University Perspective

In 2007, JHU committed to reduce its greenhouse gas emissions (GHGs) by 51% by 2025. Data was baselined at 2008. This includes emissions derived from electricity, natural gas, heating oil, and gasoline and diesel fuels consumed by university owned properties and vehicles. In addition to carbon dioxide: methane (CH4), nitrogen dioxide (N2O), and refrigerants are measured and normalized based on their global warming potentials as metric tons of carbon dioxide equivalent (MTCO2e). Grid purchased energy, electricity and natural gas, uses the local PJM emissions factors. PJM is the interconnection manager and wholesale energy market for the Northeast and North-central USA.

Raising the Profile.

The presence of “Hopkins Eco-Smart,” the umbrella of environmental sustainability efforts at Johns Hopkins University, is growing. More and more, sustainability is ingrained into processes and initiatives across the University. For the first time, the Idea Lab included a sustainability challenge alongside community and diversity. Not only is the emblematic Acorn appearing more frequently at JHU, it’s a visible seed of change in the community. In October, Johns Hopkins was a sponsor for the annual Association for the Advancement of Sustainability in Higher Education (AASHE) conference that was held in Baltimore. From workshops, panel presentations, keynotes, tabling, tours and social outings, JHU connected and empowered sustainability officers from peer institutions across the country.

Total Energy:

JHU is growing. This is seen in the building footprint, up 11% since FY08, and the total energy consumption, measured in MMBTU, up 4%. Total energy consumption is on a downward trend, dropping 3% since FY15.

Energy Density:

Given this considerable growth - by nearly 1.3M square feet - energy use per square foot tells an important story, normalizing energy consumption with growth. This highlights that JHU’s buildings are becoming more efficient, though still above the average EUI for colleges, 131 kBtu/sq ft.

Greenhouse Gas Emissions:

Even with increasing energy use, GHG emissions have been steadily decreasing, down 6.4% from FY15 and 35% from the FY08 baseline. While showing progress, when comparing effects attributed to internal efforts as opposed to grid improvements, this uncovers a need for a more robust analysis and implementation plan.

Social Cost of Emissions:

The social cost of emissions is the estimated economic cost of damages caused by climate change, such as decreased agricultural productivity, diminished human health, and property damage. Early estimates from the EPA show expected costs at $40/MTCO2e, in 2016 dollars, which is the figure we used. However, more recent studies, such as by Stanford, value carbon much higher. Stanford calculated $220/MTCO2e. This values our FY16 carbon footprint at $62,685,480.
Keswick & Mt. Washington Campuses

by the numbers:

- **$788K**
  - Economic cost of Keswick and Mt. Washington’s FY16 carbon footprint
    - Using Stanford’s economic costs for emissions this would be $4.3M

- **2,952**
  - Herbs given away during Earth Week since FY12

- **6,000**
  - Customer trips to the Keswick Farmers’ Market in FY16

- **345**
  - MWh of Electricity generated from solar panels in FY16

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**Total Energy Consumption**

Keswick was acquired in 2011, and still increasing in occupancy, and energy usage has also steadily risen each year. Keswick consumed 28,387 MMBTU in FY11 compared with 44,047 MMBTU in FY16. Mt. Washington rose from 96,219 MMBTU in FY08 to 113,369 MMBTU in FY16.

**Energy Density**

As with total energy, energy use per square foot has continued to increase for Keswick, but is slightly down from FY15. At Mt. Washington, its energy usage has varied year to year, especially given growth in its energy-intensive data center. In FY16, Keswick consumed 90 kBTU/sq ft, up from 58 kBTU/sq ft in FY11, likely due to occupancy changes. Mt. Washington’s energy density was 74 kBTU/sq ft in FY08 and is now 87 kBTU/sq ft. Both are higher than the average of 67.3 for office space.

**Greenhouse Gas Emissions**

Despite the addition of the Keswick facility in FY11, GHG emissions decreased between Keswick and Mount Washington by 9.6% since FY08. Mt. Washington alone emitted 21,778 MTCO2e in FY08, while both contributed 19,692 MTCO2e in FY16. This reduction is equivalent to the carbon captured by 1,975 acres of forest, roughly 2,000 football fields of trees.

**Waste Diversion**

Both campuses continue to improve their recycling and composting efforts. In FY11, the diversion rate was 30% combined, and in FY16 Keswick, alone, achieved a 40% diversion rate. Mt. Washington diverted 38.7%, down from 51% in FY15. This includes the collection of 139,560 lbs of compostable material during the year, a 25% increase since collection started. By comparison, the average diversion rate for the entire university was 43% in FY16.

**Domestic Water Consumption**

Domestic water consumption was approximately 31,281,500 gallons between the two campuses, an increase from FY15. The university consumed an estimated 316,500,000 gallons in all of its owned buildings in FY16.