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research and instruction;

- Educating authors on their intellectual property rights and assisting with the interpretation and amendment of publication contracts;
- Facilitating compliance with funder public access mandates;
- Developing and managing institutional repositories for the purpose of collecting, showcasing and augmenting discovery of institutional research output; and
- Advocating for open access to scholarship when appropriate.

It was in his view critical to understand how peer libraries are engaging with faculty, shifting from functioning solely as a repository of physical objects like books and bound journal volumes and as an access point for journal backfiles and other databases to working directly with the faculty, formally and collaboratively (the “together rather than independently” approach), both regarding the use of library materials and influencing and advancing scholarly communications more broadly over the whole of the research-through-publication lifecycle via library-mediated workflow management systems.

The forces and configurations implicated in the outset of the Committee’s charge are complex and dynamic. The Committee this year has begun to explore them and the ways Penn might best respond. We will continue to do so for at least the coming year. We will submit a more extensive report a year hence for SEC discussion and for possible consideration of recommendations SEC might wish to make. We will advise in that report whether we think there is further work for the Committee as such to pursue and, if so, what that work might be. Our goal in the coming year or in some longer term is to assist SEC in developing a plan or at

least a basic position from which scholarly communications issues can be addressed as they arise. Arise they surely will.

Members of the 2019-2020

Ad Hoc Committee on Scholarly Communication

- Jerry Jacobs (Professor of Sociology)
Kathleen Hall Jamieson (Faculty Senate Chair-Elect and Elizabeth Ware Packard Professor of Communication)
Lewis Kaplan (Professor of Surgery at the Hospital of the University of Pennsylvania and the Veterans Administration Medical Center)
Steven Kimbrough (Faculty Senate Chair and Professor of Operations, Information and Decisions)
Eileen Lake (Professor of Nursing)
Rebecka Peebles (Assistant Professor of Pediatrics at the Children’s Hospital of Philadelphia)
Kathy Peiss (Roy F. and Jeannette P. Nichols Professor of American History)
Daniel Raff (Associate Professor of Management), *Chair*
Beth Simmons (Andrea Mitchell University Professor of Law and Political Science)
Non-voting members:
Mary Francis (Director of the University of Pennsylvania Press)
Aishwarya Pawar (GAPSA representative, Cell and Molecular Biology Ph.D. candidate)
Jon Shaw (Associate Vice Provost and Deputy University Librarian)
Brigitte Weinstein (Associate University Librarian for Collections)

Report of the Senate Ad Hoc Committee on the Institutional Response to the Climate Emergency (CIRCE)

Committee Charge

CIRCE was established in December 2019 for the purpose of facilitating discussion of all aspects of global warming and climate change as they pertain to faculty at the University of Pennsylvania. Specifically, CIRCE will consider the following categories of faculty interest as they pertain to the climate emergency at Penn:

- Education, including classroom instruction as well as extra-curricular educational activities
- Research, including as well scholarship, practical expertise, and artistic expression
- Operations of the University, including decarbonization, energy efficiency, and sustainability
- Flourishing of community, both within Penn, and between Penn and its regional and international stakeholders

Sub-Committee Organization

It was recognized in its formulation that the charges to CIRCE could not be completed successfully by a single committee. As a result, three subcommittees were formed, specifically: Operations, Research & Education, and Community & Policy. Different types of work were pursued by each subcommittee, so the report is divided into sections for each of them.

Operations

The Operations subcommittee developed four recommendations.

1. Updated Climate and Sustainability Action Plan (CSAP)

We recommend that the administration prepare and publish an updated Carbon and Sustainability Action Plan to reflect the effects of the Solar Power Purchase Agreement (Solar PPA) and the Air Travel offsets announced by the President and to clarify the strategies, challenges, and achievements in each of the seven sections of plan. Recommendations for five of the sections are addressed in this section, while the other two are addressed by the work of the Community & Engagement and the Research & Education subcommittees.

The updated plan should explain exactly how the main campus will achieve carbon neutrality by 2042, making clear the pathway to the “100 x 42” goal mentioned in the report. It should show all the categories of campus emissions and the effect of each initiative over time. The data used to prepare the plan should be made available to the Penn community as part of the plan, including all consumption data and the carbon emissions factors for different categories of admissions. The data will provide incentives for improvement among the schools and can help students and faculty in progress projects to reduce emissions.

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Many of the recommendations address the awareness and visibility of the carbon reduction initiatives. Despite the significant ambitions of the plan, there is uneven awareness of its goals or achievements, even among those interested in the topic. There is also a great deal of untapped potential for individual action across the campus. The current plan is largely implemented from the top down through the formal administrative mechanisms available to the teams in facilities and purchasing, and the committee recommends that for the next phase of planning that the campus community be more engaged in reduction efforts.

Utilities and Operations

The updated plan should explain the sources of campus utilities, and the role played by the new Solar PPA for electricity and the purchase of summer steam for chilling. All energy use, emissions, and offsets should be fully reported.

The university should consider a solar installation within the main campus, to make the achievement of the new Solar PPA more visible.

Physical Environment

Energy use and emissions should be reported for each campus building or facility, with major renovation and efficiency initiatives listed. This will both inform the campus about efficiency achievements and provide information for new initiatives to reduce emissions.

The plan should explain the energy and carbon performance standards for all new buildings and all renovations, benchmarking them against national standards.

The University should join the “2030 District Challenge” promoted by Green Building United, reporting energy use for all its campus buildings. The CSAP 3 goals already exceed the goals of that challenge, and Penn’s participation would help provide momentum and leadership to the plan.

Waste Minimization and Recycling Goals

The updated plan should explain the carbon emissions associated with each form of waste, especially the tradeoffs between landfill and waste to energy.

Waste and recycling types and quantities should be reported for each campus building. The University should evaluate mechanisms for reporting waste and recycling quantities for all administrative units as part of the Green Office program.

The changing market for recycled materials has complicated single stream recycling and highlights the importance of the ongoing waste re-

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Report of the Senate Ad Hoc Committee on the Institutional Response to the Climate Emergency (CIRCE)

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duction methods. The University should consider establishing a parallel goal of net-zero waste by 2042, following the lead of US Army bases.

Purchasing and Air travel

The updated plan should explain the carbon emissions associated with air travel and campus fleet vehicles, including fuel types and itemized by school or unit.

CIRCE is very supportive of the initiative to purchase carbon offsets for campus air travel, which will establish Penn’s leadership among its peer schools. The criteria for carbon offsets should be clearly articulated and the administrative mechanisms for their review and purchase should continue to include faculty involvement.

As the program for offsetting air travel continues in subsequent years it will be important to consider the level at which the offsets are purchased—School, department, individual, etc—in order to provide well balanced incentives for the reduction of unnecessary air travel. For example, it will be important to protect the travel of junior faculty as they establish their reputations. It will also be necessary to provide guidance and support for remote or virtual forms of meeting.

The updated report should describe plans for replacing the campus fleet with electric or low carbon vehicles.

Transportation

The updated report should explain the amounts of emissions and emission intensity associated with each form of transportation.

The University has implemented multiple initiatives to reduce commuter transportation, increasing mass transit ridership and bicycle use, but the number of car commuters remains relatively constant. The revised report should explain the challenges to further reductions in car commuters.

2. Extend CSAP to the hospital, students, real estate holdings

CAP 1.0 declared that the plan would be extended to all of the University’s facilities, so CIRCE recommends that action plans be developed for the hospital system and for the non-campus real estate holdings of the university

Mechanisms should be considered for extending the carbon footprint to include student housing and travel, which is beyond the direct management of the University. This could be a student organized initiative. This could include a survey or auditing off campus housing and a landlord ranking for carbon intensity.

3. Carbon Offsets

Even when all the initiatives in the action plan have been realized the campus will still produce some carbon emissions, so programs for carbon offsetting and/or capture will need to be developed. At present, ideas for offsets are being considered by numerous entities across campus, and while this exploration and innovation should be supported, there should also be a central group or committee tasked with reviewing and approving any offset. The subcommittee agreed that offsets should be as local as possible, visible, verifiable, and additional (meaning that they add new carbon reduction activities).

The University might also consider partnering with an NGO to develop local or Penn specific offsets. A number of offset proposals have been advanced for consideration.

Local Carbon Offsets: West Philadelphia weatherize and solarize

CIRCE is investigating the carbon offset potential of weatherizing and solarizing low-income houses in the West Philadelphia neighborhoods adjacent to the university. This would reduce or eliminate utility bills for the residents and allow the University to retain the carbon credits. This is an inexpensive form of carbon offset, but has many additional benefits. A number of groups and agencies in the city are engaged in related forms of work and the committee has met with them to discuss potential collaborations.

Faculty and Staff energy audit and solarize campaign

Following a model developed at Duke, CIRCE is investigating the potential of a campaign to provide energy reduction audits and solar installation evaluation to faculty and staff. An initial analysis suggests that the amount of carbon associated with faculty and staff housing rivals the emissions of the main campus, so this could be a significant initiative.

Tree planting and wetland restoration

One of the most cost effective ways to directly capture carbon is through tree planting and even more so through wetland restoration. CIRCE is investigating the potential of local programs.

4. Enhanced Student Eco-Reps: Faculty supervised auditing program

CIRCE is investigating the organization of student teams to audit energy use in campus buildings, identifying efficiency improvements for review and implementation by FRES. This initiative might also be extended to non-campus buildings and could form the basis of an ABCS course.

Operations Subcommittee membership 2019-2020

- Bill Braham (Design), *Chair, CIRCE Chair*
- Alison Buttenheim (Nursing)
- Michael McGarvey (PSOM/Neurology)
- Misha Rosenbach (PSOM/Dermatology)
- Franca Trubiano (Design)
- Steve Kimbrough (Wharton), *Senate Chair*
- Kathleen Hall Jamieson (Annenberg), *Senate Chair-Elect*
- Andrew Huemmler (SEAS/CBE, Senior Lecturer), *non-voting member*
- Benjamin Pierce (SEAS)

Research and Education

The world needs an effective “response to the urgent threat of climate change on the basis of the best available scientific knowledge” (The Paris Agreement). Such a response is crucially dependent on the knowledge of physical scientists, but also the knowledge of social scientists, humanists, designers, ethicists, policy experts, and science communicators. An effective response will require an unusually high degree of multi-disciplinary collaboration and innovative protocols for translating among disciplines.

We propose that Penn’s efforts in climate change research and education heed the Paris Agreement’s call for an urgent response to an urgent threat in the creative, multidisciplinary way it requires. To give focus to these efforts, and to avoid disciplinary silos, we propose to be guided by the primary international bodies focused on climate change: The Intergovernmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC). These bodies are authoritative sources on the science and consensus about all aspects of climate change. They set an international agenda for climate change research, organizing what is known, but also scoping gaps in our collective knowledge. We propose to align our university-wide effort with these bodies by guiding our efforts on what they indicate is critically important to know, but that is not yet well known or well understood.

When we consulted with colleagues in the IPCC and UNFCCC about their largest knowledge gaps, they surprised us with their answers. For example, we expected to hear about limitations in modeling technology. Instead, they emphasized needing tools to deal with conflicts in multi-lateral negotiations. They requested tools to address the inability of most people in the world to imagine the future that is coming and how it could be changed. And they also emphasized the crucial need for place-based knowledge in climate adaptation studies: how the interaction between the changing climate, population and land use changes, and policy will interact. If we can come to understand these knowledge gaps and help to fill them, Penn’s campus-wide work on climate change will have a substantial and immediate impact. These initial, exploratory discussions are far from complete and need to be pursued in detail. What does seem clear is that the UN climate change bodies are rich sources for identifying impactful, multidisciplinary research problems suited to Penn’s unique expertise.

1. Research

Beyond the physical science of the climate system, the international priorities in climate research are new strategies of mitigation, pathways for adaptation and resilience, and, as a last resort, dealing with massive movement of people. All of these areas require physical scientists, engineers, biologists, social scientists, ethicists, policy experts, designers, and gifted communicators to work together to develop smart strategies. We propose that Penn’s research response to the climate emergency follow these patterns. Working from public documents and with our partners at IPCC and UNFCCC, we believe that the highest international climate priorities can be identified, and resources should be directed towards multi-disciplinary teams that want to work on those issues.

More specifically, we recommend that support be given to multi-disciplinary faculty teams that can identify pressing, unaddressed problems of high priority to the international climate community. For example, in consultation with colleagues at the UNFCCC and IPCC, and in our internal deliberations, we have identified these questions as the kind of research we are well-positioned to address:

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What is the best path to global decarbonization? How can we reach net zero mid-century, and negative emissions at the end of the century? [energy engineering, energy policy, market analysis, risk and behavioral analysis, sociology, communications]

Where exactly are the climate danger hot spots and how will this effect local communities and biodiversity?

[climate modelling, land use planning, ecology, public policy]

How do the Sustainable Development Goals tradeoff with Aggressive Mitigation, and what principles should guide thinking about these tradeoffs?

[ethics and political philosophy, risk and behavioral analysis, energy policy]

How will climate change effect agriculture, forestry, and fisheries management, and how can changes in these practices lead to more resilient communities and mitigation?

[ecological and population modelling, land use planning, public policy, agricultural policy]

What are complete set of risks of climate change for infrastructure, human and non-human health, biodiversity, food, migration, and so forth?

[Risk analysis, scenario planning, public health, demographics]

How can the international community and national governments help prepare local communities to be resilient against climate change, and also learn from their local expertise?

[political science, anthropology, community health]

Although these are simply examples of the kinds of multi-disciplinary collaborations we advocate, each of these ideas has been identified in IPCC reports or by parties to the UNFCCC negotiations as an area of pressing concern. They are all extremely complex questions, but they are the kinds of questions Penn is well-positioned to address.

2. Education

Penn undergraduates and graduate students should have substantial exposure to the principles of climate change and the multi-disciplinary effort required to combat it and mitigate its worst effects. We are thus very encouraged that students and faculty are requesting more substantive and sustained climate education including new courses, new programs, maybe even new minors or majors or requirements to complement existing programs such as Environmental Studies and Environmental Humanities. The members of CIRCE are enthusiastic about these ideas, as well as proposals to strengthen existing programs to enhance their climate change content. Each idea deserves careful study, and CIRCE anticipates continuing discussions around these plans in the next academic year.

We note with concern that the number of climate change related courses remains relatively

small, and this will hamper the more ambitious plans being discussed. Penn needs a series of substantial, multidisciplinary course on climate change at each level of study: gateway, core training, capstone, and seminars. Such offerings should include substantial study of the physical basis of climate change, decarbonization, adaptation and resilience, policy and ethics, and impacts including migration.

Our collective offerings thus far leave major curricular gaps, and also no central mechanism for flagging or advertising them across campus. It is our strong recommendation that administration address this lack of courses, and study the issue carefully. Resources may be required to help create and sustain requisite courses, as most of the climate courses needed to fully address the climate emergency fall outside the typical teaching demands of departments.

Research & Education Subcommittee membership 2019-2020

Herman Beavers (English/Africana)

Bill Braham (Design), *CIRCE Chair*

Thomas Daniels (Design)

Jane Dmochowski (SAS/EES, Senior Lecturer), non-voting member

Kathleen Hall Jamieson (Annenberg), Senate Chair-Elect

Andrew Huemmler (SEAS/CBE, Senior Lecturer), non-voting member

Steve Kimbrough (Wharton), Senate Chair

Howard Kunreuther (Wharton), non-voting member

Irina Marinov (SAS/EES)

Eric Stach (SEAS/MSE)

Michael Weisberg (SAS/Philosophy), *Chair*

Community and Policy

The major focus of the subcommittee on community and policy in spring semester 2020 was to raise awareness of the climate emergency, motivate climate mitigation on a significant scale, and open and enhance channels of communication between students, faculty, staff, and administration. The major accomplishments of the subcommittee were the drafting of faculty resolution and the preparation of manual to support the actions in the resolution.

Resolution on the Individual and Institutional Responses of Faculty in the University of Pennsylvania to the Global Climate Emergency

The Resolution depicts the context of the climate emergency and formulates a series of actions that faculty pledge to take with regard to their professional and personal carbon footprint, including calling on the Board of Trustees, the President, and the Provost to improve the institutional response to the climate emergency.

Manual for a Low-Carbon Faculty.

The Manual for a Low Carbon Faculty offers information and advice to faculty on shifting to renewable energy at home, air travel alternatives and offsets, and making it possible for faculty to divest retirement accounts of fossil fuel assets and to invest in green funds.

The Resolution and Manual will be released quietly over the summer and will enjoy a formal rollout in September in connection with Penn Climate Week (September 21-27). The subcommittee is coordinating with PPSA and WPPSA to adapt the Resolution and Manual for possible adoption by University staff. Before the campus closed, the subcommittee met with leadership of the Undergraduate Assembly and graduate student representatives about facilitating a conversation with the University Administration about the climate emergency.

Community and Policy Subcommittee membership 2019-2020

Anne Berg (History)20

Bill Braham (Design), *CIRCE Chair*

Daniel Aldana Cohen (SAS/Sociology)

Billy Fleming (Design/McHarg Center), non-voting member

Kathleen Hall Jamieson (Annenberg), Senate Chair-Elect

Andrew Huemmler (SEAS/CBE, Senior Lecturer), non-voting member

Steve Kimbrough (Wharton), Senate Chair

Eric Orts (Wharton)

Benjamin Pierce (SEAS/CIS)

Simon Richter (SAS/German), *Chair*

Bethany Wiggin (SAS/German)