2022

Annual Report

2023

EXPLORE OUR IMPACT

CONTENTS ×

HIGHLIGHTS
FACULTY RESEARCH
RESEARCH AND IMPACT
DEVELOPING LEADERS
CONVENING EXPERTS
OUR TEAM

Home – About – Annual Report

DIRECTOR'S LETTER

We are pleased to report that this year marks the completion of our faculty hiring campaign to bring three Presidential Distinguished Professors of Energy Policy to Penn. This summer, we welcomed energy policy and justice scholar Sanya Carley, who joined energy law scholar Shelley Welton and carbon management scholar Jennifer Wilcox (currently serving at the Department of Energy).

These three extraordinary colleagues provide the depth of expertise envisioned by our generous donors and the University of Pennsylvania—who, years ago, made a commitment to bring top energy policy scholars to Penn. With primary appointments in the Schools of Engineering, Law, and Design, these faculty demonstrate the many disciplines demanded by the complex challenges of the energy transition.

As the Kleinman Center moves into a new academic year, we look forward to supporting the work of Penn faculty, as well as our grant recipients, visiting scholars, and senior fellows. We'll accomplish this while also cultivating student research opportunities, coursework, internships, seminars, and more. Ultimately, all of our work and programming is committed to creating the conditions for policy innovation that supports a just and efficient transition to sustainable energy.

We firmly believe that solutions to today's most significant challenges, like climate change, are grounded in a reimagined energy system that can only be realized on a strong foundation of advanced energy policy research.

We hope you will join us.

Sincerely,

Mark Alan Hughes
Faculty Director, Kleinman Center

Cory Colijn
Executive Director, Kleinman Center

2022-2023 HIGHLIGHTS

WELCOME, SANYA CARLEY

This year, we hired our third Kleinman Center faculty member: Sanya Carley, Presidential Distinguished Professor of Energy Policy and City Planning. As our spring visiting scholar, Carley had an early introduction to Penn students and faculty with a week-long visit and public lecture. Carley will teach her first Kleinman Center class this spring. We look forward to her ongoing research in the field of energy justice.

POLICY DIGEST PODCAST PAST EVENT

READ THE ANNOUNCEMENT →

THE PROSPECTS FOR PENNSYLVANIA AS A RGGI MEMBER

Research by the Kleinman Center and Resources for the Future found that by joining the Regional Greenhouse Gas Initiative (RGGI), Pennsylvania could reduce its emissions, generate additional revenue, and see minimal to no impact on electricity rates. Researchers disseminated these findings to media and policymakers.

PODCAST

E&E STORY

INSIDE CLIMATE STORY

READ THE REPORT →

17

ARTICLES

Featuring report

ENERGY WEEK AT PENN

Energy Week at Penn gathers industry leaders, researchers, and students for a full week of energy programing. This annual event creates valuable connections, inspires conversations, and grows our shared commitment to drive positive change in the energy sector.

Energy Week at Penn 2023
Climate change • Climate change refers to long-term shifts in...
Watch later
Share
Watch on YouTube

Student-focused programming was a key part of Energy Week 2023, with a student poster session, networking coffee chats, lightning talks, an alumni panel, and more.

READ MORE ABOUT ENERGY WEEK →

24

EVENTS

across 6 Penn schools

> Kudos for opening these Energy Week events to the public. I love the energy sector and appreciate every single opportunity to interact with students and other professionals who feel the same way.
>
> **CAROL OBANDO-DERSTINE**
> Design Supervisor in Data Governance, PPL Electric Utilities

CELEBRATING FACULTY RESEARCH

WELTON'S FIRST YEAR AT PENN

ASU Sandra Day O'Connor College of Law
Arizona State University

Shelley Welton, Presidential Distinguished Professor of Law and Energy Policy, kicked off her first year at Penn with major accomplishments. In addition to teaching our Introduction to Energy Policy class, she also released a co-authored casebook on the law of networks, platforms, and utilities (NPU). The book explains how the tools of NPU law can help sectors—like the energy sector—address some of the most pressing problems of our time.

Welton also published an article in the *Yale Law Journal* on net zero, won the Morrison Prize for a co-authored piece on grid reliability and clean energy, and hosted the first annual Berkeley-Penn Energy Law Scholars workshop.

READ HER RESEARCH →

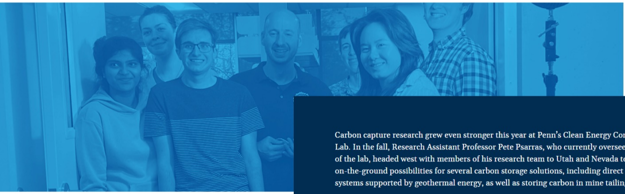
> This is the book I've been waiting for!
>
> **MARIA STAMAS**
>
> Energy justice lawyer on Shelley Welton's new book

1.5 DEGREE CLIMATE LECTURE

During Penn's Climate Week, Shelley Welton and other professors and leaders from across the university united in a series of 1.5 Minute Climate Lectures to sound the alarm about the climate emergency.

1.5 Minute Climate Lectures: "Imagining Climate Futur...
Watch later
Share
Climate change • Climate change refers to long-term shifts in temperatures and...
Watch on YouTube

THE CLEAN ENERGY CONVERSIONS LAB



Carbon capture research grew even stronger this year at Penn's Clean Energy Conversions Lab. In the fall, Research Assistant Professor Pete Psarras, who currently oversees the work of the lab, headed west with members of his research team to Utah and Nevada to explore on-the-ground possibilities for several carbon storage solutions, including direct air capture systems supported by geothermal energy, as well as storing carbon in mine tailings.

EXPLORE THE WEBSITE →

TURNING CARBON EMISSIONS INTO ROCKS

Mine Tailings in the Psarras Lab
University of Pennsylvania
00:50

Open-pit mines generate millions of tons of waste each year. Researchers in the Clean Energy Conversions Lab are working on technologies that could turn this waste into carbon-storing rocks, potentially keeping a substantial amount of CO2 out of the atmosphere.

READ THE PENN TODAY ARTICLE →

FOSTERING RESEARCH AND IMPACT

PUBLISHED DIGESTS AND REPORTS

ENERGY INSECURITY DURING THE TIME OF COVID

Millions of Americans struggle to pay their energy bills and avoid being disconnected from their energy services. This digest evaluates the incidence and implications of such for low-income families during the first year of the COVID-19 pandemic.

WHOLESALE ELECTRICITY JUSTICE

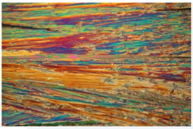
Wholesale electricity and justice are not terms often joined together. While it can be difficult to trace the consequences of federal decisions to their localized impacts, it can and should be done. Explore some targeted recommendations.

THE NET-ZERO GOVERNANCE CONVEYOR BELT

While the proliferation of net-zero targets represents progress toward reaching our global climate goals, targets vary enormously in quality. This report proposes four governance tools to steer net-zero targets toward higher integrity.

● ○ ○ ○

CENTER STAFF RESEARCH



BIOMASS: A RENEWABLE RECKONING

Despite its renewable designation, harvesting and burning forest biomass has resulted in astronomical emissions and raised questions about industry regulation.

IMPACTS OF THE IRA ON RARE EARTH ELEMENTS

The Inflation Reduction Act (IRA) has set the stage for the U.S. to make a significant contribution to the production of minerals for the energy transition. But the legislation does not solve all the barriers.

AMMONIA'S ROLE IN A NET-ZERO HYDROGEN ECONOMY

Compressed or liquefied hydrogen has many attractive properties as a store of carbon-free energy, but experts suggest that using ammonia as a temporary vector for hydrogen will be needed to overcome hydrogen's challenges.

POLICY INSIGHTS FROM THE INFLATION REDUCTION ACT

Penn faculty affiliated with the Kleinman Center give their thoughts on the Inflation Reduction Act's potential impact on energy policy. Read thoughts from Mark Alan Hughes, Michael Mann, and Shelley Welton.

MEASURING REACH

269

MEDIA MENTIONS

Highlights include *NPR*, *Philadelphia Inquirer*, and *E&E News*

337 M

REACHED

Through press articles and media mentions

900+

POLICYMAKERS

Who received and read our research

— Read More: Fostering Impact

VISITING SCHOLARS

We were excited to welcome scholars back to Penn's campus, where they met with students and colleagues and gave public lectures.

Visiting Scholar Highlight

Visiting Scholar Nikki Luke chronicled how subsidized worker training programs in the South grew a workforce of laborers in utilities, energy efficiency, and solar panel manufacturing.

2022-2023 VISITORS

Sanya Carley

Faculty Director

Meredith Fowlie

Class of 1935 Endowed Chair in Energy, UC Berkeley

Nikki Luke

Assistant Professor, University of Tennessee, Knoxville

● ○

2022-2023 GRANT RECIPENTS

Each year, the Kleinman Center for Energy Policy awards grants ranging from $5,000 to $15,000 to support new research or supplement existing research in energy and climate policy.

EXPLORE THE PROJECTS →

Susanna Berkouwer

Assistant Professor of Business Economics & Public Policy

Bing-yu Chiu

Doctoral Candidate

Christian Kaps

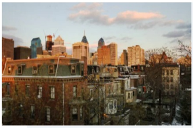
Doctoral Candidate

● ○

DEVELOPING TOMORROW'S LEADERS

STUDENT RESEARCH

Student research plays an important role in our broader policy research agenda. By engaging students in research, we not only foster a culture of curiosity and critical thinking but also tap into a valuable source of fresh perspectives and innovative ideas.



ADDRESSING ENERGY INSECURITY IN PHILADELPHIA'S AFFORDABLE HOUSING

Aging energy systems in affordable multi-family homes contribute to pervasive energy insecurity. Using and tailoring the C-PACE financing mechanism can help.

GENDER BASELINE ASSESSMENT OF ENERGY COMPACTS

One-third of the world's population lacks access to clean cooking and approximately 733 million people have no access to electricity. A global transition to sustainable energy cannot be achieved unless women are equally included as leaders, partners, and beneficiaries.

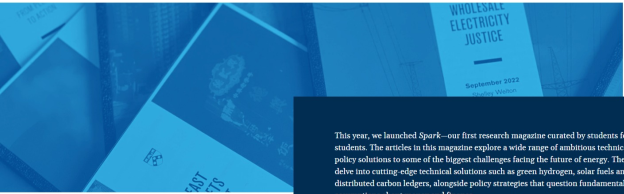
TOXIC CLOUDS AND DIRTY DATA

A project from Kleinman Center grantee Lauren Bridges explores why we need to rethink the energy, water, and waste-intensive model of cloud computing.

2023 UNDERGRADUTE FELLOW BLOGS

Each spring, the Kleinman Center hosts its undergraduate student fellows program. Each fellow wrote a thoughtful insight on an energy or climate issue of their choice

SPARK MAGAZINE



This year, we launched *Spark*—our first research magazine curated by students for students. The articles in this magazine explore a wide range of ambitious technical and policy solutions to some of the biggest challenges facing the future of energy. The authors delve into cutting-edge technical solutions such as green hydrogen, solar fuels and distributed carbon ledgers, alongside policy strategies that question fundamental assumptions about money and finance.

READ THE MAGAZINE →

Read More: Developing Leaders

STUDENT OFFERINGS

STUDENT COUNCIL

Meet the Kleinman Center Student Council. The group helps give input on the center's programming—weighing in on things from student publications to visiting scholar lectures.

Sage Basri

Student Advisory Council Member

Julian Brubaker

Student Advisory Council Member

Sean Deresh

Undergraduate Seminar Fellow

EXPANDING OUR CURRICULUM

A new collaborative course this year, Societal Grand Challenges, co-taught by faculty from the Kleinman Center, Weitzman School, and School of Engineering and Applied Science, used societal grand challenges as scenarios for identifying repeatable, process-oriented best practices for solving complex, systemic problems in the energy transition. The course brought together students from both policy and STEM backgrounds. It also provided an opportunity to learn from one another and build a holistic understanding of the technical and policy dimensions of the energy transition and the global response to climate change and environmental degradation.

BLOG COMPETITION

Undergraduate and graduate students had the opportunity to get published in our third-annual student blog competition. The insights explore personal stories—from literature that energizes climate action to family members who inspire sustainable living.

READ THE BLOGS →

TO DREAM THE IMPOSSIBLE DREAM

FIRST PLACE — Caroline Magdolen looks at how a work of science fiction highlights just how precarious our world is becoming and inspires optimism about our energy future.

THE WIN-WIN OF AGRICULTURAL SOLAR ENERGY

SECOND PLACE — Chris Quattro reflects on why our renewable future needs people of all ages and backgrounds to act and use their resources, space, and platforms to enact change.

THE DIRTY COST OF “CLEAN” ENERGY

THIRD PLACE — Emma Glasser looks at how Thea Riofrancos changed a student’s perspective on a just energy future.

GLOBAL PHILADELPHIA MURAL UNVEILING

UN Sustainability Goals Come to Life

In FDR Park, a 10×10-foot mural sponsored by the Kleinman Center for Energy Policy and painted by Penn grad student Eliza Nobles represents the global target of clean energy for all.

UNDERGRADUATE SEMINAR

This year's spring seminar drew in 14 student fellows for bi-weekly sessions with scholars across campus. Students enjoyed lunchtime presentations and discussions on the latest topics in energy policy, including: adaptive design, environmental justice, environmental risk management, and renewable energy and storage.

Enzo Bergamo

Undergraduate Seminar Fellow

Joshua Chertok

Student Advisory Council Member

Christian Daebritz

Student Advisory Council Member

● ○ ○ ○ ○

CONVENING EXPERTS

COP27

Penn faculty, researchers, and students attended the UN's annual climate conference—this year in Egypt—where they presented research, and participated in events and critical discussions.

18

INSIGHTS AND PODCASTS

Published by the Penn delegation

United
Climat

Organized by the Kleinman Center, scholars from Penn made an impact in last year's United Nations climate change conference, COP27. The Penn delegation contributed to both the negotiations, including significant work on loss and damage, led by Michael Weisberg and Zeid Ra'ad Al Hussein, and a series of events at its perimeter, called the "blue zone." Penn supported a class of law students who were able to attend and learn from the proceedings. Our podcast Energy Policy Now was also on the ground for a mini-series of COP27 interviews. Delegates provided commentary for *The Philadelphia Inquirer* and the Kleinman Center website.

READ THE INSIGHTS AND MORE →

> It's a testament to our broad expertise on climate change that so many from Penn could share their knowledge and insights in front of an international audience of this caliber. This type of engagement is crucial to finding solutions to one of the biggest challenges we face today.
>
> **LIZ MAGILL**
> President, University of Pennsylvania

PENN TODAY COP27 COVERAGE →

PUBLIC EVENTS

Both in person and in the virtual world, we delivered events on topics from geoengineering to energy insecurity.

RESPONSIBLE DEPLOYMENT IN CARBON MANAGEMENT

Pete Psarras explores challenges and opportunities in carbon management and shares a new picture of deployment.

SOLAR GEOENGINEERING THROUGH THE LENS OF JUSTICE

Explore how carbon removal and solar geoengineering technologies might evolve while breaking away from unjust mechanisms.

ARE INDUSTRY REGULATORS READY FOR THE CLIMATE TRANSITION?

Visiting Scholar Meredith Fowlie explores if regulatory regimes are up to the task of coordinating an efficient and equitable climate transition.

● ○ ○ ○

ENERGY POLICY NOW

In its seventh season, Energy Policy Now covered timely energy topics on everything from grid reliability to scaling green hydrogen.

FEATURED EPISODE

Berkeley economist and Visiting Scholar Meredith Fowlie explains why the drive to electrify everything in American homes is at odds with electricity rate-setting practices and explores pricing reforms to deliver rapid and equitable electrification.

Kleinman Center for Energy Policy
ENERGY POLICY NOW

Energy Policy Now

Overcoming Economic Barriers to Electrifying Everything

00:00 / 29:06

> Easily the best podcast I've listened to this year!

JAMES HEWETT

Manager, Policy and Advocacy at Breakthrough Energy

29

EPISODES

Released in 2022-2023

91,590

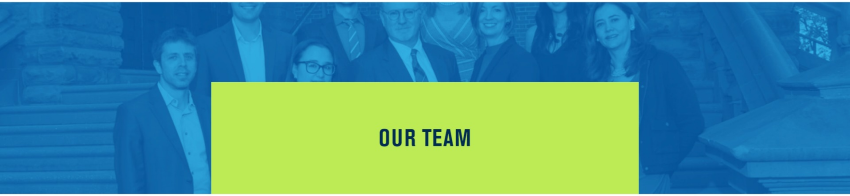
EPISODE DOWNLOADS

In the last year

163

COUNTRIES

Listeners turned in from all over the world



OUR TEAM

ADVISORY BOARD

Paul Bonney

Former Senior Vice President, Exelon

Mark Brownstein

Senior Vice President, Environmental Defense Fund

Emily Duncan

Senior VP of Federal Affairs, American Electric Power

DONORS

Scott Kleinman

Co-President, Apollo Global Management

Carl Goldsmith

Founding Partner, Beach Point Capital Management

Steven Lefkowitz

Founding Partner, Sagewind Capital LLC

STAFF AND AFFILIATES

Bill Cohen

Center Coordinator

Cornelia Colijn

Executive Director

Lucy Corlett

Research Associate

●○○○○○○○

Annual Report Archive

2021-2022

Welcoming Shelley Welton • Net Zero Nevada Report • COP26 • Carnot Prize: Nicholas Stern

Read the Report

2020-2021

Clean Energy Conversions Lab • Explainer Video • Virtual Engagement • Carnot Prize: Sheila Oparaocha

Read the Report

2019-2020

First Faculty Hire: Jennifer Wilcox • First Energy Week at Penn • Carnot Prize: Cheryl LaFleur • COVID-19 Response

Read the Report

2018-2019

$30 Million Renewal Gift • Carnot Prize India: Piyush Goyal • Philadelphia Refinery Report

Read the Report

2017-2018

Kleinman at Home & Abroad • Carnot Prize: Gina McCarthy • Advisory Board Growth

Read the Report

2016-2017

Energy Policy Now Podcast Launch • Carnot Prize: Fatih Birol • First IEA Summer Fellow

Read the Report

2015-2016

Fisher Fine Arts Renovation • First Carnot Prize: Daniel Yergin • New Programming

Read the Report

2014-2015

$10 Million Gift • Center Opening • Vision & Plan • New Research & Programs

Read the Report

Kleinman Center for Energy Policy
at the University of Pennsylvania
Stuart Weitzman School of Design

Contact
Getting Here
kleinmanenergy@upenn.edu
215.898.8502

© 2024 University of Pennsylvania
Copyright | Privacy | Disclaimer | Accessibility | Emergency Services