Advancing Wind Power in Illinois Conference 2011

Dr. David Loomis

Center for Renewable Energy
Illinois State University

Current Research by the Center for Renewable Energy at Illinois State University

Plenary Session

Friday, July 22, 2011, 8:45 AM

Current Research by the Center for Renewable Energy

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Fifth Annual Conference
Illinois Institute of Technology
July 22, 2011
www.renewableenergy.ilstu.edu/

CENTER FOR RENEWABLE ENERGY
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CENTER FOR RENEWABLE ENERGY
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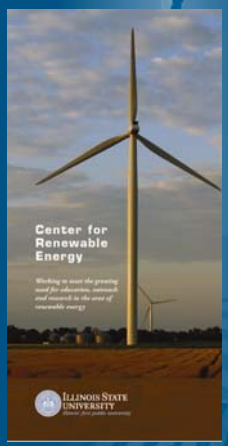
- …works to meet the growing need for education, outreach and research in the area of renewable energy.
- Three major functional areas:
  - to enhance the renewable energy major at Illinois State University;
  - to serve the Illinois renewable energy community by providing information to the public;
  - to encourage applied research concerning renewable energy at Illinois State University and through collaborations with other universities.



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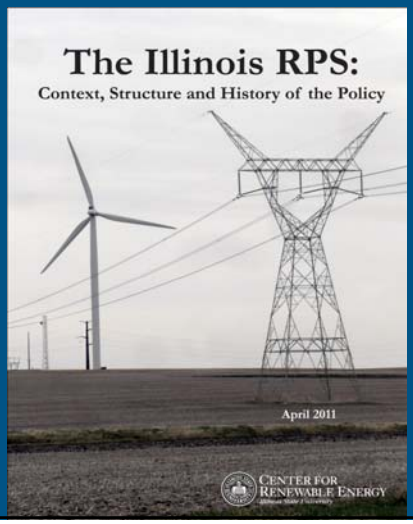
Applied Research 2011

- Illinois RPS: Context, Structure and History of the Policy Loomis/Pagan
- Optimal Wind Energy Portfolios in Illinois – Chupp/Hickey/Chupp
- Impact of Wind Farms on Property Values Loomis/Carter
- Wind Farm Implications for School Revenue - Aldeman/Loomis/Willis
- Economic Impact of Wind Energy in Illinois Loomis/Carter

Illinois RPS Loomis/Pagan



- PURPA and IL Restructuring
- 2006 Auction Results
- IL Power Agency Act
- Renewable Energy Procurement including LT contracts

Optimal Wind Portfolios Chupp/Hickey

"Optimal Wind Portfolios in Illinois"

Benjamin A. Chupp[1]
Emily Hickey[2]
David Loomis[3]

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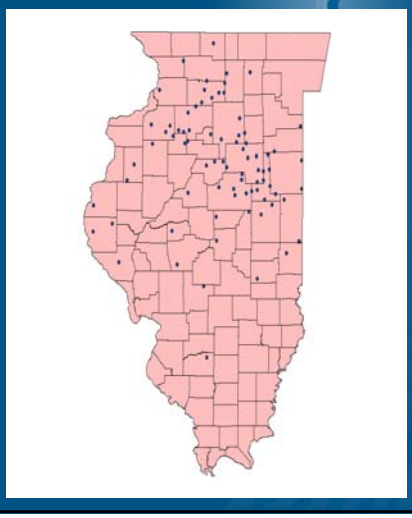
Abstract: Current renewable portfolio standards in Illinois call for 25% of the state's energy to be met through renewable means by 2025, with 75% of this requirement to come from wind. The problematic intermittency of wind might be overcome by a geographically disperse portfolio of wind farms. Using wind speeds and projected power measurements for 79 potential Illinois wind farms from 2004-2006, we use mean variance portfolio theory to calculate the optimal distribution of new wind installations.

JEL Codes: Q42, G11

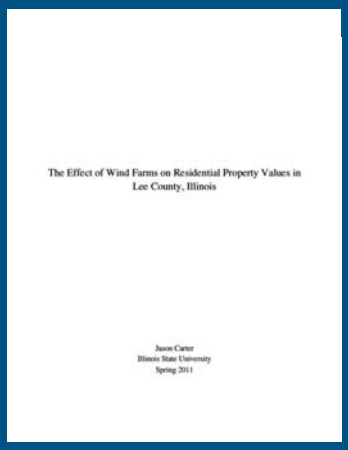
- AWS-Truewind and NREL have 1,326 simulated wind plants
- Ten-minute observations that span three years (2004-2006)

Optimal Wind Portfolios

- 79 sites were chosen, capacity factors ranging from 26.1% to 37.33% sizes ranging from 203.2 to 1290.6 MW
- Uses mean variance portfolio theory to calculate the optimal distribution of new wind installations.



Property Value Study Carter


The Effect of Wind Farms on Residential Property Values in Lee County, Illinois

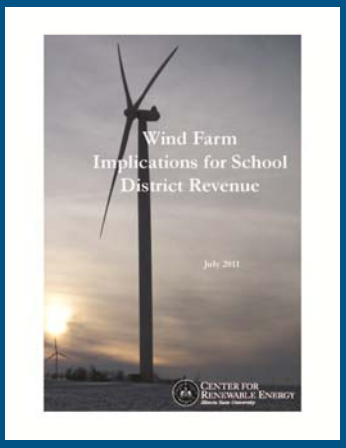
Jason Carter
Illinois State University
Spring 2011

- Lee County, Illinois
- 3 Wind Farms – November, 2003. April, 2007 and December, 2009.
- Hedonic price model using 1,298 real estate transactions from 1998 to 2010.

Property Value Study

- The analysis indicates that residential properties located near wind turbines in Lee County have not been affected by their presence.
- Mendota Hills Wind Farm in Lee County, Illinois has not impacted the average selling price of nearby residential real estate. Lee-DeKalb Wind Center and GSG Wind Farm have fewer observations.

School District Revenue Study



- 100 MW Wind Farm could result in average annual net benefits of $456,173 to $607,848 during the first three years after accounting for decreased state aid.

School District Revenue Study

- Estimated average net annual benefit to the Ridgeview school district over the first three full years of the Twin Groves wind farm's operation was $863,004.
- Average net annual benefit to the Paw Paw school district over the first three years of the Mendota Hills wind farm's operation was $246,972.

Economic Impact 2011

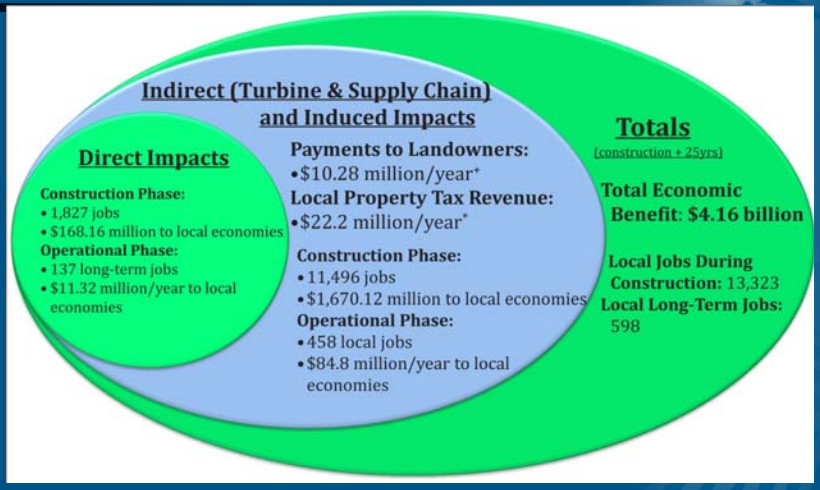
- Limited to projects > 50MW
- 17 projects total 2,422.01 MW
- Jobs and Economic Development Impacts (JEDI)

Projects Studied

Table 1.—Illinois Wind Farm Projects Larger than 50 MW

Wind Farm	Location (County)	Capacity (MW)
Streator Cayuga Ridge South Wind Farm	Livingston	300.00
Big Sky Wind Farm	Bureau and Lee	239.40
Lee-Dekalb Wind Energy Center	Dekalb and Lee	217.50
Top Crop Wind Farm Phase II	Grundy	198.00
Twin Groves Wind Farm Phase I	McLean	198.00
Twin Groves Wind Farm Phase II	McLean	198.00
White Oak Wind Farm	McLean	150.00
Camp Grove Wind Farm	Marshall and Stark	150.00
Grand Ridge Energy Center Phase II, III, and IV	LaSalle	111.00
EcoGrove Wind Farm Phase I	Stephenson	100.50
Rail Splitter Wind Farm	Logan and Tazewell	100.50
Top Crop Wind Farm Phase I	LaSalle	102.00
Grand Ridge Wind Farm Phase I	LaSalle	99.00
GSG Wind Farm	Lee and LaSalle	80.00
Providence Heights Wind Farm	Bureau	72.00
Crescent Ridge Wind Farm	Bureau	54.45
Mendota Hills Wind Farm	Lee	51.66

Results



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