



UNIVERSITY OF PENNSYLVANIA

Climate & Sustainability Action Plan 4.0





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01. *Letter from Interim Penn President J. Larry Jameson, MD, PhD*

I AM PLEASED TO PRESENT THE UNIVERSITY OF PENNSYLVANIA'S CLIMATE AND SUSTAINABILITY ACTION PLAN 4.0 [CSAP 4.0], which builds on fifteen years of Penn's sustainability leadership.



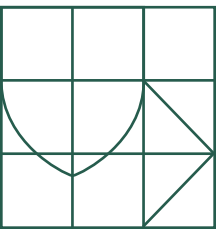
Our University's strategic framework for the future, *In Principle and Practice*, names great challenges of our time—challenges that Penn is uniquely equipped to address. None more so than climate and sustainability. Since Penn launched its first sustainability plan in 2009, we have made extraordinary strides across campus, in our teaching and research, and in our contributions to the world. Penn now serves as a national sustainability leader for higher education and beyond.

In the years to come, and in partnership with Penn's world-class schools and centers, we will do even more. Penn's latest Climate and Sustainability Action Plan will be Penn's roadmap.

From launching the largest solar project in the state of Pennsylvania, to initiating the first University air travel offset policy, to enacting Academic Climate Commitments at every School, Penn has laid a strong foundation of climate action that will enable our institution to meet the goals outlined in CSAP 4.0.

In our plan, we also expand Penn's goal of carbon neutrality by 2042 beyond our West Philadelphia campus, aligning with Penn Medicine's commitment to be the most environmentally friendly health system in the country, and working with our neighbors to enhance our shared environment.

Penn's strategic framework calls on all of us to bend our talents toward answering great challenges. As Franklin's University, we are up to the task. CSAP 4.0 outlines our community's commitment and will guide our collective strengths for climate and sustainability action over the next 5 years. I encourage everyone to read this plan carefully and then get involved as we move forward with determination, urgency, and ingenuity.



J. Larry Jameson, MD, PhD
INTERIM PRESIDENT

02. Introduction

Penn held a Solar Ribbon Cutting Event during Energy Week @ Penn to celebrate the operation of Penn's Solar Power Purchase Agreement.



CLIMATE CHANGE IS A DEFINING ISSUE OF OUR TIME. Rapid changes in global temperature and weather patterns caused by anthropogenic greenhouse gas emissions are threatening planetary and human health and well-being. Through a variety of channels, Penn is taking action to mitigate climate impacts, adapt to a changing environment, and prepare our University and Health System to lead in a rapidly evolving world.

The Climate and Sustainability Action Plan (CSAP) serves as the University's roadmap to address the environmental challenges in front of us, weaving together our collaborative efforts to make progress toward Penn's goal of carbon neutrality by 2042 and other ambitious five-

year goals that span key sustainability initiative areas. CSAP 4.0 builds on the strong foundation laid by previous plans to expand our boundaries, scope, and abilities to achieve new levels of transformation.

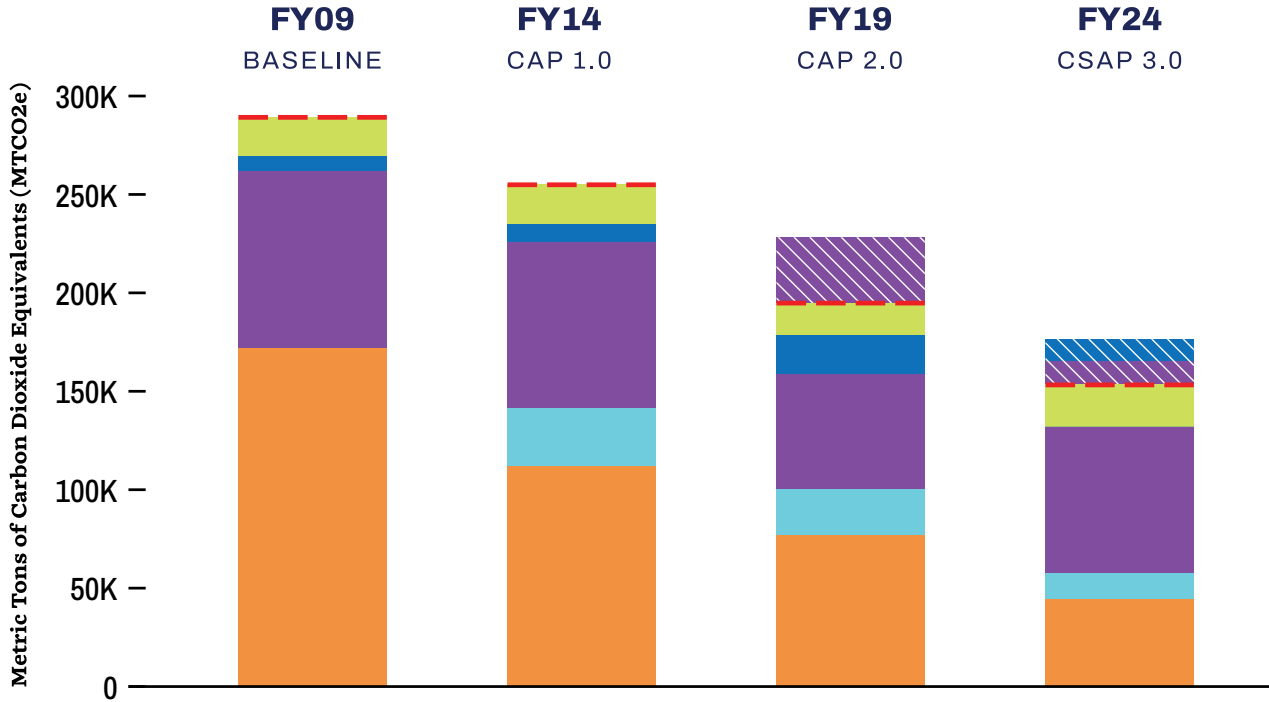
CSAP serves as the University and Health System's roadmap to address the environmental challenges in front of us, weaving together Penn's goal of carbon neutrality by 2042 and other ambitious five-year goals that span key sustainability initiative areas.



Since our first climate action plan in 2009, Penn has used five-year strategic plans to outline targets and work across our institution to reach them. CSAP 3.0 brought about Penn's inaugural solar power purchase agreement, Penn's Climate Change Survey and Penn Commuter Survey, the Ecological Landscape Stewardship Plan, and Penn's Air Travel Offset Policy and Program, to highlight a few of the major milestones reached over the past five years. A full summary of the accomplishments made over the past five years can be found in the CSAP 3.0 Summary Report.

Main Campus Carbon Emissions

2009-2024



EMISSIONS

- Electricity
- Chilled Water (Electricity)
- Steam
- Air Travel
- Other
- Net Emissions

OFFSETS

- Steam Offsets
- Air Travel Offsets



47%

2024 total carbon emissions reduced compared to baseline

THE CLIMATE & SUSTAINABILITY ACTION PLAN 4.0 IS A REFLECTION AND EXTENSION OF PENN'S *IN PRINCIPLE & PRACTICE*. As identified in Penn's strategic vision, climate change is one of the greatest challenges of our time—and one that Penn is poised to meaningfully address. CSAP 4.0 lays out Penn's commitments, targets, and pathways for addressing climate change in the classroom, across our campus, in our health system, and in partnership with our community.

CSAP 4.0 builds on the previous plan structure, organized around seven initiatives—Academics, Utilities & Operations, Physical Environment, Procurement, Strategic Waste, Transportation and Civic Engagement & Outreach—each developed by an Environmental Sustainability Advisory Committee (ESAC) subcommittee. Unique to CSAP 4.0, the plan includes goals that are specific to the University of Pennsylvania Health System. Each section that follows introduces the initiatives' themes and specifies their respective goals.

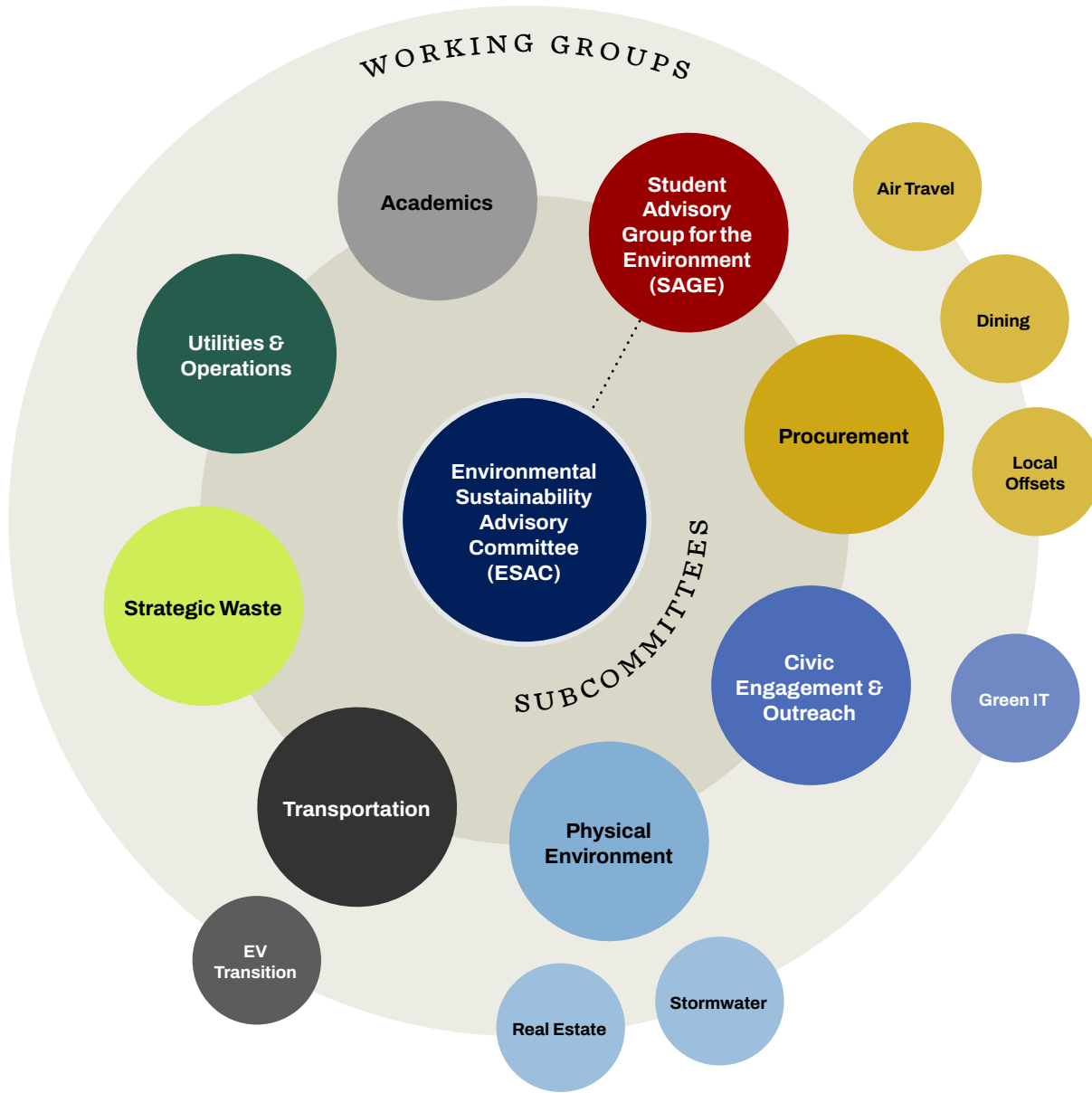
The review and goal-setting process led by the ESAC subcommittees began in the summer of 2023 and continued through the spring of 2024. A Sustainability Plan Advisory Committee was formed in fall 2023 to provide input on CSAP 4.0's development and to ensure alignment with broader Penn strategic planning. The Sustainability Plan Advisory Committee, with representation from the President's Office, Provost's Office, Office of Social Equity and Community, University of Pennsylvania Health System, and most of the SEVP divisions including Business Services and Finance, reviewed and advised on the strategic planning process. The Student Advisory Group for the Environment (SAGE) was also convened and provided recommendations on each initiative area that were incorporated, where relevant, into the goals.

IMPLEMENTATION

The implementation of CSAP 4.0 will require commitment and participation from every part of Penn's community. Through the ESAC structure and Penn Sustainability Office, progress on the goals will be tracked and communicated through publicly available annual reports.



Environmental Sustainability Advisory Committee (ESAC)



03. Executive Summary



The Climate and Sustainability Action Plan 4.0

**CSAP
4.0**

outlines Penn's
path towards



**2042
Goal**

of **carbon
neutrality**



**five-
year**

sustainability goals
between **2024 to 2029**.

CSAP 4.0 WORKS TO BETTER REFLECT THE CHANGING ENVIRONMENT BY FURTHER INTEGRATING SUSTAINABILITY AND CLIMATE-CONSCIOUS DESIGN INTO PENN'S CAMPUS, MANAGEMENT, AND OPERATIONS. The new plan also expands goals for scholarship and teaching related to climate, the environment, and sustainability, and builds on the successes of the Penn Climate Action Plans of 1.0 (2009), 2.0 (2014), and 3.0 (2019).

Unique to this plan, CSAP 4.0 puts forward 2024-2029 goals that align with the University of Pennsylvania Health System's inaugural sustainability plan, and includes civic engagement sustainability goals. This plan also expands its boundaries from the West Philadelphia academic campus to include satellite campuses of New Bolton Center, Morris Arboretum, and Penn-owned real estate properties. The plan includes both quantitative goals, such as carbon emissions reductions, as well as goals for the development of new initiatives over the next five years.



04. Academics

Faculty and students prepare for a BioBlitz in Kaskey Park.



WORLD-CLASS ACADEMICS ARE AT THE CORE OF PENN’S MISSION. ACROSS CAMPUS, IN EVERY DISCIPLINE, THOSE ACADEMICS ARE INTERWOVEN WITH CONCERNS ABOUT CLIMATE CHANGE, ENVIRONMENTAL CHALLENGES, THE ENERGY TRANSITION, AND SUSTAINABILITY. Inside and outside the classroom, students are seeking opportunities to learn about how their lives and careers can address these planetary challenges. In their scholarship, growing numbers of faculty across disciplines are pursuing lines of inquiry that connect to climate, the environment, and sustainability. Staff are developing programs and offering support to amplify and enlarge the impact of the knowledge and solutions emerging from Penn.

These efforts will only increase over the next five years, University-wide, with a focus on climate change laid out in *In Principle and Practice* and the appointment of Michael Mann (below, at right) as Penn’s inaugural Vice Provost for Climate Science, Policy, and Action. The goals below set our sights as a University community to holistically and rigorously confront climate change and sustainability challenges, leveraging our formidable intellectual might to do so—as well as our sense of justice and belief in our power to create a better world.

ENVIRONMENTAL INNOVATIONS INITIATIVE



The goals were developed in a collaborative process led by the Environmental Innovations Initiative (EII), within the Office of the Provost that has as its mission to connect, support, and accelerate research and teaching on climate, energy, the environment, and sustainability. Based on extensive consultation with faculty, staff, and students in Penn’s institutes, offices, centers, and schools,

including EII’s Internal Advisory Committee, Faculty Fellows, and student groups, three overarching thematic areas emerged: Research & Scholarship, Education, and Communication & Connection. Under these themes, seven ambitious academic goals are outlined. Achieving them will necessitate an “all in” approach, furthering Penn’s role as a leader in climate and sustainability.



ACADEMICS GOALS

Research and Scholarship

- 01** Increase opportunities and reduce barriers for transdisciplinary scholarship on climate and environment related topics by expanding faculty hiring and opportunities for student research and mentoring at all levels.
 - 02** Promote ethical community engaged research that addresses environmental challenges while centering community perspectives and needs.
-

Education

- 03** Augment climate and sustainability educational offerings so every student at Penn can access majors, minors, certificates, concentrations, and graduate programs that meaningfully address their discipline.
 - 04** Enhance applied and experiential learning in areas of climate, sustainability, energy, and the environment, using a Campus as a Living Lab model.
-

Communication and Connection

- 05** Forge strong connections among relevant centers and programs at Penn to coordinate efforts (programming, projects, communications, and opportunities for faculty, students, and staff) focused on sustainability.
 - 06** Continue to partner with each of Penn's schools to further their Academic Climate Commitments.
 - 07** Elevate Penn's reputation as a leader in environmental education, research, service, and policy, both locally and globally.
-



05.

Utilities & Operations

Penn's chilled water plant provides efficient cooling across the campus.



PENN IS COMMITTED TO CAMPUS CARBON NEUTRALITY BY 2042 TO HELP ADDRESS CLIMATE CHANGE AT THE LOCAL LEVEL. The majority of Penn’s emissions are from its buildings, which is why working on building efficiency and switching to renewable energy sources are key strategies to meet Penn’s carbon neutrality goal.

Penn utilizes energy management strategic programs and initiatives, such as optimizing building designs and operations and empowering occupants to minimize energy consumption. Other strategies include the Century Bond Program (where loans are provided to finance upgrades in lighting and HVAC systems that support energy efficiency and deferred maintenance), building recommissioning, and the Green Labs program.



Under CSAP 3.0, Penn achieved a key milestone by partnering on a Solar Power Purchase Agreement (PPA), which we anticipate will generate the equivalent of roughly 70% of Penn’s electricity of the academic campus and University of Pennsylvania Health System in the Greater Philadelphia area.



Penn’s Solar Power Purchase Agreement became operational in December 2023 when Great Cove 1 and 2 facilities were constructed in central Pennsylvania.

UTILITIES & OPERATIONS GOALS

- 01** In support of the 2042 carbon neutrality goal, develop a decarbonization plan for reducing Scope 1 and 2 emissions (heating, cooling, fleet, equipment, and electric power) directly produced by Penn or its utility suppliers. The plan will include the Main Campus, Morris Arboretum, New Bolton Center, and the Penn-owned Real Estate portfolio, with a recommendation for funding.

- 02** Establish school/center carbon and energy reduction plans to prioritize energy efficiency across Penn's building portfolio.

- 03** Explore ways to enhance Penn's existing energy standards for new construction and major renovations to improve building energy performance.

- 04** Establish an internal shadow price for carbon at least as high as the price set by the EPA for new construction and renovations and implement a standardized life-cycle cost projection of different project options. This will reflect the environmental/social costs of carbon emissions and help to buffer against the potential future imposition of a carbon tax by federal or state governments.

- 05** Ensure the Power Purchase Agreement research funds are distributed to projects that support renewable energy and sustainability.

- 06** Develop a Request for Proposal (RFP) to explore an onsite solar project that provides co-benefits such as visibility, community awareness, and educational opportunities to campus and local communities.

- 07** Study and adjust the current Red Day model to optimize grid resilience and responses by schools and centers and their occupants to more frequent extreme heat days.



06.

Physical Environment

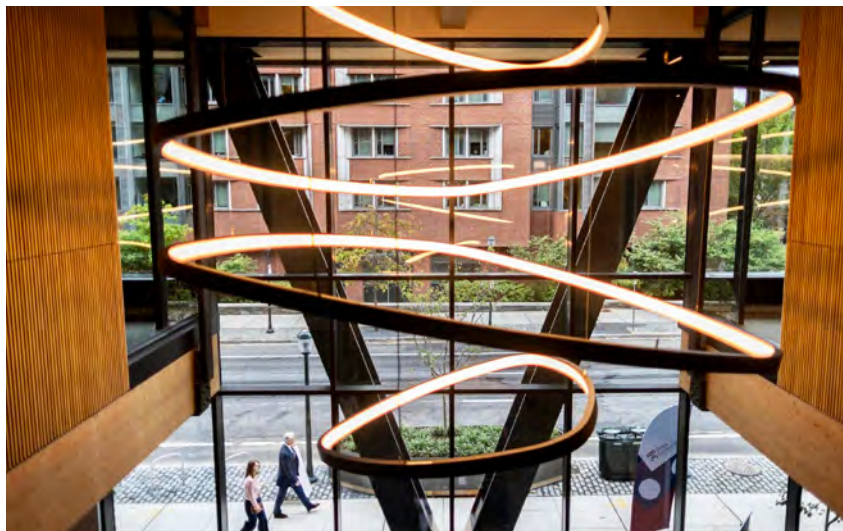
Vagelos Laboratory for Energy Science and Technology (VLEST), a collaboration between the School of Arts & Sciences (SAS) and the School of Engineering and Applied Science (SEAS), was completed in 2024. The sun shades on the building reduce solar heat gain while still letting in light.



PRESERVING HISTORY WHILE EMBRACING SUSTAINABLE DESIGN IS THE CORNERSTONE OF PENN'S APPROACH TO ITS BUILT ENVIRONMENT. Taking an ecological framework to how we renovate, reuse, and build structures keeps sustainability at the forefront of development. We maintain a sustainable campus by expanding the use of sustainable design. Penn is a natural haven found within the heart of Philadelphia that offers a connection to nature for people and wildlife alike.

Undoubtedly urban, our University is firmly integrated into West Philadelphia, but our environment does not end at campus borders. The organic system we foster — including trees, soils, and wildlife — all contribute to the greater ecosystem of our region. With CSAP 3.0, Penn released bird-friendly building guidelines, implemented an Ecological Landscape Stewardship Plan, and developed a stormwater asset map of campus.

Undoubtedly urban, our University is firmly integrated into West Philadelphia, but our environment does not end at campus borders.



PHYSICAL ENVIRONMENT GOALS

- 01 Expand Penn’s 100% x 2042 carbon neutrality goal for the West Philadelphia campus to include emissions from the Morris Arboretum, New Bolton Center, Pennovation Works, and other University-owned Real Estate portfolio properties.

- 02 Penn currently maintains a LEED v4.1 Silver certification standard for all new construction and major renovation projects. As LEED v5 is preparing to launch, evaluate its impact on our capital projects and our LEED Silver certification standard.

- 03 Evaluate the opportunity for Sustainable SITES certification on capital projects.

- 04 Smaller capital projects that are not LEED-certifiable are governed by Penn’s Sustainable Building Guidelines (2024). Define an effective review process to ensure compliance with these guidelines.

- 05 Evaluate the viability of a dedicated sustainability fund and potential school/center shared revenue sources in support of sustainable capital project initiatives.

- 06 Review opportunities to further protect Penn’s campus against climate change and address resiliency risks. Specific measures should include potential impacts from rising temperatures and increased stormwater challenges.

- 07 In alignment with the Ecological Landscape Stewardship Plan (ELSP), continue to track efforts to protect and plan for the Penn campus urban forest, such as support of the City of Philadelphia’s tree canopy goals, reducing urban heat island effect, improving air quality, and supporting biodiversity and a bird-friendly campus.

- 08 In response to the University’s strategic vision, *In Principle and Practice*, align the new campus development plan with CSAP 4.0 goals and engage school/center representation in the consultative process.

07.

Procurement

A volunteer at Penn Park Farm harvests garlic. Each year, the farm grows thousands of pounds of organic produce for Penn's dining halls as well as to support food access initiatives.

Photo by Kylie Cooper.





CONSCIOUS PROCUREMENT AT PENN ENSURES THE DOLLARS WE SPEND ALIGN WITH OUR VALUES. We are actively working to ensure Penn’s purchasing decisions consider the resulting local, social, and environmental impacts. Penn’s sustainable purchasing practices take a full-circle view of the University’s spending, from building materials and business-travel expenses to campus food.

By coordinating our efforts and sharing knowledge, we are able to develop sustainable purchasing policies and procedures. During CSAP 3.0, Penn launched the Commitment to Travel Sustainability Policy and began purchasing carbon offsets each year for Penn-related air travel.

Penn also launched the award-winning Catering@Penn website that sorts caterers by their level of commitment to sustainability.



Penn Dining’s team prepares plant-based meals in the residential dining halls.



PROCUREMENT GOALS

- 01** In coordination with the goal overseen by the Transportation subcommittee, facilitate an optimization of Penn’s fleet toward zero-emission vehicles.

- 02** Adopt and implement a sustainability policy (in RFPs, contract renewals, etc.) for third-party food retailers vending or operating on Penn’s campus, with a focus on utilization of reusable or recyclable, compostable wares, and back-of-house composting.

- 03** Track and regularly report consistent dining metrics for primary campus providers, including spend on animal/plant products and procurement of products recognized by third-party certifications.

- 04** Pilot zero-waste operations in at least one residential dining hall and begin a phased transition to require all providers to operate zero-waste residential dining halls.

- 05** Formalize the Air Travel Working Group as the Carbon Offset Working Group to review and inform the selection of all carbon offset projects for Penn.

- 06** Increase spend with local vendors.

- 07** Develop a Sustainability Buying Guide and training program to be provided to all University purchasers.

- 08** Develop a framework for measuring Scope 3 data from current and prospective vendors.

- 09** Incorporate student research to inform an approach to track Scope 3 emissions associated with Penn’s food purchases. Recommendations will align with any other Scope 3 frameworks developed or adopted by Penn.

08. Strategic Waste

Penn Sustainability volunteers help educate students on how to recycle in their dorms at Move-In each year.



SINGLE-STREAM RECYCLING IS THE PENN STANDARD, WITH SPECIALTY RECYCLING PROGRAMS POSITIONED ACROSS CAMPUS. Our recycling and waste initiatives focus on holistic minimization and diversion. We believe that every individual plays a crucial role in reducing our environmental footprint, and proper waste management and embracing circularity principles are fundamental to reducing waste.

The milestones achieved during CSAP 3.0 included Penn Dining switching to reusable to-go containers in residential dining halls, increasing compost collection in buildings, and hosting the first low-waste Hey Day. By empowering the Penn community to make thoughtful decisions on how to reduce material consumption and minimize waste, we can collectively contribute to a cleaner, more sustainable future.



A student volunteer helps break down boxes during Move-In.

STRATEGIC WASTE GOALS

- 01** Increase the diversion rate for items sent to landfill and incineration through improved data-informed education, signage, and operational improvements.

- 02** Enhance collection data to provide schools and centers waste-precinct level information, including trash, recycling, and compost weights to help identify opportunities for further diversion.

- 03** Establish standards for Penn's waste program, including all bins and signage, and develop a strategy for schools' and centers' compliance.

- 04** Establish a working group to establish goals and begin reducing single-use plastics from campus by 2029.

- 05** Develop new resources and strategies to increase the number of zero-waste campus events year over year.

- 06** Facilitate an increase in composted tonnage and collection sites.

- 07** Explore opportunities to expand surplus property programming accessible to all schools and centers that will facilitate a higher volume of intracampus exchange and donations throughout local communities.



09. Transportation

Penn Transit's buses provide safe and sustainable ways for students to get around the campus.

Photo by Kylie Cooper.



PENN'S FOCUS IS ON REDUCING SINGLE-OCCUPANCY VEHICLES and transitioning to a more holistic approach to transportation, including on-demand subsidized transit, fixed bus routes, and enhanced cyclist resources. The University supports a diverse portfolio of programs to encourage faculty, staff, students, and visitors to reduce vehicle traffic and create a cleaner future.



As part of CSAP 3.0, Penn conducted its first Commuter Survey.

4,000+ faculty and staff participated in the survey

FINDINGS

72% Penn employees' commuting trips on average made using an alternative to single-occupancy vehicles

PENN EMPLOYEES:

7x use transit at a rate seven times the average commuter in the Philadelphia region

3x bike more than three times as much as the regional rate

10x walk almost ten times more than the regional rate

TRANSPORTATION GOALS

- 01** Facilitate an increase in commuter trips to Penn made by non-single-occupancy vehicles.

- 02** Make data-informed recommendations to continue to optimize sustainable options in Penn's parking infrastructure.

- 03** Distribute the Staff & Faculty Commuter Survey at least every two years.

- 04** Collaborate with stakeholders to educate, improve infrastructure, and encourage safety for the campus biking environment.

- 05** Increase the Penn community's awareness of available transit options and other sustainable modes through improved communications, wayfinding, and outreach campaigns.

- 06** In coordination with the goal overseen by the Procurement subcommittee, facilitate an optimization of Penn's fleet towards zero-emission vehicles.

- 07** Develop a tool to aid current and prospective staff and faculty to make commute pattern decisions that incorporates Penn's complete diverse network of transportation modes.





10.

Civic Engagement & Outreach

Penn Sustainability volunteer helps load a fig tree into a car as part of Creating Canopy, a tree giveaway program.

Photo by Kylie Cooper.



AS PENN IS PART OF A LARGER ECOSYSTEM, IT IS IMPORTANT FOR US TO CONSIDER OUR IMPACTS AND HOW WE CAN BEST ENGAGE WITH OUR NEIGHBORHOOD AND BEYOND. Civic engagement is central to the intellectual experience at Penn. Civic awareness and action are woven into campus life with programs like the Creating Canopy tree giveaway, the Civic Sustainability Fellows program, and environmental justice events. This initiative area builds on the successes of CSAP 3.0's outreach goals, such as the establishment of the Green Labs Program, also expanding our goals to include a thoughtful approach toward increasing communication and collaboration across Penn and our broader community.

To be an anchored university and an excellent Philadelphia neighbor, through dialogue and collaboration, the Civic Engagement & Outreach subcommittee commits to the following goals.



Attendees learn about Penn Vet's activities at Climate Week 2023's Biodiversity Fair.

CIVIC ENGAGEMENT & OUTREACH GOALS

- 01 Enrich the daily sustainability practices of Penn students, faculty, and staff through new and existing programs.

- 02 Develop action-oriented, democratic partnerships that will increase the sustainability outcomes of Philadelphia.

- 03 Learn with and from peer institutions implementing sustainability practices with their local community partners.

- 04 In collaboration with the Environmental Innovations Initiative, explore and enhance career and professional development offerings related to sustainability professions.

- 05 Increase campus awareness around *Climate & Sustainability Action Plan 4.0* progress and accomplishments.



A Penn student gives a 1.5 Climate Lecture as part of Penn's Climate Week. *Photo by Tommy Leonardi.*

University of Pennsylvania

11.

Health System

The University of Pennsylvania Health System's Pavilion achieved LEED Gold certification.



PENN SUSTAINABILITY Climate & Sustainability Action Plan 4.0

IN A PUBLIC COMMITMENT TO LEAD AMONG HEALTH CARE ORGANIZATIONS IN REDUCING THE INDUSTRY’S OUTSIZED IMPACT ON CLIMATE CHANGE, THE UNIVERSITY OF PENNSYLVANIA HEALTH SYSTEM (UPHS) HAS SIGNED THE HEALTH SECTOR CLIMATE PLEDGE. Signing the pledge supports UPHS’ commitment to a wide-reaching goal articulated in the organization’s strategic plan: to become the most environmentally friendly health care organization in the nation.

University of Pennsylvania

HEALTH SYSTEM GOALS

- 01** At a minimum, reduce organizational emissions by 50% by 2030 (from a baseline year 2022) and achieve net-zero by 2042 in alignment with Penn goals, publicly accounting for progress on this goal every year.

- 02** Develop and implement a carbon emissions reduction strategy for energy emissions for all UPHS owned properties.

- 03** Develop and release a climate resilience plan that anticipates the needs of groups in the healthcare community that experience disproportionate risk of climate-related harm.

- 04** Apply for a minimum of LEED Silver on all new construction projects.

- 05** Ensure all UPHS entities maintain certifications from Practice Greenhealth and The Joint Commission.

- 06** In partnership with Penn, facilitate an optimization of UPHS fleet towards zero-emission vehicles.

The Health System has developed a Climate and Sustainability Action Plan 1.0 to guide its sustainability efforts. This plan will be made available in FY25.

The key goals under the Plan address each of the carbon emitting categories to include:

Energy

Transportation

Waste and Recycling

Chemicals and Gases

Procurement

Water

Food and
Nutrition

the Built Environment

Two additional components of the Plan will address:

**EMPLOYEE EDUCATION and
INTERNAL AND EXTERNAL COMMUNICATIONS.**



Penn Medicine

Penn Medicine's Climate and Sustainability Action Plan 1.0 will be released in FY25.

12. Looking Forward

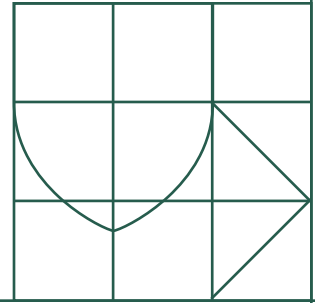


Stavros Niarchos Foundation (SNF) Paideia Program students visiting Great Cove 1 & 2 solar facilities in central Pennsylvania.

WITH THE LAUNCH OF PENN'S FOURTH CLIMATE AND SUSTAINABILITY ACTION PLAN, PENN AIMS TO ACHIEVE GREATER ALIGNMENT IN SUSTAINABILITY WORK ACROSS OUR INSTITUTION, AND CLEAR COMMUNICATION AND TRANSPARENCY TO ADVANCE IMPACT, BOTH ON CAMPUS AND BEYOND. *In Principle and Practice*

has activated our community to accelerate our commitment to environmental sustainability solutions and work in partnership to realize our goals. Building on nearly two decades of environmental commitment, Penn is well-positioned to meet this critical moment. With a strong focus on community engagement, and as an anchor institution in our regional ecosystem, Penn can be both a leader and a learner in the transformation ahead. We encourage all members of the Penn community to engage with the implementation of CSAP 4.0 and continue to innovate and inspire the solutions for today and tomorrow.

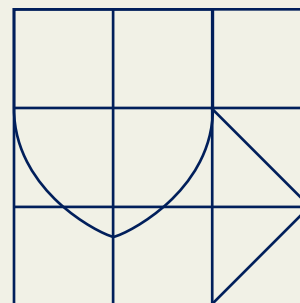
13. Glossary of Terms



Carbon Offset	“Tradeable ‘rights’ or certificates linked to activities that lower the amount of carbon dioxide in the atmosphere.” — MIT Climate Portal
Carbon Tax/Internal Shadow Price for Carbon	“Setting a price that emitters must pay for each ton of greenhouse gas emissions they emit.” — Center for Climate and Energy Solutions “A shadow price is a monetary value a company assigns to its greenhouse gas emissions on a per ton basis that is typically used to evaluate the potential cost or benefit of different strategies or investments aimed at reducing a company’s emissions.” — KPMG (Page 3)
Century Bond Program	A Penn program where funding is provided to finance upgrades in lighting and HVAC systems that support energy efficiency and deferred maintenance in buildings.
Diversion Rate	The percentage of waste materials diverted from traditional disposal such as landfilling or incineration to be recycled, composted, or re-used.” — EPA
E-Waste	“Electrical and electronic waste, or E-waste, refers to electrical or electronic equipment that is waste, including all components, subassemblies and consumables that are part of the equipment at the time the equipment becomes waste” — United Nations Environment Programme
Gross Emissions	“Carbon emissions calculated prior to reduction due to offsets.” — CSAP 3.0
Gross Total Emissions	“Carbon emissions from electricity, steam, chilled water, natural gas, fuel oil, fleet and equipment, commuting, air travel, and solid waste, excluding the impact of carbon offsets.” — CSAP 3.0
LEED	“LEED (Leadership in Energy and Environmental Design) certification provides a framework for healthy, highly efficient, and cost-saving green buildings, which offer environmental, social and governance benefits.” — U.S Green Building Council

MTCDE	“A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). Carbon dioxide equivalents are commonly expressed as ‘metric tons of carbon dioxide equivalents (MTCDE).’” — SIMAP
Net Emissions	“The amount of greenhouse gas that’s produced and the amount that’s removed from the atmosphere.” — National Grid
Non-Single-Occupancy-Vehicles	Vehicles that are not “only carrying a driver with no passengers.” — Atlanta Regional Commission
Power Purchase Agreement	“An arrangement in which a third-party developer installs, owns, and operates an energy system. The customer then purchases the system’s electric output for a predetermined period.” — Better Buildings, U.S. Department of Energy
Scope 3 Data	<p>“Emissions resulting from activities from assets not owned or controlled by the reporting organization, but that the organization indirectly affects in its value chain.” — EPA</p> <p>“Scope 3 emissions, also referred to as value chain emissions, often represent the majority of an organization’s total greenhouse gas (GHG) emissions.” — EPA</p>
Single Stream Recycling	“Refers to a system in which different recyclable materials (plastics, paper, metals, glass etc.) are placed in the same bin. Once collected, the materials are separated and processed.” — CSAP 3.0
Steam Chillers	“A machine that uses steam as a fuel source to generate chilled water for cooling and dehumidifying buildings.” — CSAP 3.0
Surplus Property	“Reusing quality surplus items generated on campus prior to considering the purchase of new items.” — Penn Procurement Services
Sustainable SITES	“A rating system that guides, evaluates, and certifies a project’s sustainability in the planning, design, construction and management of landscapes and other outdoor spaces.” — Sustainable SITES Initiative
Total Emissions	“Carbon emissions from electricity, steam, chilled water, natural gas, fuel oil, fleet and equipment, commuting, air travel, and solid waste.” — CSAP 3.0
Zero-Waste Campus Events	“A Zero Waste Event aims to reduce event waste holistically, including purchasing, usage, and disposal of resources before, during and after an event.” — Pennsylvania Resources Council

14. *Acknowledgements*



Peter Ammon

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Mark Mills

Chief Procurement Officer, Division of Finance

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Nicole Muravsky

Member, Undergraduate Assembly

Chris Nicolais

Director of Design & Construction, Perelman School of Medicine

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Senior Director of Strategic Sourcing & Sustainability, Division of Finance

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Urban Park Manager, Facilities & Real Estate Services

Joe Russo

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Noah Swistak

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Vice President for Advocacy, GAPSA

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Katherine Unger Baillie

Director, Environmental Innovations Initiative, Office of the Vice Provost for Research

Faramarz Vakili

Executive Director of Operations and Maintenance, Facilities & Real Estate Services

Kimber VanSant

Manager, Communications & Administration, Budget Planning & Analysis

Allison Wilson-Maher

Vice President, University of Pennsylvania Health System—Real Estate, Design and Construction

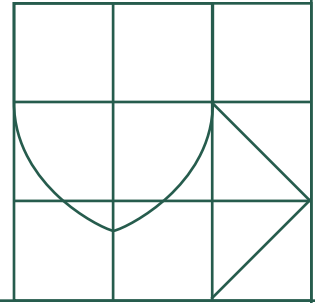
Marie Witt

Vice President, Business Services (Retired)

Heidi Wunder

Associate Director, Environmental Innovations Initiative

15. *Appendix*



Climate and Sustainability Action Plan (CSAP) 4.0 Goals

Academics

Research and Scholarship

- Increase opportunities and reduce barriers for transdisciplinary scholarship on climate and environment related topics by expanding faculty hiring and opportunities for student research and mentoring at all levels.
- Promote ethical community engaged research that addresses environmental challenges while centering community perspectives and needs.

Education

- Augment climate and sustainability educational offerings so every student at Penn can access majors, minors, certificates, concentrations, and graduate programs that meaningfully address their discipline.
- Enhance applied and experiential learning in areas of climate, sustainability, energy, and the environment, using a Campus as a Living Lab model.

Communication and Connection

- Forge strong connections among relevant centers and programs at Penn to coordinate efforts (programming, projects, communications, and opportunities for faculty, students, and staff) focused on sustainability.
- Continue to partner with each of Penn's schools to further their Academic Climate Commitments.
- Elevate Penn's reputation as a leader in environmental education, research, service, and policy, both locally and globally.

Utilities & Operations

- In support of the 2042 carbon neutrality goal, develop a decarbonization plan for reducing Scope 1 and 2 emissions (heating, cooling, fleet, equipment, and electric power) directly produced by Penn or its utility suppliers. The plan will include the Main Campus, Morris Arboretum, New Bolton Center, and the Penn-owned Real Estate portfolio, with a recommendation for funding.

- Establish school/center carbon and energy reduction plans to prioritize energy efficiency across Penn's building portfolio.

- Explore ways to enhance Penn's existing energy standards for new construction and major renovations to improve building energy performance.

- Establish an internal shadow price for carbon at least as high as the price set by the EPA for new construction and renovations and implement a standardized life-cycle cost projection of different project options. This will reflect the environmental/social costs of carbon emissions and help to buffer against the potential future imposition of a carbon tax by federal or state governments.

- Ensure the Power Purchase Agreement research funds are distributed to projects that support renewable energy and sustainability.

- Develop a Request for Proposal (RFP) to explore an onsite solar project that provides co-benefits such as visibility, community awareness, and educational opportunities to campus and local communities.

- Study and adjust the current Red Day model to optimize grid resilience and responses by schools and centers and their occupants to more frequent extreme heat days.

Physical Environment

- Expand Penn's 100% x 2042 carbon neutrality goal for the West Philadelphia campus to include emissions from the Morris Arboretum, New Bolton Center, Pennovation Works, and other University-owned Real Estate portfolio properties.

- Penn currently maintains a LEED v4.1 Silver certification standard for all new construction and major renovation projects. As LEED v5 is preparing to launch, evaluate its impact on our capital projects and our LEED Silver certification standard.

- Evaluate the opportunity for Sustainable SITES certification on capital projects.

- Smaller capital projects that are not LEED-certifiable are governed by Penn's Sustainable Building Guidelines (2024). Define an effective review process to ensure compliance with these guidelines.

- Evaluate the viability of a dedicated sustainability fund and potential school/center shared revenue sources in support of sustainable capital project initiatives.

Physical Environment (continued)

- Review opportunities to further protect Penn's campus against climate change and address resiliency risks. Specific measures should include potential impacts from rising temperatures and increased stormwater challenges.
- In alignment with the Ecological Landscape Stewardship Plan (ELSP), continue to track efforts to protect and plan for the Penn campus urban forest, such as support of the City of Philadelphia's tree canopy goals, reducing urban heat island effect, improving air quality, and supporting biodiversity and a bird-friendly campus.
- In response to the University's strategic vision, *In Principle and Practice*, align the new campus development plan with CSAP 4.0 goals and engage school/center representation in the consultative process.

Procurement

- In coordination with the goal overseen by the Transportation subcommittee, facilitate an optimization of Penn's fleet toward zero-emission vehicles.
- Adopt and implement a sustainability policy (in RFPs, contract renewals, etc.) for third-party food retailers vending or operating on Penn's campus, with a focus on utilization of reusable or recyclable, compostable wares, and back-of-house composting.
- Track and regularly report consistent dining metrics for primary campus providers, including spend on animal/plant products and procurement of products recognized by third-party certifications.
- Pilot zero-waste operations in at least one residential dining hall and begin a phased transition to require all providers to operate zero-waste residential dining halls.
- Formalize the Air Travel Working Group as the Carbon Offset Working Group to review and inform the selection of all carbon offset projects for Penn.
- Increase spend with local vendors.
- Develop a Sustainability Buying Guide and training program to be provided to all University purchasers.
- Develop a framework for measuring Scope 3 data from current and prospective vendors.
- Incorporate student research to inform an approach to track Scope 3 emissions associated with Penn's food purchases. Recommendations will align with any other Scope 3 frameworks developed or adopted by Penn.

Strategic Waste

- Increase the diversion rate for items sent to landfill and incineration through improved data-informed education, signage, and operational improvements.

- Enhance collection data to provide schools and centers waste-precinct level information, including trash, recycling, and compost weights to help identify opportunities for further diversion.

- Establish standards for Penn's waste program, including all bins and signage, and develop a strategy for schools' and centers' compliance.

- Establish a working group to establish goals and begin reducing single-use plastics from campus by 2029.

- Develop new resources and strategies to increase the number of zero-waste campus events year over year.

- Facilitate an increase in composted tonnage and collection sites.

- Explore opportunities to expand surplus property programming accessible to all schools and centers that will facilitate a higher volume of intracampus exchange and donations throughout local communities.

Transportation

- Facilitate an increase in commuter trips to Penn made by non-single-occupancy vehicles.

- Make data-informed recommendations to continue to optimize sustainable options in Penn's parking infrastructure.

- Distribute the Staff & Faculty Commuter Survey at least every two years.

- Collaborate with stakeholders to educate, improve infrastructure, and encourage safety for the campus biking environment.

- Increase the Penn community's awareness of available transit options and other sustainable modes through improved communications, wayfinding, and outreach campaigns.

- In coordination with the goal overseen by the Procurement subcommittee, facilitate an optimization of Penn's fleet towards zero-emission vehicles.

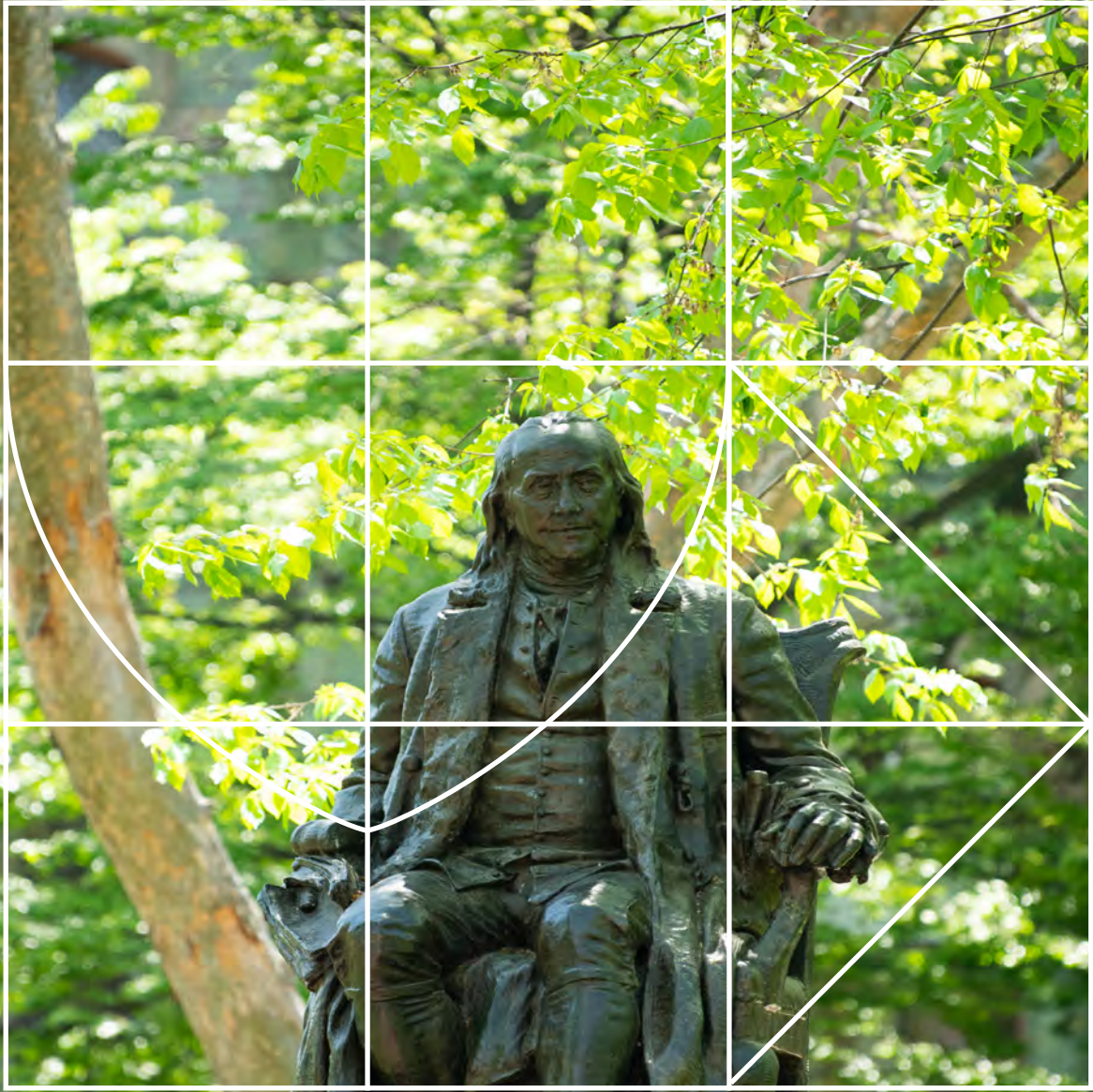
- Develop a tool to aid current and prospective staff and faculty to make commute pattern decisions that incorporates Penn's complete diverse network of transportation modes.

Civic Engagement & Outreach

- Enrich the daily sustainability practices of Penn students, faculty, and staff through new and existing programs.
- Develop action-oriented, democratic partnerships that will increase the sustainability outcomes of Philadelphia.
- Learn with and from peer institutions implementing sustainability practices with their local community partners.
- In collaboration with the Environmental Innovations Initiative, explore and enhance career and professional development offerings related to sustainability professions.
- Increase campus awareness around *Climate & Sustainability Action Plan 4.0* progress and accomplishments.

University of Pennsylvania Health System

- At a minimum, reduce organizational emissions by 50% by 2030 (from a baseline year 2022) and achieve net-zero by 2042 in alignment with Penn goals, publicly accounting for progress on this goal every year.
- Develop and implement a carbon emissions reduction strategy for energy emissions for all UPHS owned properties.
- Develop and release a climate resilience plan that anticipates the needs of groups in the healthcare community that experience disproportionate risk of climate-related harm.
- Apply for a minimum of LEED Silver on all new construction projects.
- Ensure all UPHS entities maintain certifications from Practice Greenhealth and The Joint Commission.
- In partnership with Penn, facilitate an optimization of UPHS fleet towards zero-emission vehicles.



BENJAMIN FRANKLIN
1706-1790
VENERABLE
FOR HIS WISDOM
ADMIRABLE FOR HIS
ESTABLISHED TO HIS COUNTRY

