

# Envisioning a Climate Consortium: What is a University's Role in Combating Climate Change?

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Director, Center for Landscape Dynamics  
Director, Ecology Institute  
Associate Director, Institutes of Energy and Environment



# Outline

- **The Role of Universities in Climate Action**
- **Penn State's Climate Moment**
- **Climate Consortium**
- **Next steps**



# Outline

- **The Role of Universities in Climate action**
- Penn State's Climate Moment
- Climate Consortium
- Next Steps



# The Role of Universities in Climate Action

1. *What share of the responsibility for the climate crisis should Universities hold?*
2. *What is the unique role of Universities in climate solutions?*  
*What is the unique role of Land Grant Institutions?*
3. *What barriers are in the way?*
4. *How should we measure success?*
5. *Where is untapped potential?*



# (1) What share of the responsibility for the climate crisis should Universities hold?

- C Emissions from our operations
- History of marginalization, exclusion, disempowerment of diverse voices
- Lack of broad-based climate literacy training in curriculum
- Minimal lack of institutional focus on applied solutions (beyond Ag Extension)





(2) What is the unique role of Universities in climate solutions?

What is the unique role of Land Grants?

Knowledge broker (even in a post-truth world)

Multi-Disciplinary Innovation

Place-based focus

Extension




### (3) What barriers are in the way?

- Institutional inertia
- \$\$ - funding priorities
- P&T practices
- Scalability







## (4) How should we measure success?

- **Traditional metrics** (research impact (publications/funding))
- **Relational attributes** (culture, connections, collaborations)
- **Impact on the atmosphere** (net negative)
- **Impact on the environment** (local → global)
- **Impact on societies and individuals** (well-being)





## (5) Where is the untapped potential?

- Students!!
- Partnerships (industry, communities, campuses, each other)
- Foundations and federal agencies
- Climate justice
- Transdisciplinary, interdisciplinary approaches



# Outline

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## News & Media

[Home](#) / ... / [More Stories](#) / 2019

### More Stories

### News in Video

### Meet the Team

### W&M Experts

### Campus Announcements

### W&M Weekly Newsletter

### University Communications



## Institute for Integrative Conservation to be established at William & Mary with \$19.3 million For the Bold gift

by Jennifer Page Wall, University Advancement | December 2, 2019

*Institute will tackle toughest environmental  
issues around globe and support the  
university's ambitious 2030 carbon neutrality  
goal*



# Penn State's Climate Strengths

- Interdisciplinarity: Climate-related funding across >20 units

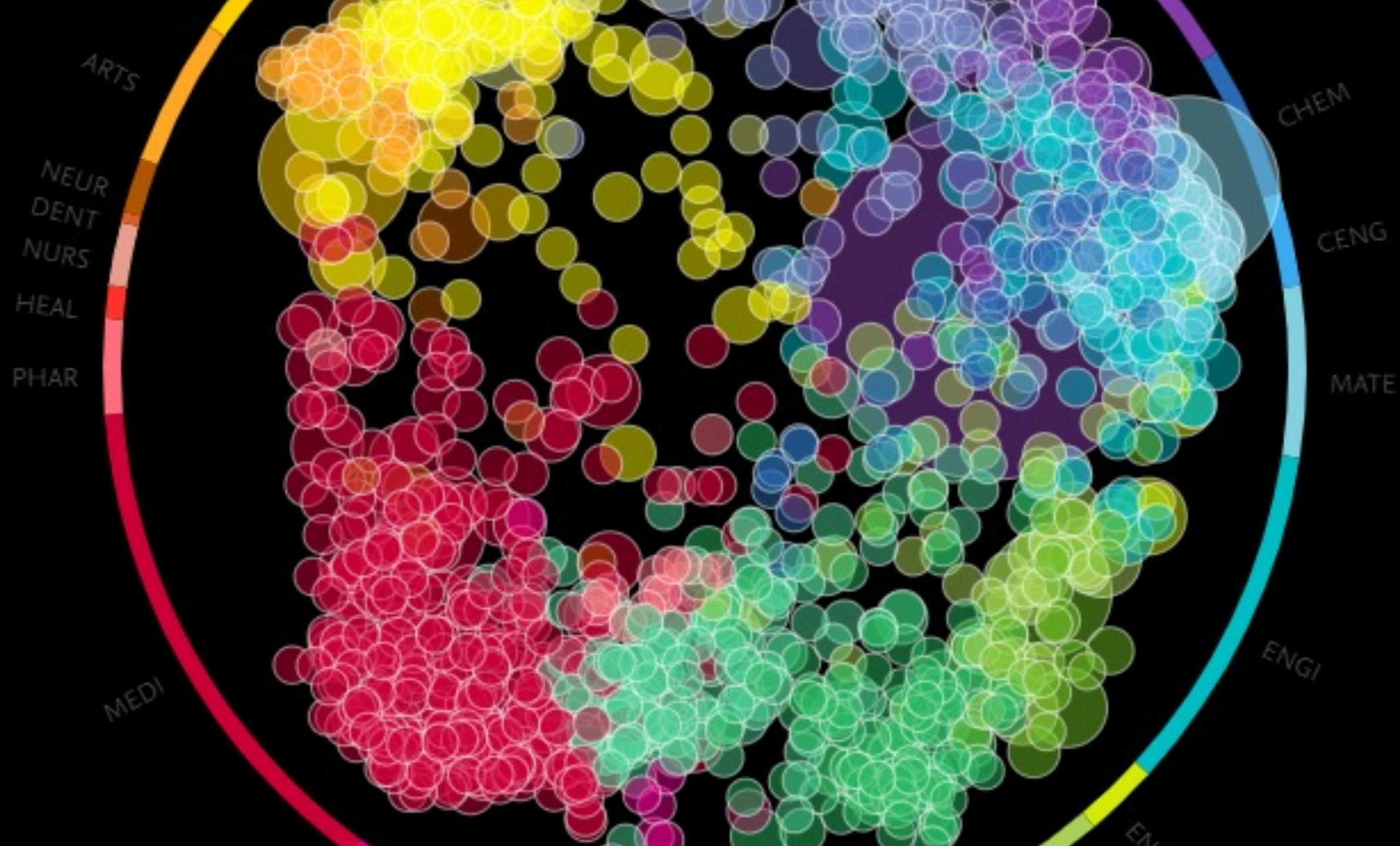
- More than 1700 faculty identified in PURE database for SDG13: Climate Action

- Top climate scientists (# times cited, journal impact, IPCC authors)

- #1 in Big10 for Sustainability

- Land-grant mission









Penn State SDG 13:  
Climate Action



## Examples of Existing Centers, Institutes, Programs & Initiatives

Earth and Environmental Systems Institute (EESI)  
Earth Systems Science Center (ESSC)  
Penn State Ice and Climate (PSICE)  
Center for Earth System Modeling, Analysis, and Data  
Pennsylvania Environmental Monitoring Network  
Institute for Sustainable Agricultural, Food, and  
Environmental Science (SAFES)  
Ecology Institute

Growing Penn State's Forestlands  
Drawdown  
Penn State Carbon Negative (PSU CaN)  
Sustainability Institute

Center for Integrated Energy Systems  
Energy2100

Center for Marine Science and Technology (CMAST)

Global Building Network  
Hamer Center for Community Design  
Ecology + Design (E+D)

School of Public Policy  
Center for Climate Risk Management (CLIMA)  
Sustainable Communities Collaborative  
Communication, Science, and Society Initiative  
(CSSI)  
Rock Ethics Institute

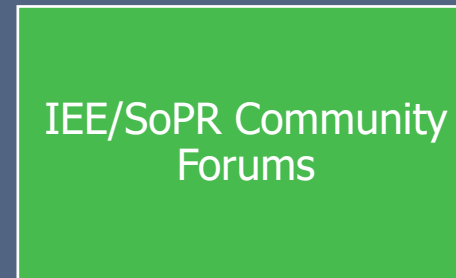
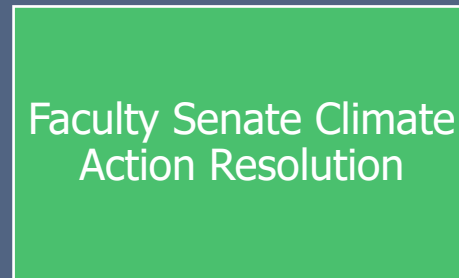
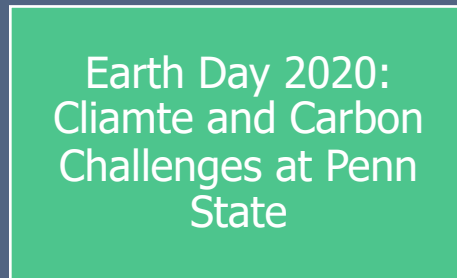
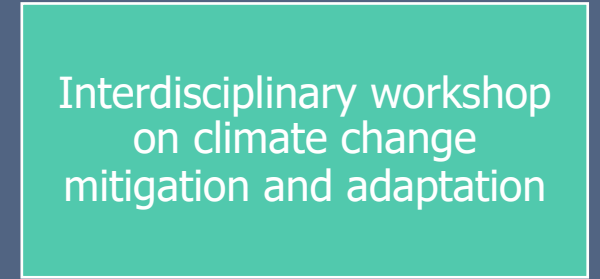
Smeal Center for the Business of Sustainability

Climate Crossover  
AwakenState  
Climate Science Dual Degree

....and many more!!!



# A year of climate action





npr

wpsu

PENN STATE

SIGN IN

NPR SHOP

DONATE

NEWS

ARTS & LIFE

MUSIC

SHOWS & PODCASTS

SEARCH

ENVIRONMENT

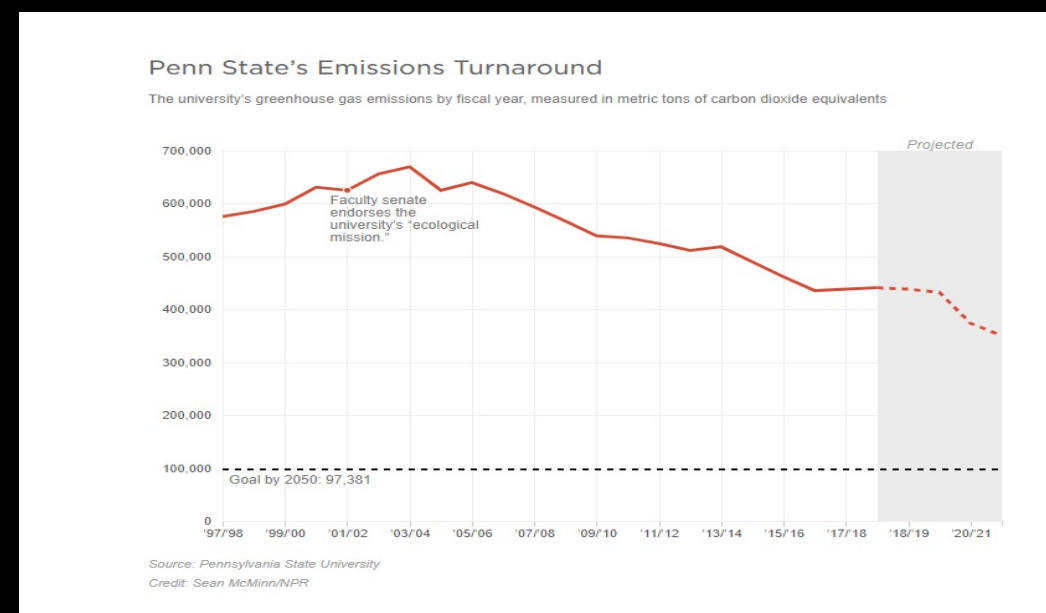
How Penn State Is Cutting Greenhouse Emissions In Half — And Saving Money

October 4, 2019 · 5:12 AM ET

Heard on Morning Edition

DAN CHARLES

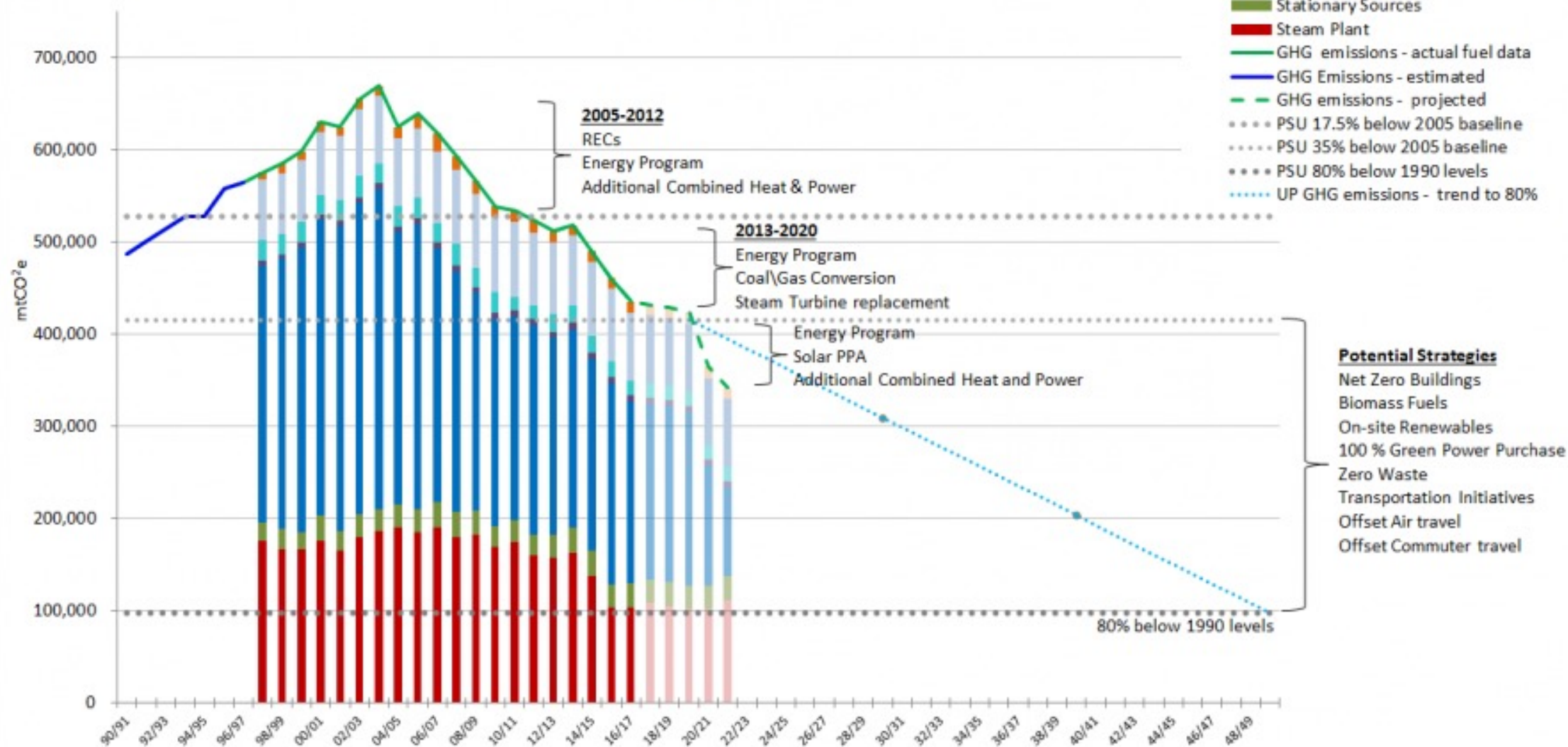
# Operations





# GHG Emissions

Penn State University  
(1990-2050)





# Funding Ecosystem

A word cloud of various funding sources, including government agencies, private foundations, and corporations, arranged in a circular pattern. The words are of different sizes and orientations, creating a sense of movement and interconnectedness. The background is a solid dark blue.

Grantham FEMA  
Hewlett Heising-Simons Shell  
NSF NASA MacArthur DOE  
Packard Bezos  
Pisces Belmont Forum USDA  
V. Kaan Rasmussen Doris Duke Breakthrough  
Schmidt Energy Coalition &  
Chevron Ventures

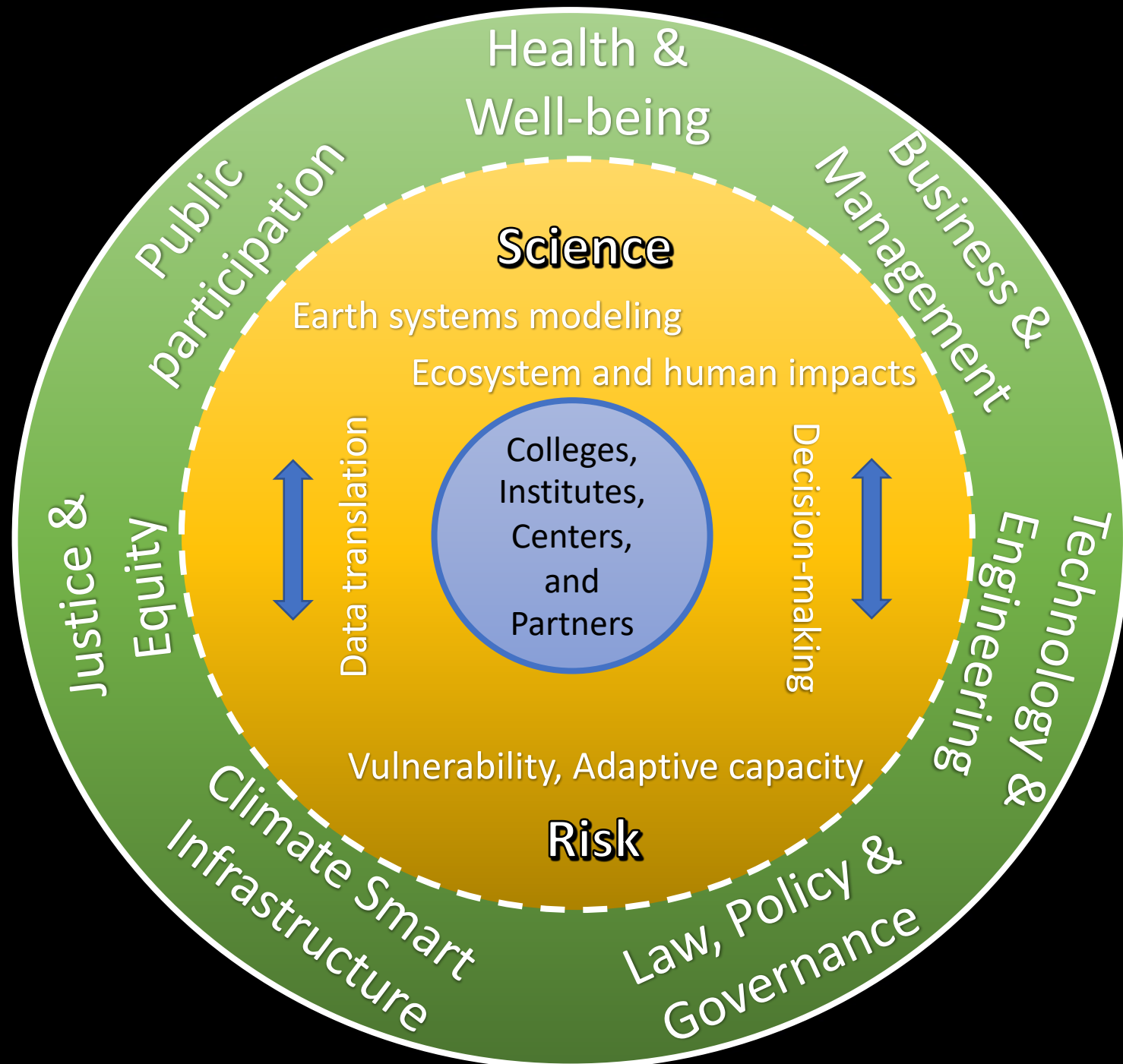


A high-resolution satellite image of Earth from space, showing the Americas, the Atlantic Ocean, and parts of Europe and Africa. The image is used as a background for the Climate Consortium logo.

# CLIMATE CONSORTIUM

**Combating Climate Change Through Convergence Research and Solutions**











# Managing **Risk** in a Changing **Climate**





# Solutions



Climate Justice



Climate and Health



Climate Policy



Infrastructure, Technology & Management



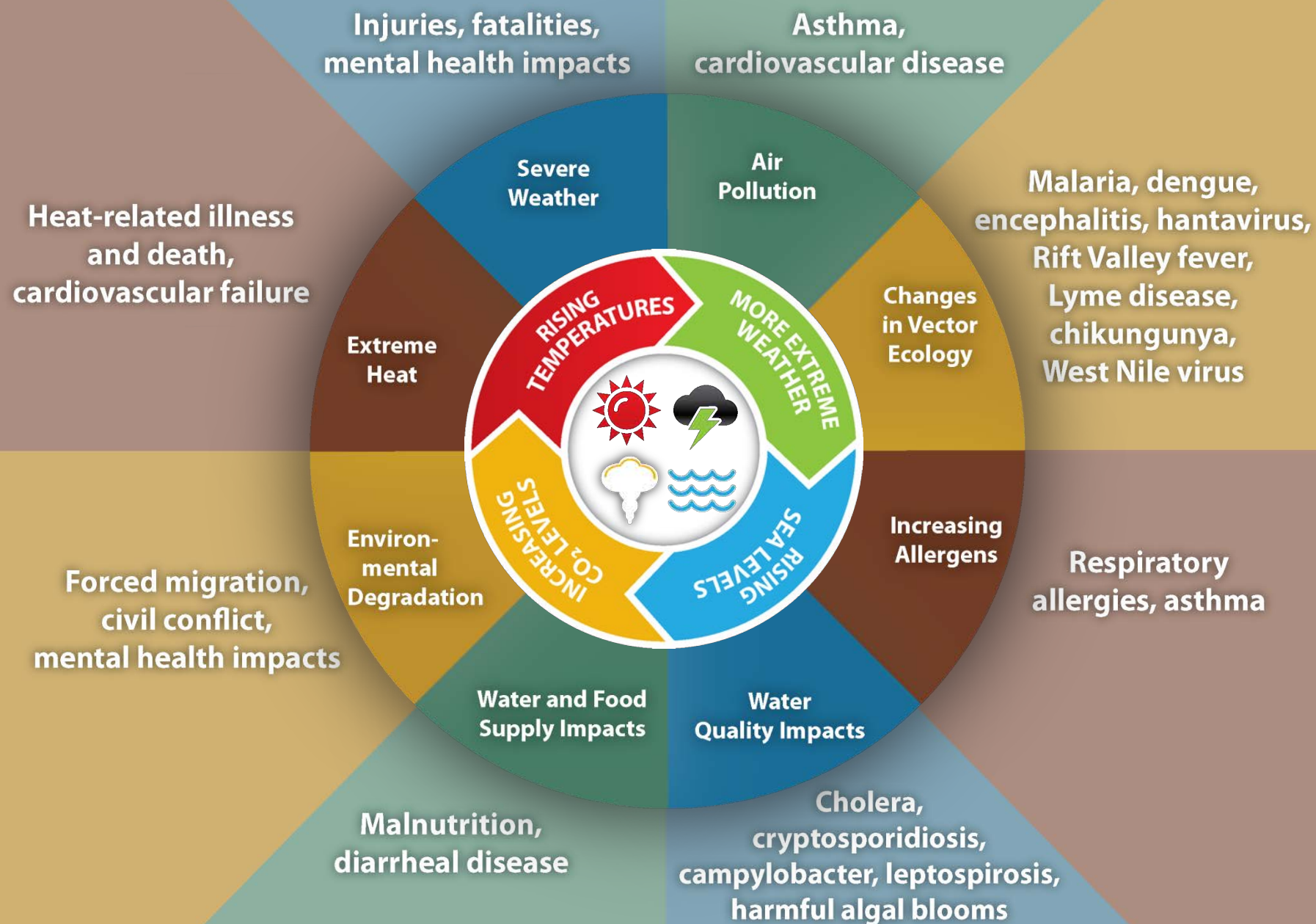
Public Participation







# Impact of Climate Change on Human Health







USA

# Biden's Earth Day Summit Aims for Reset on Climate Change

By Steve Baragona  
April 17, 2021 03:28 AM



Administration Priorities COVID-19 Brief

BRIEFING ROOM

## Executive Order on Tackling the Climate Crisis at Home and Abroad

JANUARY 27, 2021 • PRESIDENTIAL ACTIONS

The United States and the world face a profound climate crisis. We have a narrow moment to pursue action at home and abroad in order to avoid the most catastrophic impacts of that crisis and to seize the opportunity that tackling climate change presents. Domestic action must go hand in hand with United States international leadership, aimed at significantly enhancing global action. Together, we must listen to science and meet the moment.

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

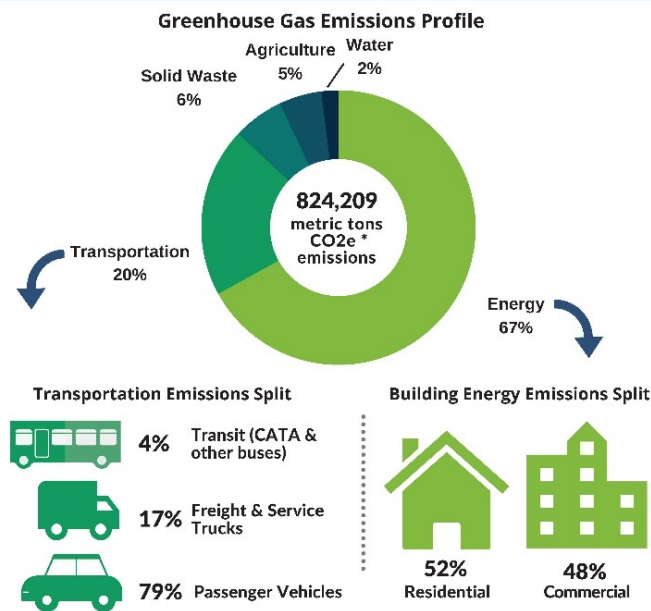
### PART I – PUTTING THE CLIMATE CRISIS AT THE CENTER OF UNITED STATES FOREIGN POLICY AND NATIONAL SECURITY

Section 101. Policy. United States international engagement to address climate change — which has become a climate crisis — is more necessary and urgent than ever. The scientific community has made clear that the scale and speed of necessary action is greater than previously believed. There is little



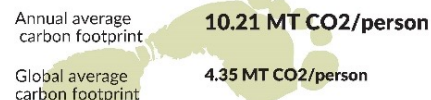
## CENTRE REGION COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY

COLLEGE FERGUSON HAITHORN HARRIS PATTON STATE COLLEGE BOROUGH



### COMMUNITY CARBON FOOTPRINT

Our annual emissions of 824,209 MTCO<sub>2</sub>e equates to a per person emission rate more than 2X the global average:



\*Inventory was compiled with 2016 data. MTCO<sub>2</sub>e: metric tons carbon dioxide equivalents - measurement used to compare the emissions from different greenhouse gases based upon their global warming potential (GWP).

### LEARN MORE

GHG Emissions Inventory:  
<https://bit.ly/2RIE0eL>

### NEXT STEPS

Develop a climate action and adaptation plan



Center for Energy Law and Policy

### Prospects for Pennsylvania in the Regional Greenhouse Gas Initiative

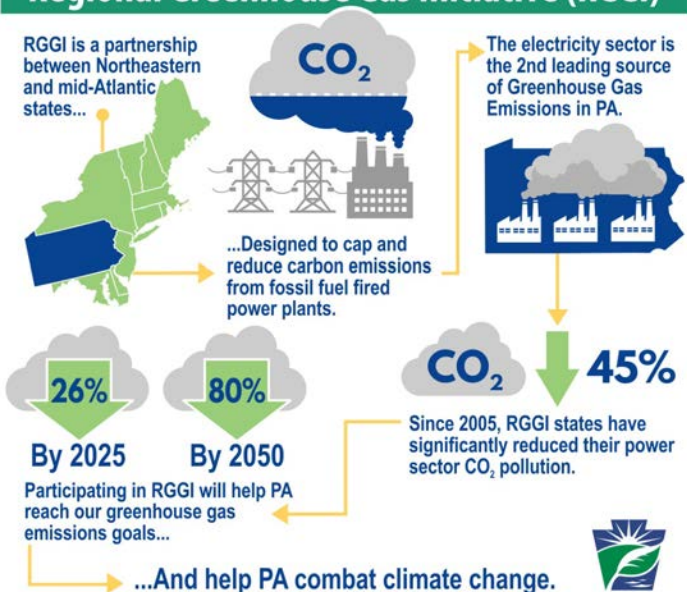
Working Paper, December 2020

#### Project Team:

Seth Blumsack, Professor, John and Willie Leone Family Department of Energy and Mineral Engineering; Earth and Environmental Systems Institute; Director, Center for Energy Law and Policy  
Andrew Bell, Student, School of Public Affairs  
Mingsong Chen, Student, John and Willie Leone Family Department of Energy and Mineral Engineering  
Seamus Gibbons, Student, John and Willie Leone Family Department of Energy and Mineral Engineering  
Joel Landry, Assistant Professor, John and Willie Leone Family Department of Energy and Mineral Engineering  
Daniel Mallinson, Assistant Professor, School of Public Affairs  
Wei Peng, Assistant Professor, School of International Affairs and Civil and Environmental Engineering  
An Pham, Student, John and Willie Leone Family Department of Energy and Mineral Engineering  
Daniel Walters, Assistant Professor, Penn State Law  
Hui Yang, Student, Civil and Environmental Engineering

## PA Participation in the Regional Greenhouse Gas Initiative (RGGI)

RGGI is a partnership between Northeastern and mid-Atlantic states...





## Global Buildings Network



Sustainable Investing  
& ESG Performance



Sustainable Product Development  
& Consumer Behavior



Sustainability in  
Supply Chains



Corporate Social  
Responsibility & Activism



Institutional &  
Social Change



Legal Incentives &  
Regulatory Impacts

## Musser Gap to Valleylands Project







**Earth Day  
talk April  
22 to  
feature  
artists  
from  
world-  
music  
film**



# SCIENCE COMMUNICATION CLIMATE CHANGE

VIRTUAL PANEL DISCUSSION ON CLIMATE CHANGE  
WEDNESDAY | OCTOBER 28  
3:30 - 4:45 P.M.



THE MCCOURTNEY INSTITUTE FOR  
DEMOCRACY





# In 5 years, the Climate Consortium will have:

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- Cemented a set of priority partnerships in Commonwealth communities and beyond, focused on carbon mitigation, energy transition, adaptation and resilience, serving as an exemplar to other Land Grant institutions.
- Transformed “who” is doing climate research, actively promoting and elevating Black, Indigenous, People of Color (BIPOC) communities and prioritizing anti-racism, diversity, equity, and inclusion in all activities.
- Informed public policy and community empowerment around climate change solutions as a leading scientific and cultural voice
- Pioneered innovative partnerships and financial models and secured external funding for net carbon negative emissions in our operations, research, education and outreach and inspire carbon solutions in partner communities.
- Recognized as an international powerhouse of climate research and scholarship.



# Activity 1: Publicize and Coordinate Climate Change Activities

Launch webpage and strategic communications

Host conference to convene scientists, public, and decision-makers

Convene research clusters on targeted challenges

Strategic development and fundraising

Identify and institutionalize partnerships with businesses, NGOs, agencies, municipalities, etc.



## **Activity 2: Promote Excellence in Climate Change Research**

**At least 6 tenure-track faculty hires; + 5 fixed-term faculty hires**

**Seed grants to support new interdisciplinary collaborations**

**New clusters and priority initiatives**







# WE Action- Research- Empowerment

## Activity 3: Empower Community Resilience

Co-design & transdisciplinary solutions

How?

- Community Hubs focused on place-based solutions
    - Hire NTL community liason
    - Lower bar for faculty engagement (time, reward structure, facilitation of partnerships)
  - Interactive Threat Assessment (cross-sector, Climate Impacts) Portal
- 
- 





# Design

(1)

**Design as** a process for finding robust solutions, through cooperative, iterative, and facilitated teamwork

(2)

**Design as** sustainable landscape patterns (solutions in the physical world)



Stakeholder  
engagement  
from project  
inception



(3)

**“Co-design”**



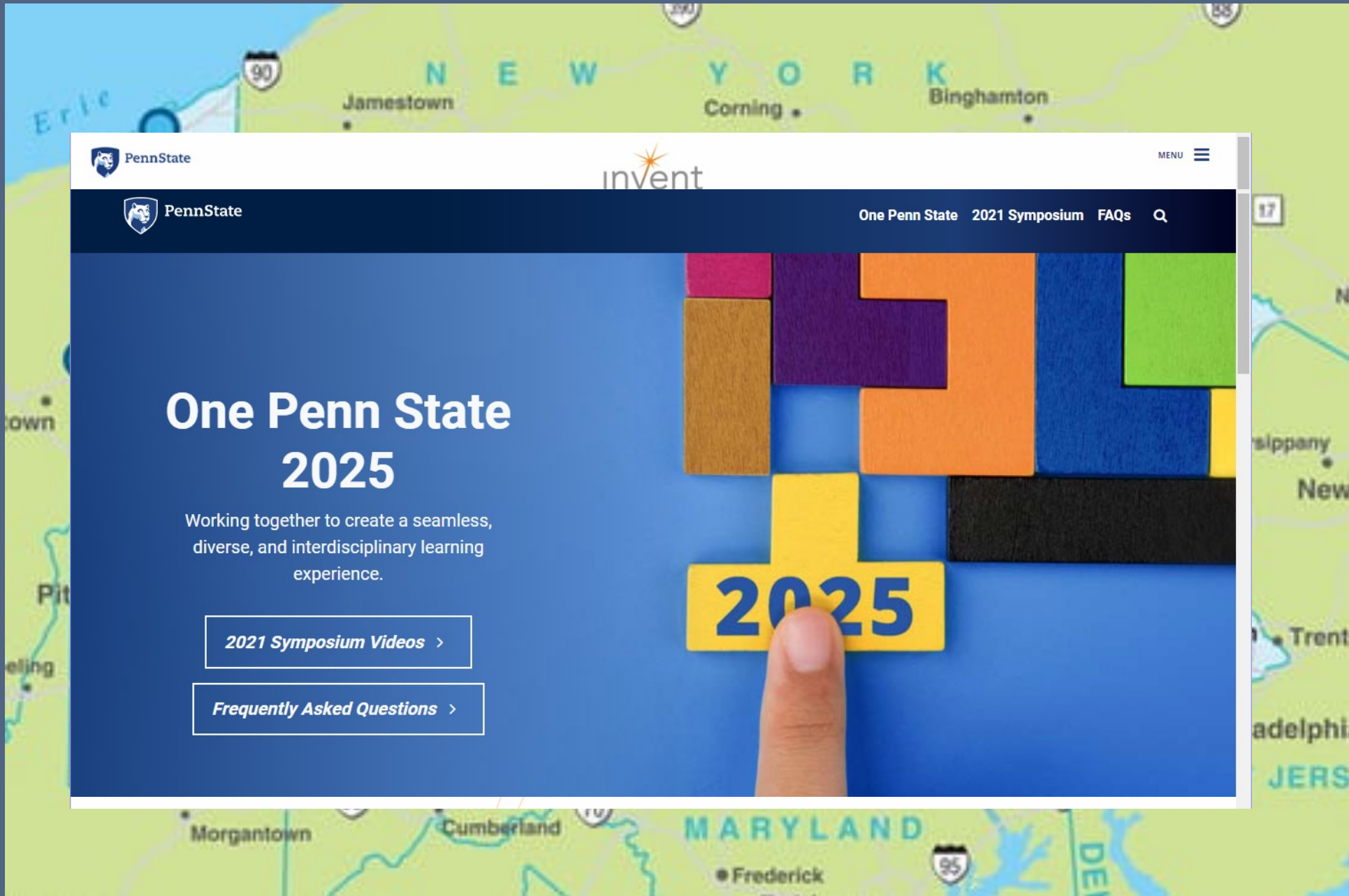


# Transdisciplinary

- Boundary Crossing (disciplines, institutions, communities)
- Collaborative Deconstruction (methodology, problem framing)
- Crossing Knowledge Systems (“ways of knowing”)
- Solutions-oriented (from systems-thinking to systems-doing)

- feedbacks challenging our disc., moving boundaries  
    ↳ underly nonlinear phenomena  
- methods matter      - formal + informal      building of knowledge





PennState

invent

MENU



PennState

One Penn State 2021 Symposium FAQs



# One Penn State 2025

Working together to create a seamless,  
diverse, and interdisciplinary learning  
experience.

[2021 Symposium Videos >](#)

[Frequently Asked Questions >](#)

2025



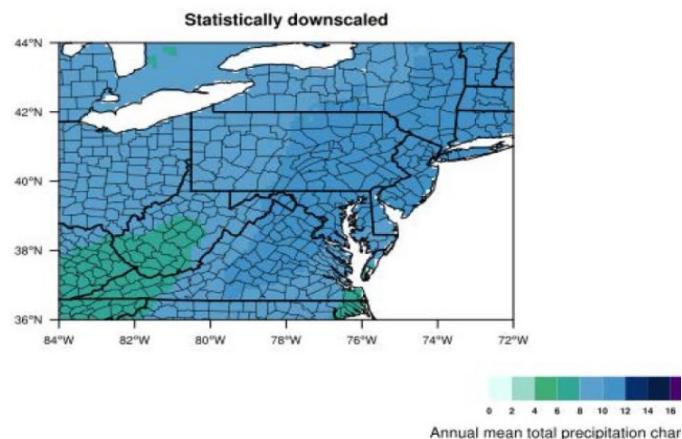
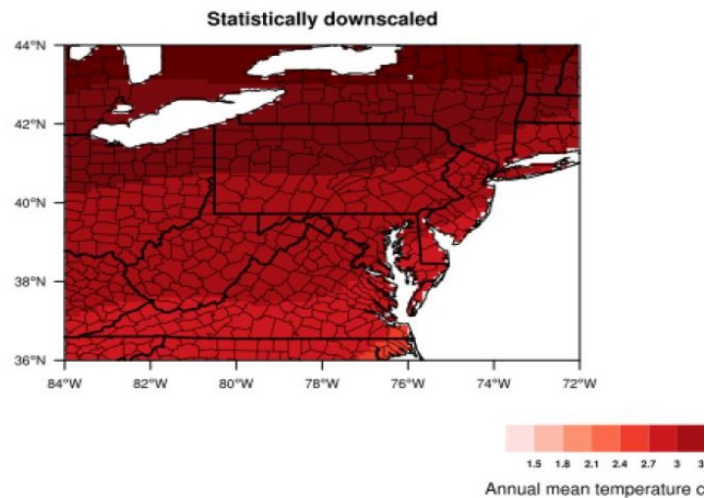
# Pennsylvania Climate Change Impacts Assessment Update

April 2020

Prepared for:



Prepared by:



MARISA Climate Data Portal

a service of the NOAA Mid-Atlantic RISA team

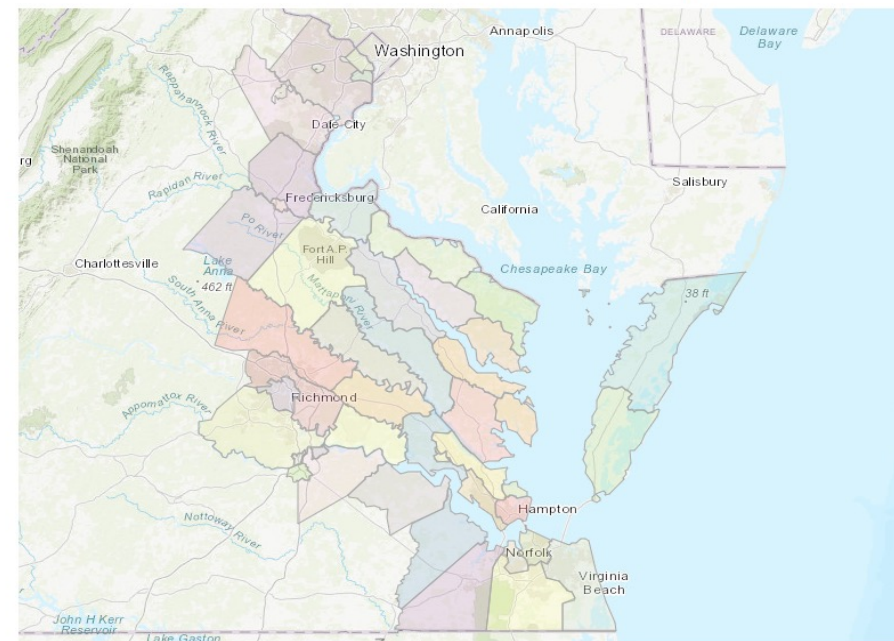
[Map](#)

[Outlooks](#)

[About](#)

## Community Climate Outlooks

**Community Climate Outlooks** are a new, experimental outreach product highlighting climate change and its associated impacts for selected coastal communities (counties and cities) in the Commonwealth of Virginia. Outlooks for additional localities in Maryland and Virginia are currently under development.



View the *Outlook* for a specific locality by clicking a shaded region on the map above or by selecting from one of the dropdown lists below:

Cross-sector impact/solutions  
mapping and forecasting



# **Activity 4: Provide National and Global Leadership in Climate-Energy Transitions and Climate Policy**

**Policy teams**

**Engagement in  
COP/UNFCCC  
activities**





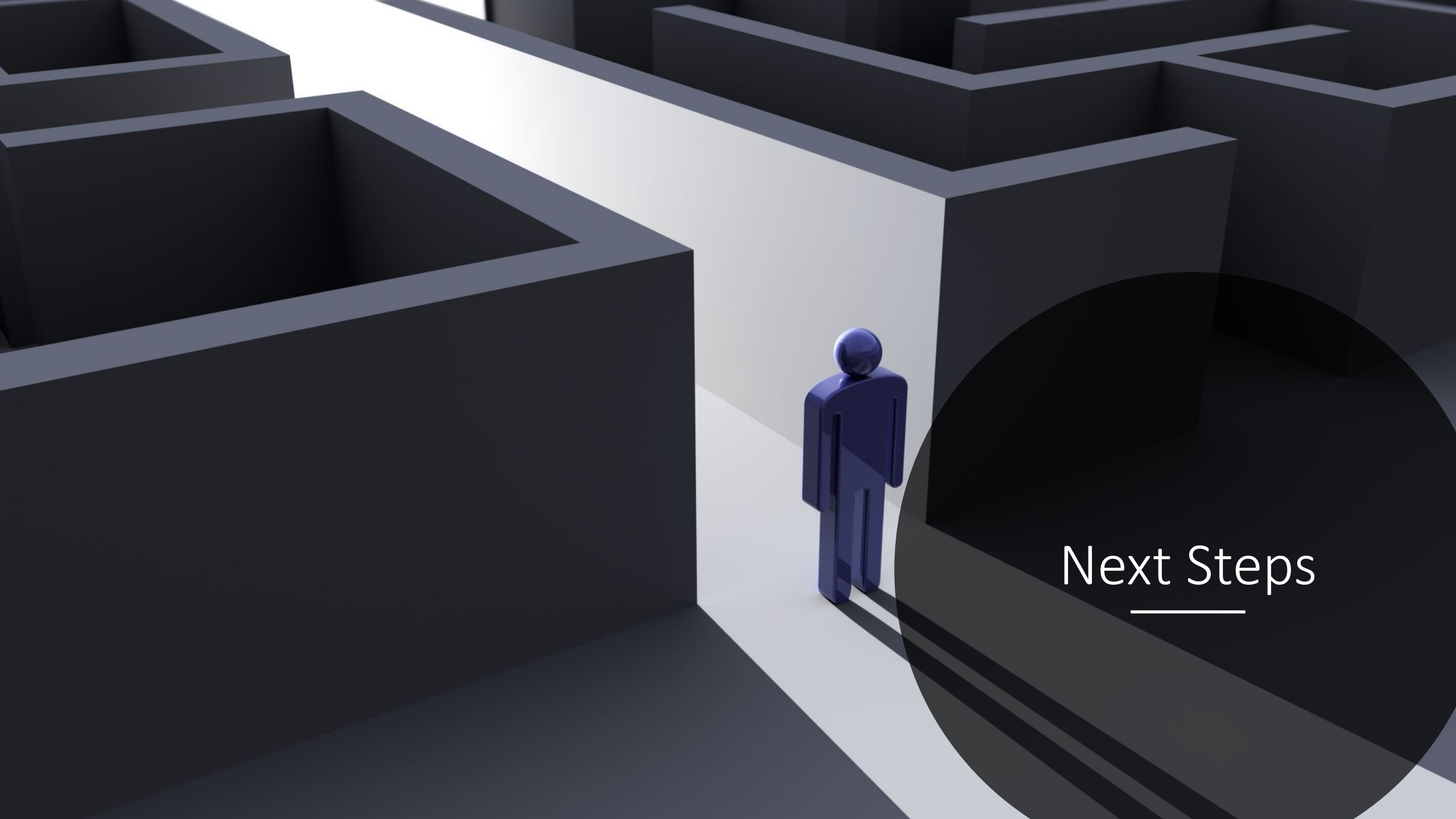
# **Activity 5: Inspire Excellence in Climate Education and Professional Development**

**Expand and coordinate climate education across existing programs**

- Environmentors
- Climate Science REU
- Drawdown Scholars REU
- Climate Crossover
- Dual-Title Graduate Degree Program in Climate Science

**New UG program in Climate Studies?**





Next Steps





**PennState**

Institutes of Energy  
and the Environment



About ▾

Programs ▾

Research ▾

Labs ▾

People ▾

Education ▾

Events ▾

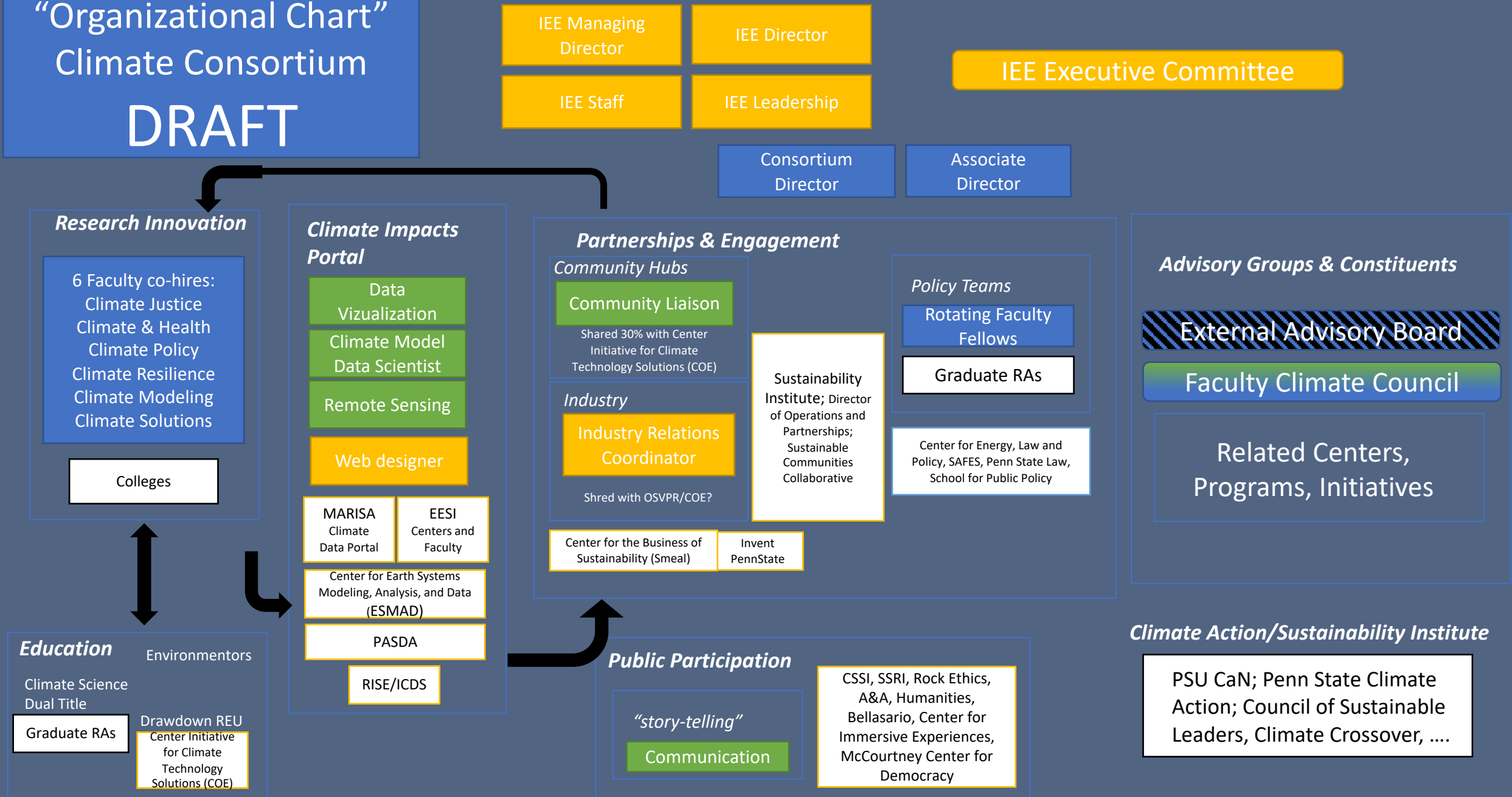
Funding ▾

# Institutes of Energy and the Environment

Solving the world's critical energy and environmental challenges



# “Organizational Chart” Climate Consortium DRAFT



Yellow = IEE leadership/staff; Blue = Tenure Line Faculty; Green = Non Tenure Line; White = TBD, related or supporting



# Faculty co-hires (proposed/sketched/TBD)

- **Climate Science**

- TL – Climate Modeling

- **Climate Risk and Resilience**

- Threat Assessment/Climate Impacts Portal
  - TL Assistant Professor in Climate Adaptation and Decision-Making
  - NTL Assistant Professor in Decision Analysis
- Community Hubs for Transdisciplinary Climate Science
  - NTL Assistant Research Professor in Transdisciplinary Climate Science
  - NTL Assistant Research Professor in Data Science or Web Design
  - NTL Assistant Research Professor in Remote Sensing of Climate Impacts

- **Convergence for Climate Solutions**

- TL Assistant Professor in Climate Justice
- TL Assistant Professor in Climate Health
- TL Assistant Professor in Climate Policy
- TL Associate Professor in Climate-smart infrastructure/technology



# Alignment with Strategic Planning

- Thematic Priorities
  - Stewarding Our Planet's Resources
  - Driving Digital Innovation
  - Enhancing Health
  - Advancing Arts & Humanities,
  - (and more)
- Foundations
  - Ensuring a Sustainable Future
  - Engaging Our Students
  - Advancing Inclusion, Equity & Diversity
  - Enhancing Global Engagement
  - (and more)



# Cementing Consortium Partnerships



Pennsylvania Environmental Resource Consortium, UN  
Economic Commission for Europe, Sustainable  
Development Solutions Network



## Energy University

Forum #3

### Energy Outreach

Thursday, April 29 | 1–2:30 p.m.





## Joe Biden to reveal US emissions pledge in key climate crisis moment

President will also call on major economies to join him in bold action at virtual summit of 40 world leaders

- So what has the rest of the world promised to do about climate change?



Cut emissions in half by 2030?



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# Happy Earth Day!

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# “Six pillars” for Net-Zero

- 1 End-use energy efficiency and electrification
- 2 Clean electricity: wind & solar generation, transmission, firm power
- 3 Bioenergy and other zero-carbon fuels and feedstocks
- 4 CO<sub>2</sub> capture, utilization, and storage
- 5 Reduced non-CO<sub>2</sub> emissions
- 6 Enhanced land sinks



73% of Penn State undergraduates see climate change as a threat to humanity

Only 10% think that Penn State is preparing them for their climate future

1584 students surveyed, 2019