

The Wharton Operations *Green Campus* initiative maintains a vision of environmental sustainability through management of Utilities & Operations, the Physical Environment, Waste Minimization and Outreach & Engagement. Its mission is to advocate for the University of Pennsylvania's campus-wide greening efforts by identifying and implementing substantive reductions in the environmental impact of the Wharton community that demonstrate leadership and sustainability on behalf of our students, faculty and staff.

The current Climate Action Plan, CAP 2.0, lays out strategies formalized by the respective Environmental Sustainability Advisory Committee (ESAC) Subcommittees organized by topic area to achieve the goal of carbon neutrality by 2042. Updated every 5-years, the ESAC sub-committees are now in the process of gathering preparatory information to develop the next campus sustainability plan (informally CAP 3.0), set for release in 2019. Wharton Operations currently has representation on multiple ESAC sub-committees as well as the University's Sustainability Coordinators program and will have an integral role in its development and execution. This report serves to highlight the Wharton Operations *Green Campus* efforts in the 2017 calendar year as well as goals for 2018.

## Utilities & Operations

**CAP 2.0 Target:** *Promote and adopt best practices in energy management, design and maintenance to improve efficiency and reduce Penn's carbon footprint. Achieve Energy Reduction in Buildings of 10% by 2019 in comparison to the FY14 baseline.*

### **Wharton Status Update:**

- The Utilities and Operations ESAC sub-committee started to meet again on a regular basis in 2017 during which Wharton Operations staff participated for the first time. In addition to planning for CAP 3.0, the sub-committee is exploring the feasibility to implement a potential long-term contract for purchasing renewable energy in lieu of the current Renewable Energy Credits (REC's).
- Wharton's on campus buildings (Jon M. Huntsman Hall, Steinberg Hall Dietrich Hall, Vance Hall, Lauder Fischer Hall, Colonial Penn Center [*electric only*] and Steinberg Conference Center) used 52,049,677 kWh equivalent of energy (electric, steam and chilled water) during the 2017 calendar year - the equivalent to the 2016 average energy consumption of 4835 homes ([US Energy Information Association](#)). The total is a 1.5% normalized decrease (7% absolute) over 2016 energy consumption.
- VH received recommissioning in April 2017 to assess the building's energy use and to lower its energy consumption. The recommended recommissioning measures provide a total savings of 2.1% in combined steam and electricity usage for an estimated implementation cost of \$19,453 and a combined project simple payback of 4.6 years.
- Along with the Green Campus Partnership, Wharton Operations was part of an exploratory committee for the Delaware Valley Green Building Council (now *Green Building United*) to explore participation in Philadelphia's [2030 District](#), an initiative to achieve voluntary reductions in energy and water use, and in transportation emissions by the year 2030. Program details are still under development in determining Penn's involvement.
- Wharton Operations continued its bi-monthly reviews with FRES Energy Managers on energy data for each of Wharton's buildings to reveal anomalies and trends which, after correction, save energy, operating costs and prevent system failures. In 2018, Wharton will pilot the ability to monitor energy data directly via the Supervisory Control And Data Acquisition (SCADA) system.

- During peak load months (June – August), Wharton continued its participation in weekly meetings with FRES to strategize about energy cost saving measures. When notified of expected “Red Days”, a known peak 5 hour of electricity use, Wharton works to reduce load as much as possible by coordinating the shutdown of HVAC equipment and contacting the Wharton community to advise them of the situation to shut off, or minimally use electrical appliances to the greatest extent possible. This past summer, the local power grid experienced a total of 9 Red Days. Through campus-wide conservation efforts, the University managed to lower its capacity charge for next year by approximately 5 Mw. This is an approximate reduction of 10% compared to 2016.

### **Physical Environment**

**CAP 2.0 Target:** *Create and maintain a sustainable campus by increasing green space, decreasing building energy consumption, and increasing education and awareness of sustainable design.*

#### **Wharton Status Update:**

- Wharton Operations staff will participate for the first time on the Physical Environment ESAC sub-committee in its development of CAP 3.0 goals.
- The Wharton Academic and Research Building (WARB) project is currently targeting LEED-NC, v2009, Gold Certification. Among other features, the project will include a vegetated roof, porous paving and bio swales, ample daylight and a projected 28% reduction in energy use over similar buildings.
- The Wharton External Affairs fit-out in the FMC Tower is currently exploring [WELL Certification](#) as a pilot, the first on Penn’s campus. WELL is the leading tool for improving health and human experience through design.
- The first phase of the SHDH classroom renovations utilized Penn’s [Green Guidelines for Renovations](#), with a focus on: low-emitting and high recycled content materials, LED lighting integrated with centralized Lutron lighting controls, a construction air quality plan and recycling construction waste.
- The Ambani Auditorium (JMHH G06) was refitted with new LED lighting, in addition to other finish and A/V upgrades. The new lighting has significantly improved the overall aesthetic, light quality and energy efficiency while decreasing disruptive maintenance to replace burnt-out light bulbs.
- The upgrade to Huntsman Hall’s lighting controls with Lutron QS system was completed in a multi-phased approach during the 2017 summer. The upgrade additionally provides centralized lighting control for Huntsman and SHDH via Lutron’s facility management software.
- Steinberg Hall-Dietrich Hall received Philadelphia’s TOBY Regional Award for the “EARTH” category from the [Building Operations Managers Association \(BOMA\)](#), recognizing the building’s quality, sustainable programs and excellent building management.

### **Waste Minimization & Recycling**

**CAP 2.0 Target:** *Improve Penn’s environmental performance by minimizing solid waste through community education, strategic purchasing, appropriate infrastructure and proper disposal, strengthened by relevant and accurate metrics. Increase recycling rate to 30% by 2019, and continue to reduce overall municipal solid waste.*

#### **Wharton Status Update:**

- Wharton Operations continues its role as part of the Solid Waste Management (SWM) ESAC sub-committee. A focus this year was to modernize and create an effective RFP for waste management services, address concerns to effectively track waste diversion, work with FRES to create campus-wide annual waste audits and effective messaging to improve human behavior.
- In 2017 Wharton generated 491.8 tons of municipal solid waste via JMHH, SHDH and SCC compactors (JMHH 178.1; SHDH 219.27; SCC 94.47 tons) and 22 tons of compost (JMHH and SHDH only). This equates to 9.2% and 19%, respectively, of total campus waste and is 53 tons less than in 2016. This does not include recycling totals or the waste streams from CPC or Vance Hall. Addressing accurate metrics from all waste streams so each school and center has accurate data on their annual solid waste output has been a priority of the SWM-ESAC and was factored into the current RFP for campus solid waste management.

- Wharton Operations performed a 24-hour waste audit on SHDH in April 2017. SHDH generated 1149 pounds of waste, including 63.8 pounds from Joe’s Café. The audit found a potential waste diversion rate of 75.8% (includes recycling and composting); however, significant contamination of the recycling stream by building occupants (namely mixing food waste with recyclables) renders the material unusable by market standards. In the absence of contamination, the recycling rate would be 32.9 percent, exceeding CAP 2.0 goals. Contamination issues are common across Penn’s campus and Wharton Operations is working with the SWM-ESAC committee to address. Educating building occupants on effective waste management is essential to minimize contamination risks.
- Construction waste management on Wharton summer projects and storage clean-outs diverted 108.8 tons, or 86.4%, of construction debris from the landfill, an 83 ton increase over 2016 due to improved metric tracking via the Green Guidelines for Renovation program.
- In conjunction with the above, Wharton Operations continues its participation in the [Carpet America Recovery Effort \(CARE\)](#) Program for carpet replacement projects and expanded the effort in 2017 to include capital projects. As a result, total carpet diverted from landfills increased significantly over 2016 to 67,900 square feet, the equivalent of over 16 tons.
- Wharton Operations’ Special Events Manager, Kelly Busch, received Penn Purchasing’s 2017 *Bright Green Idea Green Purchasing Award* recognizing her work to pre-certify Wharton caterers on a policy of zero waste for all Wharton events. She successfully implemented this policy for the 2017 Commencement weekend which diverted 1700 pounds of compost from the landfill.
- In collaboration with FRES, Wharton Operations expanded our battery and writing instrument recycle program to include centralized drop off stations in JMHH, SHDH and Vance Hall.
- Wharton Operations completed the installation of 5 additional public water bottle filling stations in SHDH, Lauder Fischer Hall and CPC for a total of 24. In 2017, the fillers diverted the equivalent of over 637,700 16 oz. plastic water bottles from the waste stream – more than doubling last year’s total. Since the start of the program in November 2013, the bottle fillers have offset over 1.5 million plastic bottles. (*Note, metrics do not include departmental water dispensers (i.e. Quench) which would increase this figure significantly*).
- Wharton Operations continues to improve re-purposing used furniture assets in lieu of recycling or sending to the landfill. In 2017, Wharton Operations donated over 150 pieces within Penn via [Ben’s Attic](#), or through area organizations such as the [Netter Center](#) and [Boomerang](#). For 2018, Operations will continue developing a formal policy for the reuse and repair of surplus assets.
- Wharton Computing and Information Technology (WCIT) recycled 20,442 pounds of used computer equipment in 2017, including monitors and TV’s, servers, printers, wiring, batteries and misc. steel.
- Wharton’s annual Office Clean-up Day initiative, sponsored by the Finance and Administration Department, generated 765 pounds of electronic waste, batteries and compact fluorescent bulbs for recycling.

## **Outreach & Engagement**

**CAP 2.0 Target:** *Build a culture of sustainability that informs all constituents of University life.*

### **Wharton Status Update:**

- Wharton Operations continues to participate in the University’s Sustainability Coordinators program. Representing the majority of the Schools and Centers, the program has evolved into an advisory body and held a successful retreat in January 2017 to address strategic issues for the group’s future, including a mission statement and its role in developing CAP 3.0.
- Wharton Operations became a member of [Penn’s Green Fund](#) selection committee, providing grants to improve the University’s environmental performance and reduce campus emissions.
- Wharton faculty and staff [Eco-Reps](#) membership increased again in 2017 from 10 to 13 members. Additionally, 3 Wharton staff members were named to the 7-person Eco-Rep Steering Committee.
- In 2017, the first full year of collaboration, Wharton Green Team membership grew to include 20 members representing 13 Wharton Departments. Green Team members represent the various departments within

Wharton and work to minimize the environmental impacts of their workplace and teach fellow co-workers about sustainable practices. Efforts included announcing “Red Days” to their respective departments, collaborating in the Wharton Clean-up Day, organizing and promoting the showing of [Merchants of Doubt](#) for Penn’s Power Down Challenge and implementing Wharton’s green catering policies in their respective departments.

- With a total of 4 certified offices, Wharton’s participation in the [Green Office Certification program](#) continues to grow. In 2017, Wharton’s McNulty Leadership program and Customer Analytics Initiative each achieved certification.

### **Academics**

**CAP 2.0 Target:** *Expand opportunities for teaching, learning and researching sustainability among students, staff and faculty.*

#### **Wharton Status Update:**

- 2017 saw the first full year of efforts by the Wharton Student Sustainability Advisory Board (SSAB). The SSAB is sponsored by and works directly with Wharton Operations to support and advance the Wharton Schools sustainability objectives and is the only board at Wharton to be comprised of both MBAs and Undergraduates. SSAB initiatives include a post-consumer compost pilot outside the 2nd floor Pret Café, transportation initiatives to encourage use of bicycling and public transportation for commuting, and a plan to pilot an app that rewards student impactful behaviors.
- Wharton Operations continues its partnership with the Wharton [Initiative for Global Environmental Leadership](#) (IGEL), contributing blog posts, participating in speaker panels and initiative partnerships.
- Wharton Operations serves as a co-sponsor and advisor for the multi-disciplinary student initiative *InstaHub*. They developed a battery-powered device with occupancy sensing capabilities that attaches over existing toggle light switches for instant light automation. A [Penn Green Fund recipient](#), the device is now testing a pilot in Wharton Operations staff offices with plans to install prototypes in residence hall student lounges.