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INDIANA RENEWABLE ENERGY

Siting through Technical Engagement and Planning (R-STEP™)

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The Relationship between Utility-Scale Wind and Solar Farms and Property Values

Dagney Faulk, Ph.D.

dgfaulk@bsu.edu

Center for Business and Economic Research

Ball State University

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Total investment in Indiana

$6.78 billion (wind)

$1.7 billion (solar)

(IURC)

Wind Turbines (2008 – 2023):

1,684 turbines

7 counties

(LBNL)

Utility-Scale Solar (2012 – 2023):

77 projects

3,000 Acres

38 counties

(LBNL)

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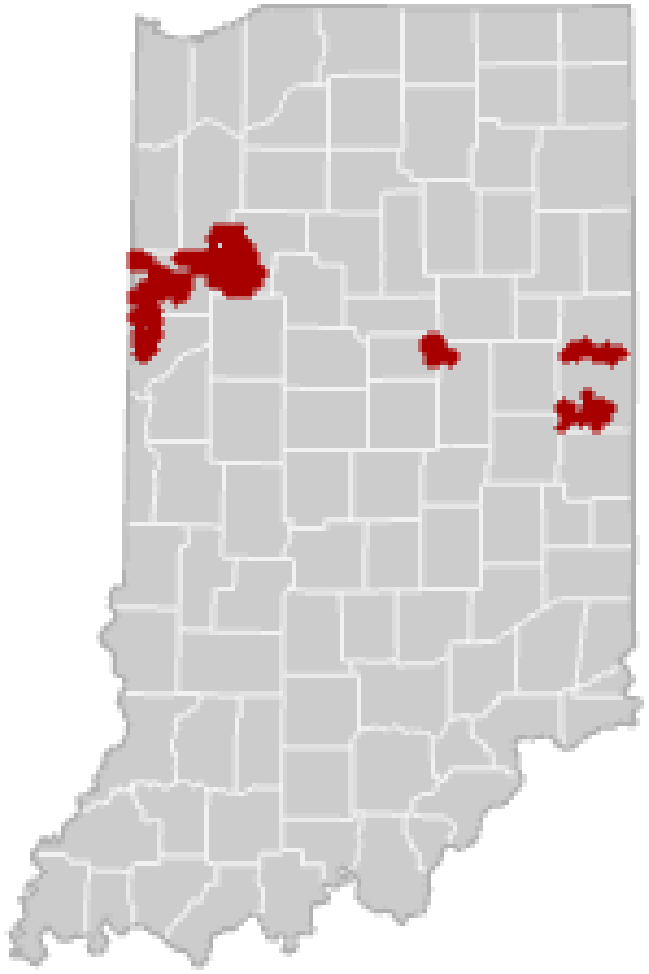
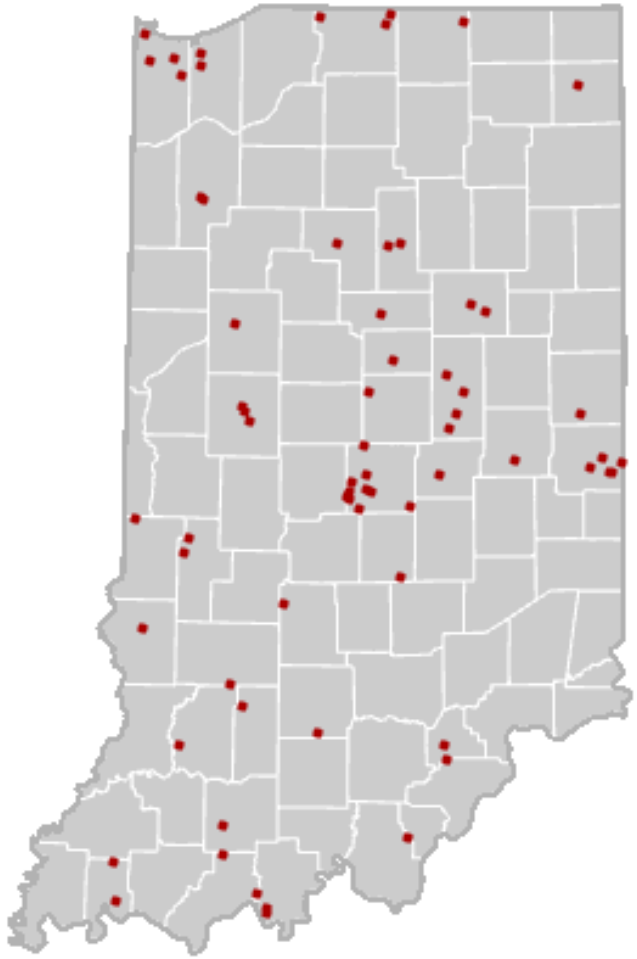
Location of Utility-Scale Wind and Solar Projects

Wind



Solar



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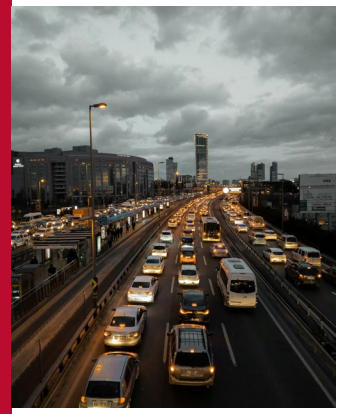

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Why would large wind and solar projects affect property values? Externalities

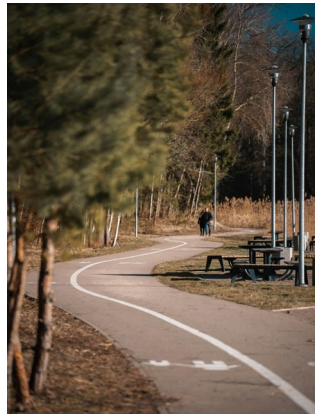
An externality is a property characteristic/feature that affects nearby property.

- Amenities – features that increase property values
- Disamenities – features that decrease property values

Impact on Property Values: May negatively or positively impact nearby property values.

Examples:

Negative	Positive
Pollution	Greenway Trails & Parks
Traffic Congestion	High Performing Schools
Noise	Infrastructure Improvements



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Measuring Property Value Impacts of Externalities:

Common Methods of Analysis

Paired Sales Analysis – Direct comparison of sale prices of similar properties that are adjacent and farther away from amenities or (dis)amenities.

Hedonic Analysis – Econometric (regression) model separating the price of a house into the value of each characteristic (e.g., number of bedrooms, square footage, basement, and certain location characteristics including amenity or disamenity).

Hedonic Difference-in-Difference Analysis – An econometric approach using the base hedonic approach, but defines treatment (test) group and control groups (or multiple spatial treatment groups) before and after a certain event (siting of a solar or wind facility).

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Paired Sale Analysis

- Small sample method
- Identify adjoining sale
- Find similar nearby sales
- Make adjustments
- Determine Impact

Findings:

No consistent negative impact of wind or solar on nearby properties

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Peer-Reviewed Recent Academic Studies
(Impact of utility-scale wind and solar projects on property values)

- Large national or multistate datasets, long time periods

- Hedonic Difference-in-difference with event study.
  - Method to statistically compare a property near solar or wind project with similar property further from project.

  - These models estimate an average impact at multiple locations, or distances, after turbines or solar are operational.

Peer-Reviewed Academic Studies (continued)

(Impact of utility-scale wind and solar projects on residential property values)

Findings:

Wind		Solar	
Impact (change in property value)	Distance (from wind turbine)	Impact	Distance (from solar field)
Up to -11%	< 1 mile	Up to -7.9%	< .5 mile
Impact dissipates over time and distance			
Properties > 2 miles: No impact		Properties > 1 mile: No impact	
Urban Areas: Up to -14.94% within 1 mile, -4.27% within 1-2 miles, ~U-shaped		Rural Areas: -4.2% within 0.5 miles, -2.0% within 0.5-1 mile, ~ Mild U-shaped	
Impact in rural areas: small to none		Impact in urban areas: small to none	
		Positive impact on ag and vacant land (+19.8%, within 2 miles of solar)	
		Residential properties near brownfields w/ solar (+0.22%)	

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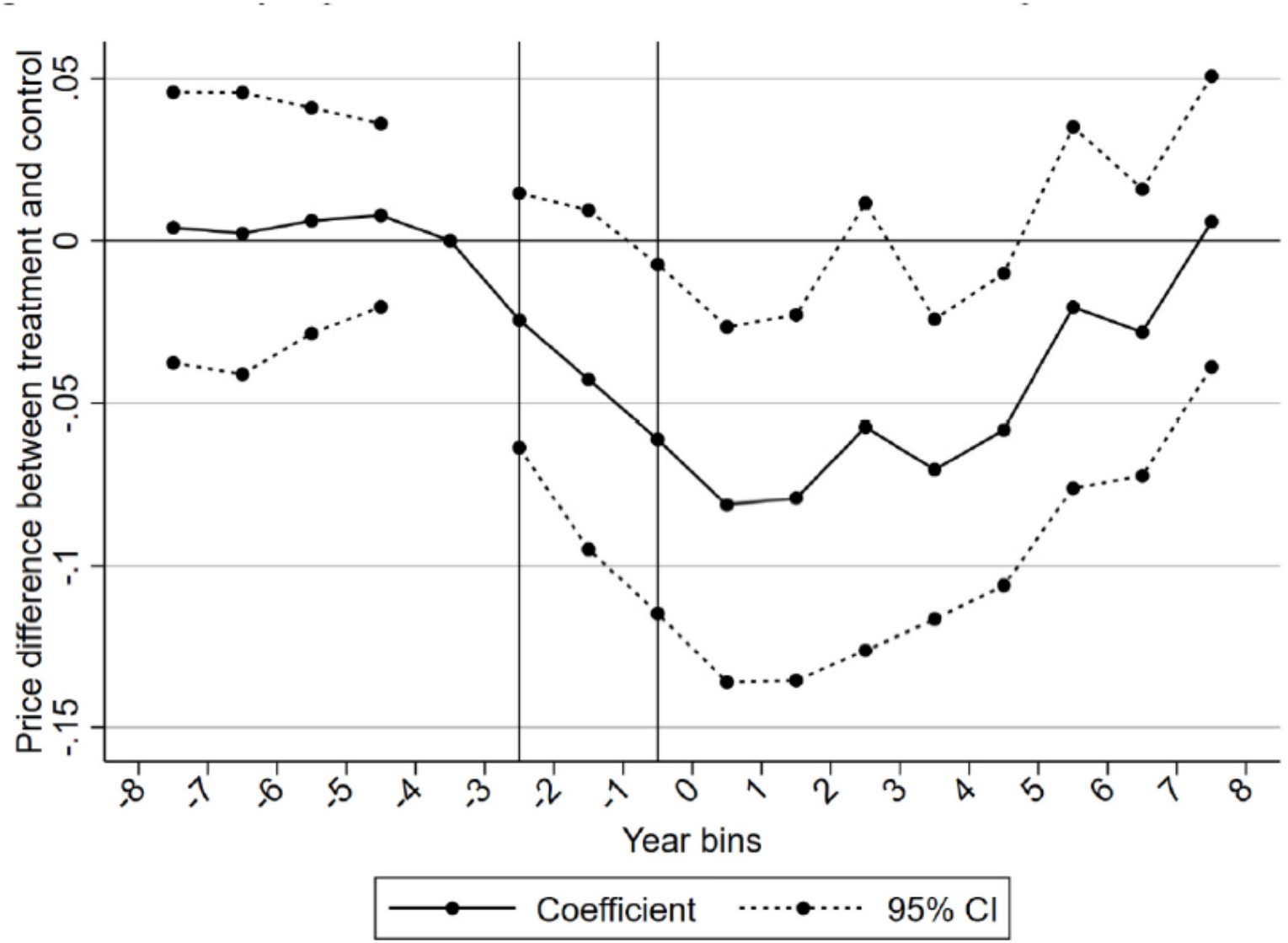
Event study of price differences before and after wind turbine operation
Demonstrating U-shaped effect



Treatment group: house sales within 1 km of closest wind turbine

Control group: house sales between 3 and 10 km of closest wind turbine

1km=.62 mile

Year bins are the number of years before and after the operation date of the wind turbine.

First vertical line is approximate start of construction

Second vertical line is approx. completion of construction

Source: Dong et al. (2023)

Data for Massachusetts and Rhode Island

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Conclusions

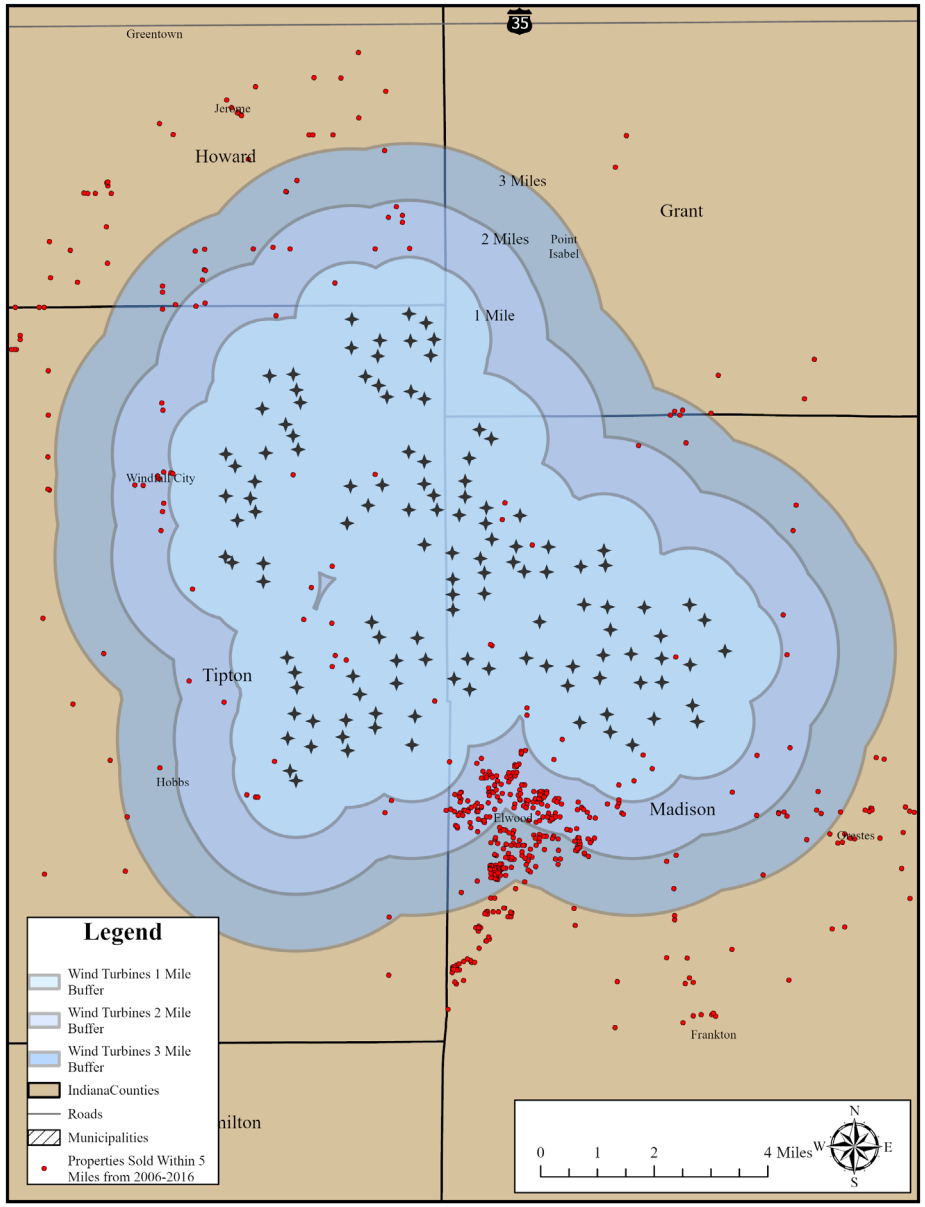
Location of wind and solar projects matters, and **distance** of sale property from wind and solar project matters.

Indiana wind turbines are placed in rural areas. Studies find that wind projects in rural areas have low or no significant impact on property values.

Indiana solar projects are **more widely dispersed**. Studies have found impacts on sale prices, primarily in rural areas.

Impact dissipates over **time and distance**. Properties closest to wind or solar project are most impacted and the impact lessens over time.

Wind Turbines and Property Transactions, North Central Indiana (Data used in BSU CBER Study)



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Studies Examining the Impact of Utility-Scale Solar Projects

Author(s)	Geography	Unit of Analysis (Method) Years	Sample Size, Distance, Number of Solar Projects	Key Findings
CohnReznick, LLP *Valuation Advisory Services (2021)*	IN, IL, MN, MI	Farmland and homes (Paired Sales, Interviews, review of other studies)	26 adjoining properties and 93 comparable (control) sales over 6 solar farms	"… no measurable and consistent difference in property values…"
Hu et al. (2025)	US, lower 48	Residential, ag and vacant properties (Hedonic DID, Event study) 15 years before installation to 2020	8.8 million sales within six miles of 3,699 large-scale solar sites	Negative impact of up to 7.2% within 0.5 miles that decreases to 4.6% within 3 miles if no view. Higher impact 7.9% (<0.5 mi) and 5.2% (<3 mi) with view. Fades after 9 years. Stronger effects in NE. Ag or vacant land within 2 miles of solar experienced 19.4% increase in sale price.
Elmallah et al. (2023)	CA, CT, MA, MN, NC, NJ	Residential property sales (Hedonic DiD, Event study) 6 years before and after first year of operation	Over 1.8 million property transactions within four miles of 1,500 solar projects	Negative impact of 0.82 to 2.26% depending on distance to solar project. No measurable impact on homes > 1 mile from solar project. Rural areas are driving this result.
Gaur and Lang (2023)	MA, RI	Residential property sales (Hedonic DiD, Event study) 2005-2019	Over 107,000 property transactions within 2 miles of 282 solar projects	Negative impact of 1.5-3.6% on sale prices within 0.6 miles of solar project. Stronger effects in rural areas (2.5-5.8%)
Hao & Michaud (2024)	IL, IN, IA, KS, MI, MN, MO, NE, OH, WI	Avg. house value of 3-BR houses in zip codes (DiD) 2009-2022	Over 20,000 zip code obs. containing or adjacent to 35 solar projects	Solar project ***increased*** average house values 0.5-2.0%. Smaller solar projects had a larger positive impact on avg. house value.

Studies Examining the Impact of Utility-Scale Wind Projects

Author(s)	Geography	Unit of Analysis (Method) Years	Sample Size, Distance, Number of Wind Projects/Turbines	Key Findings
CohnReznick, LLP *Valuation Advisory Services (2024)*	IL	Residential property sales (Paired Sales, Interviews, review of other studies)	28 adjoining properties and 163 comparable (control) properties near 8 IL wind farms,	"…no consistent negative impact …to adjacent property values…."
Brunner et al. (2024)	687 US counties with wind energy installations (34 states)	Residential property sales (Hedonic DiD, Event study) 2005-2020	Over 496,000 property transactions within 5 miles of 428 wind projects	Avg home within one mile of turbine experienced 11% sales price decline at announcement, became smaller after construction and then insignificant at 9 years. Homes located 1-2 miles experienced smaller impact that dissipated after 5 years. No impact on properties > 2 miles from turbine. Impact limited to urban areas. No impact in rural areas.
Dong et al. (2023)	MA, RI	Residential property sales (Hedonic DiD, Event study) 2000-2019	Over 369,000 transactions within 10 km of 119 wind turbines	Only properties in the Cape Cod and Nantucket region (urban area) within 1 km of wind farm experienced decline in sale prices of 7%-10.8% and started to recover within a few years. Small to no impact in other regions.

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