Energy University

Forum #2

Energy Education

Friday, March 5 | 9–10:30 a.m.

PennState

AGENDA

9:00-9:05	Welcome, format, and objectives by Tom Richard
9:05-9:35	Panelist introduction and single-slide energy education summary moderated by Bruce Logan
9:35-10:00	Panel Q&A moderated by Bruce Logan/Tom Richard
10:00-10:30	Community comment and Q&A moderated by Tom Richard/Bruce Logan

TOPICS

Energy Literacy
Energy Intensive Education
Energy Adjacent Education

PANELISTS

- **Derek Hall**, program lead of the Energy Engineering Program and assistant professor in the College of Earth and Mineral Sciences
- **Hannah Wiseman**, professor of law at Penn State Law and professor and Wilson Faculty Fellow in the College of Earth and Mineral Sciences
- **Mark Sentesy**, assistant professor of philosophy and classics and ancient Mediterranean studies in the College of the Liberal Arts
- **Mary Beth Williams**, senior associate dean for instruction and curricula and professor of chemistry in the Eberly College of Science
- **Joseph Ranalli**, engineering program coordinator and associate professor of engineering at Penn State Hazleton
- **Susan Stewart**, director of the Pennsylvania Wind for Schools Program and associate teaching professor in the College of Engineering

We Need To Update our Curriculum

Derek Hall

Earth and Mineral Sciences, University Park

- As our energy infrastructure continues to change, we have a responsibility to change what we teach about energy.
  - Educate everyone about their daily energy use
  - Explore the ethics of our energy choices
  - Examine the sustainability of the materials involved
  - Equip our students to be fluent in fossil fuel and renewable energy sources
- A lot of the skills will look familiar, but the goals should be quite different.
  - Electric cars need sustainable mining to supply raw materials
  - Geothermal energy needs safe and inexpensive borehole drilling

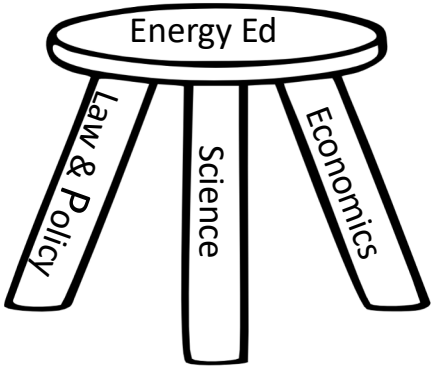
Credit http://macaulay.cuny.edu

Credit: https://medium.com/@aleemuddinm

Energy Law & Policy

Hannah Wiseman

Penn State Law & College of Earth & Mineral Sciences, University Park



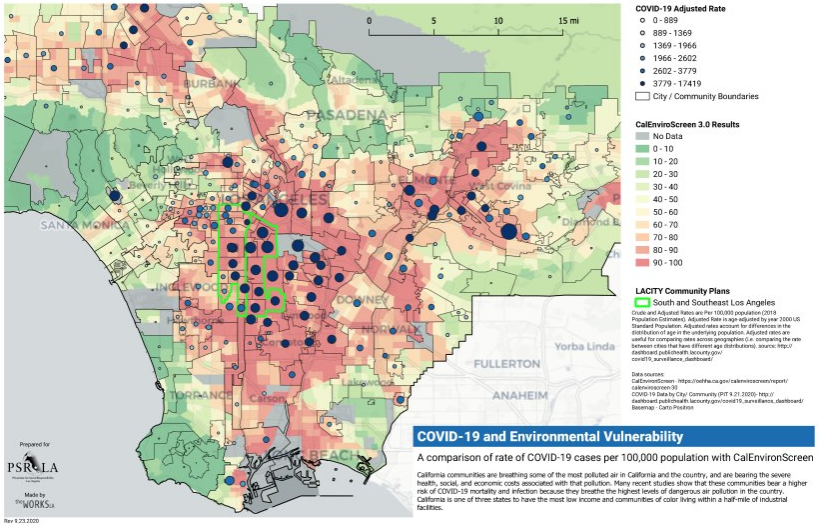
- Educate U.S. and international students in legal, scientific, and economic aspects of energy, with a focus on problem solving for clients
- Example classes:
  - Energy Law & Policy
  - Mediation of Environmental & Public Conflicts- public forum on climate change (April 13; https://centresustains.com/)
  - New Energy Transitions class with EMS (undergrads too!)
  - New Energy Infrastructure class
- Clinical education/Info sharing:
  - Sustainable rural economic development; https://aglaw.psu.edu
  - Center for Energy Law & Policy; Agricultural and Shale Law Center

Interdisciplinary Energy Education

Mark Sentesy

Liberal Arts, University Park

- Energy is a Health Issue and an Opportunity
  - California wildfires, hurricane Maria, Texas energy crisis closed hospitals, clinics, and reduced services
  - Fossil fuel pollution aggravates Covid-19, caused up to 18% of human mortality in 2018
- Energy is a Justice Issue and an Opportunity
  - Impacts of access to energy and fossil fuel pollution are unequally distributed, fall disproportionately on fence-line and marginalized communities
  - The maps of energy pollution, vulnerability to heat and cold, health issues, food, and water overlap
- Understanding and improving energy's contribution to society requires interdisciplinary work



Pollution burden and Covid-19 case rate in LA. Physicians for Social Responsibility, Oct, 8 2020.

MORTALITY DUE TO FOSSIL FUEL POLLUTION:
https://www.nature.com/articles/s41893-019-0453-5
https://www.sciencedirect.com/science/article/abs/pii/S1352231013004548
https://www.pnas.org/content/116/18/8775
https://www.pnas.org/content/116/15/7192
http://acmg.seas.harvard.edu/publications/2021/yohra_2021_ff_mortality.pdf

FOSSIL FUEL POLLUTION AND COVID-19:
https://pubmed.ncbi.nlm.nih.gov/33148655/
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3596698
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7128509/
https://pubmed.ncbi.nlm.nih.gov/33302074/
https://erj.ersjournals.com/content/54/1/1802140

https://www.propublica.org/article/new-research-shows-disproportionate-rate-of-coronavirus-deaths-in-polluted-areas
Map: https://www.latimes.com/environment/newsletter/2020-10-08/boiling-point-air-pollution-and-covid-19-can-be-a-deadly-mix-boiling-point

Foundational Science & Energy Education

Mary Beth Williams

Eberly College of Science, University Park

Campus-level Energy Education

Joe Ranalli

Alternative Energy & Power Generation Engineering - Penn State Hazleton

- Growing access through campus-level energy degrees (GA & HN)
- Gen Ed interdomain programming highlighting cross-cutting impacts
- Faculty and student collaborative research experiences
- Challenges and Contributions:
  - Move toward university-wide engagement
  - What is an Energy Engineer?

Embracing Energy U in Engineering

Susan W. Stewart

College of Engineering, University Park

- Building off existing courses across multiple departments, opportunity to develop minors, certificates, and/or new degree programs in energy
- Embracing ABET student outcomes and SDGs opportunity to create college-wide curricula centered on energy topics that also bring a level of energy literacy

Picture by Kenueone CC-0 via Wikimedia Commons