Synergies and Innovations in Coordinating Energy Impacts Research:
The Case of Shale Development Impacts
November 10, 2016, 1:30 – 2:30 p.m. CST
Synergies and Innovations in Coordinating Energy Impacts Research:
The Case of Renewables
December 15, 2016, 1:30 – 2:30 p.m. CST

New Voices in Energy Impacts Research: Graduate Research Highlights
February 16, 2017, 1:30 – 2:30 p.m. CST
Anne Junod, Ohio State University (host)
Rebecca Colvin, University of Queensland
Dylan Bugden, Cornell University
Emily Grubert, Stanford University
Shawn Olson-Hazboun, Utah State University

Coordinating Research on Energy Law and Policy
April 13, 2017, 1:30 – 2:30 p.m. CST

Today’s Speakers

• Dustin Mulvaney, Ph.D., Geographer, San Jose State University
• Claire Haggett, Ph.D., Sociologist, The University of Edinburgh
• Ben Hoen, M.S., Economist, Lawrence Berkeley National Laboratory

Each of 3 speakers present 8-10 on intro to their discipline’s approach to studying renewable energy, emerging topics, areas, variables and 1-2 examples of recent research

Followed by
• 10-20 minutes of audience questions and general discussion regarding speaker presentations, areas of commonality, opportunities for synthesis, emerging frontiers, etc.
Political Ecology

- Not a theory, or method, but draws on key concepts from other areas to explain socio-environmental outcomes and change.
- Case studies can be didactic, not helpful for theory building.
- Multi-method: interviews, participant observation, survey instruments, we note sensing, immersive experiences.
- Multi-sited: looks at reconnections between global, national, local, and local.
- Supposed to expand narratives: rethink new environmental problems as rooted in supply-demand, scarcity, lack of environmental education, poor management, population, lack of free markets, etc.
- Research questions related to power, control over access to resources, institutions, meaning.
- Representation of developmental problems.
- Seeks a better understanding of prevalent structures of justice & injustice, disempowerment, marginalization.

Science & Technology studies

Social planning for energy transitions

“...seeking to understand and prepare for the social implications and outcomes of energy transitions and to develop strategies for incorporating these considerations into energy systems design, as well as energy policy and planning.” (Miller & Richter 2014).

Cadmium toxicity claims

“GreenPeace is deeply concerned with the possibility of the California Power Authority choosing to purchase solar modules that contain toxic metals...Current CdTe panels result in Cd (gaseous) emissions of 0.5 g/GWh, equivalent to that of a coal fired power plant. The majority of these emissions (77%) result from mining and utilization of the modules...” - public comment 2002

Cadmium compounds are considered: carcinogens, mutagens, & genotoxins

Chronic effects: lung and prostate cancer; kidney damage; pulmonary emphysema

Itai-Itai ‘ouch-ouch’ disease in Japan: osteomalacia, osteoporosis, renal disfunction

Life Cycle Cadmium Emissions to the Environment versus occupational and environmental exposures

"We are taking a waste product and turning into a green product." - PV manufacturer

"We are phasing out cadmium because its not compatible with our sustainability ethic." - PV manufacturer

What policies and practices can help ensure the best environmental health, and safety outcomes?

- Locate facilities in regions with strong labor laws and enforcement
- Ensure workers have freedom of association
- Prohibit forced or child labor
- Enact extended producer responsibility laws
- Develop green chemistry alternatives to toxic and high volume chemicals
the ‘social gap’ in renewable energy deployment

...strong, consistent support for renewable energy, but widespread local resistance to siting renewable energy projects.

Explanations from earlier research emphasize importance of:
- De-emphasizing self-interested NYMBYism as explanation,
- Process/structure of public participation, "democratic deficit" hypothesis,
- The acceptability of the major impacts in the decision-making context (the "qualified support" hypothesis),
- Values and beliefs,
- Degree of collaboration with stakeholders, degree of ownership,
- Inequitable power relations.

Photo: Chris Clarke

“We’re all for solar projects. We need more of them. But not in this place.”- Thomas Lovejoy & E.O. Wilson

Western Solar Plan

22.5 million acres studied
300,000 acres of Solar Energy Zones

Table 1. Land Allocations in California’s Desert Renewable Energy Conservation Plan across six western states: Arizona, California, Colorado, Nevada, New Mexico, Utah.

<table>
<thead>
<tr>
<th>Land Allocation</th>
<th>Acres</th>
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<tbody>
<tr>
<td>Development Focus Areas</td>
<td>22,500,000</td>
</tr>
<tr>
<td>Recreation Management Areas</td>
<td>3,595,000</td>
</tr>
<tr>
<td>General Public Lands</td>
<td>419,000</td>
</tr>
<tr>
<td>Total</td>
<td>26,514,000</td>
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What can we learn from experiences siting utility-scale solar projects to make them more sustainable?

- Broaden the considerations for alternative places to site solar energy
- Site with "no regrets" (Desert Renewable Energy Conservation Plan’s scientific advisory panel recommendations)
- Participatory & collaborative planning, science-based approach
- Better incentivize distributed generation and disturbed lands

"The argument that we must sacrifice fragile ecosystems for the common good (i.e., major impingement in the Ivampah Valley to save the planet from climate change) is specious, relies on a false choice, and reflects a myopic view of the common good. Do we seriously believe a single coal-fired or nuclear plant will not be built or shut down if this solar project is constructed? Of course we must do our part to address climate change but not at the expense of an irreplaceable community jewel." - natural resource agency official

References


Scotland is the windiest country in Europe, 25% of its wind resource

Hello from Scotland!

Sociological approaches

- Some of the big issues
  - Social change, power, interaction, agency...
  - Energy developments as a microcosm
  - Asking questions which speak to these issues...
  - Exploring issues around communication, engagement, culture, value and meaning
  - Moving beyond attitudes – thinking in a much fuller way about perceptions and responses

- Some examples in practice...

A Sociological understanding: But impacts doesn’t mean that those who protest are NIMBYs...

- Classic explanation, still widespread
  - Assumptions:
    - Agreement about the usefulness of a project
    - Everyone prefers it in someone else’s backyard
  - Claims can therefore be safely dismissed

Sociological focus:
acknowledging and identifying that there are community impacts from renewables

Local issues not global warming

- (Inter)National benefits, local disadvantages
- Disparity between the global benefits of wind power and the effect on the local vicinity
- Tangible (dis)benefits
Unpacking ‘Nimby’

- Research from across the UK, US and Europe
- Largely incorrect as an explanation
- Majority value on wider public interest rather than their own individual cost-benefit calculations
- Objections from non-proximate residents: ‘NIABYs’
- Generally used as a pejorative
- Label likely to breed resentment
- Broadly used as a descriptor for all protest
- Actual causes of opposition obscured
- Need to understand support, opposition, and impact

1) A Sociological focus: on the importance of social context

- Local social and historical context
  - Particular siting and local relations crucial
- One size does not fit all
  - Experience dependant on local situation
- But there will be something...

2) Importance of value and meaning, and local expertise

Local people are not NIMBYs – very knowledgeable
Have a nuanced understanding of landscape
Local landscapes matter locally; they are embodied with memory and meaning

Reimagining current land-use planning processes
Asking people to creatively articulate their perceptions, ideas, and values
Include beauty, naturalness, meaning, memory and community

Current landscape assessment procedures/environmental and social impact assessments fail to fully capture meaning and value in a landscape setting

Landscape as composed of life events and social meanings, with no separation of self from scene: Landscape not as looked at but lived in
Accounting for the interface between landscape and community when making decisions about developments to the Scottish landscape
3) Importance of trust, communication and consultation in shaping impacts

- Imposition of (inter)national interests
  - Heavy handed ‘education’ not helpful
  - Opposition not to a development but the developer
  - Lack of communication the ‘perfect catalyst’ for creating opposition

- Nature of consultation
  - ‘Real’ involvement or going through the motions?
  - Conclusions taken into account? Or ‘Doublespeak’?
  - Fairness of outcomes and process (Gross, 2007)
In summary...

- A sociological approach highlights
  - The significant role of people – not merely NIMBYs
  - The role of social context
  - The role of local experience; and the factors that shape this
  - That landscapes are locally valuable and meaningful; and that this is currently not assessed in planning
  - The interconnection between policy, participation, and responses

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Economic Theory and Research:
Household & Community Impacts of Wind and Solar Power

Ben Hoen
Lawrence Berkeley National Laboratory

Webinar Series
NCRCRD
December 15th, 2016

Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Content</th>
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<tbody>
<tr>
<td>0:00</td>
<td>Intro to Economic Valuation and Renewable Energy, Topics &amp; Variables</td>
</tr>
<tr>
<td>0:05</td>
<td>Examples of Related Research</td>
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</tbody>
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(Some) Economic Valuation Methods

- Stated Preference (SP) methods
  - Examine impacts to individuals or groups
  - It is based on hypothetical situations
  - Types: Contingent Valuation & Choice Experiments

- Revealed Preference (RP) methods
  - Examine impacts to individuals or groups
  - Based on observing real actions
  - Types: Travel Cost & Hedonic Pricing Models

- Regional or Technology Specific Economic Models
  - Examine impacts across a broad area
  - Based on supply chain, construction and operation
  - Ex-Ante or Ex-Post
  - Types: Input-Output Models & Export-Import Models
Schedule

0:00
• Intro to Economic Valuation and Renewable Energy, Topics & Variables

0:05
• Examples of Related Research

Hedonic Study Of Home Price Impacts Near Massachusetts Wind Farms

Summary
• 312,677 total sales, 26 facilities
• 1,503 post-construction sales w/in 1 mile
• Urban settings, mostly small facilities
• First study to test wind turbine and other environmental amenities/disamenities together

Model Uncovered Clear Home Price Sensitivities To The Surrounding Environment

Despite the presence of effects for other environmental characteristics, no effects were discovered for turbines

I/O Model: Economic Impacts From Wind Energy Are Significant

Impacts from the 25 largest wind facilities in IL (3.6 GW) equate to $6.4 billion or $1.7 million/MW
Wind Counties Have Been Found To Have Lower Taxes (And Higher School Quality)

“...property tax rates have fallen and public school quality has improved in those counties where wind farms have been built.” (p. 800)

Kahn (2013): Statistical analysis of West Texas county tax rates, school expenditures, teacher-student ratios, county level pollution, and population migration.

Solar, When Owned, Has Been Found To Increase Home Values Consistently

Preliminary results from third party owned solar, though, indicate lower or no value increase

Thank You & Questions?

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Additional Material

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References


Stated Preference Methods

1. Contingent Valuation
   What would you be: ...willing to pay for 100% renewable electricity? ...willing to accept to live near a large scale solar installation?

2. Choice Experiments
   Given two choices (e.g., electricity prices X/Y and distances from shore of A/B) which would you choose?

Revealed Preference Methods

1. Travel Cost Method
   How often do people visit beaches that have views of wind power?

2. Hedonic Pricing Model
   How much do people pay for homes with solar panels? Or those near wind facilities?

Regional Or Technology Specific Economic Models

1. Input-Output Model
   What economic effects does wind power development have in TX?

2. Export-Import Model
   What % of 2016 solar installations was sourced from the US?
Key Economic Variables:
Household/Community Impacts of Wind and Solar Power

1. Home prices
2. Consumer energy cost savings
3. Tourist expenditures
4. Taxes and community economic benefits
5. Construction/Operation expenditures
6. Employment levels

Energy Impacts Research Coordination Network >>> www.energyimpacts.org

Questions?
Thoughts?
Ideas?

Type them in the Chat Box!