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# The Impact of Wind Facilities on Residential Property Values

What We Know And What We Don't Know

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10 Area Preliminary Results  
June 2008

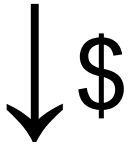
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- Subject & LBNL Study Methods Overview
- Study Results
  - Area Stigma
  - Scenic Vista Stigma
  - Nuisance Effects
- Conclusions

# Proximity, Aesthetics & Property Values Are Strongly Linked

Highway



Transmission Lines



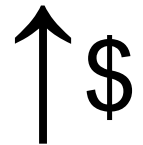
Average Home



Green Space



Ocean Front



This linkage is well studied

# Property Value Concerns For Wind Projects Fall Into Three Possible Categories

1. **Area Stigma:** Concerns over “industrialization” of area

No one will move here!

2. **Scenic Vista Stigma:** Concerns over decrease in quality of scenic vistas from homes

It will ruin my view!

3. **Nuisance Effects:** Potential health/well-being concerns of nearby residents

I won't be able to live in my home!

Each of these effects could impact property values

# Relatively Few Wind & Property Studies: A List Of The Most Publicized

<u>Author (Year)</u>	<u>Location</u>	<u>Method</u>	<u>Test</u>	<u>Conclusion**</u>
Jordal-Jorgensen (1996)	Denmark	Hedonic	Area Stigma	↓ \$ ?
Sterzinger et. al. (2003)	10 US sites	Simple	Area Stigma	↑ \$ ?
Haughton et al. (2004)	Cape Cod, MA	Survey	Area & Scenic Vista Stigma	↓ \$ ?
Poletti (2005)	WI / IL	Simple	Area Stigma	↓ \$ & ↑ \$ x
Delacy (2005)	Washington	Paired Sales	Area Stigma	↑ \$ ?
Sims & Dent (2006)	UK	Hedonic	Area Stigma	↓ \$ *
Hoen (2006)	New York	Hedonic	Area Stigma/ Scenic Vista Stigma	↓ \$ x ↑ \$ x
Poletti (2007)	WI / IL	Simple	Area Stigma	↓ \$ & ↑ \$ x
Crowley (2007)	12 US Counties	Survey	Area Stigma & Nuisance	no change ?

\*\*Notes: ↓ \$ = decrease in value found, ↑ \$ = increase in value found

\* statistically significant at 90%, x not significant at 90%, ? statistical significance not reported

## Overview

- Few tested if results were statistically significant
- Most tested for just area stigma
- None of the studies, except Hoen, visited homes
- None have been published (in journals) and only Hoen has been academically peer reviewed
- **THIS DOES NOT NECESSARILY MEAN CONCLUSIONS ARE WRONG**

# LBNL Study Methods

## Build And Improve On Past Work

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- Multiple U.S. wind project locations
- Sample sizes of over 450 for each area
- Valid residential sales values (not assessed values)
- Field visits to each home
- Hedonic pricing model
- Test for all three potential effects
- Rigorously analyze data & peer review results

# Data Collected From 11 Study Areas Surrounding More Than 25 Wind Facilities

Roughly 8500 transactions

3 Adjoining Counties Washington & Oregon  
7 Facilities: 557 WTG  
790 Sales

Kewaunee Cnty., WI  
2 Facilities: 32 WTG  
811 Sales

Madison Cnty., NY  
Area 1: Madison  
7 WTG 462 Sales

Madison Cnty., NY  
Area 2: Fenner  
20 WTG 695 Sales

Wayne Cnty., PA  
43 WTG  
554 Sales

Buena Vista Cnty., IA  
5 Facilities: 381 WTG  
1023 Sales

Lee Cnty., IL  
557 WTG  
790 Sales

Somerset Cnty., PA  
3 Facilities: 34 WTG  
481 Sales

Riverside Cnty., CA  
30+ Facilities: 2000+ WTG  
758 Sales

Custer Cnty., OK  
2 Facilities: 98 WTG  
1086 Sales

Howard Cnty., TX  
46 WTG  
790 Sales

● Study Areas  
● All North American Sites > .6 MW

Source: Global Energy Concepts, LBNL  
Map Prepared By LBNL



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# Preliminary Results Based On Data From 10 Of The 11 Areas\* and Initial Analysis

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## **NOTE OF CAUTION:**

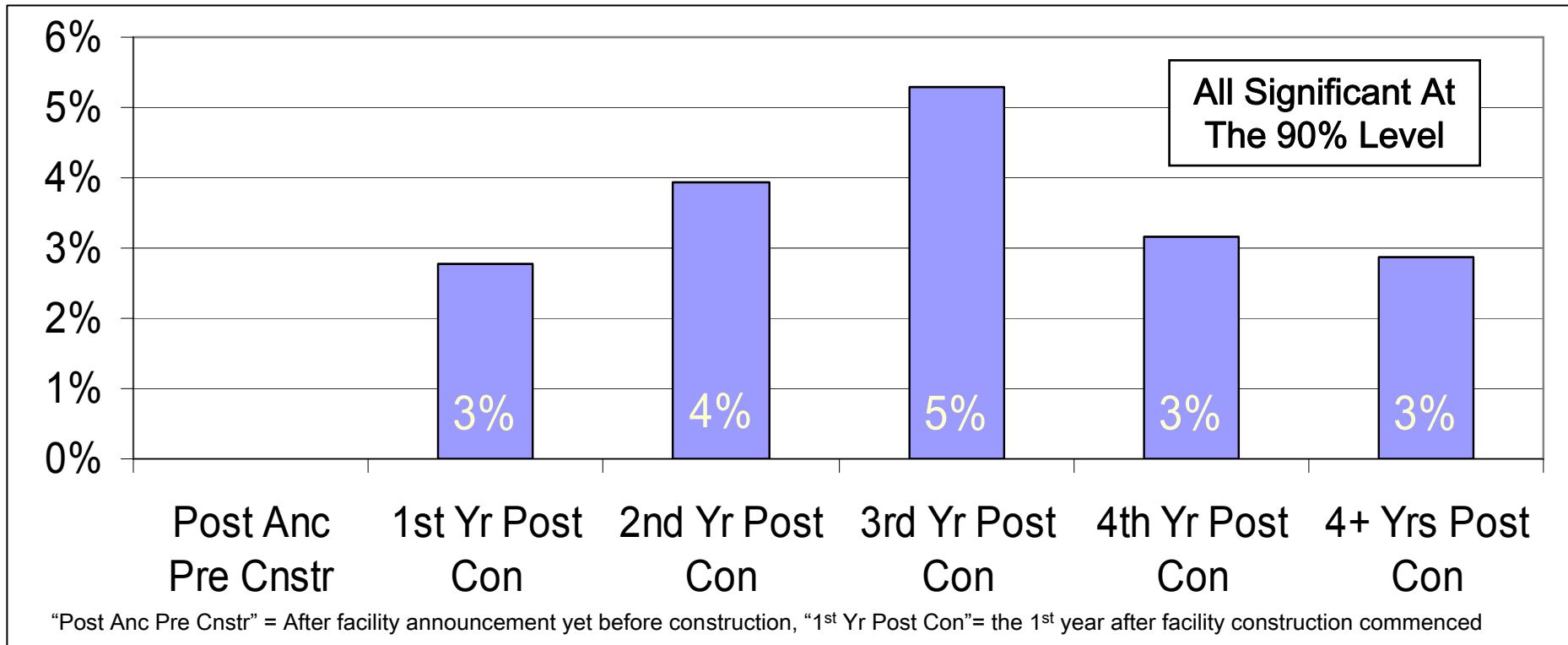
The following graphs and findings are preliminary, so conclusions based on these results should be considered preliminary as well

\* Data from Riverside County, CA area not included in these results

# Area Stigma

There Is No Evidence That Facilities Negatively Affect The Whole Community In Any Period After Announcement

■ % Change In Price as Compared to Pre Announcement Price Levels After Controlling For Housing Inflation



*DV = LN of SalePrice (\$96), Pre Anc omitted*

*n = 7632, R2 = 0.77, f = 224*



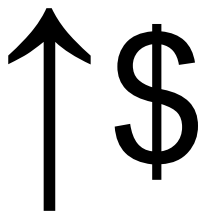
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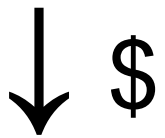
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# To Test For Scenic Vista Stigma, Scenic Vista Itself Needs To Be Controlled For

They might pull in two directions



Without separating out scenic vista,  
measurements of the effects of the view  
of wind turbines might be artificially inflated



# Five Qualitative Rankings For Scenic Vista

Each home was given a scenic vista rating



Poor



Average

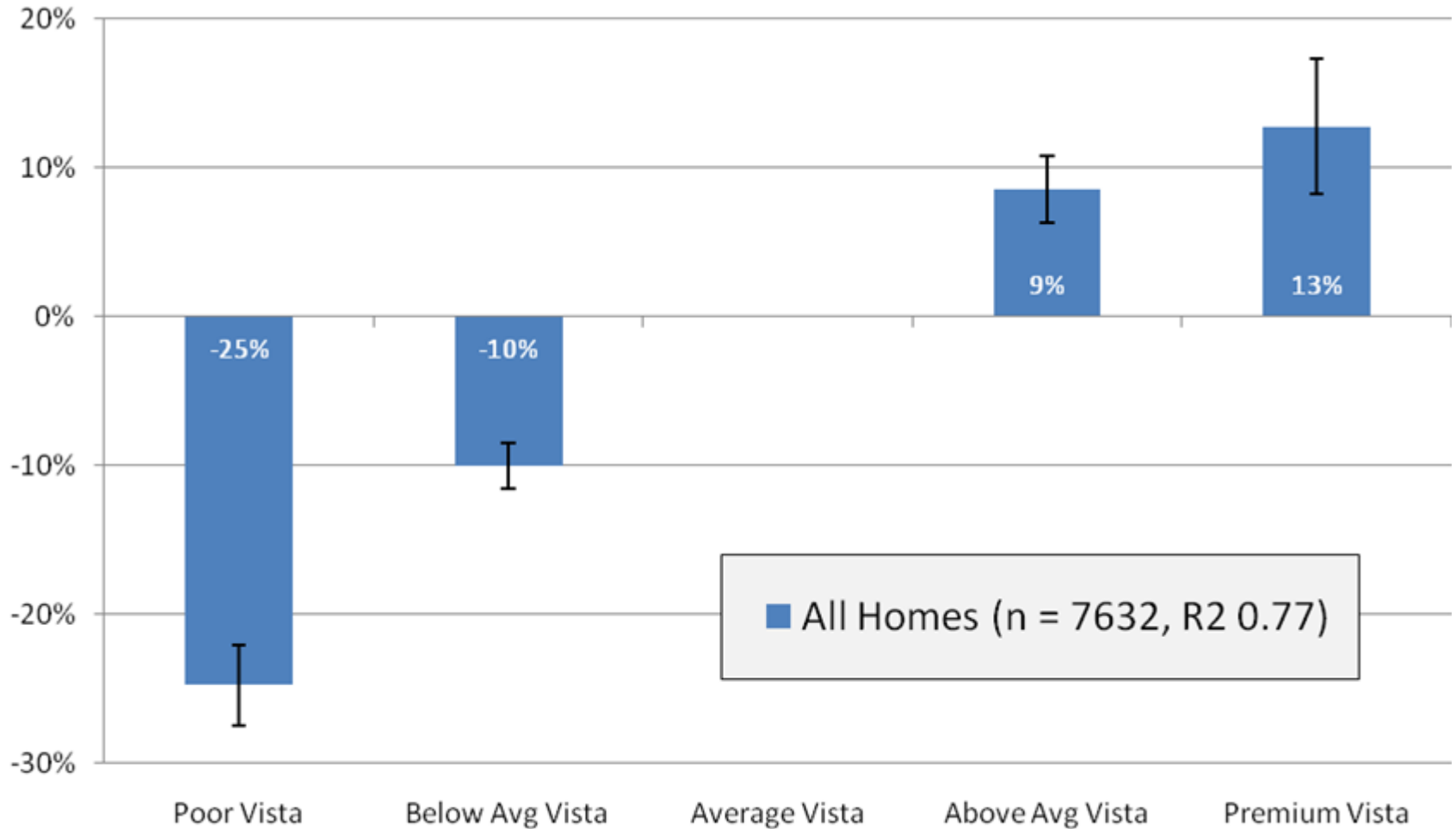


Premium

Below  
Average

Above  
Average

# Buyers & Sellers Care About Scenic Vista



*DV: LN\_SalePrice (\$96), Average Vista omitted, 90% Confidence Intervals shown*

# Four Qualitative Ratings For Dominance Of View

Each home was given a view of turbines dominance rating



Minor



Moderate



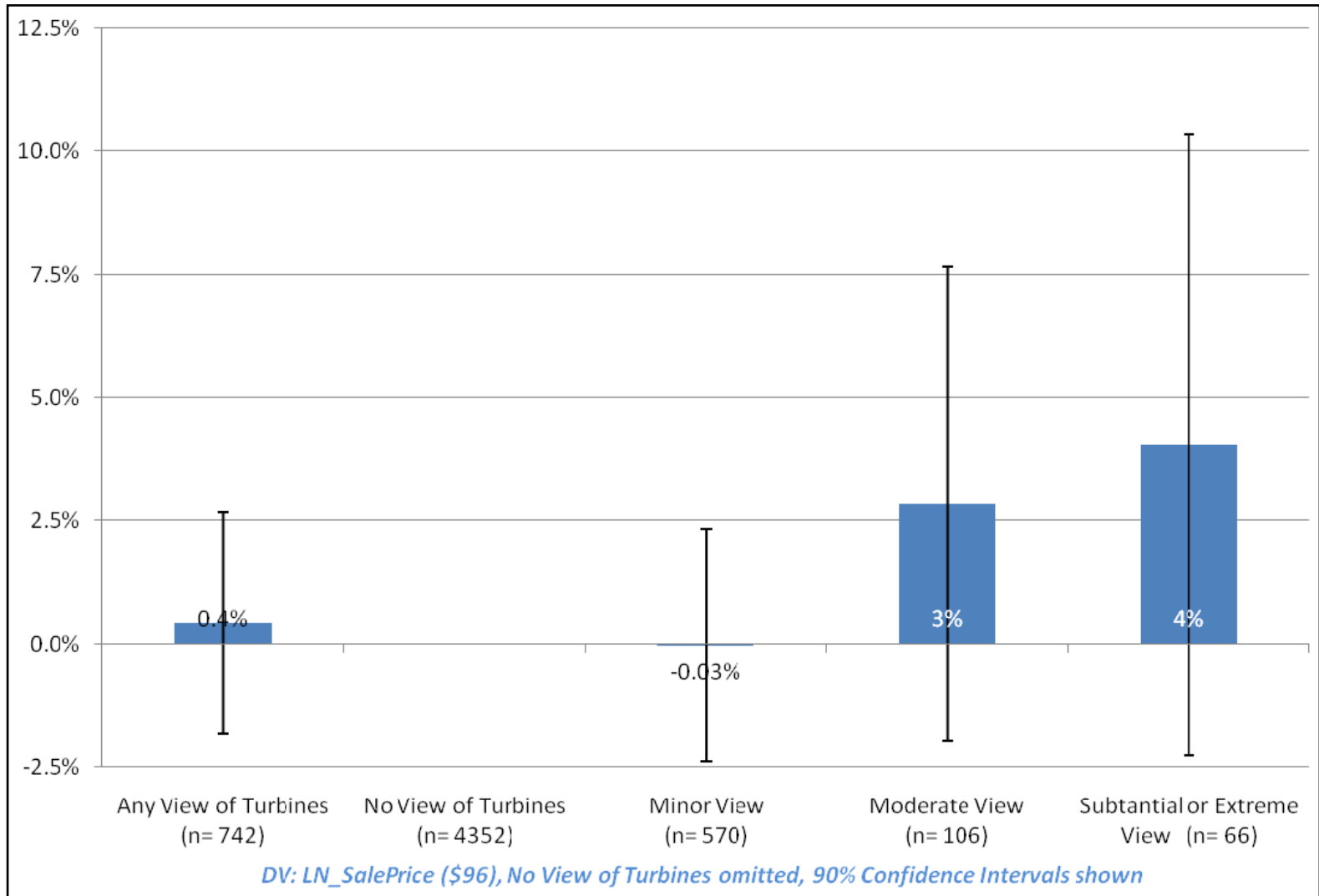
Extreme

Substantial



# Scenic Vista Stigma

There Is No Statistical Evidence That Views Of Turbines Affect Home Values Using Qualitative Rating Method



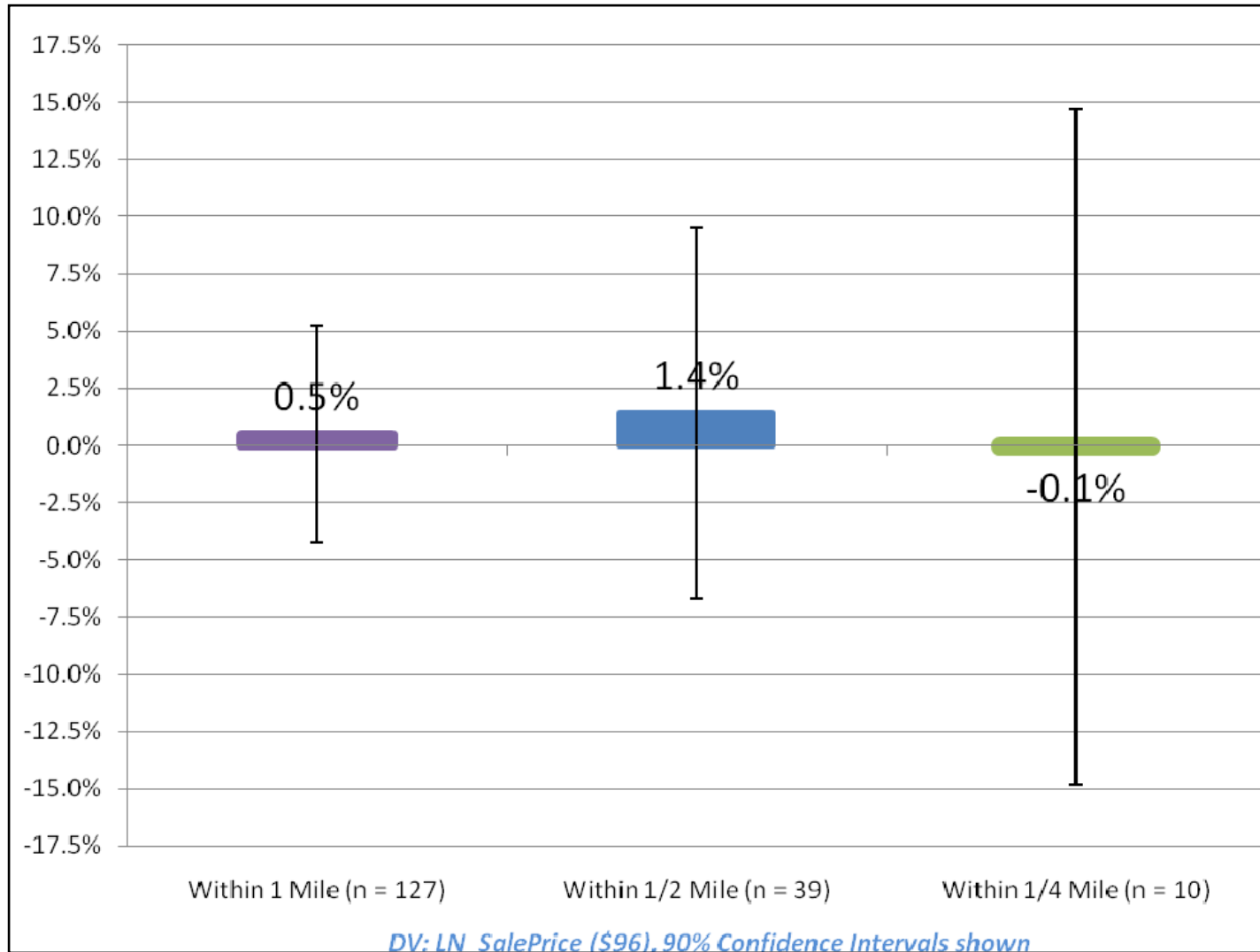


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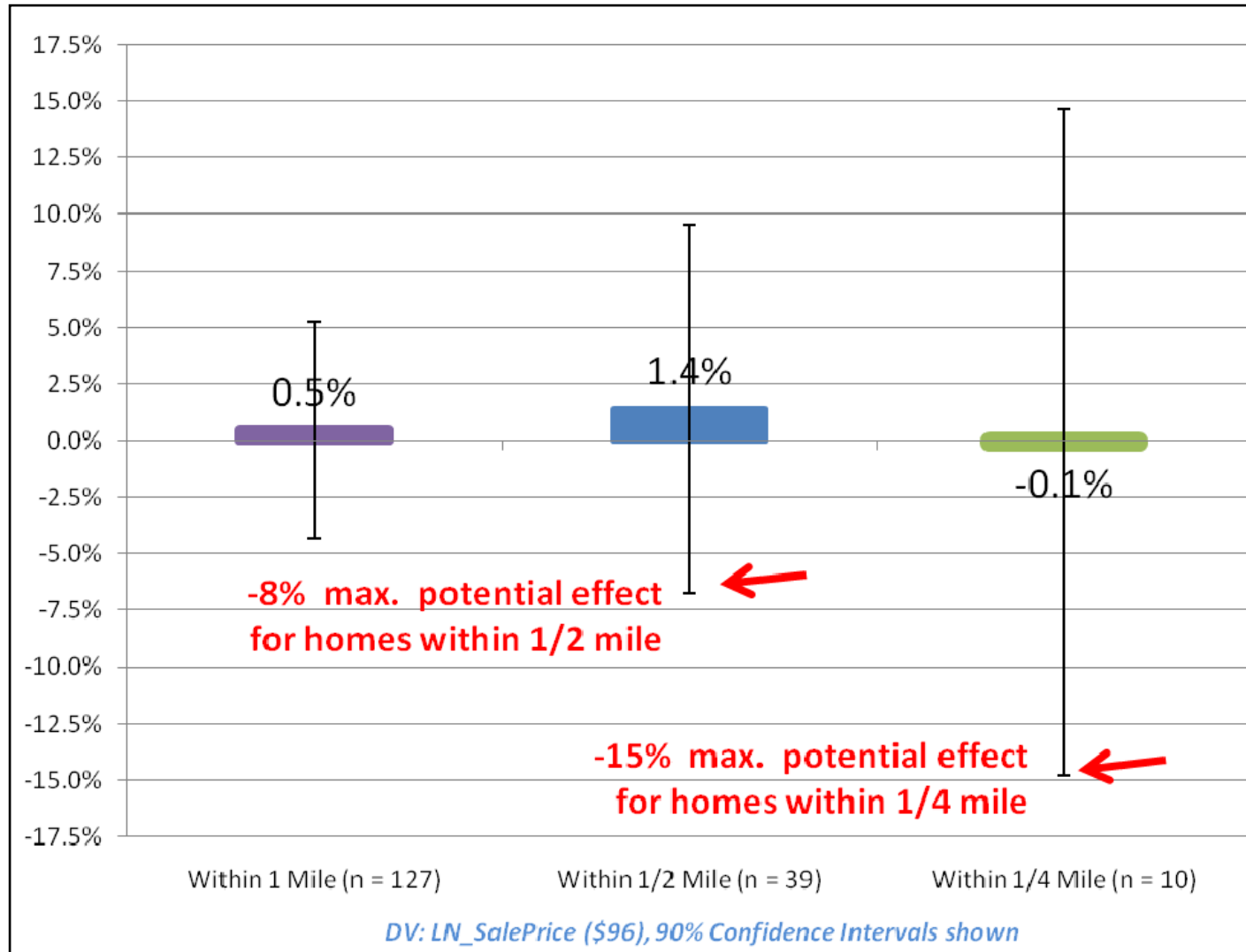
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# Nuisance Effects: Even Homes Located Very Near Wind Facilities Are Seemingly Unaffected



# Nuisance Effects: And Maximum Probable Effects Are Fairly Small



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# What Conclusions Can Be Drawn From Study Results?

## Given our sample and preliminary analysis...

- **Area Stigma:** We find no statistical evidence that homes near wind facilities are stigmatized by those facilities as compared to other homes in the region
- **Scenic Vista Stigma:** We find no statistical evidence that homes with a view of wind turbines have different values than homes without such views
- **Nuisance:** We find no statistical evidence that homes within  $\frac{1}{4}$ ,  $\frac{1}{2}$  and 1 mile of turbines sell for different values than those further away.

**Bottom line:** Though one cannot rule out isolated cases where property values are negatively impacted, any such impacts within our sample are not widespread nor statistically identifiable

# More Detailed Results Expected In Final Report & Papers Due Out Fall 2008

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**We hope to investigate the following types of homes for  
unique effects**

- Homes in the top 25% of market value
- Secondary (vacation) residences

**And further refine our analysis**

- Control for spatial autocorrelation



# Thank You



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