



UNIVERSITY OF PENNSYLVANIA

CLIMATE AND SUSTAINABILITY ACTION PLAN 3.0 ANNUAL REPORT FY21



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Penn’s leadership sets a national model. Our concern is unflagging, and our commitment is resolute: We are embarking on the next step in addressing the urgent environmental challenges of 2019 and beyond.

—DR. AMY GUTMANN, UNIVERSITY PRESIDENT



The climate emergency affects all of us, but its effects are not felt equally. Climate change exacerbates existing social, economic, and racial inequities in the U.S. and around the world. It will take each of us, and all of us, collectively working together to tackle a complex global challenge.

—PROVOST WENDELL PRITCHETT

TIMELINE OF SUSTAINABILITY

2007

JUNE

President Gutmann signs the *American College and University Presidents Climate Commitment (ACUPCC)*.

2009

SEPTEMBER

Penn launches its first *Climate Action Plan* defining its University-wide sustainability goals through 2014.

2010

MARCH

Penn issues *Century Bonds*, with \$200 million earmarked for projects that combine deep energy retrofits, deferred maintenance, and sustainability.

2012

JANUARY

Penn commits to being a 100% carbon neutral campus by 2042.

2014

OCTOBER

Penn launches its *Climate Action Plan 2.0*, reporting on five years of accomplishments and establishing goals through 2019.

2017

JUNE

Penn joins eleven Ivy Plus universities in reaffirming commitment to climate change mitigation after U.S. withdrawal from the Paris Agreement.

2019

OCTOBER

Penn launches its *Climate and Sustainability Action Plan 3.0 (CSAP 3.0)*, reporting on ten years of accomplishments and establishing goals through 2024.

2020

APRIL

Penn announces the signing of a *Power Purchase Agreement (PPA)* designed to offset approximately 75% of electricity use for the University and Health System.

2021

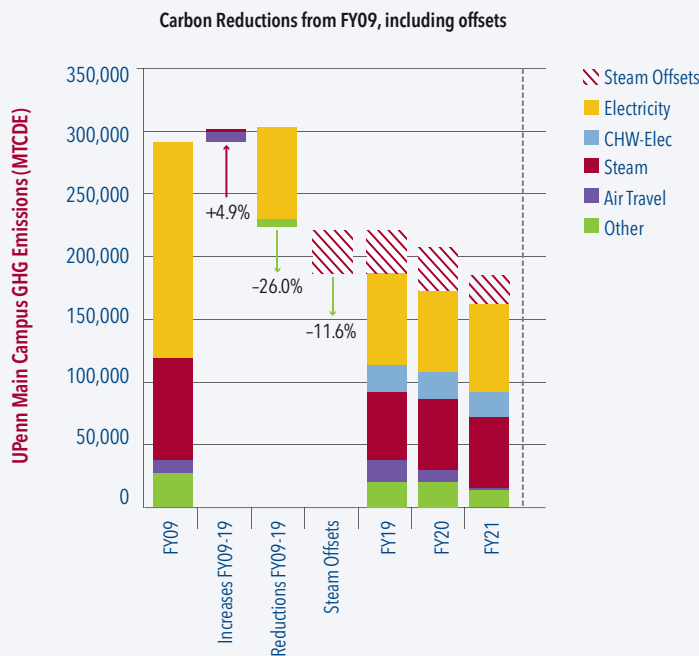
JUNE

The Environmental Innovations Initiative launches its strategic plan to catalyze Penn's role in creating solutions to real-world environmental challenges.

PROGRESS SUMMARY

This report highlights fiscal year 2021 progress toward achieving the goals of the *Climate and Sustainability Action Plan 3.0 (CSAP 3.0)*, Penn’s guiding document for campus sustainability. Opening with a summary of academic programs, the report provides metrics on the status of the seven initiatives of the *CSAP 3.0* – initiatives designed to transform Penn towards its goals to:

- Expand the scope of sustainability research in Penn’s academic centers, and connect students to Penn’s abundant resources in this field;
- Continue to reduce carbon emissions and explore expanded use of renewable energy to mitigate the impacts of climate change;
- Embrace circular economy principles to reduce waste and single-use products;
- Make sustainable choices in transportation, purchasing, and business operations;
- Inform, educate, and empower the Penn community to participate in Penn’s climate change and sustainability goals.



The chart shows Penn’s progress in reducing the main campus carbon footprint over the past three years as compared to the Fiscal Year 2009 baseline year.

Reductions

FY19: 32.6%

FY20: 37.2%

FY21: 44.3%

As the University looks toward achieving the goals set forth in the CSAP 3.0, this annual report provides an opportunity for Penn to reflect on what has already been achieved over the past year and prioritize what has yet to be accomplished.

Please send any comments or questions to the Penn Sustainability Office (PSO) at sustainability@upenn.edu. For more information, please visit sustainability.upenn.edu.

Throughout the report, we use these symbols to denote progress.



We are achieving our goal










We have made progress



**Goal to be achieved
in a future year**

HIGHLIGHTS | Seven Initiatives

Academics		<ul style="list-style-type: none"> • The Environmental Innovations Initiative hired its Senior Director and Associate Director, created a strategic plan, established three trans-disciplinary research communities, and created an Internal Advisory Committee. • Penn Sustainability hired three Civic Sustainability Fellows to work for three organizations in the City of Philadelphia. • Penn Sustainability released an updated Sustainability Course Inventory.
Utilities & Operations		<ul style="list-style-type: none"> • In FY21, Penn reduced overall emissions by 44% and building-related emissions by 41% as compared to the 2009 baseline year. • Thirteen enhanced recommissioning energy assessments have been completed and energy saving opportunities have been completed in buildings at the Perelman School of Medicine, the School of Arts and Sciences, Penn Engineering, and Penn Vet. • A working group continues to investigate long-term options for low-carbon and alternatives to steam.
Physical Environment		<ul style="list-style-type: none"> • Bird-friendly guidelines and a Bird-Friendly Design web-page have been developed in an effort to reduce the number of bird strikes on campus and increase awareness of local bird species. • Penn's Real Estate team developed an annual reporting process for tracking energy use in its portfolio. • The New Bolton Center and Morris Arboretum have provided information to incorporate their centers into Penn's carbon footprint process. • A water footprint was developed by two Student Eco-Reps in collaboration with The Water Center at Penn.
Waste Minimization & Recycling		<ul style="list-style-type: none"> • Penn is the first higher education institution to join the City of Philadelphia's Zero Waste Partnership. • The Environmental Sustainability Advisory Committee (ESAC) Waste and Recycling subcommittee has developed a comprehensive plan to regularly audit waste and recycling for a sample building in six key areas. • Penn is exploring opportunities to recover animal bedding from labs for composting.
Procurement		<ul style="list-style-type: none"> • In Penn dining facilities that are managed by Bon Appetit, 62% of the food used meets AASHE STARS requirements for sustainability or ethically produced, and 30% is plant-based. • Penn Procurement Services launched the Climate Impact Offset charge (CLIO) to be applied to air travel and dedicated to a Travel Sustainability Fund which will be invested in best-fit sustainability projects to fully offset the carbon impacts of the University's air travel.
Transportation		<ul style="list-style-type: none"> • A working group has engaged Penn Praxis to explore options for a staff and faculty commuter survey to better understand pedestrian and other commuting practices. • Penn developed a draft low-emissions vehicle purchasing guide. • Penn Transportation and Parking continues to support a wide array of sustainable commuting programs including mass transit subsidies, incentivized vanpool and carpool use, bicycle expense reimbursement, and a robust Penn-oriented mass transit system as well as focused expansion of both electric vehicle procurement and publicly available electric charging stations.
Outreach & Engagement		<ul style="list-style-type: none"> • Penn hosted both the inaugural Climate Week at Penn and the first Penn Labs Freezer Challenge both to become annual programs. • The Strategic Marketing and Communications Subcommittee has developed a Sustainability Marketing and Communications Plan. • Penn Sustainability and partners hosted a panel discussion to explore food justice and inequity as part of the Dr. MLK, Jr. Commemorative Symposium on Social Change. • Climate Leaders @ Penn launched their first Climate Leaders at Penn Inaugural Fellowship.



Jocelyn Chin, Civic Sustainability Fellow working with the City of Philadelphia on their Zero Waste Partnership Program

ACADEMICS

MISSION

- Make climate change and sustainability part of the curriculum and educational experience available to all students, including classroom instruction, extracurricular experiences, research opportunities, and internships
- Support faculty teaching, learning, research, and scholarship on sustainability
- Inform the entire University community of the principles of sustainability and its three key constituent pillars: environmental protection, economic prosperity, and equitable distribution of resources



PROGRESS SUMMARY

Academic sustainability initiatives over the past year laid the foundation to elevate opportunities for students and faculty to participate in sustainability-related curricula.

- The Environmental Innovations Initiative is led by two faculty co-directors, Kathleen Morrison (Anthropology) and Joseph Francisco (Earth and Environmental Sciences). Melissa Brown Goodall joined the leadership team in March of 2021 as the Initiative's Senior Director and Kelley Widerman joined as the Associate Director for Outreach in July 2021. Over the past year, the Initiative has charted a path towards clarifying and improving students' educational experience, catalyzing research collaboration, and elevating Penn's reputation locally, nationally, and globally.
- Professors across disciplines expanded sustainability learnings for twelve courses as they participated in the Integrating Sustainability Across the Curriculum (ISAC) program.
- The Faculty Senate Select Committee on the Institutional Response to the Climate Emergency (CIRCE) broadened the committee's reach by creating a sub-committee dedicated to supporting the University of Pennsylvania Health System (UPHS).



TOWARDS AN EQUITABLE FUTURE

During the summer of 2021, Penn student Shelby Abayie served as a Civic Sustainability Fellow with University City Green (UC Green), an organization focused on equitable and accessible greening in several West Philadelphia zip codes. Through her internship with UC Green, Shelby worked on a project targeting one block in 19139 for tree planting using a multifaceted outreach plan, including flyers, door-to-door outreach, and a Zoom town hall to explain the benefits of urban tree planting and address questions and concerns from local residents.

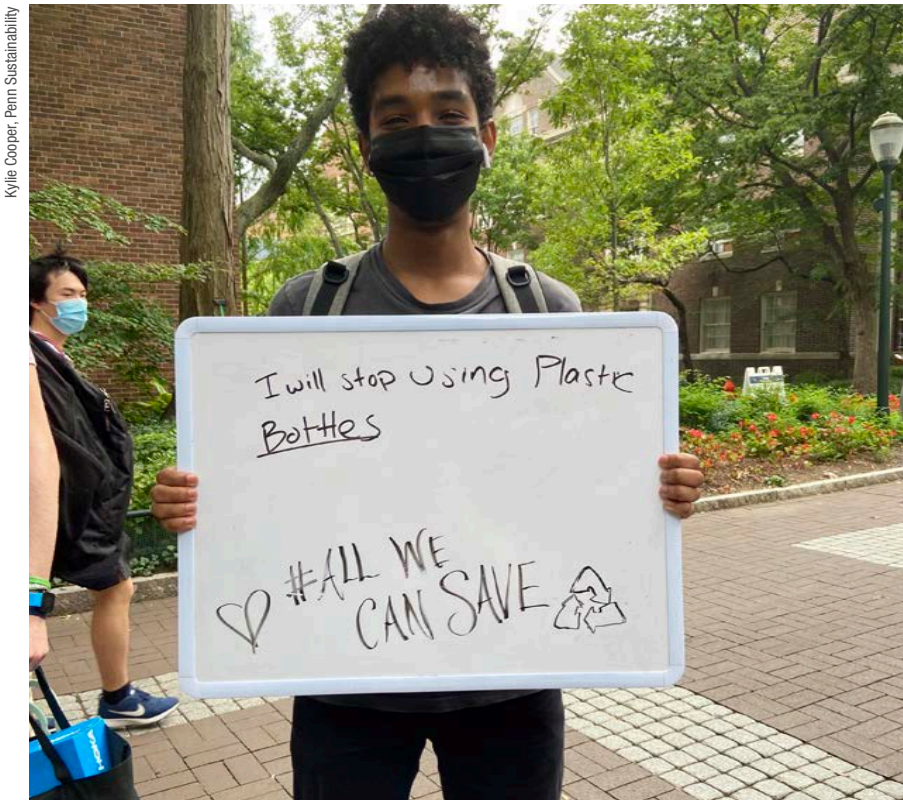
Kylie Cooper, Penn Sustainability





GOALS	STRATEGIES	FY21 PROGRESS
<p>Support cross-disciplinary research and coordination of work between Schools and Academic Centers</p>	<p>Work with the Office of the Provost to promote curricular opportunities; coordination of scholarship in Schools and Centers and promotion of majors, minors, and concentrations in sustainability</p>	<ul style="list-style-type: none"> In 2020, the President and Provost announced the launch of the Environmental Innovations Initiative. The vision of the Initiative is to meaningfully impact the critical environmental challenges of our time, particularly climate change, biodiversity loss, and human vulnerability. To accomplish this, the Initiative will bring together scholars, leaders, practitioners, students, community members, and partners around themes of climate action, stewardship of nature, and societal resilience – including equity and inclusion. Its mission is to catalyze solutions to significant real-world environmental challenges. This will be done through fostering collaboration across disciplines, leading inclusive and dynamic programming on- and off-campus, forming strategic alliances with external partners, and elevating the visibility of Penn’s assets.
<p>Support the use of campus-as-lab to promote applied learning</p>	<p>Develop a formal Campus-as-Lab initiative to merge Penn’s operational sustainability goals with applied learning and research for faculty and students.</p>	<ul style="list-style-type: none"> In June 2021 the Environmental Innovations Initiative announced its inaugural cohort of Research Communities, which were defined as multi-year efforts that bring together faculty members from different disciplines around the study of a common theme of broad environmental significance. To be awarded the seed grants of \$25,000 each, researchers were required to demonstrate how students would be engaged, what the public-facing outcomes would be, and how success would be measured. External collaboration was also encouraged. The three selected communities are led by researchers from the Perelman School of Medicine, the School of Arts and Sciences (Philosophy), and the Weitzman School of Design. The allowable scope of impact ranged from local to global. This model will be further developed in the coming year.
<p>Help advance the City’s regional sustainability objectives and provide professional development and real-world learning opportunities to Penn students</p>	<p>Formalize a Civic Sustainability Fellowship program to place Penn students in internships with City agencies.</p>	<ul style="list-style-type: none"> Penn Sustainability hired three Civic Sustainability Fellows to work with different organizations across the City of Philadelphia during the summer of 2021. Organizations included the Philadelphia Office of Sustainability, Philadelphia Energy Authority, and University City Green. Three Civic Sustainability Fellows have been hired since the launch of the CSAP 3.0.
<p>Improve the Climate Literacy of Penn Students</p>	<p>Develop a climate literacy assessment of Penn’s undergraduate student body and recommendations to strengthen climate change education across the curriculum.</p>	<ul style="list-style-type: none"> Two Student Eco-Reps worked with the Netter Center for Community Partnerships, in collaboration with faculty and the Penn Sustainability Office, to develop and distribute a climate literacy assessment to both Penn’s undergraduate student body and neighboring Philadelphia fifth and sixth grade students. Preliminary results indicate that students are moderately knowledgeable about some climate-related topics and uninformed on others. The Penn Sustainability Office will work with the Environmental Innovations Initiative to refine the survey and distribute to all members of the Penn community on a biannual basis.

GOALS	STRATEGIES	FY21 PROGRESS
Expand tracking and reporting of student enrollment in sustainability-related majors, minors, and concentrations	Document students in sustainability-related majors, minors, and concentrations.	<ul style="list-style-type: none"> • 4,890 students were enrolled in sustainability related courses during the 2020-2021 Academic Year. • Penn Sustainability released an updated Sustainability Course Inventory, outlining sustainability- focused and sustainability-inclusive courses offered by the University. Penn faculty identified three main category groupings for courses for further course identification.
Improve opportunities for a cohesive sustainability education at Penn	Improve undergraduate education by identifying course sequencing and essential early-curricular courses.	<ul style="list-style-type: none"> • The Environmental Innovations Initiative conducted a course gap analysis to explore course offerings at each level related to nature, climate, resilience, environment and health, environmental justice, and urbanization. The outcomes of this will be an academic pathway guide for students and a report to academic decision-makers highlighting gaps in current course offerings. • To address the need for introductory environmental courses, the three leaders of the Environmental Innovations Initiative are co-creating a course called "Humans and the Earth System: how it works, how we got here, and how to save our planet." This course will be offered in the Spring 2022 semester.



UTILITIES AND OPERATIONS

Penn's Clinical Research Building is one of thirteen enhanced recommissioning energy assessments completed at the University.

MISSION

To reduce campus carbon emissions and the costs associated with maintaining campus operations by:

- Adopting best practices in energy conservation through design, operation, and maintenance of both building infrastructure and district energy systems
- Exploring and adopting best practices for campus energy procurement

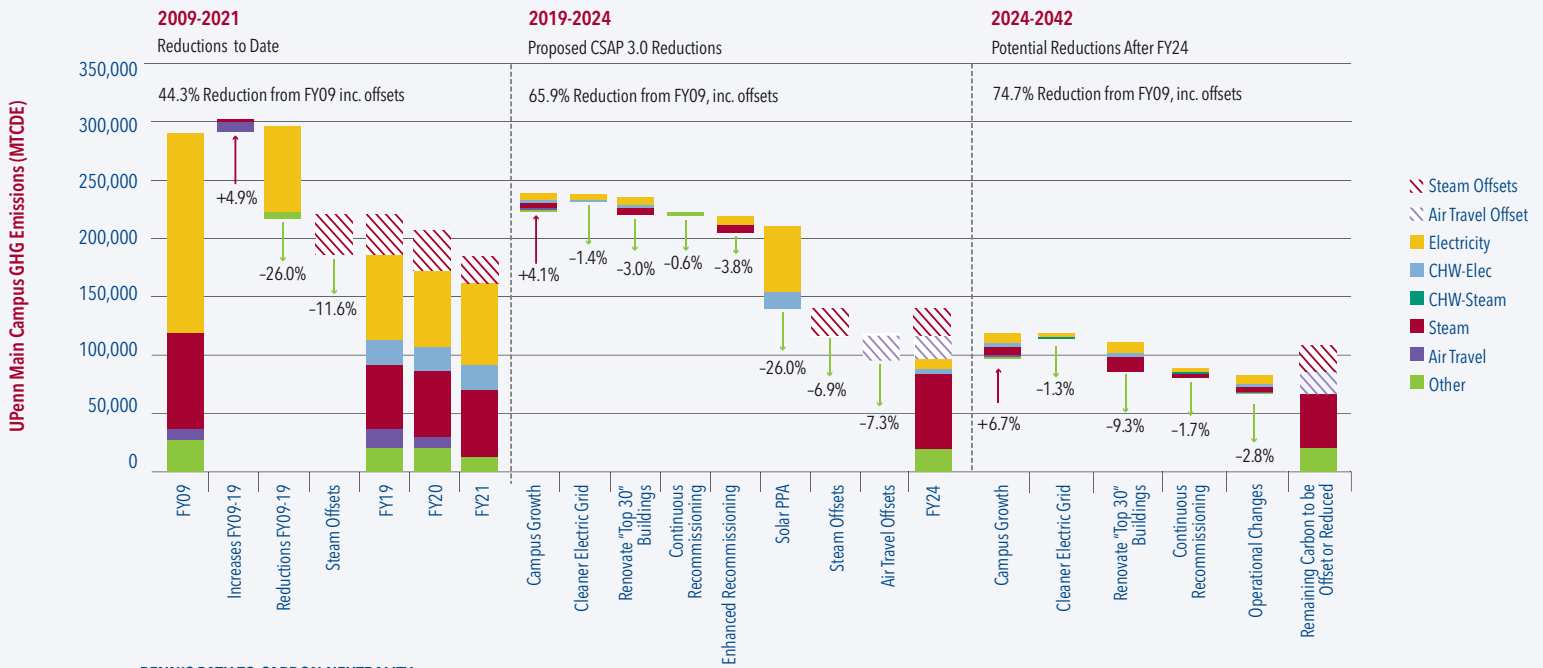


PROGRESS SUMMARY

Through energy efficiency, recommissioning, and a cleaner electricity grid, Penn has made immense progress towards achieving the 100 x 42 goal of carbon neutrality by 2042.

- Overall emissions have been reduced by 44% and building-related emissions have been reduced by 41%.
- Emissions reductions are partly due to lack of air travel during the COVID-19 pandemic and energy reductions due to the campus being depopulated.

CARBON REDUCTION 2009-2042



PENN'S PATH TO CARBON NEUTRALITY

The waterfall chart above shows Penn’s path to carbon neutrality. At the end of FY21, we had achieved a 37% reduction in our carbon footprint as compared to FY09 when steam offsets are not considered, and a 44% reduction in our carbon footprint when including steam offsets.

The PPA and Penn’s air travel Climate Impact Offset (CLIO) represent significant progress moving Penn closer to carbon neutrality. While we have made significant progress, our roadmap calls for action from all Penn community members to promote sustainable and responsible use of resources both on and off campus. Over the next three years, we expect to implement additional enhanced recommissioning measures, explore opportunities for local air travel offset initiatives, and purchase electricity from two solar facilities. These actions combined with continuous recommissioning, operational changes, and renovation of the top 30 energy-consuming buildings are important steps on our trajectory to neutrality by 2042.



TOWARDS AN EQUITABLE FUTURE

Climate change is expected to result in hotter temperatures, more precipitation, and extreme weather patterns in the Philadelphia region. These impacts are already being realized by city residents and disproportionately so by low-income and black and brown communities due to systemic racism. The City of Philadelphia Climate Action Playbook explains that some neighborhoods in Philadelphia are as much as 22°F hotter than other neighborhoods in the city. The impacts of extreme heat events and weather patterns can result in heat related injuries and death, displacement, and respiratory disease exacerbation.

Penn’s investment in measures to improve the efficiency of our buildings and operations through retro-commissioning and a renewable energy Power Purchase Agreement are some of the ways that Penn is working to reduce greenhouse gases in our environment and have a more positive impact on our community.

Source: *Philadelphia Climate Action Playbook*. The City of Philadelphia Office of Sustainability, Jan. 2021, <https://www.phila.gov/media/20210113125627/Philadelphia-Climate-Action-Playbook.pdf>

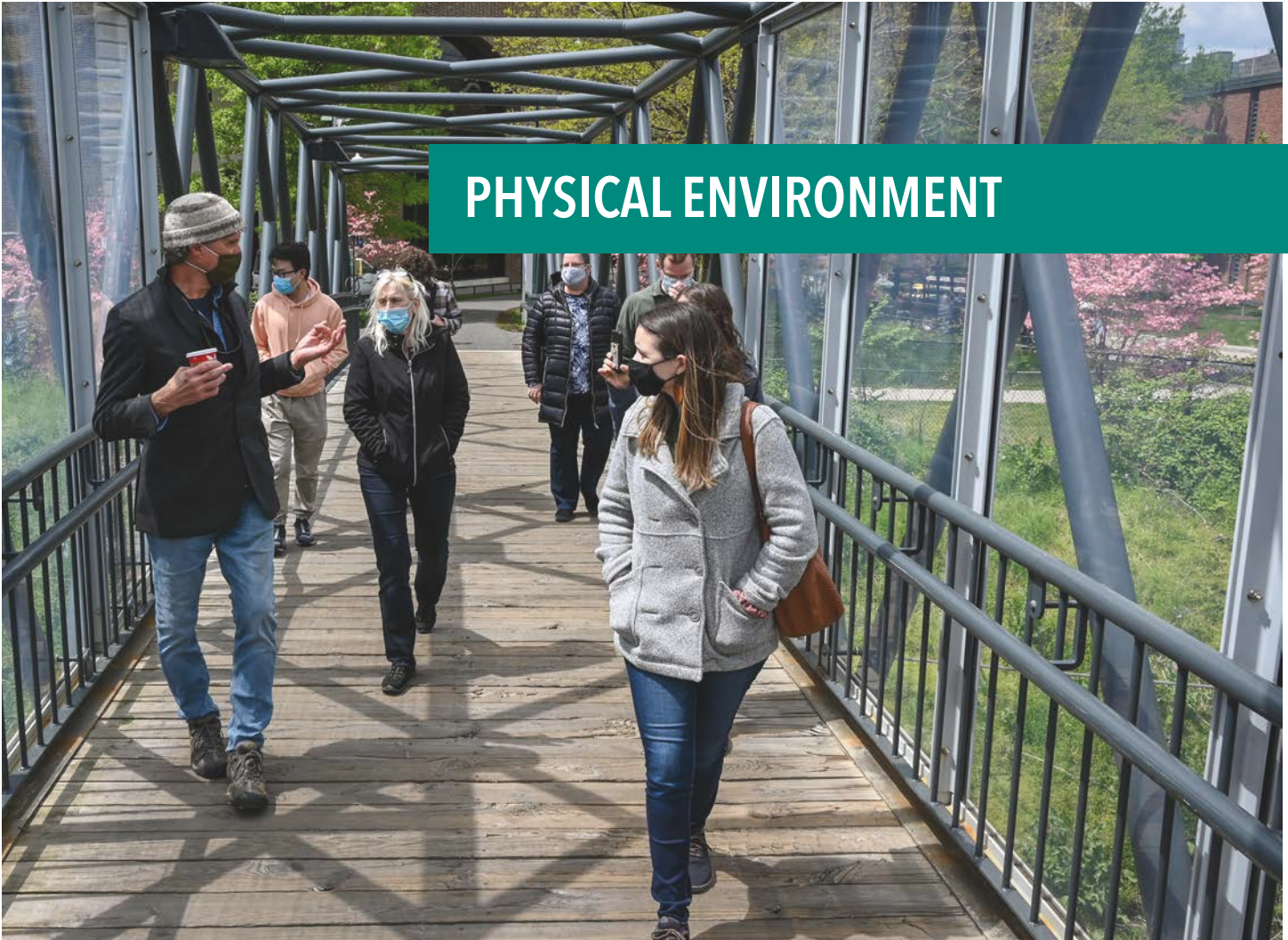
Kylie Cooper, Penn Sustainability



Students participating in PennGreen Pre-Orientation at Penn Park Farm



GOALS	STRATEGIES	FY21 PROGRESS
Reduce Penn's overall carbon footprint towards 2042 carbon neutrality goal	Investigate a renewable Power Purchase Agreement to reduce Penn's emissions from electricity.	<ul style="list-style-type: none"> • Penn has signed a power purchase agreement (PPA) for the supply of electricity, capacity, and renewable energy credits expected to offset 75% of the electricity used by Penn's main campus and the University of Pennsylvania Health System electricity. • Construction of two solar energy facilities with combined capacity of 220 MW is anticipated to begin in October 2021 with anticipated completion in 2022.
	Study options to mitigate emissions from campus steam consumption, including low-carbon steam, alternative heating solutions, and viable offsets.	<ul style="list-style-type: none"> • A working group continues to investigate long-term options for low-carbon and alternatives to steam. • Penn's steam provider, Vicinity, has committed to carbon neutrality by 2050 and is evaluating the integration of LR100, a waste vegetable oil, into their fuel mix.
	Expand School and Center awareness and training sessions through energy data awareness programs and the expansion of Energy Dashboards for Facilities and Real Estate Services (FRES) Operations and Maintenance (O&M) and School and Centers.	<ul style="list-style-type: none"> • In August of 2020, Building Energy Management Plans were completed for the top 30 buildings with opportunities to improve energy use. • A new interface has been developed for utility information using a platform to enable Schools and Centers to see their current and historic utility usage in a simple format. This will allow Schools and Centers to access energy usage on a monthly basis, an improvement from annual data reports.
	Identify and implement approved energy and carbon reducing measures as part of the Enhanced Recommissioning program.	<ul style="list-style-type: none"> • Thirteen enhanced recommissioning energy investigations have been completed. Energy savings opportunities (ESO) resulting from these investigations have been incorporated at the Biomedical Research Building (BRB). For the remaining ESOs, the applicable schools have reviewed and selected the items they would like to pursue. Those ESOs are awaiting proposals from contractors to provide the schools with final costs before proceeding.
	Leverage Supervisory Control and Data Acquisition (SCADA) capabilities to transition towards a continuous recommissioning O&M process.	<ul style="list-style-type: none"> • Controls engineers are updating building controls, one building at a time, with the goal of standardizing the nomenclature and graphics for building equipment. By standardizing these elements, it will open the opportunity to employing standardized algorithms in the future, which are the basis for continuous commissioning and improve efficiency and building function.
	Optimize maintenance activities to improve energy efficiency through pro-active maintenance.	<ul style="list-style-type: none"> • The FRES Operations and Maintenance (O&M) team is working on a three-stage strategy to expand their preventative maintenance approach to all Schools and Centers.
	Work with academic centers to determine an internal cost of carbon and incorporate into capital planning.	<ul style="list-style-type: none"> • Penn's Kleinmann Center for Energy Policy, in collaboration with a Penn Sustainability Graduate Intern, has been working with the ESAC Utilities and Operations Subcommittee to explore the feasibility of carbon pricing at Penn.



PHYSICAL ENVIRONMENT

MISSION

- Create and maintain a sustainable campus by increasing ecologically managed green space, reducing building energy consumption, and expanding awareness of sustainable design



PROGRESS SUMMARY

Penn’s commitment to a sustainable built environment and ecologically managed landscape continues.

- LEED Silver continues to be the minimum standard for new construction and major renovations, though many projects achieve LEED Gold certification.
- Over the past year, three new buildings have received LEED accreditation, with Stemmler Hall receiving LEED Gold for New Construction and The Lauder Institute receiving LEED Silver for Commercial Interiors, both in September of 2020, totaling 36 LEED projects at Penn.
- In May of 2021, the renovation of Vance Hall’s third and fourth floors received LEED Gold for Commercial Interiors.
- Penn continues to explore opportunities for more bird-friendly design practices, publishing the University’s first bird-friendly design guidelines.



TOWARDS AN EQUITABLE FUTURE

The Penn Food and Wellness Collaborative (PFWC) is a new program that brings together a diverse group of campus stakeholders including the Center for Public Health Initiatives, Wellness at Penn, and Facilities and Real Estate Services. The heart of the initiative is the Penn Park Farm, Penn’s first on-campus farm which grows produce for various hunger relief efforts and delivers year-round programming. The PFWC’s programs focus on health and wellness, food/social justice, sustainability, and food insecurity. In FY21, PFWC donated over 1,180 lbs of food to local food banks and the Hospital of the University of Pennsylvania food pantry.



Kylie Cooper, Penn Sustainability

Carrots harvested from Penn Park Farm



GOALS	STRATEGIES	FY21 PROGRESS
Update Campus Design Standards	Review and revise as needed Penn’s engineering and design guidelines.	<ul style="list-style-type: none"> Working groups have created bird-friendly guidelines. Penn is working with a consultant to review the Green Guidelines for Renovation and identify needed revisions. Penn’s Real Estate team is in the process of expanding sustainability language in a tenant handbook in order to promote sustainability in leases. A working group has reviewed opportunities to include Wellness initiatives into design guidelines.
	Review and revise Penn’s non-LEED project Sustainable Building and Renovation Guidelines.	<ul style="list-style-type: none"> Penn has engaged a consultant to review the Green Guidelines for Renovation as part of their work renovating the Quad. They will provide recommendations for the ESAC Physical Environment Subcommittee to consider to update the guidelines.
Improve Penn’s Landscape Ecology Practices	Identify priority areas within the Ecological Landscape Stewardship Plan (ELSP).	<ul style="list-style-type: none"> An ELSP has been developed in collaboration with Penn’s Landscape Architecture team and Operations and Maintenance team. A tentative priority list was developed and is currently under review by FRES.
	Reduce the number of bird strikes on campus.	<ul style="list-style-type: none"> Penn’s Landscape Planner, along with Student Eco-Reps, developed bird-friendly guidelines in an effort to reduce the number of bird-strikes on campus. A Bird-Friendly Design website was also developed in an effort to expand awareness of bird species, bird strike tracking, and bird-friendly building practices on Penn’s campus.
Continue to Improve the Sustainability of Penn’s Real Estate Holdings	Emphasize Penn’s commitment to sustainability and work with landlords to integrate sustainability-related policies.	<ul style="list-style-type: none"> Penn’s Real Estate team has reached out to the major third-party landlords and received summary documents of their sustainability efforts which were shared with PSO.
	Integrate green leasing policies for Penn-owned retail and commercial tenants and encourage sustainability-related policies.	<ul style="list-style-type: none"> Penn’s Real Estate team maintains a Tenant Handbook which includes sustainability practices in order to promote sustainability in leases. The ESAC Physical Environment Subcommittee worked with the Real Estate team to revise sustainability language in the tenant handbook and provide resources to support tenants in adopting more sustainable practices. The revised language, along with additional resources, is being finalized and will be distributed to University City Associates commercial tenants in Q1 of FY22.
	Continue to track energy use and develop metrics to quantify the impact across the Penn Real Estate portfolio.	<ul style="list-style-type: none"> Penn’s Real Estate team developed an annual reporting process for tracking energy use in its portfolio. The Real Estate team is working with the ESAC Physical Environment Subcommittee to determine how to incorporate the carbon footprint of their portfolio into the main campus reporting process.



GOALS	STRATEGIES	FY21 PROGRESS
Expand Penn's carbon footprint geography to include Morris Arboretum and New Bolton Center (NBC)	Penn Sustainability and the Center for Environmental Building and Design collaborate to finalize carbon footprints for Morris Arboretum and NBC.	<ul style="list-style-type: none"> Morris Arboretum and the New Bolton Center (NBC) have provided information needed to incorporate their centers into future emissions reporting.
Integrate best practices in occupant health and wellness to Penn's building standards	Assess opportunities for implementation of wellness criteria in new construction and major renovations.	<ul style="list-style-type: none"> A working group, co-led by the School of Arts and Sciences and FRES Design and Construction, has developed a matrix to assess all International WELL Building Standard concepts and their feasibility for implementation at Penn.
Improve water use and management on campus	Minimize potable water use.	<ul style="list-style-type: none"> Two Student Eco-Reps, in collaboration with The Water Center at Penn, researched Penn's campus water footprint during the 2020/2021 Academic Year. Direct and indirect water usage were calculated, and findings have been reported to the ESAC Physical Environment Subcommittee, and are under review by the Subcommittee.
	Improve stormwater management.	<ul style="list-style-type: none"> A stormwater working group has been developed to identify opportunities to improve stormwater management at Penn. A Summer '21 Sustainability Intern supported the focus group by researching best practices at peer institutions and engaging key local stakeholders.
Improve Penn's Preparedness, Resiliency, and Adaptation to Climate Change	Aggregate information to combine resiliency, adaptation, and mission continuity.	<ul style="list-style-type: none"> Climate resiliency strategy is in development. Progress toward this goal has been delayed due to COVID-19 impacts.



WASTE MINIMIZATION AND RECYCLING

MISSION

- Increase diversion and minimize solid waste through community education, strategic purchasing, appropriate infrastructure, and proper disposal, strengthened by relevant and accurate metrics



PROGRESS SUMMARY

While waste practices were significantly impacted by the COVID-19 pandemic, Penn’s ESAC Waste and Recycling Subcommittee continued to explore innovative solutions for improving waste diversion. The campus was less populated than typical, and more disposable items were used on campus to help minimize exposure to COVID-19.

- Penn Sustainability worked closely with Penn’s food service provider and Penn’s single stream recycling vendor to ensure that disposable containers could be recycled.
- Penn Procurement Services partnered with an outside organization to make mask and glove recycling available to interested Schools and Centers.
- A regular waste and recycling audit process was developed to identify waste trends and find new ways to reduce waste.
- While the total volume of waste decreased by 48% in FY21 as compared to FY09, a lower percentage of Penn’s waste was diverted from the trash stream.



TOWARDS AN EQUITABLE FUTURE

The City of Philadelphia’s Zero Waste Partnership Program is a way for local businesses and organizations to work closely with the City of Philadelphia to advance common waste reduction and diversion-from-landfill goals. Waste disposal, whether in a landfill or through waste-to-energy incineration, can have negative impacts on human health such as reduced air quality, groundwater contamination, and methane gas formation.

Penn is committed to supporting regional waste goals and reducing the impacts of our waste on human health and the environment. As the main campus joins other local organizations in becoming a Zero Waste Partner with the City of Philadelphia, Penn is demonstrating this commitment to supporting the City’s 2035 Zero Waste goal.

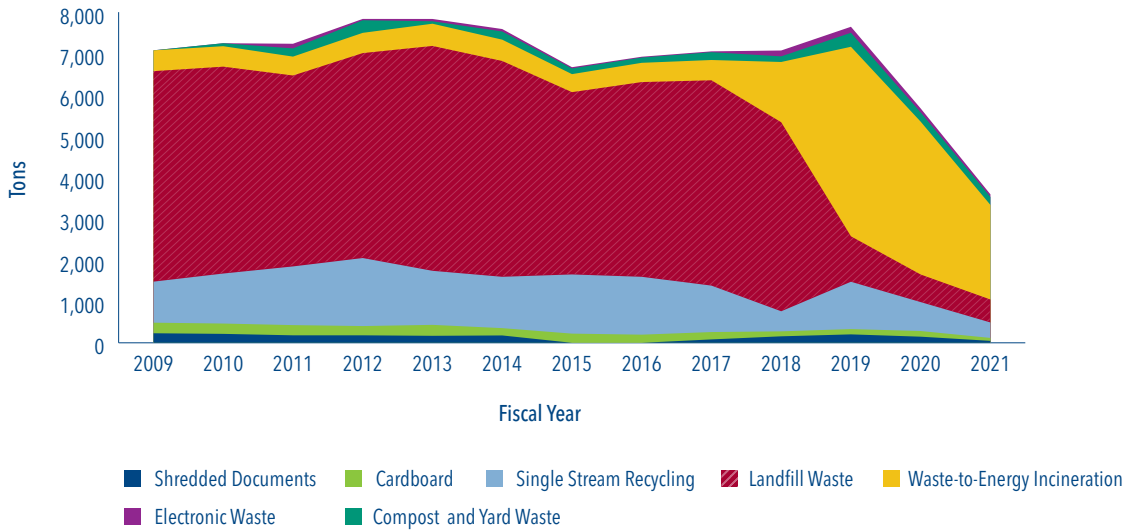
Kylie Cooper, Penn Sustainability



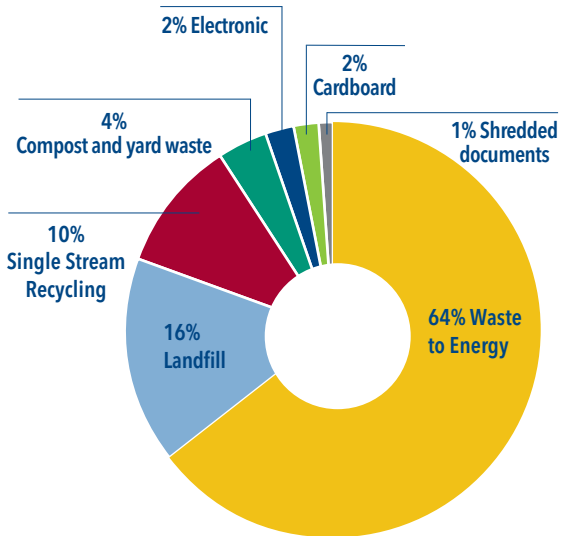
Student speaking during Student 1.5 Minute Climate Lectures as part of Climate Week at Penn.



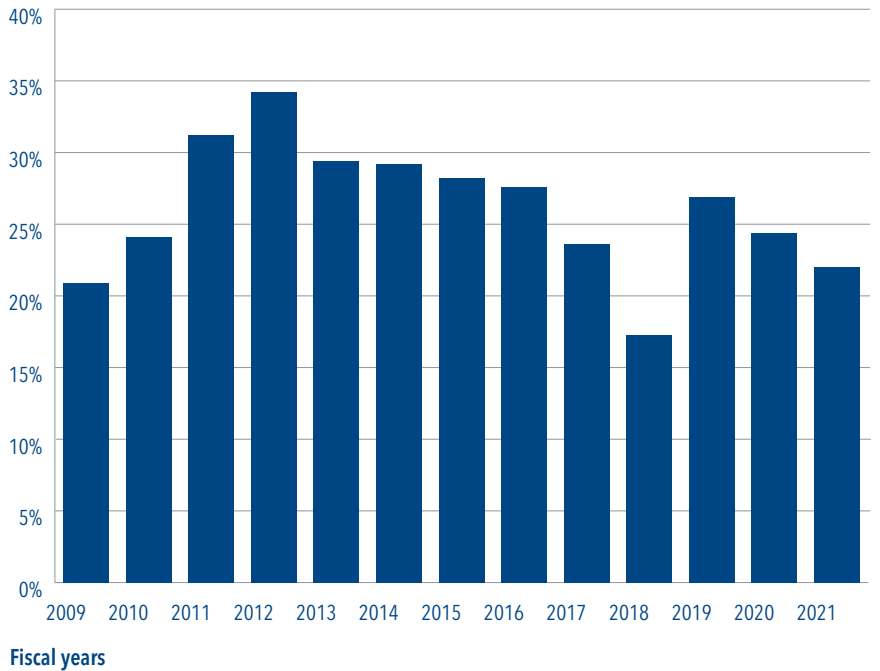
2009-2021 | Municipal Solid Waste and Recycling



FY21 | Waste Breakdown



Waste Diversion from Landfill





GOALS	STRATEGIES	FY21 PROGRESS
Increase Penn's Overall Waste Diversion and Minimize Waste Sent to Landfill	Improve waste data tracking and reporting.	<ul style="list-style-type: none"> While waste and recycling were previously assessed quarterly, Penn is now reviewing waste metrics every month and reporting the fate of waste and recycling materials and Penn's diversion rate to the City of Philadelphia.
	Evaluate and improve campus waste practices, recycling, and all diversion streams.	<ul style="list-style-type: none"> Scales for trucks will be included in the RFP for new trucks when it is time to purchase them.
		<ul style="list-style-type: none"> The ESAC Waste and Recycling Subcommittee has developed a comprehensive plan to regularly audit waste and recycling for a sample building in six key areas: dining, academics, research, athletics, residential, and student union/event space.
		<ul style="list-style-type: none"> During a research building waste audit, Penn's Solid Waste Management Working Group discovered that some animal bedding materials can be composted instead of being thrown in the trash. Penn's Urban Park team and University Laboratory Animal Resources are exploring ways to compost these materials.
	<ul style="list-style-type: none"> A working group focused on reducing bottled water use on campus is in the process of inventorying water bottle fillers on campus to identify opportunities for improvement. 	
	Strengthen education, training, and transparency.	<ul style="list-style-type: none"> In collaboration with a Masters of Environmental Studies (MES) student at Penn, Penn Sustainability and the ESAC Waste and Recycling Subcommittee are working on developing an infographic to explain where Penn's various waste streams go and how they are recycled, reused, or disposed.
Expand the University's Surplus Property Program.	<ul style="list-style-type: none"> PSO has identified key members for a working group to evaluate Penn's surplus property program and explore opportunities to improve Penn's surplus property program during the fall of 2021. 	
Support Regional Waste Goals	Support the City's 2035 Zero Waste Goal.	<ul style="list-style-type: none"> In March of 2021, Penn joined the City of Philadelphia's Zero Waste Partnership Program, committing to work closely with the City of Philadelphia to advance common waste reduction and diversion from landfill goals.

PROCUREMENT



MISSION

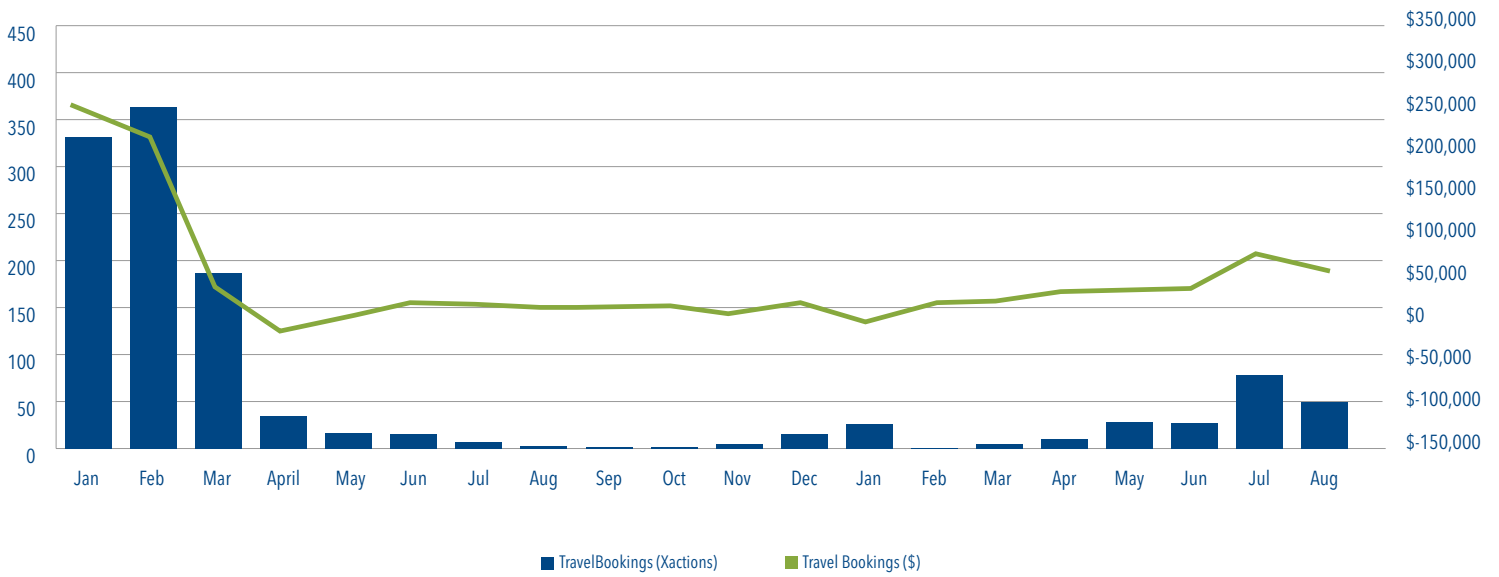
- Increase awareness and enable the procurement of environmentally responsible products and options
- Engage with suppliers and campus partners to reduce waste, and to identify and promote sustainable supply chains



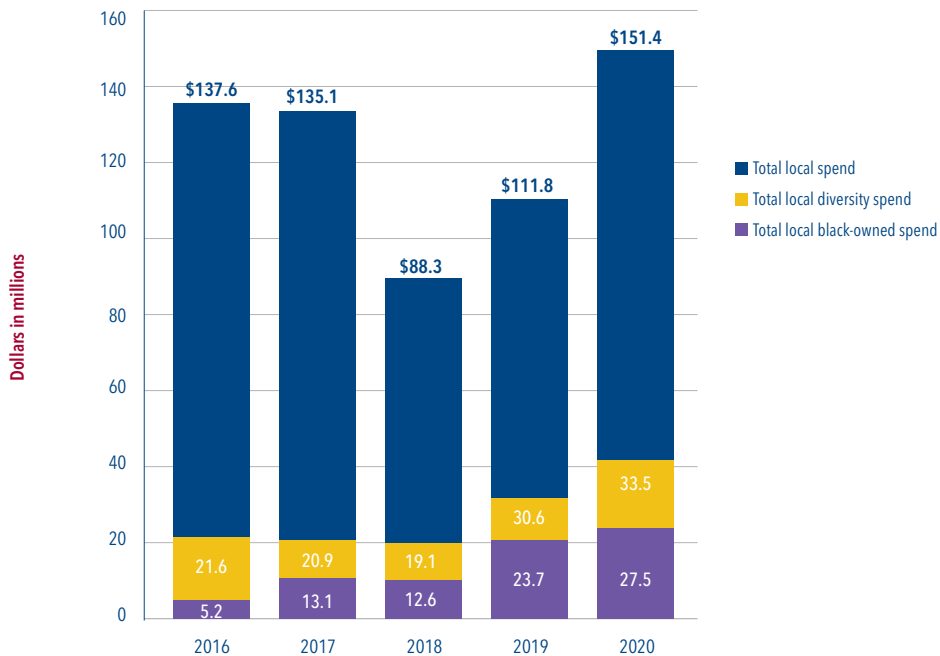
PROGRESS SUMMARY

- Noteworthy progress has been made to address emissions from Penn’s air travel through an Air Travel Working Group led by Penn Procurement Services. In FY21, this group established a Travel Sustainability Fund that will invest in best-fit sustainability projects to fully offset the carbon impacts of the University’s air travel. This fund is supported by a Climate Impact Offset (CLIO) charge, which was applied to air travel as of July of 2021. Initially, CLIO will offset air travel by purchasing offsets from a market provider.
- The Air Travel Working Group is actively investigating opportunities to develop a measurable, validated local offset program.

Travel Bookings
January 2020 through August 2021



2016-2020 | West and Southwest Philadelphia Trends in Penn’s Local Spending





TOWARDS AN EQUITABLE FUTURE PROCUREMENT - SUPPLIER DIVERSITY AND INCLUSION

A working group, chaired by the Senior Executive Vice President has led an ongoing initiative to advance Penn's impact in the area of supplier diversity and inclusion. Building on a track record of leadership in this area, the working group engaged a third-party consultant, faculty, students, suppliers, and thought leaders; and has put in place a 12-point action plan with the goal of increasing local and diverse spend, while expanding Penn's outreach and influence.

On July 28, at the 2021 Penn Supplier Diversity Forum & Expo, the University launched the **Fueling Business Growth** supplier diversity and inclusion campaign to rally the University around this shared priority. The virtual event, attended by hundreds of professionals from Penn and beyond, featured a discussion between Wharton Dean Erika James and Janice Bryant Howroyd, the founder and CEO of the largest Black woman-owned staffing business in North America. The event also featured the honoring of the inaugural Supplier Diversity & Economic Inclusion Impact Awards. The Impact Awards honored those at Penn who have embraced Penn's inclusive values and intentionally driven increased diversity spend impact.

As part of the campaign launch and action plan, Penn Procurement Services is working across the University and among its external network to optimize opportunities for local and diverse businesses while implementing ongoing program improvements. Meanwhile, in a challenging pandemic year, the University logged near-record spend with Black-owned suppliers, maintaining a spend level that is double the level from five years prior.



GOALS	STRATEGIES	FY21 PROGRESS
<p>Increase Procurement of Sustainable Food Products</p>	<p>Create a Dining Working Group to increase tracking and reporting of sustainable food purchases.</p>	<ul style="list-style-type: none"> • Chefs from Bon Appetit worked with two Student Eco-Reps during the 2020/2021 Academic Year to conduct an inventory of all food purchases and assess them against sustainability metrics developed by AASHE STARS. • Approximately 20% of the food used in Penn Dining facilities that are managed by Bon Appetit is sourced from local vendors, while 62% of the food meets STARS requirements for sustainability or ethically produced, and 30% is plant-based.
	<p>Improve catering practices on campus.</p>	<ul style="list-style-type: none"> • Penn Procurement Services launched a new catering website "Catering@Penn" which includes sustainability criteria when searching for vendors. The new and interactive webpage is hosted on the Procurement Services website.
<p>Encourage purchasing of low- or zero-emissions vehicles</p>	<p>Develop a low-emissions vehicle purchasing guide.</p>	<ul style="list-style-type: none"> • A Graduate Sustainability Intern conducted interviews with the top vehicle purchasers at Penn to evaluate departmental vehicle purchasing practices and develop draft guidance for low-emissions vehicle purchases. This guidance is under review by the ESAC Procurement and Transportation Subcommittees.
	<p>Expand campus fleet tracking.</p>	<ul style="list-style-type: none"> • PSO has been able to expand fleet tracking through strategic outreach to asset managers and information provided by the Office of Risk Management. • Penn currently has 26 electric vehicles, 6 gasoline-electric hybrid vehicles, and 39 vehicles fueled by a biodiesel blend fuel.
	<p>Establish a plan to reduce Penn's carbon emissions from air travel.</p>	<ul style="list-style-type: none"> • Penn Procurement Services leads an Air Travel working group comprised of faculty and staff from across the University. Over the past year, this group has analyzed and shared data to better understand air travel behavior; implemented policy #2371, Commitment to Travel Sustainability; published travel sustainability guidance webpages and one-pagers; and engaged partner organizations to pursue localized offset solutions.

PROCUREMENT

GOALS	STRATEGIES	FY21 PROGRESS
Expand Sustainable Office Equipment Purchases, Options, Standards, and Technology	Expand use of auto-replacements.	<ul style="list-style-type: none"> • Penn’s Business Services Division is currently exploring options for expanding auto-replacements for lab supplies in the Penn Marketplace. • Penn Sustainability is developing a resource for lab researchers to support in prioritizing more sustainable products.
	Expand use of Managed Print Services to all Schools.	<ul style="list-style-type: none"> • Penn Procurement Services finalized new contracts for Managed Print Services (MPS) in July 2020 and has promoted the program with the Penn community as faculty and staff return to campus. • New programs have been implemented with a Philadelphia-based, Black-owned supplier.
	Establish sustainable furniture standards for healthy interiors.	<ul style="list-style-type: none"> • A Furniture Working Group was established to make recommendations and develop guidelines for more sustainable furniture purchasing. The working group, with support from a School of Arts and Sciences (SAS) intern, has collected information from current suppliers about their sustainability practices. • Penn’s Sustainability Coordinators were also surveyed to understand their preferences or sustainability attributes of furniture.
	Quantify and communicate Penn’s supply chain impact.	<ul style="list-style-type: none"> • An Environmental Studies student completed a capstone project quantifying the environmental impact of paper purchased and used by Penn’s campus. • Penn Sustainability is exploring opportunities to quantify the impact of additional purchased goods and services.



Kylie Cooper, Penn Sustainability



MISSION

- Continue to prioritize a pedestrian and bike-friendly campus
- Encourage the use of local, alternative, and low-carbon transportation options
- Promote pedestrian and cyclist safety on campus



PROGRESS SUMMARY

Penn Transit continues to seek opportunities to champion more sustainable transportation in and around campus.

- Penn was recognized as a top national performer in the 2020 Sustainable Campus Index, ranking 5th overall in the area of transportation.
- Resources such as the Low-Emission Vehicle Guidance further advance opportunities for students, faculty, and staff to make informed decisions around transportation.
- Due to the COVID-19 pandemic campus population restrictions, there were dramatic changes to commuting in FY21. Many staff began working remotely in March of 2020, and only essential staff were working on campus.

- In order to understand transit patterns more holistically, the Transportation Subcommittee is evaluating commuting behavior and will be engaging Penn Praxis in a commuter survey. In addition, the Transportation Subcommittee is working to identify how COVID-19 will impact commuting behavior in the long term.

The pie charts on page 30 show the percentage of faculty and staff who participated in Penn Transportation and Parking subsidized programs in FY21 (during COVID-19) and FY20 (with part of the year during COVID-19). It is assumed that many staff and faculty were working remotely during FY21 due to the pandemic and did not participate in one of the Penn Transit-offered subsidy programs.



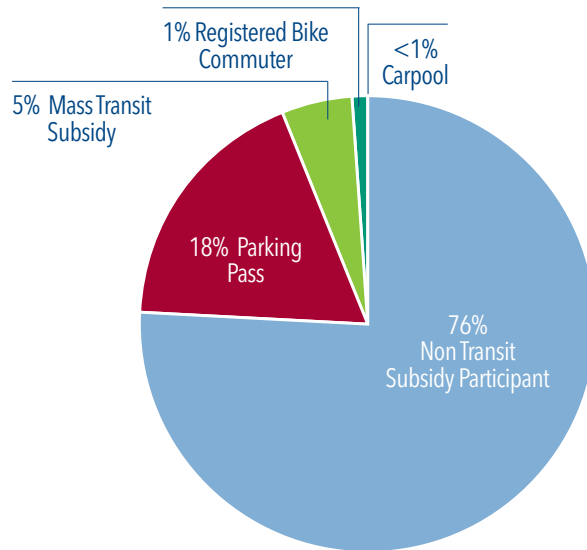
TOWARDS AN EQUITABLE FUTURE

In 2019, a report by the American Lung Association placed Philadelphia as the 18th most air polluted city in the United States. Unhealthy levels of air pollution can lead to both short- and long-term health impacts for people living in these areas. Some of the main driving factors of Philadelphia's polluted air are local emissions, including those that come from vehicles.

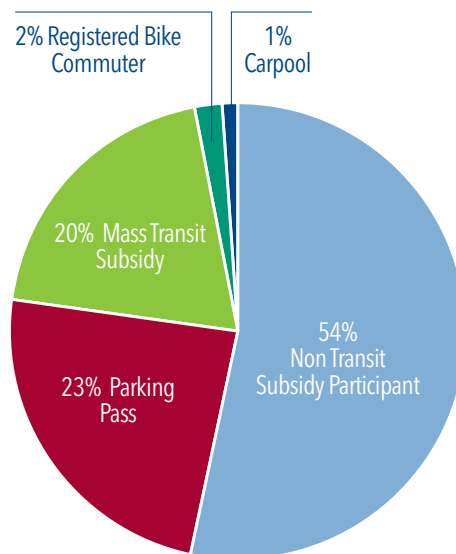
While changes to commuting and transportation patterns of the Penn community cannot independently solve Philadelphia's air pollution challenges, the University continues to seek opportunities to support the Penn Community in reducing the impact of travel to and around campus through expanding electric vehicle infrastructure and guidance, expanding bike infrastructure, and exploring opportunities to improve the sustainability of Penn's fleet.

FACULTY AND STAFF WHO PARTICIPATE IN PENN TRANSIT
SUBSIDIZED PROGRAMS FY21 AND FY20

Penn Staff and Faculty Commuting FY21



Penn Staff and Faculty Commuting Prior to March 2020





GOALS	STRATEGIES	FY21 PROGRESS
<p>A campus supported by an accessible, integrated multi-modal transportation system</p>	<p>Promote incentive programs for alternative transportation, integrate services with other transit providers, and influence local transportation systems.</p>	<ul style="list-style-type: none"> • Penn Transportation and Parking staff conducted a review and update of all transit-related websites in an effort to improve communication about incentive programs and sustainable transportation. • Throughout FY21, many staff and faculty were working remotely and students were engaged in off-campus learning. Because of the decrease in commuting to campus and other concerns about health and safety on public transportation, subsidy program participation decreased. • Penn is exploring the installation of 4 electric vehicle charging stations at the Walnut 40 Garage.
<p>Have an accessible and safe campus for bicyclists and pedestrians</p>	<p>Promote a pedestrian-friendly and safe campus in support of the City's Vision Zero efforts.</p>	<ul style="list-style-type: none"> • A working group has engaged Penn Praxis to explore options for a commuter survey to better understand pedestrian and other commuting practices of Penn staff and faculty.
	<p>Enhance the University's bicycle policies and coordinate initiatives with the greater Philadelphia bike community.</p>	<ul style="list-style-type: none"> • The Penn Community now has access to 6 Indego stations near campus. During FY21, over 35,000 Indego trips started and ended at these 6 locations. This is a 35% increase in trips originating and 38% increase in trips ending at these locations as compared to FY20. Penn is working with Indego to plan for future expansion of Indego stations in University City. • Penn's Bike Commuter Reimbursement Program completed its 4th year of subsidizing Penn faculty and staff that commute to campus by bike. This program continued to be useful and well utilized, despite impacts from COVID-19.
<p>Improved energy efficiency of parking and transportation facilities and fleet composition</p>	<p>Improve energy efficiency in parking facilities operations.</p>	<ul style="list-style-type: none"> • Penn Sustainability and Penn Transportation and Parking will research potential items to add to the facilities assessment related to more sustainable practices for existing parking garages. • 50% of Penn's parking garages have transitioned to LED lighting with a goal of fully transitioning to LED lighting by FY28.
	<p>Transition Penn vehicles from high carbon to low carbon or renewable fuels.</p>	<ul style="list-style-type: none"> • A Graduate Sustainability Intern conducted interviews with the top vehicle purchasers at Penn to evaluate departmental vehicle purchasing practices and develop draft guidance for low-emissions vehicle purchases. This guidance is under review by the ESAC Procurement and Transportation subcommittees and includes recommendations for e-assist bicycles, low-speed vehicles, passenger vehicles, passenger vans, cargo vans, pickup trucks, buses, medium- and heavy-duty chassis and equipment, and public safety vehicles.

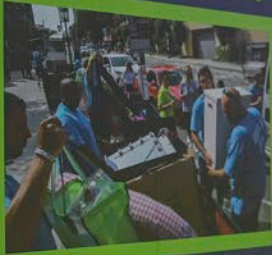
OUTREACH AND ENGAGEMENT

**Move-In Green:
Keep Move-Out In Mind**

Last year, over 100,000 pounds of trash were thrown out on campus during Move-In!

Pack light and buy secondhand to minimize your footprint.

Learn more at sustainability.upenn.edu



Penn
Sustainability

MISSION

- Continue to highlight the urgency of global environmental concerns, while building a holistic on-campus culture of sustainability

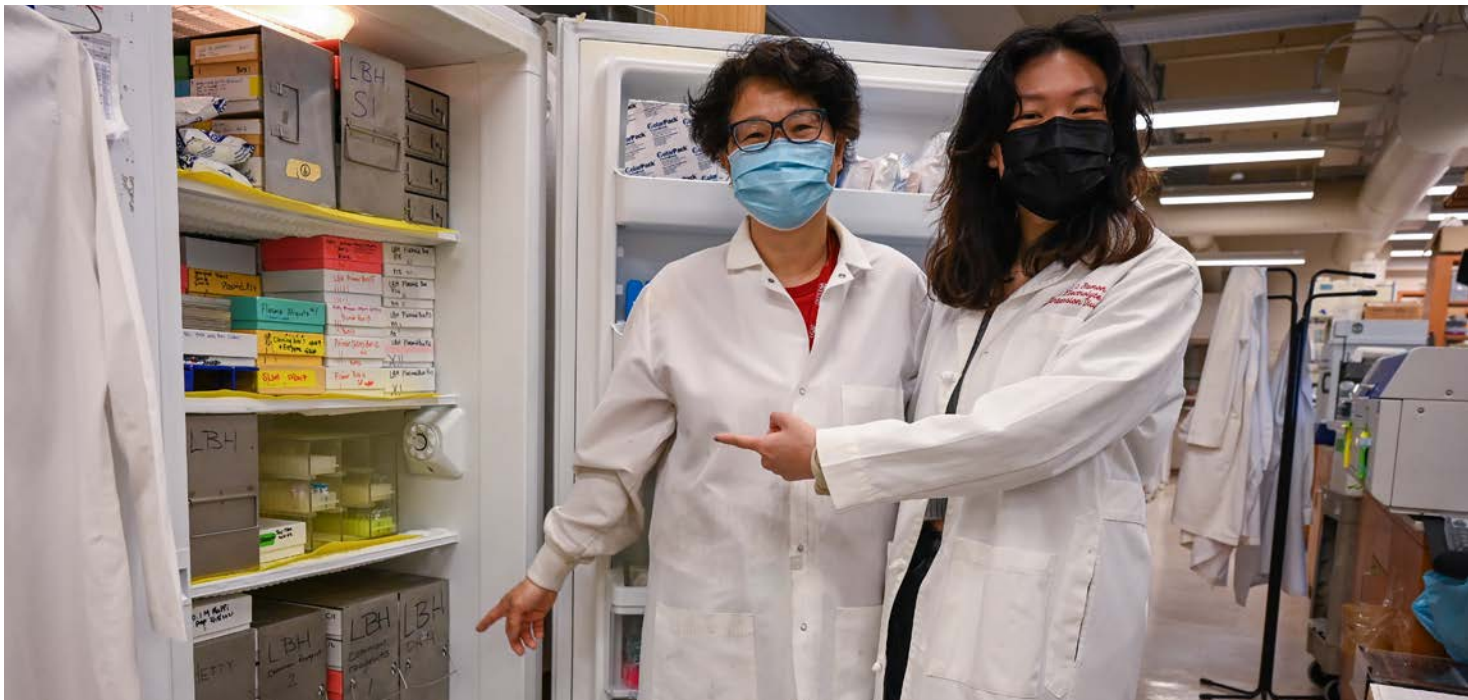


PROGRESS SUMMARY

Sustainability programs and outreach remain strong, despite the fact that much of the Penn community was working virtually.

- Students, faculty, and staff collaborated to host the inaugural Climate Week at Penn.
- The PSO and partners hosted a panel discussion to explore food justice and inequity as part of the MLK Commemorative Symposium on Social Change, and several successful Earth Week Events took place both in person and virtually.
- On the communications front, a Strategic Marketing and Communications Working Group has developed a Marketing and Communications Plan.
- Penn Sustainability hired a Photography Intern to capture initiatives and events and secured a contract to create a series of videos focused on Penn's CSAP 3.0.
- While changes to University operations due to COVID-19 altered many campus programs, PSO was able to continue many events and initiatives remotely.
- Nine Student Eco-Reps completed and presented on five year-long projects.
- The Green Fund Review Board reviewed three grant applications.
- The Green Labs Executive Committee hosted the first Freezer Challenge, pictured below.
- Climate Leaders @ Penn, an interdisciplinary graduate student group, launched the Climate Leaders at Penn Inaugural Fellowship.

Kylie Cooper, Penn Sustainability



Researchers in Holzman Lab, third place winner in Penn's first Freezer Challenge



TOWARDS AN EQUITABLE FUTURE

In September of 2020, students, faculty, and staff collaborated to hold the inaugural Climate Week at Penn. The primary objectives of Climate Week were to underscore the connection between racial justice, environmental justice, and the climate emergency; increase awareness about the climate emergency on campus; and to motivate the Penn Community to take climate action.

- A cross-disciplinary set of student organizations, Schools, and Centers demonstrated their interest in making a difference as 28 Penn organizations designed 45 unique events with close to 3,000 participants.
- The Netter Center at Penn organized a two-part teach in about environmental and climate health, social justice, and the intersection of these issues in West Philadelphia where community leaders shared their perspectives on current challenges, priorities, and hopes for the future.
- Organizers of these events aligned with the vision for the week by starting new conversations to enhance partnerships between Penn and our West Philadelphia community around topic of energy, the environment, and climate adaptation.
- Penn Sustainability organized an event featuring community members from University City Green and Overbrook Environment Center and the director of the Urban Health Lab to talk about the impacts of nature on health, the history of the environmental movement, and how each organization is working to address issues of racial justice related to access to nature.

Moving forward, the University plans to host Climate Week annually and continue to provide a space for University and community voices to engage in critical conversations about the University's role in climate change.



GOALS	STRATEGIES	FY21 PROGRESS
Expand and Strengthen Existing Outreach Programs	Incorporate sustainability as a formal component of the Wellness at Penn Initiative.	<ul style="list-style-type: none"> Environmental wellness has been incorporated as a formal component of the Wellness at Penn Initiative. The Wellness at Penn website provides a number of resources related to sustainability and the environment.
	Strengthen the Green Labs Working Group, Green Living, and Green Office programs.	<ul style="list-style-type: none"> The Green Labs Executive Committee and Green Labs Working Group continued to meet virtually to support sustainability in labs, which were some of the few spaces still operating in 2020 while Penn’s campus operations were limited. The Green Labs Executive Committee hosted the first Penn Labs Freezer Challenge, designed to promote best practices in cold storage management. Three winning labs implemented many actions in support of freezer efficiency, including performing defrosts, cleaning out old samples, and temperature tuning.
	Develop a comprehensive strategic communication plan for sustainability.	<ul style="list-style-type: none"> A Strategic Marketing and Communications Working Group has developed a first draft of a Sustainability Marketing and Communications Plan that encompasses media relations, social media, partner promotions and events, website, advertising and collateral materials, photography, and videos. PSO hired a Photography Intern to capture visual assets including events, sustainability practices, and initiatives for use in marketing materials. A contract was secured with a video and visual content product team to create a series of videos focused on CSAP 3.0 progress and initiatives.
	Create a Green IT Working Group.	<ul style="list-style-type: none"> A Green IT Working Group is in development. Progress toward this goal has been slowed due to COVID-19. Key members have been identified and the group aims to resume work in the Fall of 2021.
	Launch a new sustainability website.	<ul style="list-style-type: none"> Priorities for a new website have been identified in the Sustainability Strategic Marketing and Communications Plan.
	Elevate visibility of sustainability as core priority for employee onboarding and training.	<ul style="list-style-type: none"> The Environmental Sustainability Advisory Committee Behavior Change Subcommittee explored opportunities to better engage employees in campus sustainability during onboarding.
Engage Penn’s Leadership to Serve as Sustainability Change Agents	Develop a Senior Facilities Subcommittee to improve communication/collaboration for best practices across Schools & Centers.	<ul style="list-style-type: none"> The Building Administrator (BA) Forum has served as a place for communication and collaboration among Schools and Centers throughout the COVID-19 pandemic. Over the past fiscal year, Penn Sustainability presented to Schools and Centers through the Building Administrators Forum on topics including the Green Labs Commitment, the Penn Labs Freezer Challenge, and the Lights Out Philly campaign to minimize bird strikes.

LOOKING FORWARD

With two full years of the *Climate and Sustainability Action Plan 3.0 (CSAP 3.0)* behind us, it is clear that the Penn community is committed to accomplishing the strategies laid out in the CSAP 3.0. From the launch of the Environmental Innovations Initiative, to the signing of the largest solar PPA east of the Mississippi river, to the implementation of Penn's first bird-friendly building guidelines, there are clear outcomes from the collaborative work of Penn's sustainability community.

As a newer member of the Penn community, I am in awe of the level of commitment and tenacity of Penn's faculty, staff, and students to advance a sustainable, equitable future. Although more difficult to measure in outcomes, I'm continually impressed by the commitment of our community to find sustainable solutions in a constantly changing environment. For me, it is Penn's willingness to adapt and its ability to work together that signals our potential to face the challenges in front of us.


By working together to achieve the goals laid out in the CSAP 3.0, Penn is holding itself accountable while continuously learning and understanding our impacts. As Penn continually refines and expands its understanding of a sustainable community, I see the continued strengthening of partnerships, a wider embrace of our neighbors, and an acceleration of Penn's illimitable intelligence to address the environmental challenges and burdens facing many communities of color and vulnerable populations. I hope this annual report is both a way to see progress made, and a call for increased engagement and effort from all parts of the Penn community. I look forward to seeing Penn's continued progress and continued visioning for the years to come.




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Penn Sustainability Office



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Students reading *All We Can Save* during the New Student Orientation Second Year Reading Experience Student Panel