2020

Annual Report

2021

SEE OUR IMPACT

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Home – Annual Report

FROM OUR DIRECTORS

This annual report marks a full year operating in a pandemic. After transitioning to an entirely digital delivery system last year, we are pleased to report a highly productive year in our three core areas:

fostering impactful research

convening today's experts

developing tomorrow's leaders

> We have produced some of our most attended events, most read policy digests, and most listened to podcast episodes. Our audience is tuning in to Kleinman Center programming now more than ever.

MARK ALAN HUGHES
Founding Faculty Director

VIDEO LETTER

Faculty Director Mark Alan Hughes and Executive Director Cory Colijn share highlights in this year's video letter.

2020-2021 Directors Letter
Watch later
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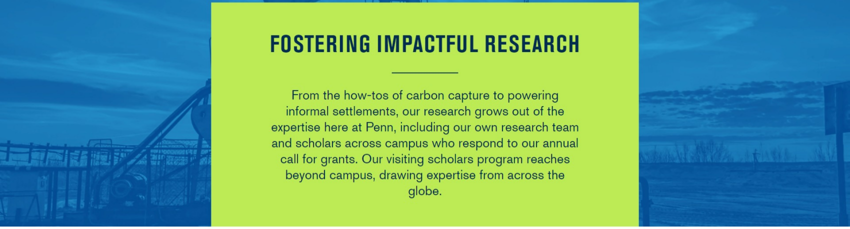
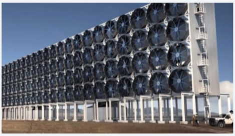


FOSTERING IMPACTFUL RESEARCH

From the how-tos of carbon capture to powering informal settlements, our research grows out of the expertise here at Penn, including our own research team and scholars across campus who respond to our annual call for grants. Our visiting scholars program reaches beyond campus, drawing expertise from across the globe.

CENTER RESEARCH

CLEAN ENERGY CONVERSIONS LAB



Last fall we were pleased to welcome our first faculty hire: Jennifer Wilcox, Presidential Distinguished Professor of Chemical Engineering and Energy Policy. In December, Wilcox took a leave of absence to serve at the Department of Energy, where she is Principal Deputy Assistant Secretary for the Office of Fossil Energy and Carbon Management.

A team of researchers continues her carbon capture work here at Penn's Clean Energy Conversations Lab, researching everything from carbon mapping to reverse mining.

While at Penn, Wilcox and her team published the first *CDR Primer*, a resource on the fundamentals of carbon dioxide removal and its role in addressing the climate crisis. This online tool has already garnered more than 100K page views.

ABOUT JEN **CDR PRIMER** **ABOUT THE LAB**

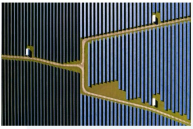
~$1M

GRANT MONEY

Six prestigious grants help fund this work, including ARPA-E and ClimateWorks Foundation

> Carbon capture expert and Penn Kleinman Energy Faculty Jennifer Wilcox will be Principal Deputy Assistant Secretary for Fossil Energy at Department of Energy, and I cannot think of a better choice! A great team being assembled here.
>
> **JESSE JENKINS**
> Assistant Professor, Andlinger Center for Energy and the Environment, Princeton

KLEINMAN CENTER PROJECTS



RARE EARTH ELEMENTS

Today's electric motors and turbines require rare earth elements, but extracting these elements is a polluting and energy-intensive process. How can we sustainably source clean energy technologies?

CLEAN ENERGY AND AGRICULTURE

In the United States, more land is needed for infrastructure installation due to growing energy demand and more clean energy projects. Farmland is often the best option. Today's farmers are gravitating toward solar instead of oil and gas.

WATER DEMANDS OF THE POWER SECTOR

Electricity production accounts for 40% of total water withdrawals in the United States. Solar and wind power have far lower on-site water demands than thermal generation sources—a key factor for regions experiencing water stress due to development and climate change. In this study, we create county-scale maps of U.S. water stress levels to ascertain which areas are ripe for power plant retirement and solar and wind investment.

DECISION MAKING UNDER DEEP UNCERTAINTY

Historically, we made decisions based on intuition and limited data. Today, big data and robust computers allow us to model endless pathways and outcomes. This year, we worked with Penn Praxis Design Fellow Hadi El Kebbi to illustrate these dynamic pathways. We then presented our illustrations at Caltech's Climate Information for Adaptation workshop.

RESEARCH GRANTS

Our research grants this year supported energy-related projects that spanned the disciplines of business, economics, engineering, design, arts, and science. Grant recipients wrote on everything from carbon tax to energy storage. We learned about the opportunities for nuclear in Africa and the challenges of energy efficiency in historic preservation.

10

GRANTS GIVEN THIS YEAR

Meet our research grant recipients

5

SCHOOLS REPRESENTED

Browse this year's research topics

POLICY DIGESTS AND REPORTS

THE CARBON SHOCK

Over the past decade, governments have finally started to combat climate change through policy interventions, but a constant fear has been how the economy and the markets will react to any new legislation. To what degree are such concerns warranted?

ELECTRICITY STORAGE AND RENEWABLES

Wind has become the cheapest energy source, and energy storage is becoming cheaper every year. Together they could become the main source of electricity worldwide. When will this happen and which storage technology will prevail?

POWERING THE SLUM

More than a billion people worldwide live in informal settlements and lack proper access to energy. This case study explores energy poverty in the slums of Accra, Ghana, where illegal electrical hookups are the norm. How can we reverse this trend while providing safe, reliable, and affordable energy to all?

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RESEARCH RECOGNITION

TRUCK PORTS EXPLAINER VIDEO

Highlighting the work of Kleinman Center affiliate Steve Viscelli, this short explainer video on the energy efficiency gains of well-designed truck ports caught the attention of numerous federal and corporate policy makers, as well as journalists. On campus, it was featured in *Penn Today* and other Penn outlets, reaching an audience of 230,000.

Urban Truck Ports
Watch later
Share
Watch on YouTube

Ride-Hail Research

In 2019, Ph.D. student Xiaoxia "Summer" Dong received a Kleinman Center grant for his original research on Uber and Lyft ridership trends in the Philadelphia area. The resulting paper was recently named "2021 Best Article by an Emerging Scholar" by the Journal of the American Planning Association.

> An analysis by the University of Pennsylvania's Kleinman Center for Energy Policy notes that the soil and groundwater at the site of P.E.S. have been contaminated with a number of toxic substances, including benzene, a known carcinogen.
>
> NEW YORK TIMES MAGAZINE

100

MEDIA MENTIONS

Browse our news clips

100+

ACADEMIC REFERENCES

Explore our publications

CONVENING TODAY'S EXPERTS

While we missed gathering in the Energy Forum, we continued to convene students, thought leaders, and visiting scholars for a full lineup of content-rich virtual events. Our workshops, lectures, panels, and seminars drew speakers and audiences from around the world.

CARNOT PRIZE

The Carnot Prize is the Kleinman Center's annual recognition of distinguished contributions to energy policy through scholarship or practice.

Carnot 2021 Recap
Watch later
Share
Watch on YouTube

Sheila Oparaocha, an energy equity leader at ENERGIA, received this year's Carnot Prize for distinguished contributions to energy policy. Oparaocha has spent nearly two decades working in the gender and energy sector. She currently manages a multi-country and multi-partner program portfolio spanning 22 countries in Asia and Africa. Oparaocha accepted the prize remotely from her home in Zambia—with her mother by her side.

PODCAST DISCUSSION

ABOUT THE PRIZE

EVENT HIGHLIGHTS →

LECTURES, WORKSHOPS & SEMINARS

During the pandemic, we produced virtual events with an emphasis on timely and engaging topics and high-profile presenters.

PUBLIC EVENTS

TARGETING ENERGY JUSTICE

Tony Reames explored racial disparities in energy efficiency and rooftop solar adoption and offered examples of community-based solutions.

THE CASE FOR NATURE-BASED SOLUTIONS

Our panel of experts discussed the implementation of nature-based solutions to mitigate climate change and help achieve climate neutrality.

A CONVERSATION WITH LEAH STOKES

Leah Stokes presented her recent academic research, including ongoing projects.

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WORKSHOPS & SEMINARS

UNIVERSITY of PENNSYLVANIA

NORTHEAST WORKSHOP ON ENERGY POLICY

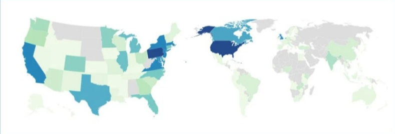
This annual conference, hosted this year at Penn, featured the latest research on energy policy and environmental economics.

ENERGY ECONOMICS & FINANCE SEMINAR

Now in its fifth year, this seminar provided a space to workshop research at the intersection of energy economics and finance.

VIRTUAL ENGAGEMENT

This year, we learned that the silver lining of virtual events is a larger reach. While past live events gathered local audiences, this year's events pulled in registered guests well-beyond the Philadelphia area.



VIRTUAL VISITING SCHOLARS

With no travel to campus, our visiting scholars participated in more flexible collaborations this year—meeting with Penn faculty and presenting public lectures from their home offices.

Sara Bronin

Professor, Cornell University

Tony Reames

Assistant Professor, University of Michigan

Nathalie Seddon

Professor, University of Oxford

PODCAST

In its fifth season, *Energy Policy Now* covered timely energy topics on everything from Europe's hydrogen plan to Biden's climate agenda.

24

EPISODES THIS YEAR

250K

LISTENS OVER 5 SEASONS

ALL EPISODES →

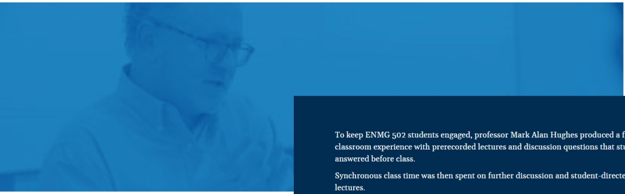
> I want to echo my appreciation for the podcast and the attention it has already brought to ENERGIA's work. I have been contacted by four new local women groups working in Zambia that I would not have engaged with otherwise.

SHEILA OPARAOCHA
2021 Carnot Prize Recipient

DEVELOPING TOMORROW'S LEADERS

We aim to not only educate students about energy policy, but to immerse them in energy policy. Our student grants program, spring seminar series, summer fellowships, and research opportunities are just a few ways students get hands-on experience through the Kleinman Center. This year, we offered our first-ever student blog competition—preparing tomorrow's leaders with research and writing opportunities.

INTRODUCTION TO ENERGY POLICY



To keep ENMG 502 students engaged, professor Mark Alan Hughes produced a flipped classroom experience with prerecorded lectures and discussion questions that students answered before class.

Synchronous class time was then spent on further discussion and student-directed mini-lectures.

This innovative teaching approach recently captured the interest of a journalist from *Inside Climate News*, who asked to come and observe the class and write a story about it.

BLOG COMPETITION

Our first student blog competition drew submissions from across campus. Students proposed unique energy policy solutions to address the climate crisis. Finalists were featured on the Kleinman Center website and the top three writers received cash prizes.

READ THE BLOG POSTS →

UNDERGRADUATE STUDENT SEMINAR

Once again, we gathered students interested in climate and energy policy for bi-weekly conversations with Penn researchers. We also organized a blog writing workshop led by energy reporter David Roberts.

19

STUDENTS

From across three schools and eleven departments or programs

8

SCHOLARS

From across six schools

19

PUBLICATIONS

Including sixteen blog posts and three policy digests

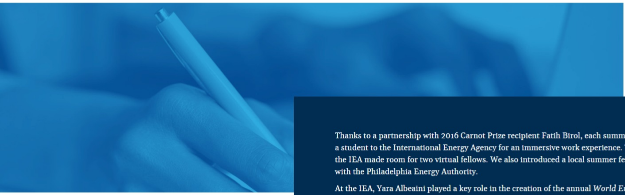
ABOUT THE SEMINAR →

> Thanks for putting together such a great seminar with so many interesting speakers this year!

FRANKY BARRERA

2021 Undergraduate Seminar Student

SUMMER FELLOWSHIPS



Thanks to a partnership with 2016 Carnot Prize recipient Fatih Birol, each summer we send a student to the International Energy Agency for an immersive work experience. This year, the IEA made room for two virtual fellows. We also introduced a local summer fellowship with the Philadelphia Energy Authority.

At the IEA, Yara Albeaini played a key role in the creation of the annual *World Energy Outlook*, exploring how producer economies in the Middle East and North Africa can undergo an energy transition in their local supply and energy exports. Maxwell Pisciotta, also a 2021 Kleinman Birol Fellow, worked on an IEA report about direct air capture.

Joshua El-Beya worked at the Philadelphia Energy Authority on several projects, including developing a new pipeline project, building as well as implementing new financial tools, accessible loan products, and resources to accelerate the adoption of energy efficiency and renewable energy in Philadelphia.

LEARN MORE →

Yara Albeaini

2021 Kleinman Birol Fellow

Joshua El-Bey

2021 Philadelphia Energy Authority Fellow

Maxwell Pisciotta

Student Advisory Council Member

BEHIND THE SCENES

Many thanks to the people working with us behind the scenes to make each year a success. This year, our advisory board put in extra hours to provide direction and feedback on our five-year strategic plan. And our staff worked on a plethora of projects, including the planning and creation of this new website.

THANK YOU

ADVISORY BOARD

Thank you to our advisory board for your continued guidance and your detailed direction on our strategic plan.

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

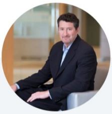
Thank you to our donors, who make this effort possible.

Scott Kleinman

Co-President, Apollo Global Management

Eric Gribetz

Managing Partner, Stonecourt Capital



Carl Goldsmith

Founding Partner, Beach Point Capital Management

● ○

WEITZMAN SCHOOL

Thank you to colleagues at our home school who provide us with expertise, inspiration, and support.

> Dialogue is essential to everything we do at the Weitzman School of Design, and this year the Kleinman Center strengthened its connections with its constituents in meaningful ways.
>
> **FRITZ STEINER**
>
> Dean and Paley Professor, Stuart Weitzman School of Design

STAFF

And thank you to our team—for the tireless work this year from remote offices.

> This year, in addition to recruiting top faculty to Penn, publishing more scholarship than ever before, and launching a public lecture series online, our staff made real contributions from home through the complete redesign of our website and the launch of a five-year strategic plan.
>
> **CORY COLIJN**
> Executive Director

Annual Report Archive

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

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at the University of Pennsylvania
Stuart Weitzman School of Design

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