Examining how place, policy, process, and perceptions impact solar development and climate mitigation

December 9th, 2024

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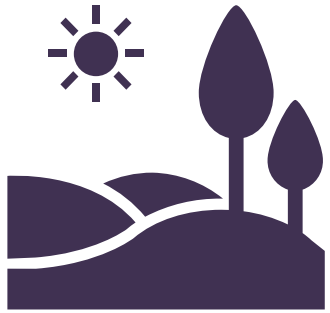
4 Factors Influencing Large-scale Solar Development & Climate Mitigation



Place

Local, Regional vs. Global; Rural vs. (Sub)urban, Prime farm, marginal, developed or previously contaminated land; Identity, Aesthetics, Place Attachment

Policy

Federal decarbonization goals, incentives; State vs. Municipal Siting & Permitting; Community Solar, Shared ownership, & Subscription

Process

Engagement, Information & Access; Community Benefits; Justice (Distributive, Procedural, Recognition, Cosmopolitan)

Perceptions

Risk tolerance & perceptions; Familiarity; Values, Politics, Education, Income; Landowners, Neighbors, Renters

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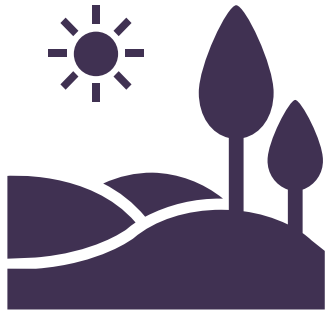

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Outcomes

2 Projects to Examine 4 Factors

- **DOE SETO: Community-Centered Solar Development (CCSD)**
  - A first-of-its-kind neighbor survey of 380 existing large-scale solar (LSS) projects in the US (n = 984)
  - Stakeholder interviews around existing LSS projects in 7 States (n = 54)
  - 8 “Community Conversations” held in 5 States

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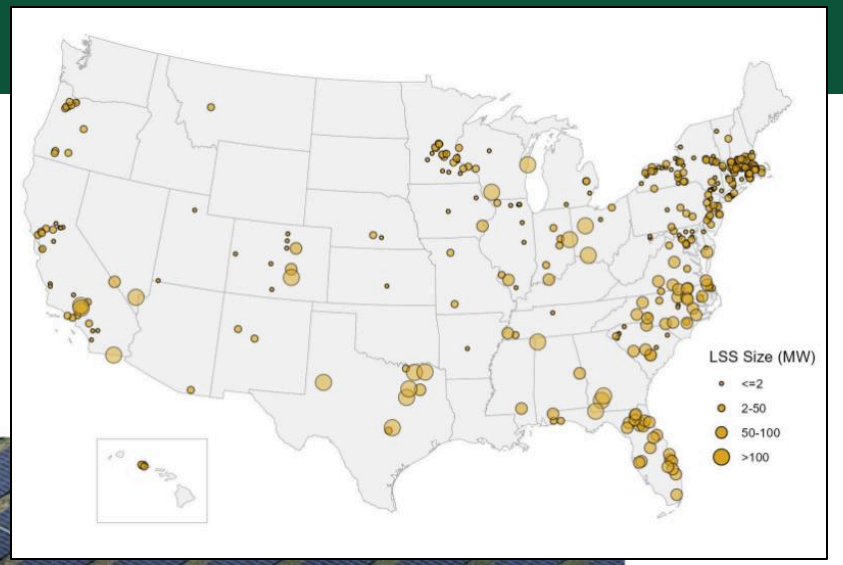
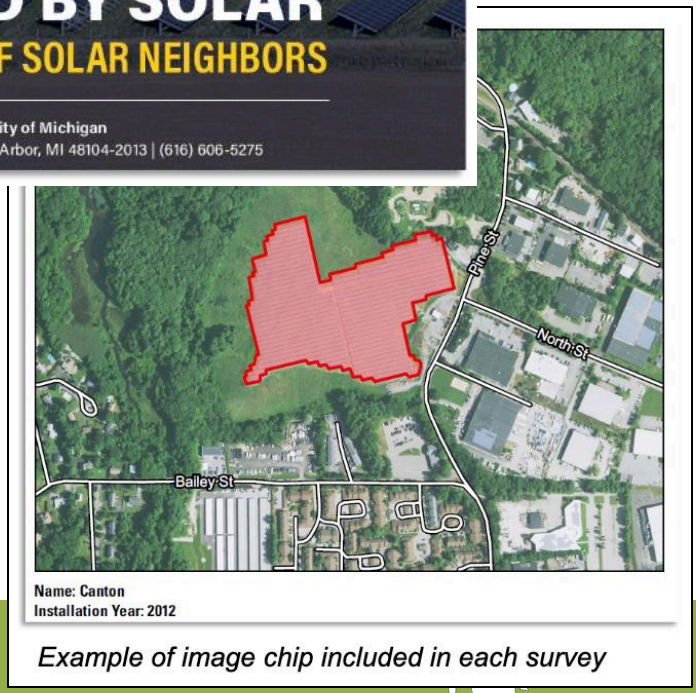
Energy Efficiency & Renewable Energy





Example of image chip included in each survey

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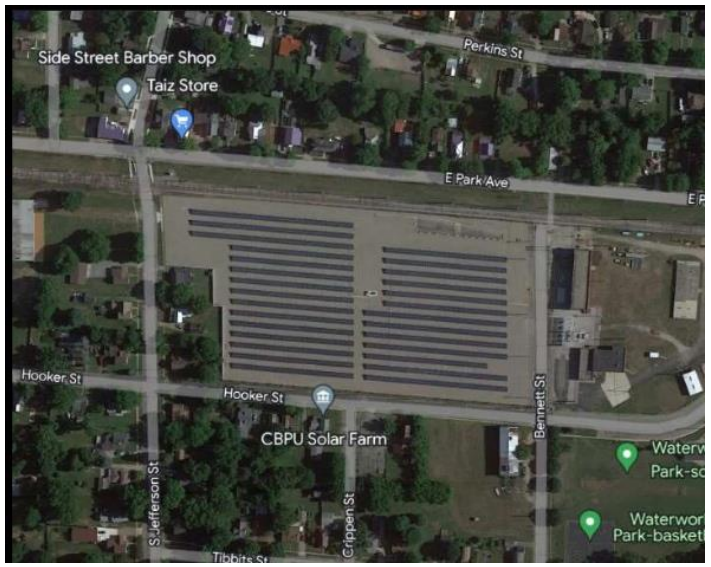
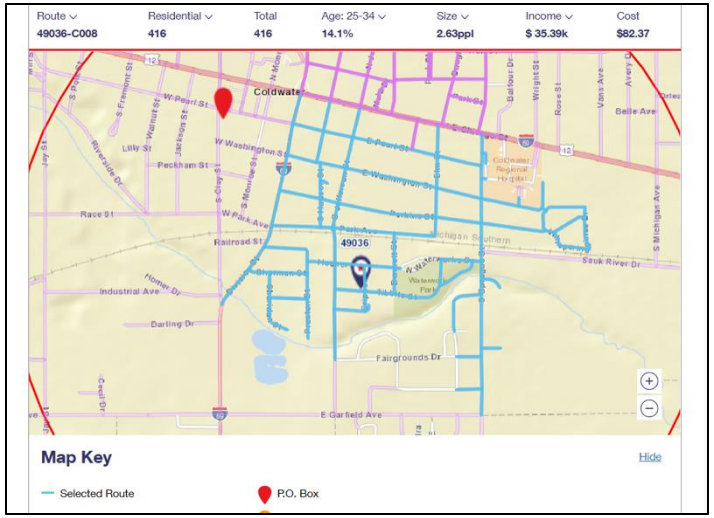
- **NSF GCR: Michigan Brownfield & Urban Solar (MBUS) Survey**
  - An every-door-direct-mail survey of 3 urban/brownfield solar project neighbors in Michigan (n = 159)

NSF

White, Jacob. *Urban Resident Perceptions and Preferences of Local Large-Scale Solar Sited on Brownfields and Disturbed Lands*. MS thesis. Michigan State University, 2024.





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Acknowledgment & Disclaimer

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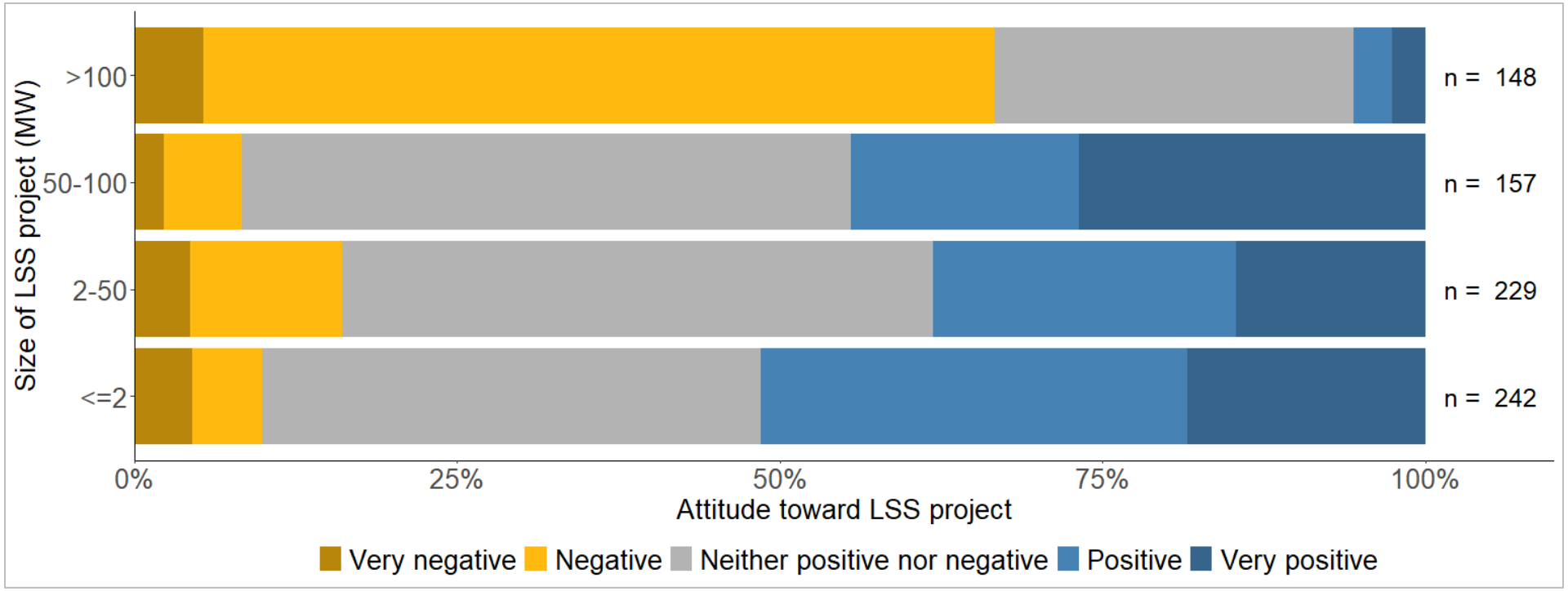
- U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the **Solar Energy Technologies Office, Award Number 38419**, and:
- **National Science Foundation Convergence Grant #1934346** "GCR: Collaborative Research: Socio-Technological System Transitions: Michigan Community and Anishinaabe Renewable Energy Sovereignty."

Respondents tended to have more positive attitudes about solar than negative, but still prefer alternative development

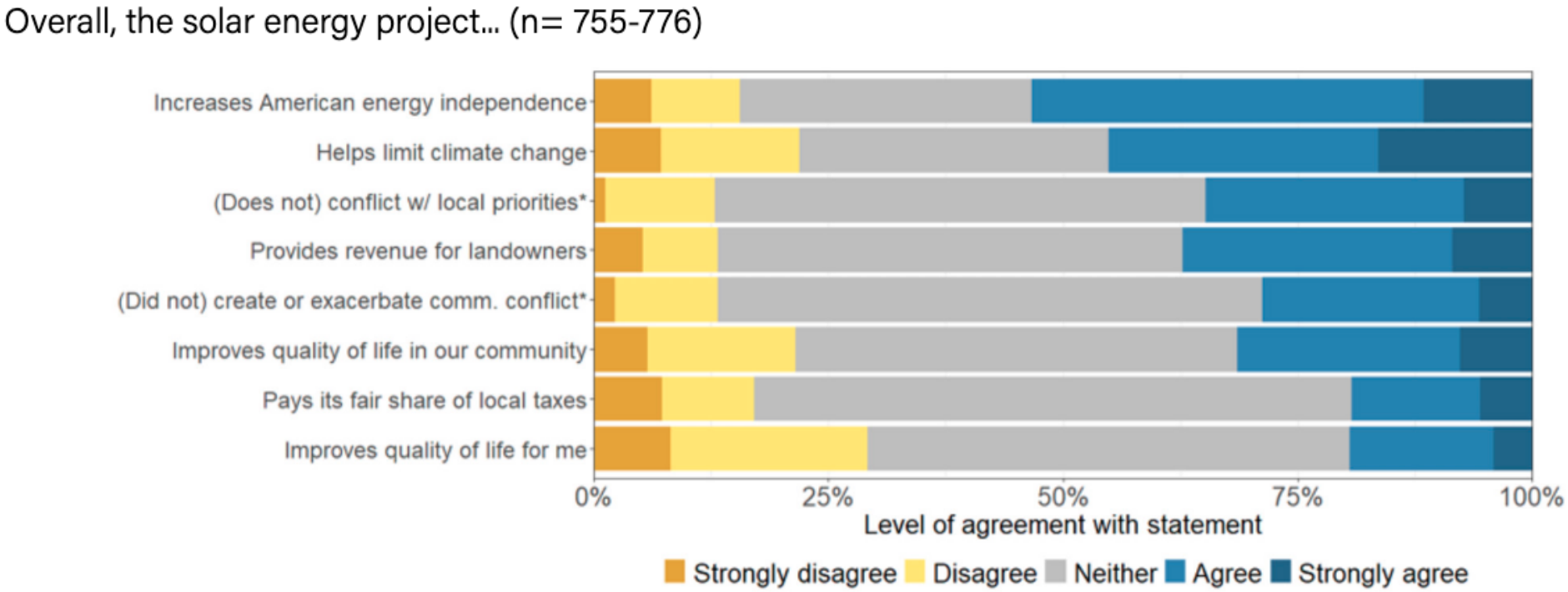
- More LSS (3 to 1) and MBUS (5 to 1) respondents demonstrated positive attitudes than negative
  - In Detroit, it was only 1.3 to 1
- Support for additional solar development (42% of respondents) was higher amongst LSS respondents than those opposed (18%)
  - Even amongst supporters of MBUS projects, respondents preferred housing (2 to 1) and parks (3 to 1)

Negative attitudes were more common near large projects (12 to 1); evenly split amongst those living with 1/4 mile of LSS



- Liking panels' looks strongly correlated with attitude about project overall (polychoric correlation: 0.73); nearly half of LSS respondents perceived worsened landscape aesthetics (3/4 around large projects)

Some perceptions relating to aesthetic, economic, and quality of life impacts are correlated with attitudes*



- Most haven't formed opinions about or perceive LSS impacts; 1/5 believe LSS has reduced property values
- MBUS respondents who perceived positive benefits were 8x more likely to support their project

Process improvements are needed; Few residents were aware of the nearest solar project before construction

- Only 12% of LSS respondents were aware of their local project prior to construction
  - More than 1/3 of LSS respondents were not aware project existed.
- Of those that were aware before construction, most reported the public had not been informed or engaged
  - Amongst MBUSS respondents, only ___ were aware of the project before construction
- Most LSS respondents had no opinion of the fairness of the process, but those that perceived process as 'fair' were more likely to have positive attitudes of project

Where there was more engagement, attitudes of both supporters and opponents were more positive than in places with less engagement; project size and distance were not significant! (Hoesch et al., in review)

What can process change?

- Project changes based on process participation were rare
- Less than 25% reported changes in the following:
  - Neighbor compensation
  - Subscription program changes
  - Community-wide benefits Location
- Less than 10% reported changes in the following:
  - Site aesthetics
  - Footprint/Size
  - Integrated agriculture

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On average, LSS respondents who were active and aware prior to construction expected more public engagement than occurred (Hoesch et al., 2024)

Policy Preferences

- Very little support amongst respondents (< 20%) for increased state-level decision-making in future large-scale solar siting and permitting
- Strong support for:
  - Increased opportunities to participate in planning
  - Increased opportunities to provide feedback after project is constructed (and desire for information more generally!)
  - Third-party advocates to inform community-members

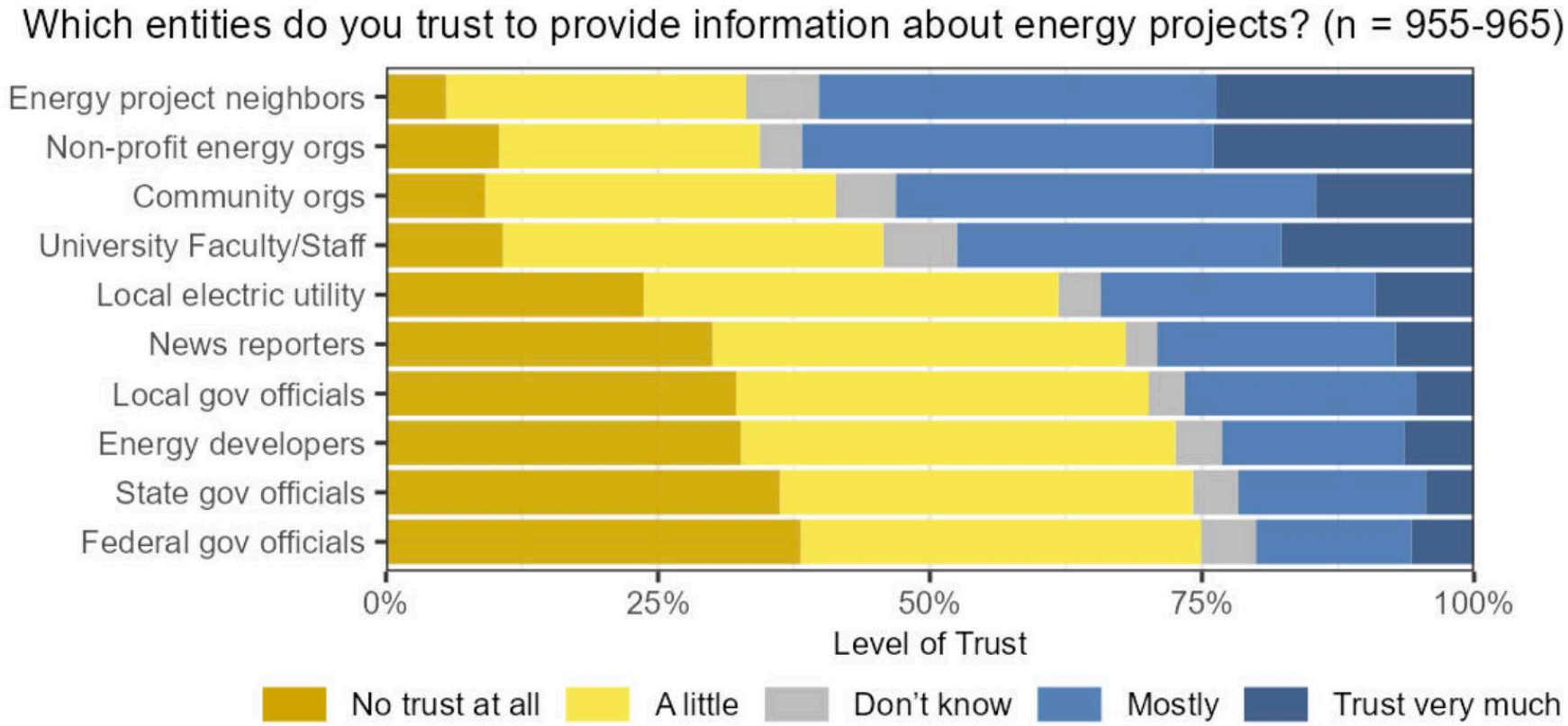
Townships file appeal challenging Public Act 233, state regulators' control over energy projects

Mitch Galloway, Farm News Media

According to the appeal, PA 233 is both "unlawful and unreasonable," expands the Michigan Public Service Commission jurisdiction, and violates state law. The municipalities' appeal seeks to restore local control over renewable energy siting decisions. | Photo by Getty Images

November 18, 2024

Most trusted entities to provide information about energy projects are neighbors, not developers or officials.



Rand, J., Hoesch, K., Mills, S., Hoen, B., Nilson, R., Bessette, D., & White, J. (2024). Perceptions of Large-Scale Solar Project Neighbors: Results From a National Survey.

So we partnered with University Extension to hold "Community Conversations"

Sherrie Gruder et al.

Extension
University of Wisconsin-Madison

IOWA STATE UNIVERSITY
Extension and Outreach

Luke Seaberg et al.

UNIVERSITY OF MARYLAND EXTENSION

Drew Schiavone et al.

Cornell University
Cooperative Extension

Mitch McCormick et al.

MSU EXTENSION

Mary Reilly et al.

Community Conversations identified 4 Tensions in more widespread LSS Engagement and Planning

1. Trusted entities ***vs.*** Credible information
2. Local, contextual knowledge and relationships **vs.** Technical expertise
    1. Generalists vs. Specialists
    2. “Have you swung a hammer?” (the problem of urban elites) (S.B. Mills)
3. One-off, unique interventions **vs.** Repeatable processes
4. Climate mitigation **vs.** Community interests
    - Just under ½ of LSS respondents thought solar helped limit climate change (just under ¼ disagreed)

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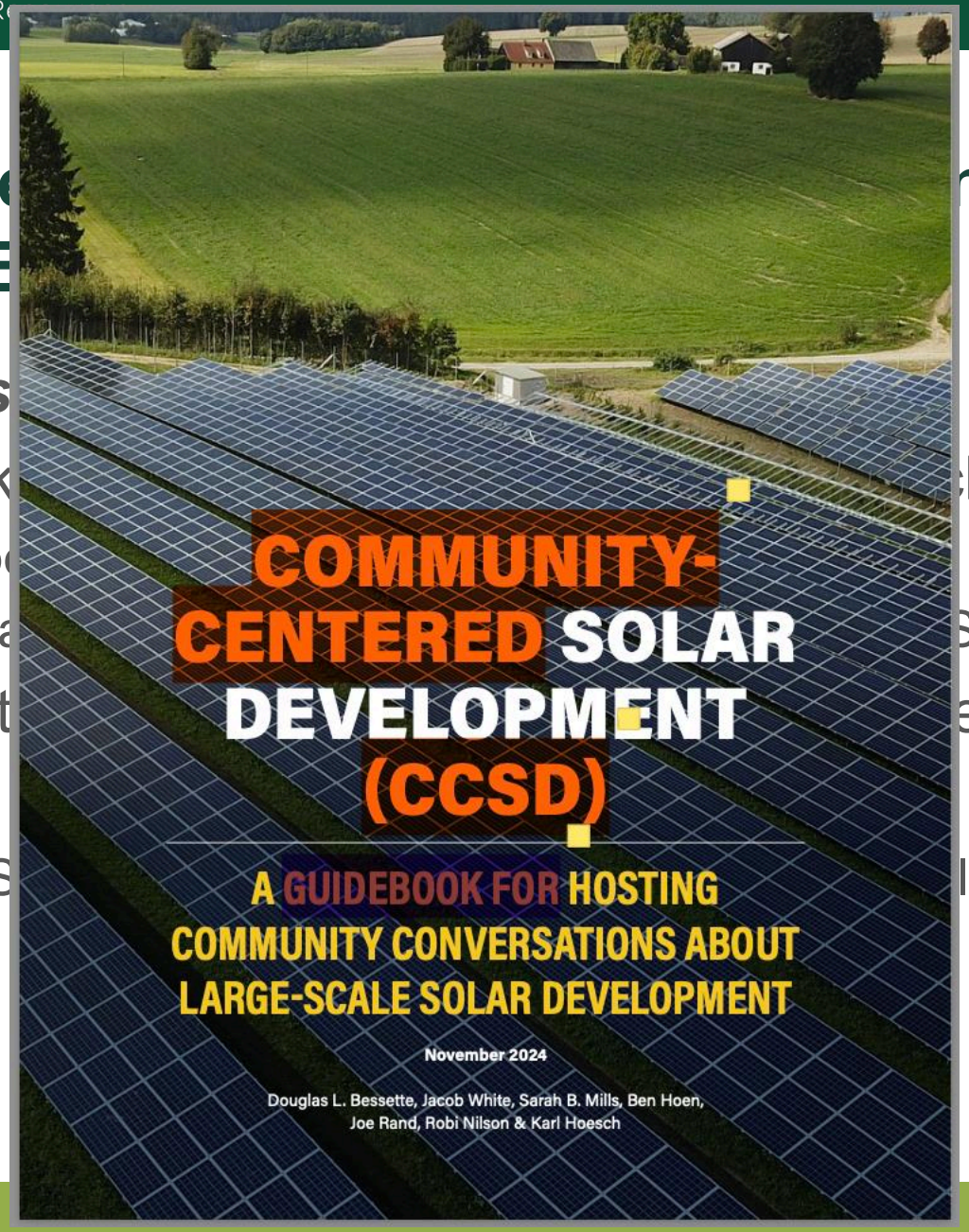

Thank you! Any questions!

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