A presentation by
Kurt C. Kielisch, ASA, IFAS, SR/WA, R/W-AC
President/Sr. Appraiser – Appraisal Group One

Wind Turbines & Property Value
Focus on Value

- **PERCEPTION = VALUE**
  - The key to understanding real estate value is to understand it is based on perception.
  - Perception drives the buying decision.
    - E.g. perceived enjoyment of home.
    - E.g. perceived income stream of investment.

- Perception need not be based on a proven, scientific fact. (e.g. the haunted house or electric power lines)

- When the buyer acts on this perception through a buying action you have established value and the effects of this perception.
### E.g. Perception of Electric Transmission Lines

<table>
<thead>
<tr>
<th>Perception</th>
<th>Fact</th>
</tr>
</thead>
<tbody>
<tr>
<td>- They cause health problems especially cancer.</td>
<td>- Not proven as a scientific fact, however the jury is still out and there is published literature on this issue.</td>
</tr>
<tr>
<td>- They are noisy.</td>
<td>- True, depending on humidity, power and distance.</td>
</tr>
<tr>
<td>- They are unsightly, ruin view shed</td>
<td>- True both near and far.</td>
</tr>
</tbody>
</table>
Perception of Wind Turbines

**Perception**
- They cause health problems through noise and deep ultrasonic sound waves, sleep deprivation
- They are noisy.
- They cause light flicker.
- They are unsightly, ruin view shed

**Fact**
- Not proven as a scientific fact, however the jury is still out and there is published literature on this issue.
- True, depending on wind, size, age and distance.
- True depending on location and distance.
- True both near and far.
What Drives Perception?

- Media
  - Printed media
  - Electronic media
  - Internet

To measure this perception of media we conducted a Literature Review
Literature Review

- Health Issues
  - Articles found on health disorders including:
    - Sleep deprivation
    - Headaches
    - Dizziness
    - Anxiety
    - Depression
    - Vibroacoustic Disease (VAD) & Wind Tower Syndrome
  - Doesn’t affect everyone.
  - Wind industry has counter claims stating “no health impact”
  - Similar to the EMF issue relating to power lines.
Measuring Perception

To measure the impact of this perception we did two things:

- Conducted a **Realtor Survey** of Realtors who worked in a wind turbine area.

- Conducted an **Impact Study** using sales of properties impacted by wind turbines compared to those that were not.
Realtor Survey

Purpose: learn from the guys in the trenches of buying and selling

Focus: residential land use, both vacant and improved.

Visual field proximity: 3 different levels
- 600ft from turbine (border)
- 1,000ft (close)
- ½ mile (2,640ft) (near)

Survey utilized graphics and pictures to standardize the concept being portrayed.

Survey was to Realtors that were in a wind turbine area.
- Fond du Lac County
- Northeast Dodge County

Surveys were given in person, on-site, verified with date, person’s name and contact
Realtor Survey results . . .

- Question to impact of wind turbine to vacant land
  - 82% negative if border
    - Loss estimated at -43%
  - 69% negative if close
    - Loss estimated at -36%
  - 59% negative if near
    - Loss estimate at -29%
Realtor Survey results . . .

- Question to impact of wind turbine to improved property
  - 91% negative if border
    - Loss estimated at -39%
  - 86% negative if close
    - Loss estimated at -33%
  - 60% negative if near
    - Loss estimate at -24%
Realtor Survey results . . .

**Hobby Farm**

- Bordering proximity (600ft)
  - 70% said negative impact
  - 23% said no impact

- Close proximity (1,000ft)
  - 47% said negative impact
  - 47% said no impact

- Near proximity (1/2 mile)
  - 44% said negative impact
  - 47% said no impact

**Position of Turbines**

- **83%** said the impact was negative if the turbines are in the front yard of a 1-5 acre residential parcel.

- **71%** said the impact was negative if the turbines were located in the back yard of a 1-5 acre residential parcel.
Impact Studies

Checking perception with buying action
WE ENERGIES - BLUE SKY GREEN FIELD WIND FARM
1 acre to 8 acre residential land sales -- all sales included

- Non-Wind Turbine Residential Lot Value
- Wind Turbine Area Residential Lot Sales
- Power (Non-Wind Turbine Residential Lot Value)

Total residential lot sales = 68 sales
Total wind turbine area = 6 sales
Total non-turbine area = 62

R² = 0.8302
Blue Sky Green Field results . . .

- Sales within the wind turbine area sold for less than comparative sales outside of the area.

- There were less sales available within the wind turbine area than without – substantially less.

- The impact of the wind turbines on vacant residential land is in the range of -19% to -40%.

- This loss range corresponds with the Realtor survey.
INVENERGY - FORWARD WIND FARM
1 acre to 20 acre residential lot sales -- low sales removed

- Total residential land sales = 34
- Sales in wind turbine area = 6
- Sales out of turbine area = 28

All low sales were removed which included 3 in turbine area and 2 outside of area.
Forward Wind Farm results . . .

- Sales within the wind turbine area **sold for less** than comparative sales outside of the area.

- There were **less sales** available within the wind turbine area than without – substantially less.

- The impact of the wind turbines on vacant residential land is in the range of **-12% to -30%**

- This loss range corresponds with the Realtor survey.
Conclusion of Perception of Wind Turbines Impact to Property Value

1. Media has reported on negative health issues and value issues influencing a negative perception.

2. Realtor survey indicated that these perceptions are real in the market.

1. Impact studies suggest the values are substantially negatively impacted in the range of -12% to -40%. 