

# School of Engineering & Applied Science

## FY 2019 Sustainability Report



Penn  
Engineering

### Academics

Goal: Expand opportunities for teaching, learning, and researching sustainability among students, staff and faculty.

- **Energy and Sustainability (ENSU) Minor** is offered by SEAS. In spring 2019 there was a total of 320 students enrolled in the course offerings with 64 students enrolled in the most popular class.
- Over 27 classes are available regarding sustainability within CBE, MEAM, MSE, ESE, and EAS departments.
- Penn Electric Racing achieved 4 awards for the Formula SAE Series. **3rd place Overall** in Electric Vehicles, 2nd place in the Autocross Event, 3rd Place in the Endurance Event, and 1st place for the Cummins Advanced Technology Award for the use of flexible CellLink PCB in their battery design. They are the first competitive American FSAE Electric team with 4 wheel drive.
- Aleksandra Vojvodic of PICS & CBE models solutions with her students in an effort to develop economical and sustainable methods to **store energy** and produce hydrogen and ammonia.
- George Ilhwan Park of MEAM studies air turbulence impacting the **flight efficacy of air travel**. Through the computer modeling of turbulent eddies, energy consumption of aircrafts can be reduced. Studies can improve the energy efficacy and structural design of wind turbines and wind farms.
- Benjamin C. Pierce of CIS, in collaboration with CIS and the Association for Computing Machinery are measuring and **reducing the carbon footprint** of computer science conferences. The first policy has been implemented allowing ACM conferences to include carbon offsets in their registration process, and ACM has had their first 100% net-zero-carbon conference.
- The Shu Yang lab is developing "**Smart Windows**" that can be switched between transparent and opaque states through dynamic actuation of optically active materials. Since solar gains and loss through windows impacts energy consumption, "Smart Windows" will help to improve energy efficiency in next-generation smart buildings and automobiles.
- **REACT**, Research and Education in Active Coatings Technologies for the Human Habitat Program, students work in one of three "acts" – water, infectious disease, and energy – completing a 10-week research experience abroad and a 4-day workshop on campus. The program bridges a student's education and skills to the creation and application of a physical product that can make a direct, positive impact on a community's environment.

### Physical Environment

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

- 3401 Walnut St. 4th floor B & C Wing was awarded **LEED CI Silver** Certification. SEAS is pursuing LEED Certifications on 3 new buildings currently being designed – Tangen Hall, Data Science Building, and the Energy, Science, and Technology Center.
- Towne 3rd Floor Active Learning Classroom Project recycled **1.23 tons of construction debris**.
- "The best form of recycling is reuse", approximately **17 tons of furniture** was reused within the complex instead of trashed or sent to a recycling facility.
- **11.78 tons of small renovation** trash and furniture was recycled through Revolution Recovery.
- 1 new water bottle filling station has been installed at SEAS, there are now a total of 12 stations. These units have counted over **143,600** diverted water bottles this year.
- All carpet installed in SEAS has a minimum of 45% recycled content, is NSF 140 and CRI Green Label Plus.

### Utilities and Operations

Targets: 7% total carbon reduction in buildings by 2019 in comparison to the FY14 baseline. 10% energy reduction in buildings by 2019 in comparison to FY14 baseline.

- SEAS Operations provides Smart Strips that reduce energy usage by synchronizing and turning off devices.
- Housekeeping protocols require less chemical stripping and more equipment that uses water only.
- All applicable SEAS buildings cycle air handler equipment off on a schedule to reduce power consumption, especially on Red Days.
- SEAS actively maintains HVAC equipment in buildings to maximize performance and reduce maintenance.

### Waste Minimization & Recycling

Target: Improve Penn's environmental performance by minimizing solid waste through education, purchasing, infrastructure, and proper disposal. Increase recycling rate by 30% by 2019.

- SEAS Recycling Center recycled **17,522 tons** of electronics, lightbulbs, Styrofoam, cardboard and more through EForce.
- SEAS is promoting deskside recycling through Green Office Certifications and renovation projects.
- The SEAS Green Team worked with building operations to conduct a survey of all public trash and recycling bins inside the Engineering buildings. Bins were reorganized where necessary and labeled with updated, appropriate signage.
- SEAS held 2 book swaps, donating about **675 books** to Books 4 Cause.
- Keurig Recycling Grounds to Grow On recycled nearly 198.2 lbs.

### Communications, Outreach and Engagement

Goal: Develop communications to inform the Penn community and key external stakeholders about the goals of the Climate Action Plan.  
Build a culture of sustainability that informs all constituents of University life.

- The SEAS Green Team continues to promote sustainability events and information for the SEAS Recycling Center, Penn recycling/waste streams, energy reduction strategies and culture change. The SEAS Green Team hosted the annual **Sustainability Fair** for the ReThink Campaign featuring tables focused on Solid Waste Management, the SEAS Recycling Center, Eco Office, Office Materials Swap, Book Recycling & Water Tasting.
- The SEAS furniture reuse list serv continues to save lightly used furniture from recycling centers and landfills. **36 staff members** are enrolled and actively use the resource before purchasing new or refurbished furniture.
- **16 Green Office Certifications** have been completed in SEAS, levels 2-4. Two offices are in the process of applying for certification.
- **3 Green Lab Certifications** have been completed in SEAS and 2 more are in the process of applying for certification.