

# School of Engineering & Applied Science

## FY 2021 Sustainability Report



# Penn Engineering

### Academics & Research

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

- Two member of SEAS faculty have been appointed to the Biden-Harris Administration's Department of Energy.
  - Vanessa Chan, Jonathan and Linda Brassington Practice Professor, Innovation and Entrepreneurship, will serve as the DOE's Chief Commercialization Officer and Director of its office of Technology Transitions.
  - Jennifer Wilcox, Presidential Distinguished Professor of Chemical Engineering and Energy Policy, will serve as the Principal Deputy Assistant Secretary for Fossil Energy in the DOE's Division of Fossil Energy.
- The traditional plastic home pregnancy test creates approximately two million pounds of waste each year. Bethany Edwards and Anna Couturier, graduates of the Integrated Product Design program, have developed a plastic-free, flushable, and biodegradable alternative. Utilizing natural, cellulose fibers, the product will begin to break down in water and disintegrate in soil.
- Devin Carroll and Mark Yim, of the GRASP Lab, propose the possibility of making robots out of ice. These robots, intended for temperatures similar to that found in outer space, would be capable of self-reconfiguration, self-replication, and self-repair.
- Cofounder of Treeswift and doctoral student of Computer and Information Sciences, Steven Chen, aims to ease the difficult collection of research from our forests. Utilizing flying drones equipped with appropriate technology, Treeswift can photograph and map a forest in 3D. The data they collect can aid researchers in combatting forest fires and help to preserve forests.
- The Department of Energy has awarded a grant to researchers in the Vagelos Institute for Energy Science and Technology. The grant focuses on a more timely advancement in solar energy production. Penn is among six other institutions that have partnered with the Center for Hybrid Approaches in Solar Energy (CHASE) to Liquid Fuels in their efforts to better streamline solar power systems.
- SEAS offers an Energy & Sustainability Minor with a selection of 21 course options.

### 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.

- SEAS is perusing LEED Certifications on 3 new buildings – Tangen Hall, Amy Gutmann Hall, and the Vagelos Laboratory for Energy, Science, and Technology Center.
- The new Amy Gutmann Hall Data Science Building will be a mass timber structure. Mass timber reduces the carbon impact of a building and would continue to sequester carbon.
- "The best form of recycling is reuse". Approximately **2.8 tons of furniture** was reused within the complex instead of trashed or sent to a recycling facility.
- **1.29 tons of small renovation trash and furniture** was recycled through Revolution Recovery this year.
- Water bottle filling stations have been installed at SEAS, there are now a total of 14 stations. These units have counted over **200,000** 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: 40% total carbon reduction in buildings by 2024 in comparison to the FY09 baseline.

- SEAS Operations provides Smart Strips (power strips) that reduce energy usage by synchronizing and turning off devices.
- SEAS prioritizes recommissioning and FRF equipment replacement projects to reduce our carbon footprint.
- LRSM's HVAC Century Bond project has completed the first year's worth of renovations to replace aging HVAC equipment with high efficiency equipment.
- This year, the engineering complex saw a 1% increase in energy usage. The majority of this increase occurred as occupants returned to campus.

### Waste Minimization & Recycling

Target: Improve Penn's environmental performance by minimizing solid waste through education, purchasing, infrastructure, and proper disposal. Increase Penn's overall waste diversion and minimize waste sent to landfill.

- SEAS Recycling Center recycled **3.83 tons** of electronics, lightbulbs, styrofoam, cardboard, and more through EForce.
- SEAS is promoting deskside recycling through Green Office Certifications and renovation projects.
- In recognition of developing more sustainable purchasing at Penn, Cheryl Hickey of Computer and Information Sciences has been honored with the University of Pennsylvania's 2020 Green Purchasing Award. Cheryl has eliminated a waste stream from the department's kitchens, switching from a monthly order of disposable cups to permanent ceramic replacements.

### 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 has pivoted to hosting online talks focusing on sustainable education. Talks included: **Treeswift and the Penn Journey: From Research to Startup** (Steven Chen), **VIPER Lighting Talks: Addressing Energy Challenges Through Undergraduate Research** (Natalia Acero, Caroline Magdolen, Kevin Xu, & Michelle Hutchings), **Plastic Waste: Global Challenge and Opportunities** (Raymond J. Gorte, Daeyeon Lee, Karen I. Winey, & Reto Gieré), **Climate Change and Cities** (Michael Weisberg & Lolita Jackson), **Sustainability and the Built Environment: Building Materials and Cooling Strategies that Combat a Warming Planet** (Dorit Aviv, William W. Braham, Shu Yang, Charles Berman, & Fiona Cousins), **Penn Electric Racing and Battery Innovation** (Leslie Lytle & Bailey Carlson).
- 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 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.
- **8 Green Office Certifications**, levels 2-4, and **3 Green Lab Certifications** are registered in SEAS.