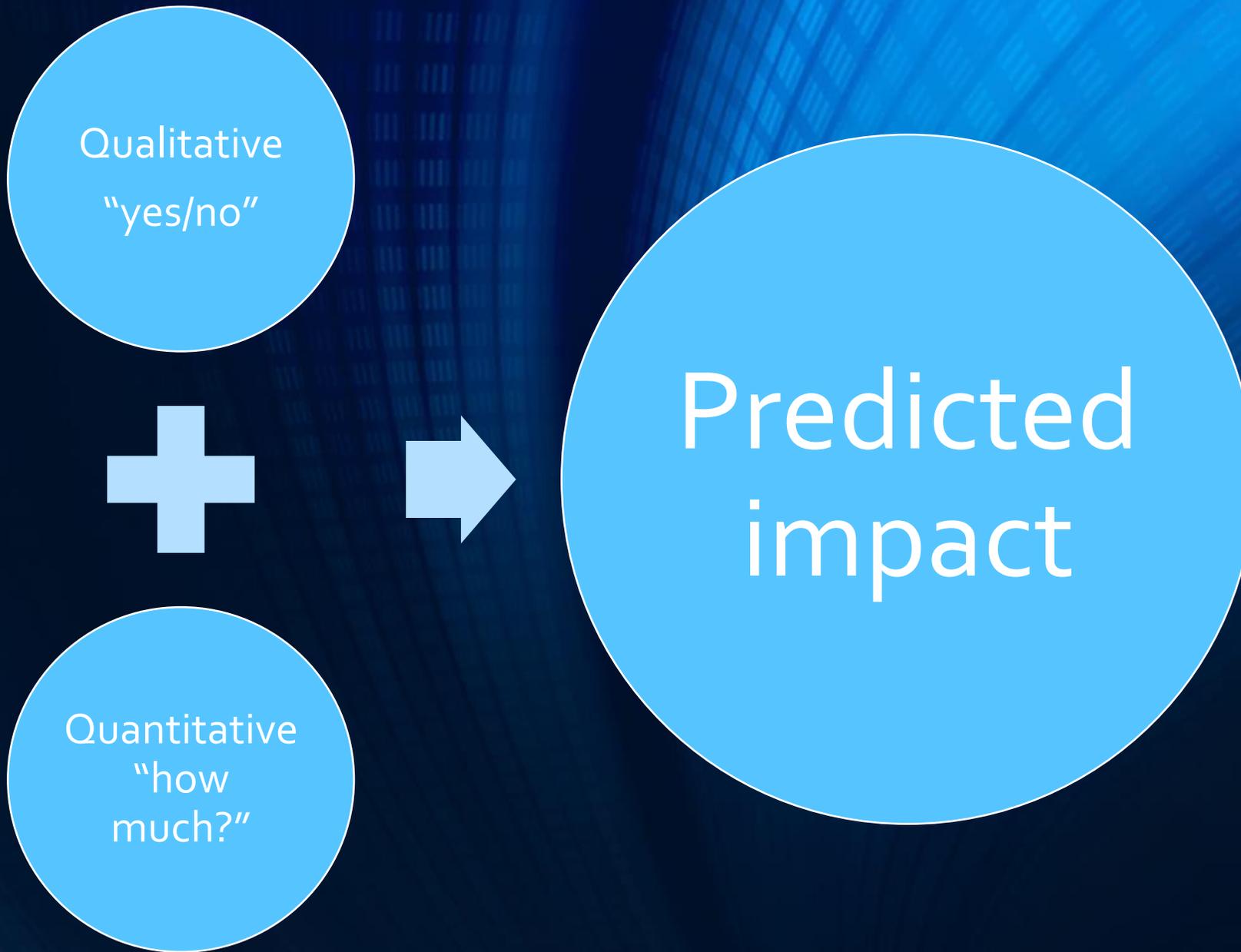


Analysis of the Impact that the Proposed McClean County Wind Farm Will Have on Rural Residential Property Value

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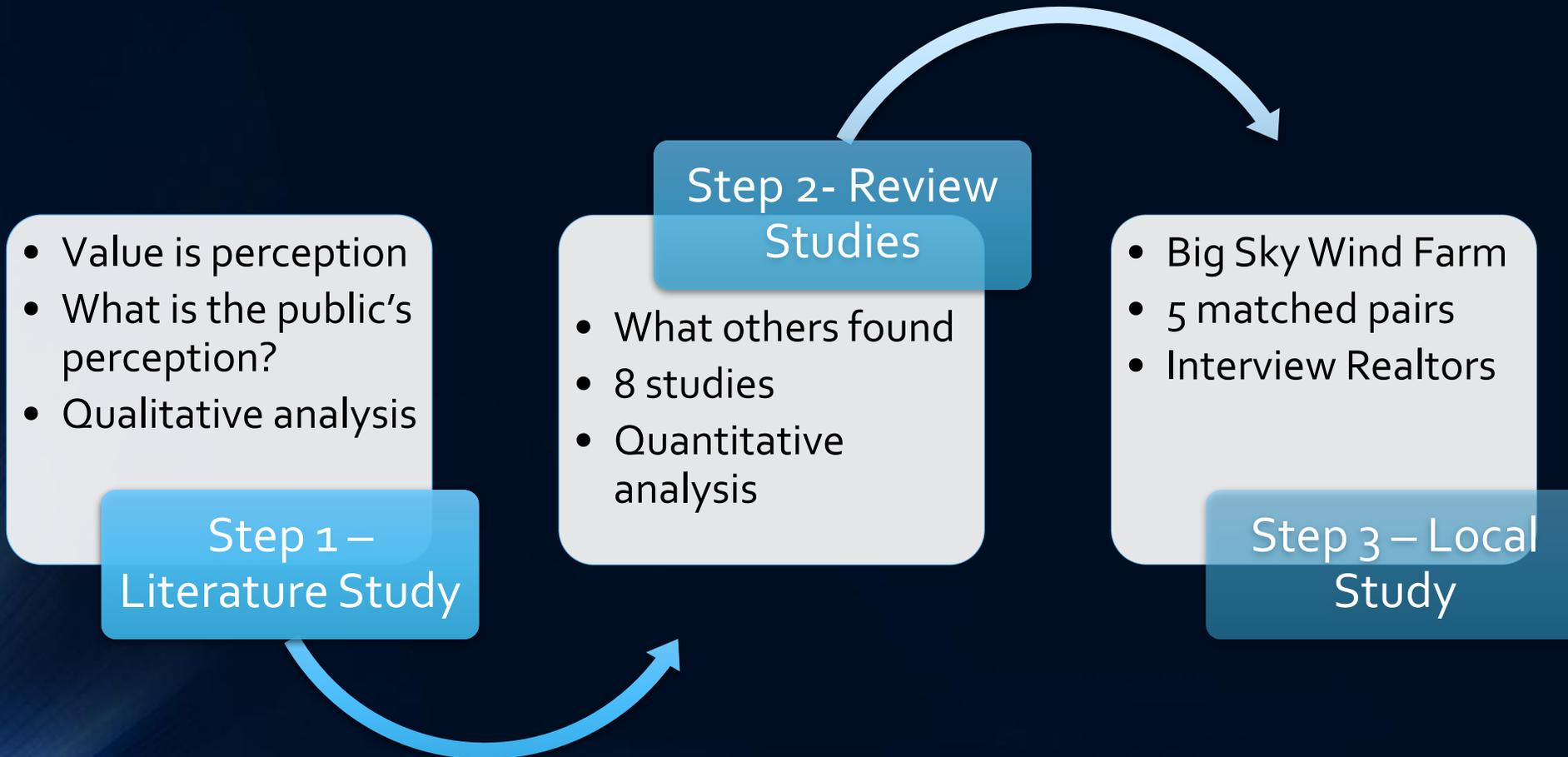
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WHY USE QUALITATIVE & QUANTITATIVE ANALYSIS?

Purpose is to discover if wind farms impact rural residential property value.



Literature Study

A LOOK AT WHAT THE PUBLIC IS READING & SAYING

Health



- Neurological & physiological disorders
- Sleeplessness & headaches (UofM study)
- Advocates & WHO counter there is no evidence
- Low frequency noise (LFN) reported as the problem

Health Solutions

- Increase setbacks (1,500ft to 1.5 miles)
- Mandatory minimum of 2km from any residence
- Filter inverters
- Bury all collector lines

Hazards



- Subject to accidents & failures
- Ice throw
- Blade throw due to weakening
- Danger to planes/crop dusters
- Nuisance- flicker etc

Conservation



- Protect natural viewshed
- Birds killed
 - 10,000 to 40,000 annually
 - Not close to bird kill by windows
- Bats in greater danger
- Predatory birds killed

Property Values



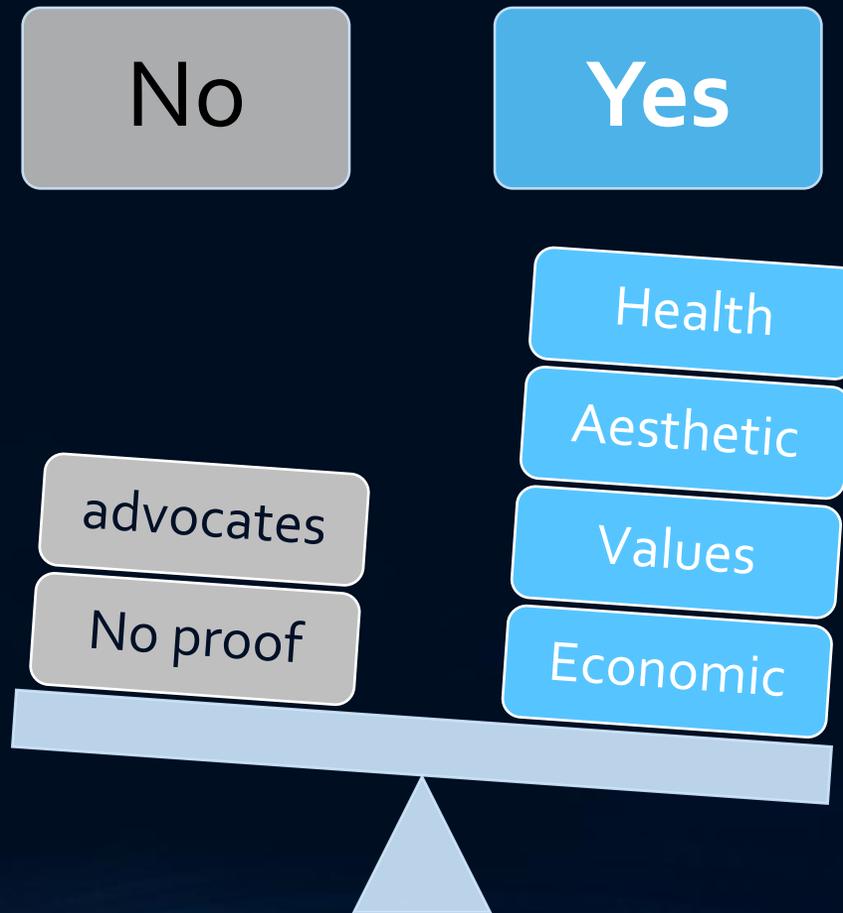
- Wind advocates deny neg impact – claim made up
- Most studies paid by wind
- REPP study finds value increase- critics find loss
- Many small studies found loss of value of 15%-37% (MI Township findings)
- Aesthetics impacted
- Difficult to sell, long listings

Economic Impact



- Tax revenues from project benefit local treasury
- Lost property value takes income from local treasury
- Job creation is nominal in lieu of impact quality of life
- Negative perception makes rural residential home placement undesirable

Qualitative Analysis – Is there a negative impact?



Review of Studies

WHAT OTHERS HAVE FOUND QUANTITATIVELY

Berkeley National Laboratory Study (2009)

- Sponsored by DOE \$500,000 grant.
 - Used hedonic analysis of 7,500 improved properties.
 - Used properties from all over the country and bundled them together for one hedonic study.
 - Found no relationship between presence of wind turbines and residential property value.
 - All were statisticians no real estate professionals (appraisers/Realtors).
 - Used improved properties but only used 12 variables (3 for land, 9 for improvements).
 - Typical 12 for land
 - Typical 25 for improvements
 - Used assessment data only for improvement description – did not verify data though.
- Compared rural to urban sales.
 - Wind sales were all rural.
 - Most of the non-wind sales were urban.
 - Failed to mention properties bought by developer in Kewaunee, WI, wind farm that could not resale and razed.
 - Few wind sales were in close proximity to wind turbines.
 - Only 67 sales (<1%) were within 0.57 miles of turbine & only 63 had a view of them.
 - Conversely, 57% were over 3 miles away.
 - Chart (p29) shows poor vista has a -21% loss, below average -9% loss, yet states turbines do not constitute a bad vista.
 - A statistic of -5.5% loss was considered statistically insignificant, but for a \$250,000 home that's a loss of almost \$14,000 – which to them is significant

Impact of Industrial Wind Turbines on Residential Property Assessment in Ontario (2012)

- ❑ MPAC did study – assessment agency
 - ❑ Both political & governmental
 - ❑ Motivation?
- ❑ Tested accuracy of assessments from sales, used two zones
 - ❑ <2km from wind turbines
 - ❑ >2km from wind turbines
- ❑ Test would fail (i.e. show impact) if the ASR (assessment to sales ratio) was outside of 0.95 to 1.05.
- ❑ Used 15 market areas in Ontario, CA
- Study showed
 - <2km properties had a -4.5%.
 - <2km properties were consistently less than the >2km properties.
- Second test was a multiple regression study
 - Found only 2 market areas had enough sales
 - Found one of the two areas indicated a loss of \$6,451 per property if <1km and \$3,686 loss if between 1km-2km.
 - Losses were considered statistically insignificant using a 10% factor.
- Study did not measure impact – measured accuracy of assessments.

Case Study Diminution in Value Wind Turbine Analysis (2012)

- ❖ Appraiser Ben Lansink was author.
- ❖ Based in Shelburne, Ontario, CA
- ❖ Did a comparative analysis of 5 properties located within wind farm.
- ❖ Properties were purchased by wind farm developer and then resold after project was up and running.
- ❖ Properties were bought at full market value by wind developer.
- ❖ Bought in 2005-2007, sold in 2009-2012.
- ✓ Lansink tested validity of purchase price to ascertain market value was paid.
- ✓ Lansink did market trend study to compensate for time.
- ✓ Used trend analysis to predict selling price without any impact.
- ✓ Then compared actual resell price to predicted model price to derive impact.
- ✓ Found losses ranging from -9% to -50% with average loss -39%.

Glen Taylor – wind tower study (2010)

- Glen Taylor is an experienced Realtor
- Informal study in area of Chevron Wind Farm, Evansville, Wyoming.
- Wind farm had 11 turbines.
- Based study on observations of market activity in close proximity of wind farm and a distance away.
- Concluded
 - Detrimental impact to all property value.
 - Properties closest to turbines most affected.

Appraisal Group One Study – Wisconsin (2009)

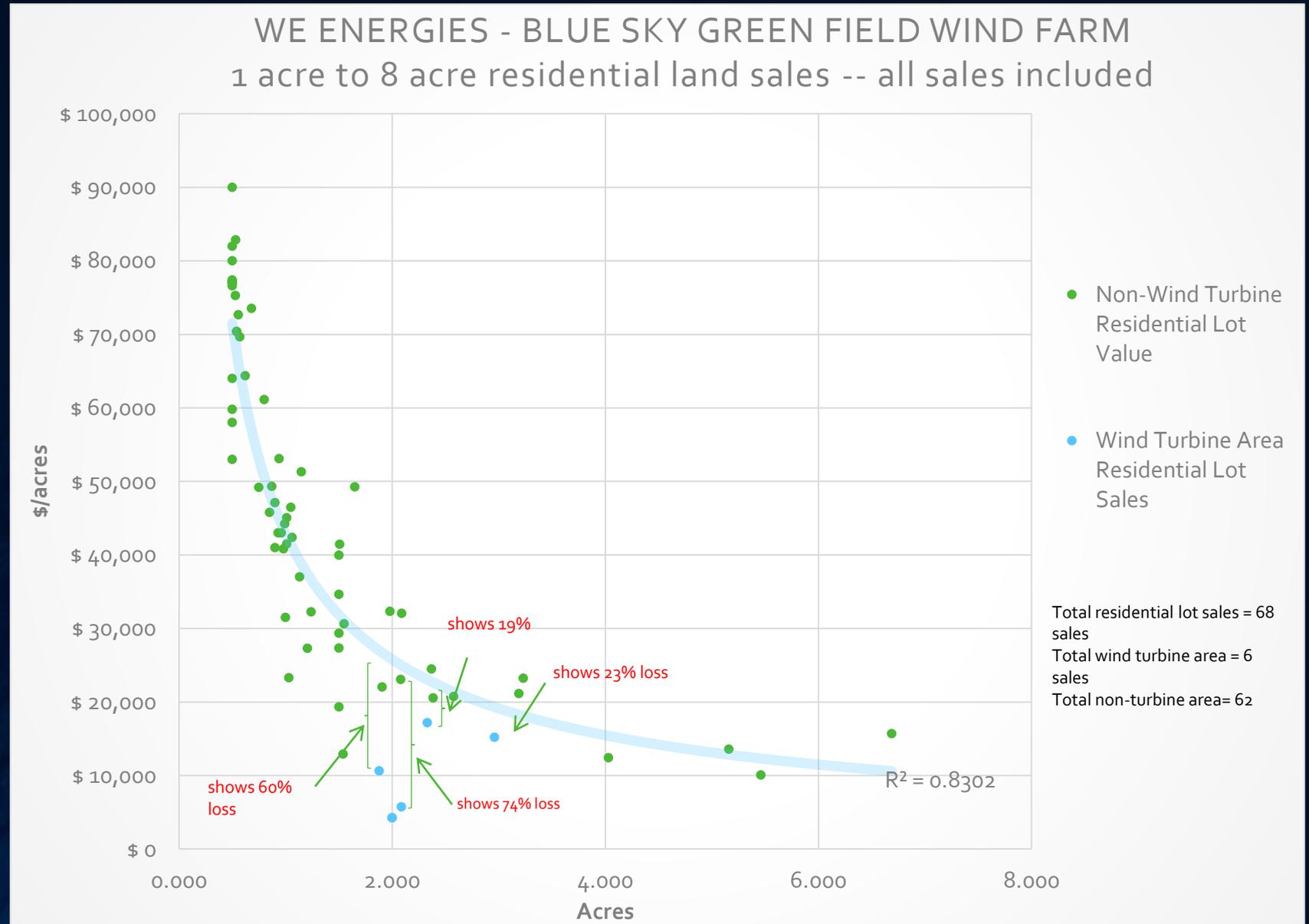
- Based in Fond du Lac & Dodge Counties, Wisconsin
- Realtor survey.
- Comparative sales simple regression analysis



Realtor Survey

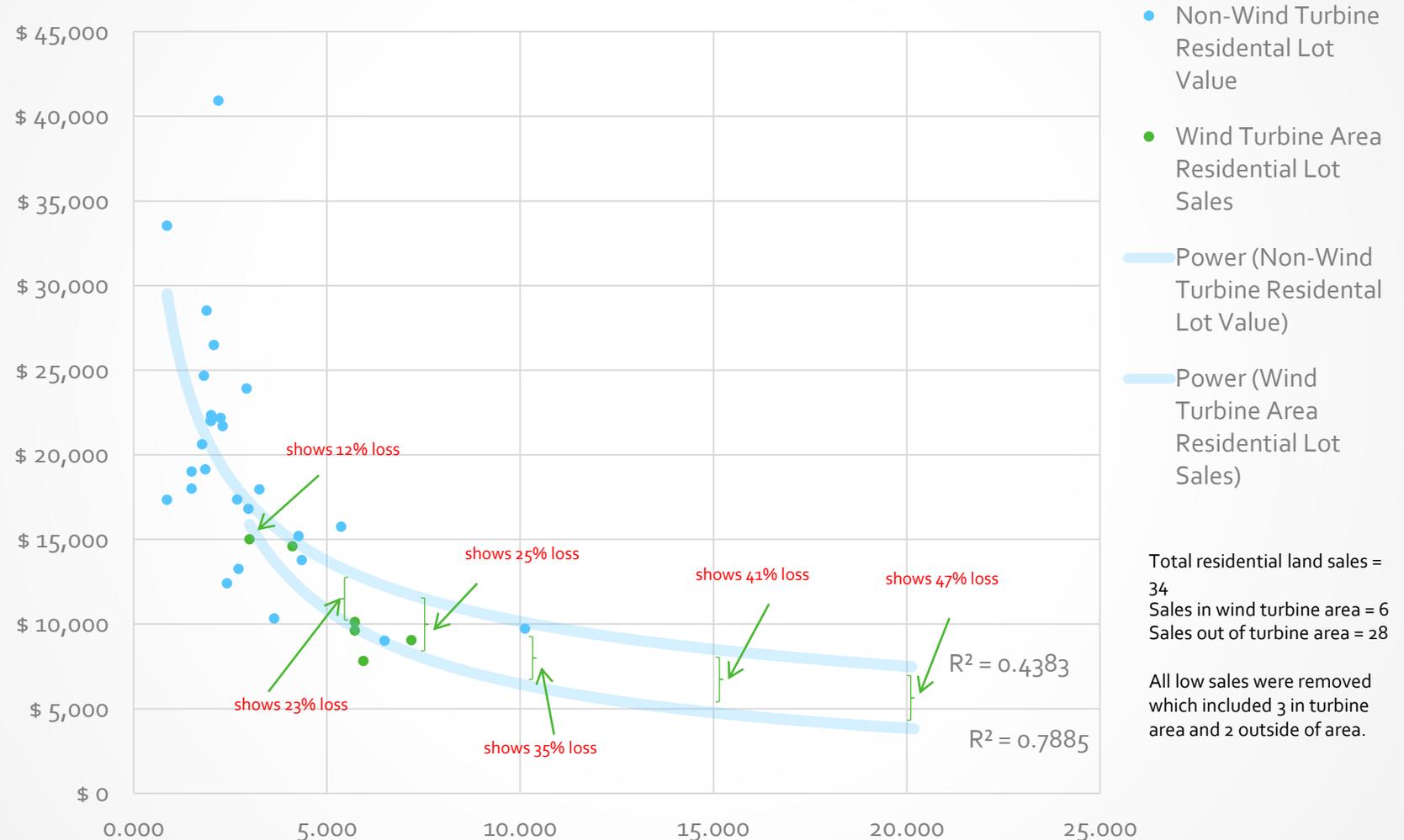
- 36 experienced Realtors were surveyed
 - Average experience = 13.4 yrs
 - All surveyed worked in same geographic area as wind farms.
 - All surveys were given in person with the surveyor's signature and date.
 - All surveys had pictures and graphics to assist in understanding the question.
 - Three distance categories were used
 - "Bordering" being 600ft from turbine
 - "Close" being 1,000ft from turbine
 - "Near" being 0.50 miles from turbine
- In all cases the 1-5 acre residential properties were perceived as negatively impacted.
 - Those properties **bordering** the wind farm were estimated to have a -39% to -43% impact.
 - The **close** proximity (a little farther away) properties were estimated to have a -33% to -39% impact.
 - The **near** (even further away) properties the impact estimate was -24% to -29%.
 - Hobby farms had less sensitivity to being impacted negatively.

- All non-wind turbine sales were outside of area with no view.
- Land sales only
- Residential land use only
- 68 sales total
 - 6 sales were influenced by the wind farm
 - 62 sales were not influenced.
- Simple regression technique.
- Impact was found to be -19% to -74% with the average being -40%.



- All non-wind turbine sales were outside of area with no view.
- Land sales only
- Residential land use only
- 34 sales total
 - 6 sales were influenced by the wind farm
 - 28 sales were not influenced.
- Simple regression technique.
- Impact was found to be -12% to -47% with the average being -30%.

INVENERGY - FORWARD WIND FARM 1 acre to 20 acre residential lot sales -- low sales removed

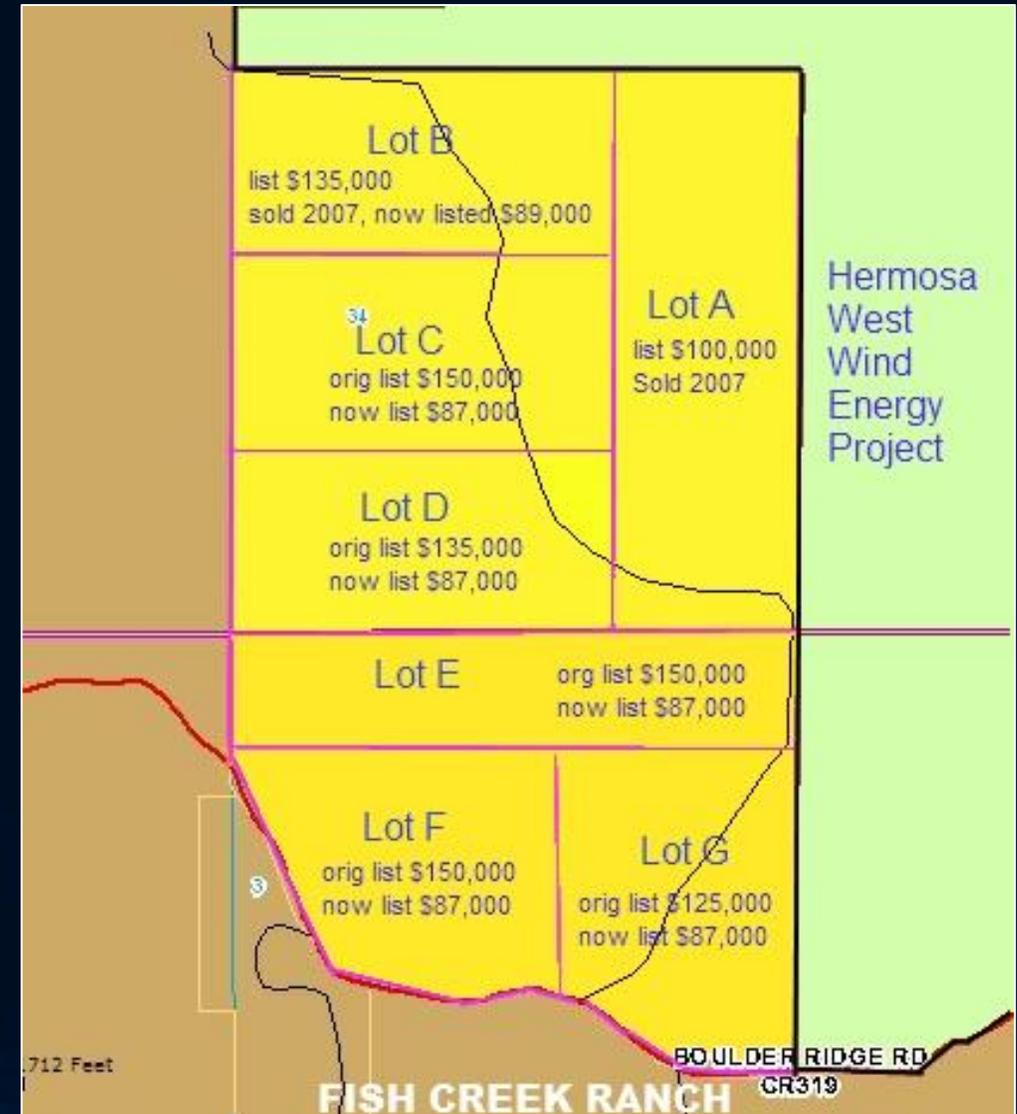


Clarkson University Study (2011)

- Authored by Martin D. Heintzelman, Ph.D. & Carrie Tuttle, Ph.D. candidate.
- Title of study- *Values in the Wind: a Hedonic Analysis of Wind Power Facilities.*
- Used 11,369 sales of residential & agricultural properties.
- Time period was 2000 to 2009.
- Northern New York State (NE corner)
- Area is rural, lightly populated, includes 6 wind farms.
- ✓ Study showed impact of wind farm on property values was significantly negative.
- ✓ Distance from the wind farm is a factor, the further away the less the impact.
 - ✓ E.g. -32% impact 0.10 miles away of turbine
 - ✓ E.g. -14% impact 3.0 miles from turbine
- ✓ Found properties 1-to-3 miles away were impacted between -16% to -31%

Coral Springs Development Study

- Development located in Albany County, Wyoming.
- Comprised of 7 lots (35ac each)
- Located on side of foothills.
- Faces valley which has annual elk migration
- Hermosa West Wind Farm was planned and known by buyers
- 3 lots sold since announcement.
- Sales analysis showed loss ranging from -25% to -44%, average= -35%

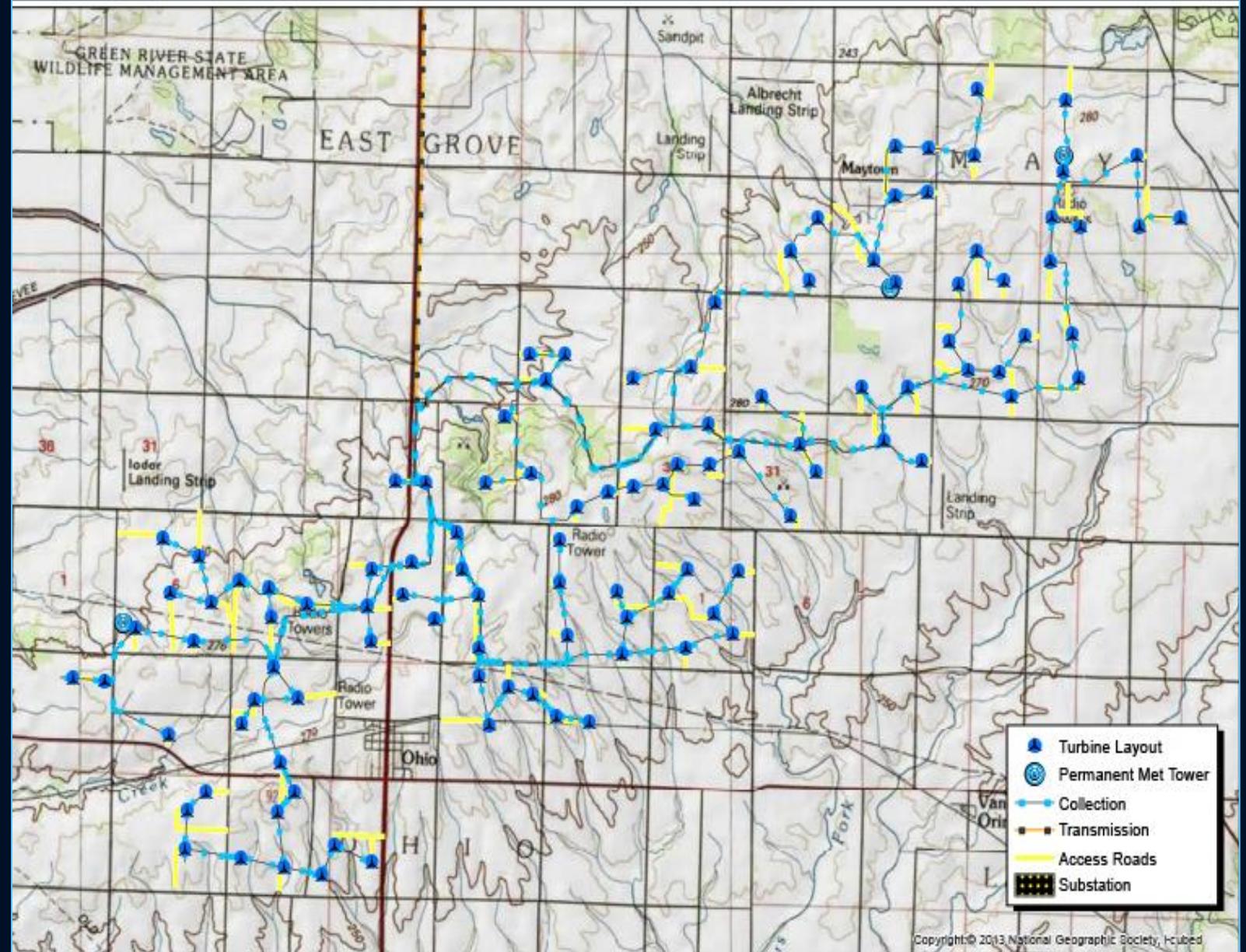


Matched Pair Analysis

BIG SKY WIND FARM – LEE & BUREAU COUNTIES, ILLINOIS

BIG SKY WIND FARM BUREAU AND LEE COUNTY, ILLINOIS

Big Sky Wind Farm



Matched Pair 1

Matched Pair 1						
Item	Sale 1-WF	adj	Comparable 1-A	adj	difference	notes
Sale ID	Sublette-IR-001		Leecter-IR-003			
distance to WT	1.72 miles (duster)		none visible (see note)			wind turbines 0.875 miles from comparable but cannot see them due to the wooded area and ravines, can see them as you exit and enter subdivision.
address	408 LaMoillee Road		1939 Ole Hickory Rd			
city/county	Sublette/Lee		Amboy/Lee			
sales price	\$ 250,000.00		\$ 272,000.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	January 9, 2015		June 19, 2015			
difference in month	base		-5			
time adj			none needed	0%		
adj sales price	\$ 250,000.00		\$ 272,000.00			
GLA (above grade)	2,271		2,008			
\$/GLA	\$ 110.08		\$ 135.46		-23%	comparing GLAs only with no other adjustments
neighborhood						
neighborhood	rural		rural- subdivision	\$ -		subdivision has superior appeal is factored in land
lot size in acres	3.01		2.2	\$ 13,500.00		based on \$15,000/ac
lot description	open with few trees		good landscaping, mature trees	\$ (10,000.00)		superior landscaping
home style	1 sty- traditional		1 story- traditional	\$ -		
exterior siding	vinyl/brick		vinyl	\$ 5,000.00		brick 3% adjustment based on cost
home built/eff age	2004/10yrs		2000/14yrs	\$ 13,000.00		total economic life used = 55 yrs
condition	very good		very good	\$ -		
room count	7 total/4 br/3.5bth		6 total/3 br/2.5 baths	\$ 6,000.00		bathroom contribution value = \$6,000
GLA in sf	2,271		2,008	\$ 21,000.00		contribution value = \$80/sf
basement	partly finished		finished 924tsf, br, fam, kit, fair quality	\$ (4,000.00)		finished bsmt at \$20/sf contribution value includes extra br, family rm, bath less the partial finish of WT sale
patio/deck/porch	patio		deck	\$ -		similar
fireplace	yes- 2 sided		yes	\$ -		similar
central air	yes		yes	\$ -		
garage	attached 3-car		attached 3-car	\$ -		similar size
outbuildings	none		2 car garage w/loft	\$ (15,000.00)		garage = \$15,000 contribution value
other	gravel drive, garden tub, central vac, in ground pool		paved driveway, whirlpool	\$ 7,000.00		paved vs gravel= \$5,000, whirlpool= garden tub, central vac = \$2,000, pool= \$10,000
total adjusted \$				\$ 36,500.00		
total adjusted value (adj + adj sales price)		\$ 250,000.00		\$ 308,500.00		
difference in value in \$					\$ (58,500.00)	
difference in value in %					-23%	overall impact due to presence of wind turbines/far

Matched Pair 2A

Matched Pair 2-A						
Item	Sale 2-WF	adj	Comparable 2-A	adj	difference	notes
Sale ID	Ohio-IR-001		Wyanet-IR-001			
distance to WT	0.32 miles		none			no wind turbine was visible from property, closest turbine was 5.58 miles away
address	29813 2010 E. Street		16025 Wyanet-Walnut Rd			
city/county	Ohio/Bureau		Wyanet/Bureau			
sales price	\$ 231,000.00		\$ 275,000.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	June 2, 2015		April 3, 2015			
difference in month	base		2			
time adj			none needed	0%		
adj sales price	\$ 231,000.00		\$ 275,000.00			
GLA (above grade)	2,316		1,936			
\$/GLA	\$ 99.74		\$ 142.05		-42%	comparing GLAs only with no other adjustments
neighborhood						
neighborhood	rural- near Ohio		rural- near Wyanet	\$ -		
lot size in acres	6.07		6.95	\$ -		similar in size
lot description	mature landscaping, trees & stream		mature landscaping, young trees	\$ 5,000.00		stream typically adds +10% of land value
home style	1.5 sty- traditional		1.5 sty- traditional	\$ -		
exterior siding	vinyl		vinyl	\$ -		
home built/eff age	2001/eff 12yrs		1998/eff 12 yrs	\$ -		similar in condition and effective age
condition	good		good	\$ -		
room count	7 total/4 br/2.5bth		6 total/3 br/2.5 baths	\$ -		
GLA in sf	2,316		1,936	\$ 29,000.00		based on \$ 78/sf contribution value
basement	full - unfinished		full- partly finished	\$ (12,000.00)		estimated @ \$12,000
patio/deck/porch	deck, screened porch		covered porch	\$ 2,500.00		deck = cov porch, screened porch = \$2,500
fireplace	yes		yes	\$ -		
central air	yes		yes	\$ -		
garage	2 car attached		2 car attached	\$ -		
outbuildings	refurbished barn - ave condition		large steel pole barn with truck & reg overhead doors	\$ (20,000.00)		refurbished barn = \$10,000 contrib value, pole barn with concrete floor, storage, ave qlty = \$30,000
other	concrete drive, hot tub, heated garage		concrete circular drive	\$ -		comparable concrete drive was larger \$2,000, hot tub \$1,000 and heated garage \$1,000
total adjusted \$				\$ 4,500.00		
total adjusted value (adj + adj sales price)		\$ 231,000.00		\$ 279,500.00		
difference in value in \$					\$ (48,500.00)	
difference in value in %					-21%	overall impact due to presence of wind turbines/farm

Matched Pair 2B

Matched Pair 2-B						
Item	Sale 2-WF	adj	Comparable 2-B	adj	difference	notes
Sale ID	Ohio-IR-001		Marion-IR-001			
distance to WT	0.32 miles		none			no wind turbines visible, closest one is 9.42 miles.
address	29813 2010 E. Street		1033 Pump Factory Rd			
city/county	Ohio/Bureau		Dixon/Lee			
sales price	\$ 231,000.00		\$ 225,000.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	June 2, 2015		June 24, 2014			
difference in month	base		11			
time adj			none needed	0%		
adj sales price	\$ 231,000.00		\$ 225,000.00			
GLA (above grade)	2,316		2,900			
\$/GLA	\$ 99.74		\$ 77.59		22%	comparing GLAs only with no other adjustments
neighborhood						
neighborhood	rural- near Ohio		rural-near Wyandot	\$ -		
lot size in acres	6.07		1.08	\$ 40,000.00		estimated 1 acre value at \$20,000, 6 acres = \$60,000
lot description	mature landscaping, trees & stream		mature landscaping, trees	\$ -		
home style	1.5 sty- traditional		1.5 sty- traditional	\$ -		
exterior siding	vinyl		vinyl	\$ -		
home built/eff age	2001/eff 12 yrs		1999/eff 12 yrs	\$ -		similar in condition and effective age
condition	good		good	\$ -		
room count	7 total/4 br/2.5bth		8 total/4 br/1.5 baths	\$ 5,000.00		adj based on one bath
GLA in sf	2,316		2,900	\$ (45,500.00)		based on \$ 78/sf contribution value
basement	full - unfinished		none (crawl space)	\$ 21,000.00		estimated @ \$20/sfx 1,038sf due to no basement
patio/deck/porch	deck, screened porch		lg cov porch, lg deck	\$ -		deck = deck, screened porch = lg cov porch
fireplace	yes		yes	\$ -		
central air	yes		yes	\$ -		
garage	2 car attached		2 car attached	\$ -		
outbuildings	refurbished barn - ave condition		none	\$ 10,000.00		refurbished barn = \$10,000 contribution value
other	concrete drive, hot tub, heated garage		gravel drive, hot tub	\$ 6,000.00		concrete \$5,000, hot tub \$1,000, heated garage \$1,000, comparable had an above ground pool treated as personal property
total adjusted \$				\$ 36,500.00		
total adjusted value (adj + adj sales price)		\$ 231,000.00		\$ 261,500.00		
difference in value in \$					\$ (30,500.00)	
difference in value in %					-13%	overall impact due to presence of wind turbines/farm

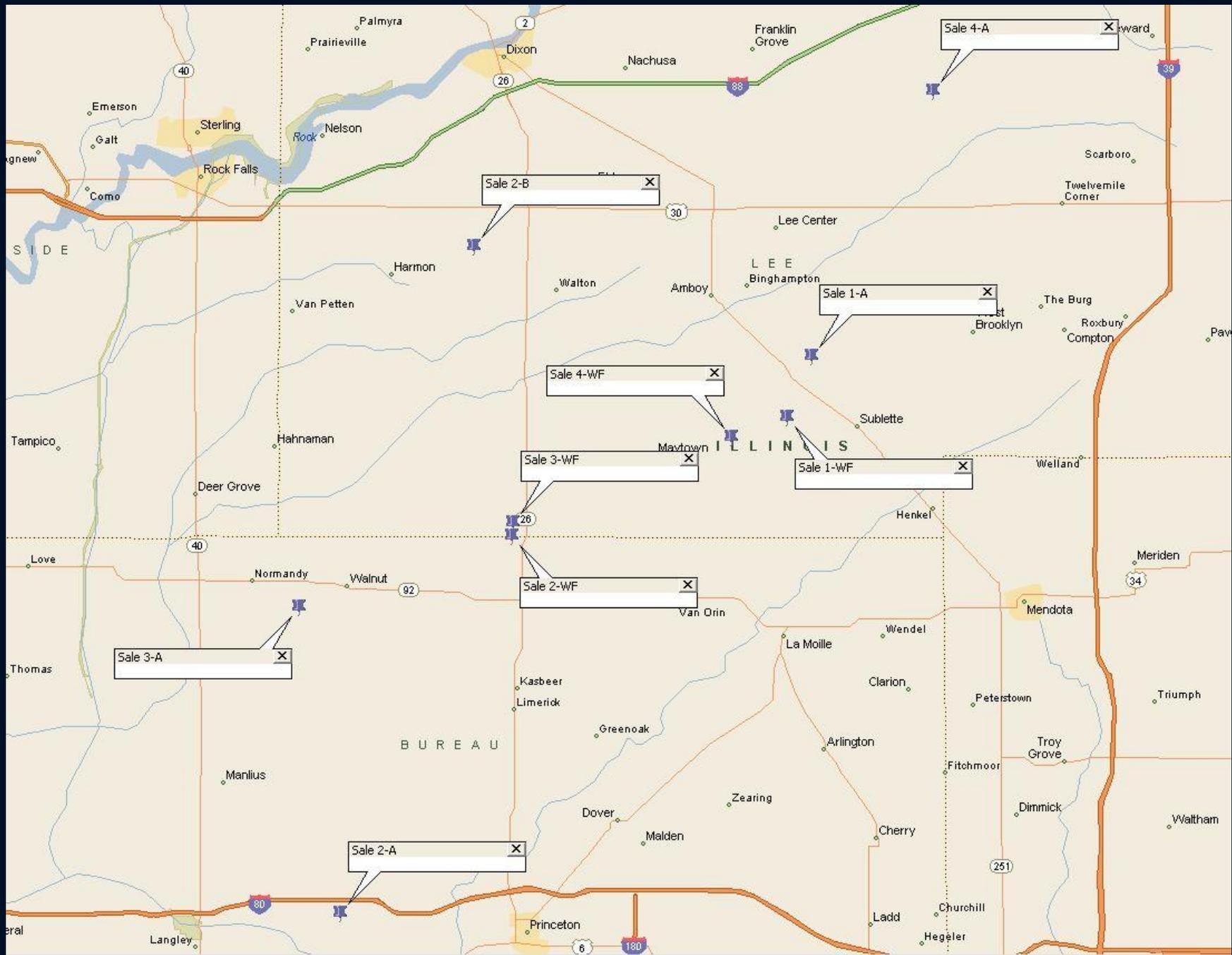
Matched Pair 3

Matched Pair 3						
Item	Sale 3-WF	adj	Comparable 3-A	adj	difference	notes
Sale ID	Eastove-IR-001		Walnut-IR-001			
distance to WT	0.34 miles to nearest one		none visible			closest wind turbine to comparable sale is 5.2 miles
address	31 Peoria Road		27531 1250 E. Street			
city/county	Ohio/Lee		Walnut/Bureau			
sales price	\$ 125,000.00		\$ 139,700.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	December 8, 2012		February 4, 2014			
difference in months	base		-14			
time adj			none needed	0%		
adj sales price	\$ 125,000.00		\$ 139,700.00			
GLA (above grade)	1,420		1,864			
\$/GLA	\$ 88.03		\$ 74.95		15%	comparing GLAs only with no other adjustments
neighborhood	rural- close to Ohio		rural - dose to Walnut	\$ -		
lot size in acres	2.45		2.5	\$ -		similar
lot description	mature landscaping some trees		mature landscaping some trees	\$ -		
home style	ranch		ranch	\$ -		
exterior siding	vinyl		wood press board, brick wainscoting in front	\$ 3,600.00		5% of cost per sf contribution value of residence for press board vs vinyl
home built/eff age	1978/24 yrs		1977/24 yrs	\$ -		similar condition and effective age
condition	average		average	\$ -		
room count	7 total/3 br/2bth		7 total/4 br/3.5 baths	\$ (5,000.00)		adj is for 1.5 baths @\$3,000 per bath & \$2,000 half
GLA in sf	1,420		1,864	\$ (22,200.00)		based on \$50/sf contribution value
basement	no basement- slab		full- partly finished	\$ (14,000.00)		estimated @ \$10/sf x 1420sf due to no basement
patio/deck/porch	brick paver patio		none	\$ 2,000.00		
fireplace	yes		yes	\$ -		
central air	yes		yes	\$ -		
garage	3 car detached		2 car attached	\$ 8,000.00		\$8,000 per car bay beyond two
outbuildings	32x40 pole shed- newer		none	\$ 22,000.00		pole shed estimated at \$39,000 new, \$22,000 contribution value
other	concrete drive, new greenhouse, fence		concrete drive, none	\$ 6,000.00		greenhouse estimated at \$5,000 contribution value, fence=\$1,000
total adjusted \$				\$ 400.00		
total adjusted value (adj + adj sales price)		\$ 125,000.00		\$ 140,100.00		
difference in value in \$					\$(15,100.00)	
difference in value in %					-12%	overall impact due to presence of wind turbines/farm

Matched Pair 4

Matched Pair 4						
Item	Sale 4-WF	adj	Comparable 4-A	adj	difference	notes
Sale ID	May-1R-001		Bradford-1R-001			
distance to WT	0.53 mi to closest one		none			no wind turbines in view, closest one is 7.89 miles
address	341 Rockyford Road		2369 McGirr Road			
city/county	Amboy/Lee		Ashton/Lee			
sales price	\$ 132,000.00		\$ 183,000.00			
terms	arms length/divorce		arms length			
terms adj	typical	10%	typical	0%		Realtor stated thought sold under market due to divorce, 10% adjustment was made to represent this based on comments & appraiser's experience
date of sale	February 6, 2015		October 6, 2014			
difference in month	base		4			
time adj			none needed	0%		
adj sales price	\$ 145,200.00		\$ 183,000.00			
GLA (above grade)	2,000		1,936			
\$/GLA	\$ 72.60		\$ 94.52		-30%	comparing GLAs only with no other adjustments
neighborhood						
neighborhood	rural		rural	\$ -		
lot size in acres	5.00		3.92	\$ 8,000.00		at \$8,000/ac
lot description	mature lot, some trees		mature lot, some trees	\$ -		
home style	2 sty- farmhouse		2 sty- farmhouse	\$ -		
exterior siding	vinyl		vinyl	\$ -		
home built/eff age	1901/30 yrs		1901/25 yrs	\$ (12,900.00)		used total economic life = 55 yrs
condition	average		average	\$ -		
room count	8 total/4 br/2bth		7 total/3 br/1 bath	\$ 3,000.00		\$3,000 for full bath
GLA in sf	2,000		1,936	\$ -		no adjustment needed, very similar in size
basement	full- unfinished		partial- unfinished	\$ -		no adjustment needed, similar in use, old basement
patio/deck/porch	cov porch		wood deck	\$ -		wood deck = covered porch
fireplace	none		heatilator system	\$ (2,000.00)		
central air	none		none	\$ -		
garage	none		2 car detached w/game room	\$ (12,000.00)		\$12,000 contribution value for garage w/14x21 game room
outbuildings	36x120 metal sided shed with heat and bathroom, 36x140 metal sided shed, 50x55 metal sided barn, 28x33 corn crib		40x50 metal sided machine shed	\$ 14,000.00		36x140 building old chicken coop= \$3,000, 36x120 building has work shop w/bathroom = \$18,000, 50x55 barn = \$5,000, corn crib is Quonset hut for storage= \$3,000, 40x50 machine shed= \$15,000
other	gravel drive		gravel drive	\$ -		
total adjusted \$				\$ (1,900.00)		
total adjusted value (adj + adj sales price)		\$ 145,200.00		\$ 181,100.00		
difference in value in \$					\$ (35,900.00)	
difference in value in %					-25%	overall impact due to presence of wind turbines/farm

Matched Pair Sales Map



Summary of Matched Pair Sales Study

- ❖ Comments from Realtors and buyer of sales showed complexity of valuation of impacts and mostly negative view.
- ❖ Comments about 40 Pump Factory Road, Ohio – no good comps.
- ❖ Comments about 1950 Shady Oaks Road, Amboy – not a wind turbine influenced sale, can't see the turbines.
- ❖ No sales in Zero zone (within the perimeter of the wind farm).
- ❖ Matched pair sales impact ranged from -12% to -25%.
- ❖ Wind turbine sales had a range of 0.32 miles to 1.72 miles from the nearest wind turbine – average was 0.65 miles.

Conclusion of Impact of Proposed McClean County Wind Farm

- ❑ Literature study indicated the general perception of wind turbines is negative with regards to health, environment, property values and economic impact.
- ❑ Review of studies indicated a number of studies showing negative impact to residential properties due to the presence of wind turbines.
- ❑ Matched pair analysis of the Big Sky Wind Farm indicated that the studies which showed a negative impact due to wind turbines were correct and this impact ranged from -12% to -25%.
- ❑ Overall impact of the Wind Farm is estimated to have a negative impact on all rural residential property value the lies with the perimeter of the wind farm and approximately 2 miles from this perimeter. The impact will range from -10% to -50% depending on location and other factors.

END