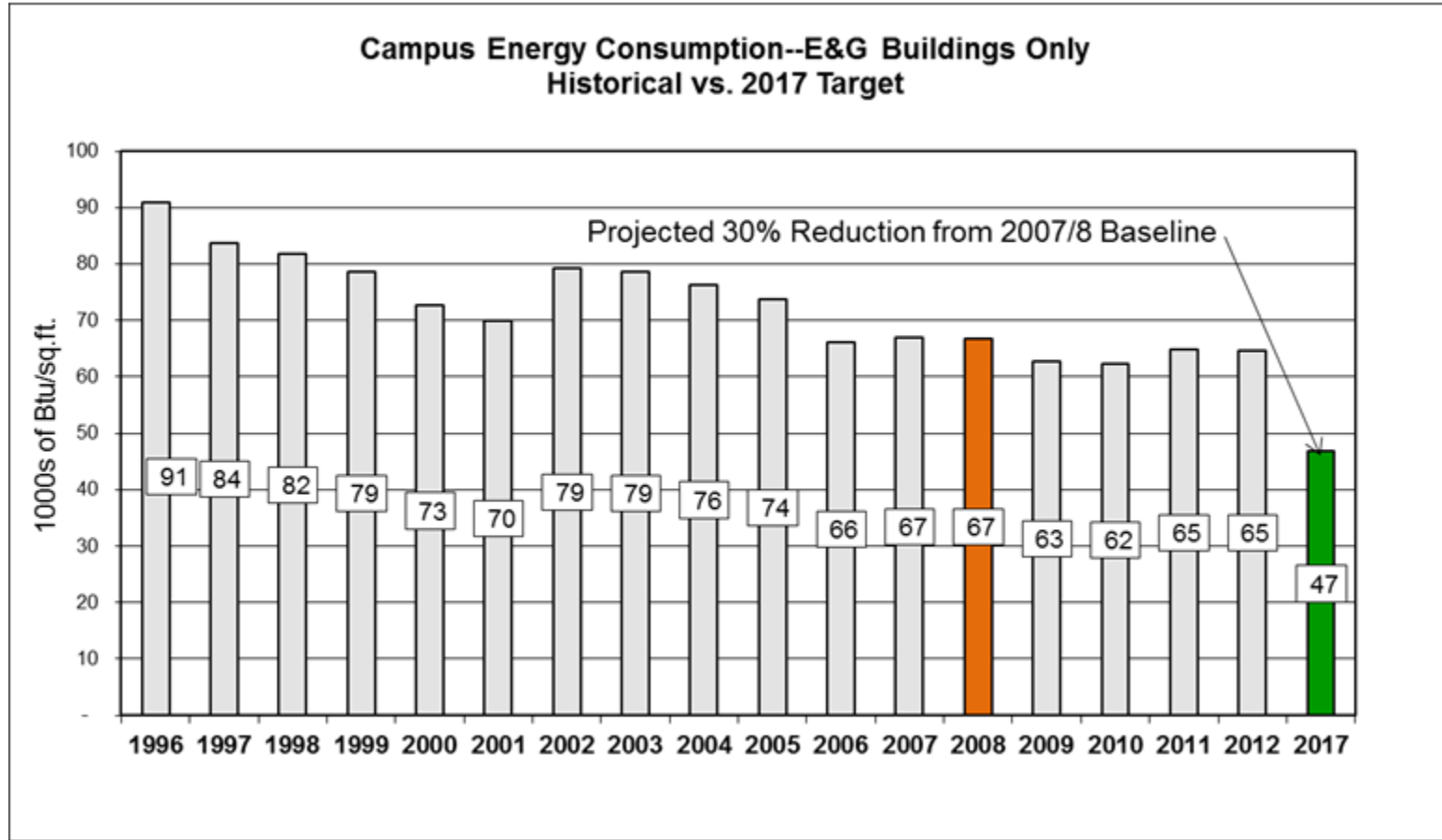
# Non E&G Target



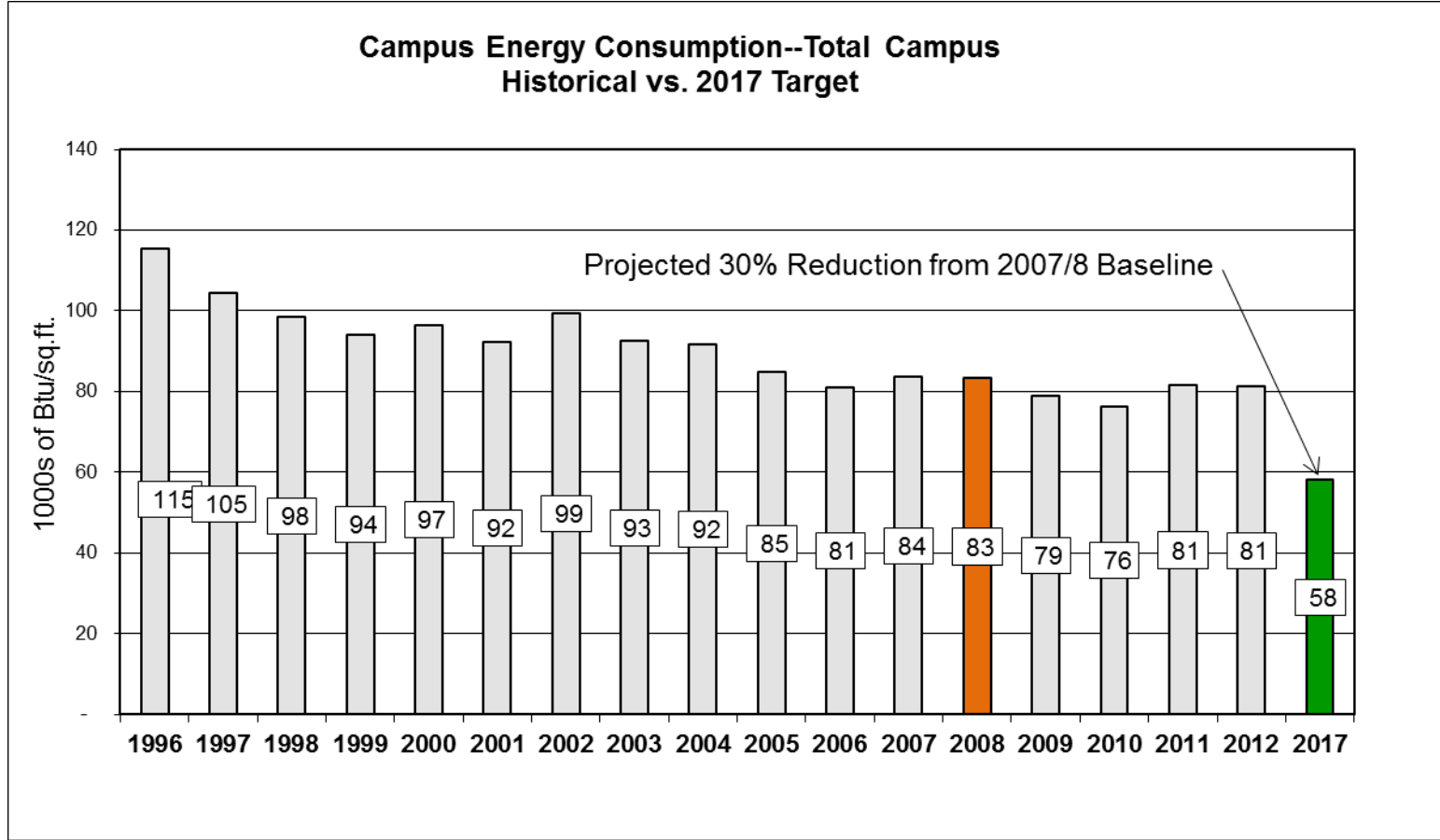
## E&G BUILDINGS TOTAL ENERGY USE IN 1000s BTUs per Square Foot

|                            | 2007      | 2012      | Change      | 2007 Rank | 2012 Rank |
|----------------------------|-----------|-----------|-------------|-----------|-----------|
| Bernard                    | 62        | 54        | -13%        | 1         | 6         |
| Buffalo Hall               | 72        | 56        | -22%        | 2         | 7         |
| Burdick                    | 78        | 75        | -4%         | 3         | 18        |
| College of Business        |           | 47        |             |           | 1         |
| Conference Center          | 86        | 84        | -2%         | 4         | 23        |
| Farris                     | 132       | 80        | -39%        | 5         | 21        |
| Harrin                     | 113       | 96        | -14%        | 6         | 25        |
| Health Sciences & Meador   | 75        | 64        | -14%        | 7         | 12        |
| Irby                       | 80        | 89        | +11%        | 8         | 24        |
| Laney                      | 94        | 108       | +14%        | 9         | 27        |
| Lewis                      | 88        | 74        | -16%        | 10        | 15        |
| Library                    | 70        | 62        | -12%        | 11        | 10        |
| Mashburn                   | 66        | 54        | -18%        | 12        | 5         |
| Mass Communications        | 60        | 58        | -2%         | 13        | 8         |
| Math Tech                  | 57        | 50        | -12%        | 14        | 4         |
| McAlister                  | 107       | 73        | -32%        | 15        | 14        |
| McCastlain                 | 72        | 75        | +4%         | 16        | 17        |
| Prince Center              | 78        | 83        | +7%         | 17        | 22        |
| Old Main                   | 103       | 75        | -28%        | 18        | 16        |
| Physical Plant             | 57        | 49        | -13%        | 19        | 3         |
| Physical Therapy           | 82        | 101       | +23%        | 20        | 26        |
| Reynolds                   | 73        | 69        | -5%         | 21        | 13        |
| Schichtl                   | 117       | 76        | -35%        | 22        | 19        |
| Snow Fine Arts             | 77        | 60        | -22%        | 23        | 9         |
| Speech Path                | 93        | 77        | -18%        | 24        | 20        |
| Thompson Hall              | 36        | 49        | +35%        | 25        | 2         |
| Wingo Admin                | 61        | 63        | +2%         | 26        | 11        |
| <b>E &amp; G Subtotals</b> | <b>77</b> | <b>69</b> | <b>-10%</b> |           |           |

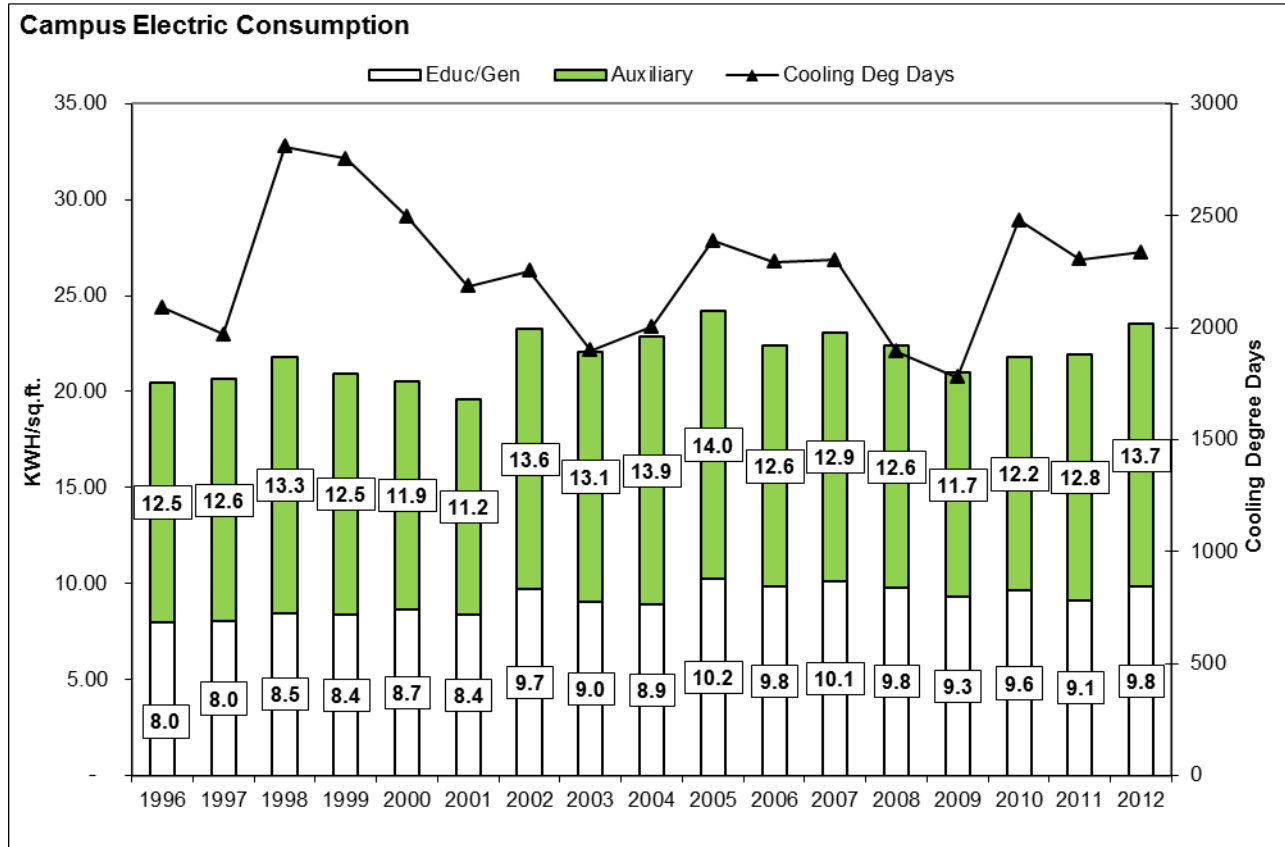
# E&G Target



# Total Campus Target



# Electric Consumption



# Gas Consumption

