Zoning for Wind Energy: Trespass Zoning or Property Rights Zoning?

By
Kevon Martis
Certified Citizen Planner, MSUE
Certified Zoning Administrator, MSUE

Director, IICC

Senior Policy Fellow
E&E Legal Institute
Washington, DC

Who is this guy?

- **MSU Certified Zoning Administrator and Citizen Planner**
- **Former Vice-chairman Riga Township PC-6 years**
- **Worked for 2 years drafting ag preservation plan for county**
- **Helped draft wind energy ordinance that became a State model ordinance**
- **BA History, University of Michigan, Class of ‘89**


Michigan State University Extension
Citizen Planner Program

awards this

Citizen Planner Certificate

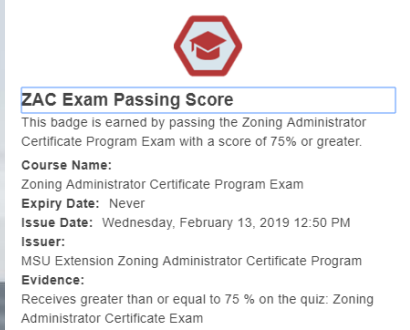
Kevon Martis

In recognition of successful completion of the Citizen Planner Program — 2019

Brad Neumann

Brad Neumann, AICP
Senior Extension Educator
Government & Community Vitality

MICHIGAN STATE UNIVERSITY | Extension


ZAC Exam Passing Score

This badge is earned by passing the Zoning Administrator Certificate Program Exam with a score of 75% or greater.

Course Name:
Zoning Administrator Certificate Program Exam
Expiry Date: Never
Issue Date: Wednesday, February 13, 2019 12:50 PM
Issuer:
MSU Extension Zoning Administrator Certificate Program
Evidence:
Receives greater than or equal to 75 % on the quiz: Zoning Administrator Certificate Exam

Developed State model wind ordinance:

Examples of Zoning Guidelines for On-Shore Wind

The Environmental Law Institute report on State Enabling Legislation for Commercial-Scale Wind Power (see below) provides examples Model Wind Ordinances provided by ten different states. In 2009, the Bureau of Energy Systems (now Michigan Energy Office), published the Sample Zoning for Wind Energy Systems. Since that time, a number of organizations and communities have embarked on their own wind projects and have developed zoning ordinances. The MEO recommends that communities review the examples of wind policies at the local government level in Michigan.

The U.S. Department of Energy's Wind Powering America initiative provides examples of local wind zoning ordinances from a number of communities in the state, as well as information on best practices. The site also provides a link to the U.S. Department of Energy publication, Wind Energy Ordinances.

Please Note: the MEDC – Michigan Energy Office does not endorse nor offer these ordinances as a Best Practices. These ordinances are provided only as examples of Zoning Ordinances currently in use in the state and do not constitute a complete list. The MEDC Michigan Energy Office does highlight the Gratiot County Wind Energy Ordinance as notable because it was unanimously adopted as Michigan's first county-wide wind energy zoning ordinance.

City of Holland, Zoning Amendment

Centerville Township Zoning Ordinance for Commercial Wind Energy Systems

Emmet County Zoning Ordinance

Environmental Law Institute Report, *State Enabling Legislation for the Commercial-Scale Wind Power Siting and the Local Government Role, 2011*

Gratiot County Wind Energy Ordinance

Great Lakes Wind Collaborative, 2011, *Best Practices for Sustainable Wind Energy Development in the Great Lakes Region*, June 2011

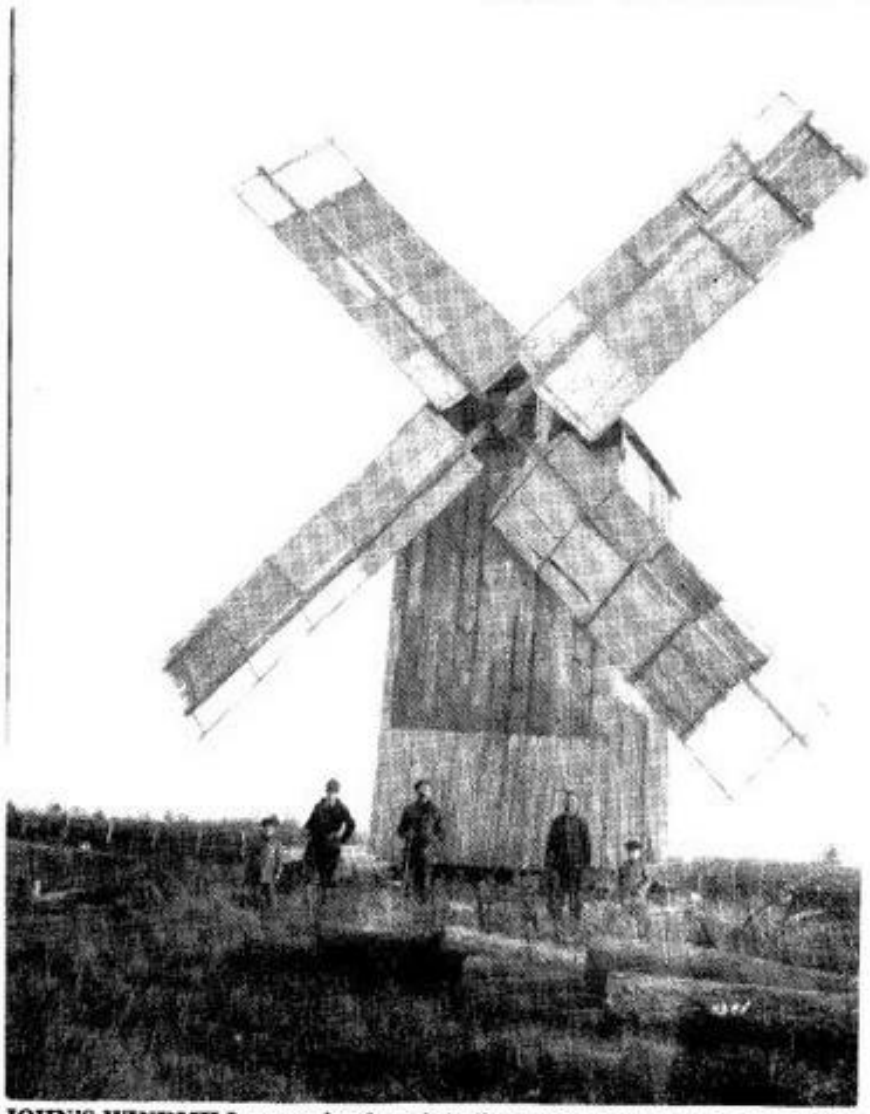
Oliver Township Land Use Plan

Otsego County Ordinance No. 18.5 for Wind Turbine Generators and Anemometers

Riga Township Ordinance No. 32, Amendment to the 1974 Zoning Ordinance of Riga Township

Shiawassee County Wind Ordinances

I have deep UP roots:



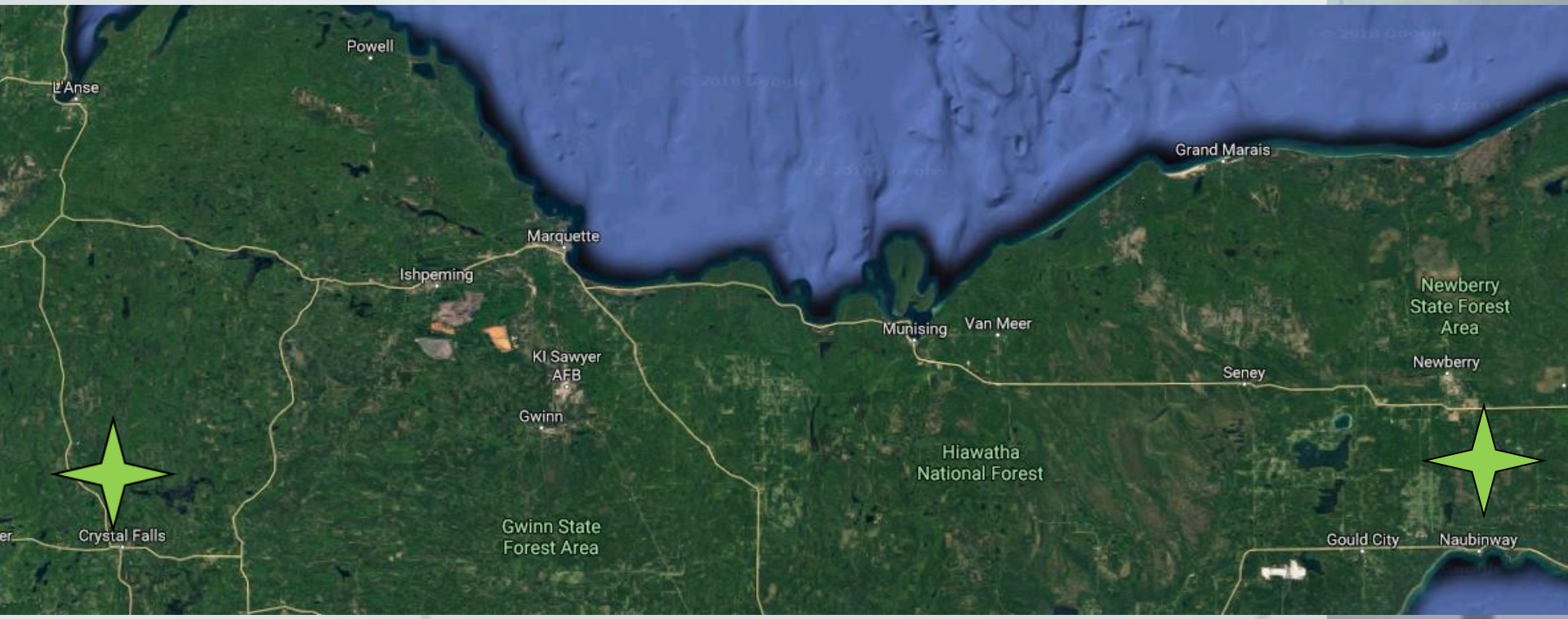
JOHN'S WINDMILL was a landmark in the Lake Mary plains area on the road between Blaney and Gliddens. He built the windmill and its entire mechanism and crafted the millstones as well, which may still be seen standing in the Alex Bortolini yard on the Hope Mine Road. This picture was taken by G.E. Harrison in 1923. The mill was later destroyed by a forest fire, which supposedly also claimed the life of its creator.

This windmill was built by John Morgson and my great-grandfather Frank Martis. They were both Lithuanian immigrants.

My grandfather Henry Martis is pictured here as well.

The date was 1923 and the location was Crystal Falls.

The UP: My Heritage:



My great grandfather is buried in an unmarked grave in Crystal Falls.
My grandparents are both buried in Rexton along with two uncles.
My cousin and his children still live in Rexton.

Question:

What's all the fuss over wind development?

The U. P.:

Wind development has proven controversial in the U.P.

Heritage Wind Noise Complaints:

73 named

October 8, 2012

Delta County Building and Zoning
310 Ludington Street
Escanaba, MI 49829

Dear Building and Zoning Board:

The sounds generated by the turbines erected on the Garden Peninsula have caused a great deal of the distress to those of us who live near this wind farm. Residents were told that the sound would not exceed levels of <45 dB(A) at occupied buildings, which was no louder than a dishwasher. Unfortunately, residents do not believe that is case. The sounds are so obnoxious and disturbing that it is causing individuals to have to resort to lifestyle changes that should not have to be endured.

Inside their homes people hear the sounds when they are conversing, watching TV, or simply going about their daily lives, thus increasing stress levels, as well as increasing their concerns over possible hearing loss. All which are bringing the issue of overall health to the forefront. When trying to sleep at night the noise awakens people, and some have a difficult time getting to sleep, making sleep deprivations a real concern.

Outside our home the sound and the feel of the turbulent air movement is further cause for concern. Working in our yards and gardens is no longer a relaxing time. Headaches, earaches, equilibrium issues and an overall uncomfortabel feeling is now what is being endured when spending our time outside our homes. It is unconscionable that these turbines were placed so close to homes in an area of such importance to wildlife and people, with little regard to what the effects would be.

We have been advised that studies continue regarding the killing of birds and bats. We also worry about taking away more area for all wildlife. Many of us have noticed far fewer birds in the area. The turbines are like enormous moving scarecrows that also create very uncomfortable sounds and vibrations.

These turbines are too noisy and causing much more distrubance than Heritage promised. We are requesting assistance in measuring the noise levels in question. Individuals living near the turbines are having difficulty proving this issue, and bringing in experts with the sound equipment is very expensive. Therefore, we are respectfully requesting the county to bring in the audio equipment they have at their disposal to help us learn if the sounds we are hearing indeed does exceed recommendations. There may also be a need to re-evaluate the permitted noise levels for future zoning. We would like to see setbacks much further homes. Also, the concerns from the Dept. of Interiors need to be considered regarding the Garden Peninsula.

Delta County, as well as the entire State must be educated as to what having turbines near home and wildlife will do in the long run. Perhaps this type of information will improve regulations made in turbine placement in the future.

1

73 people living inside the wind energy plant's 14 turbine cluster signed petitions asking for relief.

Farm Wind project rejected in Baltic:

Community rejects proposed Wind Farm site

TOPICS: Adams Township Baltic Eric Udelhofen Farm Wind Energy Gerald Heikkinen Houghton County Jeffrey Gosse Local News Turbines U.S. Fish And Wildlife Service Wind Farm

POSTED BY: JT APRIL 14, 2015

ADAMS TOWNSHIP — Residents in Adams Township are taking a stand against a proposed wind farm.

At a public meeting in Baltic, concerned citizens packed the township hall to hear a presentation by representatives from Farm Wind Energy and the U.S. Fish and Wildlife Service. At issue was a request by Farm Wind Energy developer Dave Hokens to amend a local ordinance that prohibits wind turbines from being closer than 3,000 feet from any adjacent property lines, roads or houses.

L'Anse Township and RES Americas:

L'Anse Sentinel
On guard for over 130 years

Search this site...

Extras | Critter Corner | Military Photos | Cartoons | National Columnists | Sentinel Photos

BROWSE: HOME ▸ BARAGA COUNTY ▸ FHM MOVES ON PETITION

FHM moves on petition

Published by Tammy on October 26, 2018 | 0 Comment

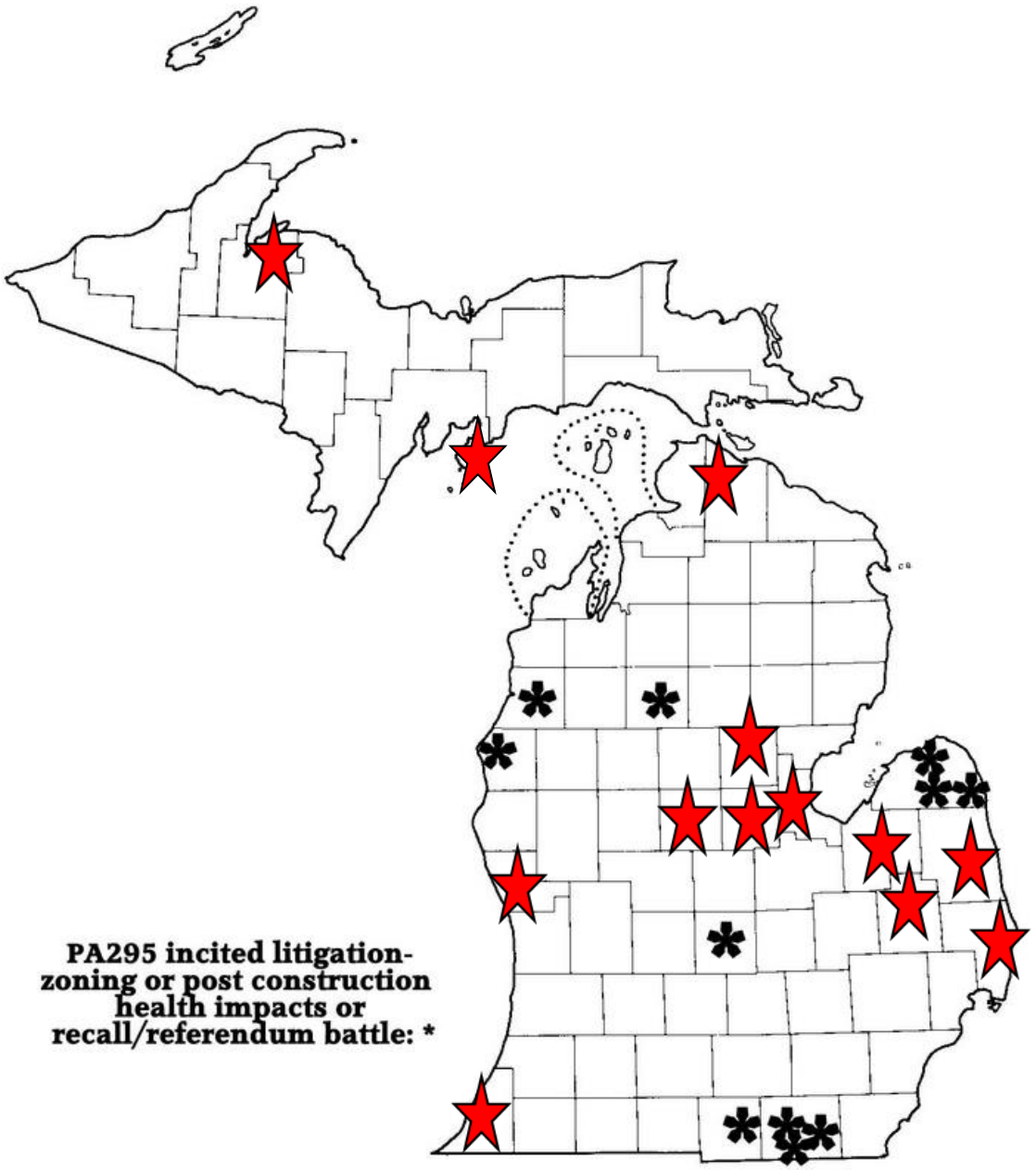
INTENT TO PETITION–Bob Kissel, right, a member of the Friends of the Huron Mountains, submits an intent to file petitions to Township Clerk Brian Jentoft. The petition is to seek a referendum regarding amendments to the L'Anse Township Zoning Ordinance. Photo submitted by Burt Mason.

L'Anse residents placed zoning amendments on ballot. RES intends to build turbines on top of Mt. Arvon and Mt. Curwood.

Wind isn't a divisive issue just in the UP.

Experience has been a harsh teacher:

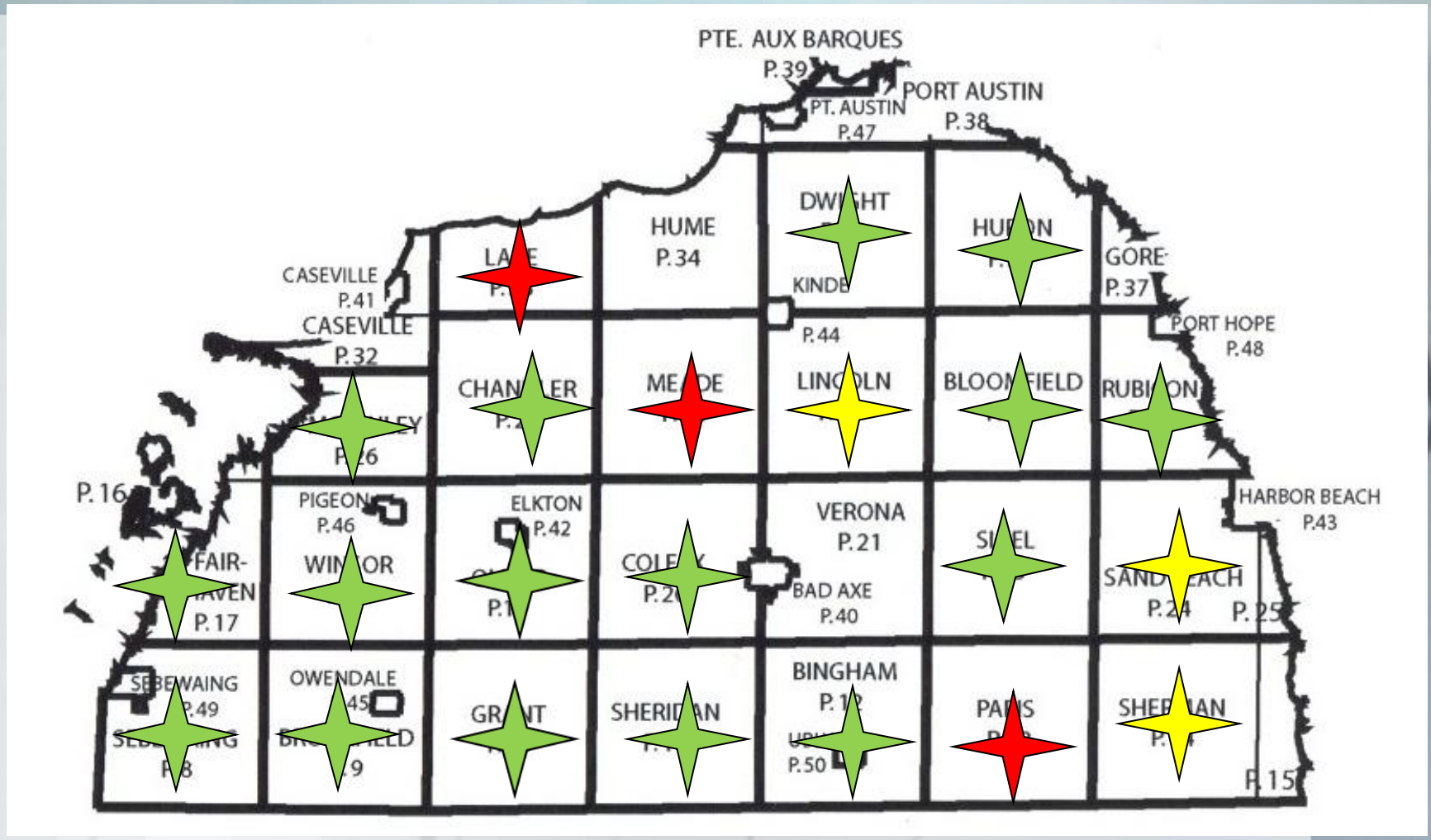
Statewide wind development has produced widespread complaints and/or legal & political action regarding wind turbine impacts.



Case study:

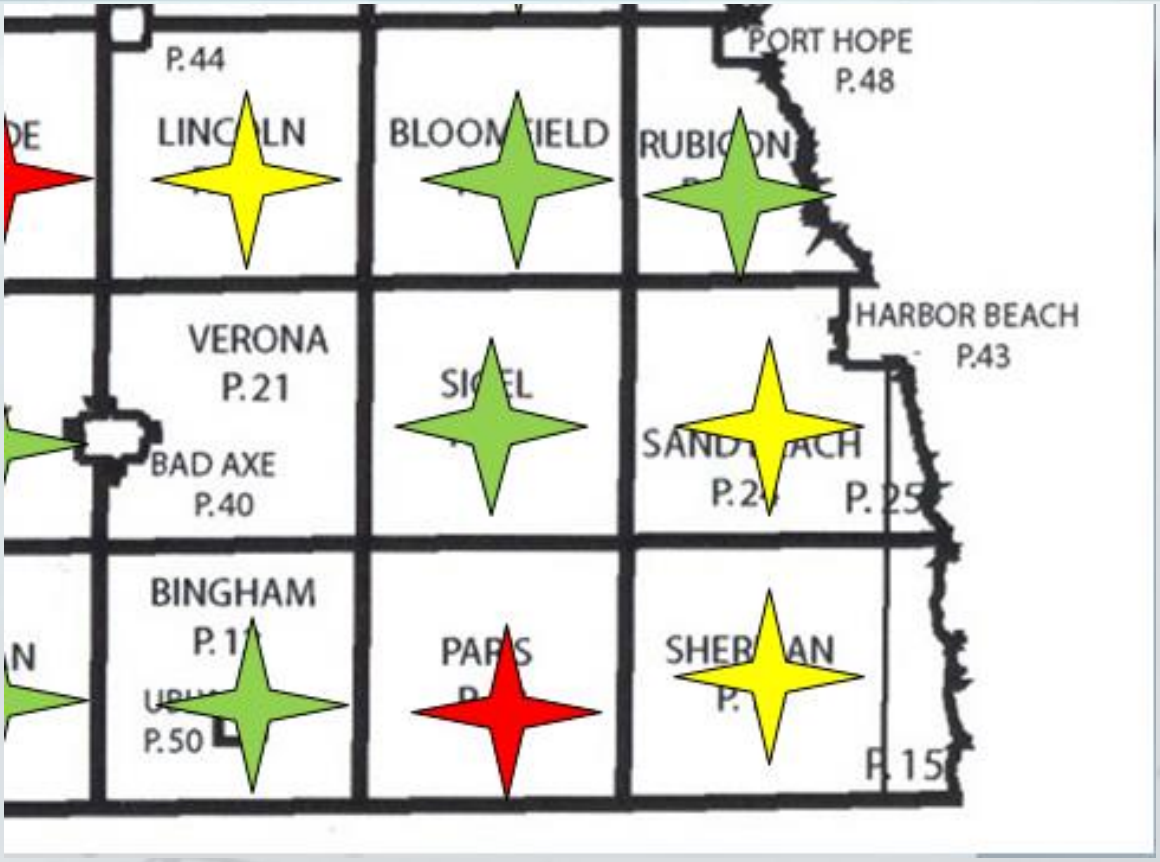
Huron County

Huron County:



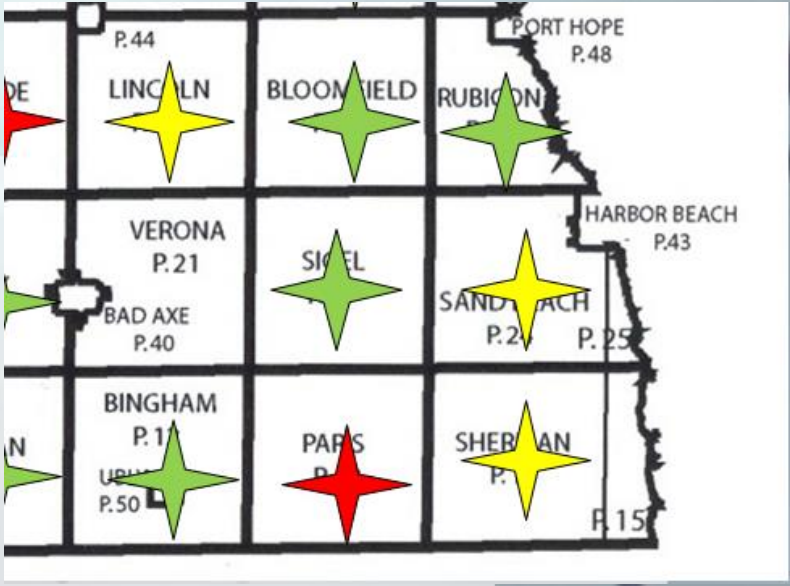
With stronger wind, Huron County has been a free-for-all for wind development since 2008.

Huron County:



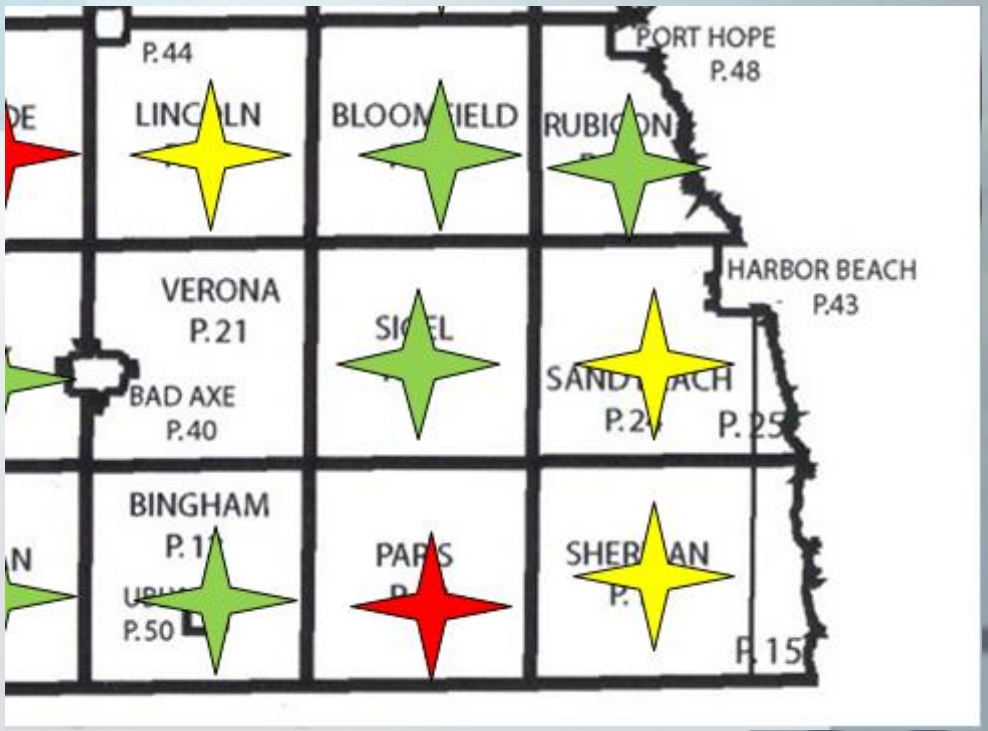
In 2016, 3 HC townships faced even more wind development-Lincoln Township by DTE and Sand Beach and Sherman by NextEra

Huron County:



Curiously, although 4 of 5 Lincoln Township trustees had DTE wind leases, they took action to remove themselves from county zoning in order to enact protective zoning of their own. They told the Huron County PC: "We feel that Huron County has done our part as far as Green Energy. We feel that no additional turbines should be allowed in Huron County."

Huron County:

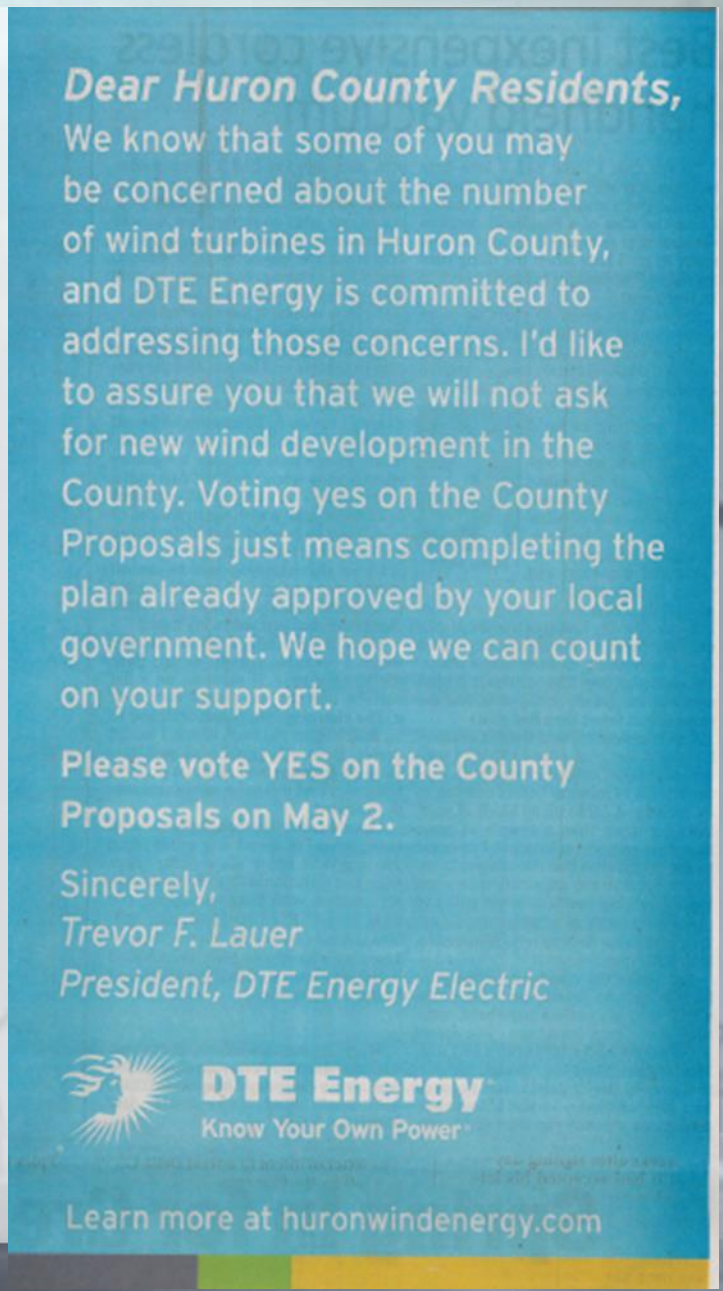


Without going into the details, the net effect of these two proposed projects was to engender 2 countywide zoning referenda and two township level referenda on the May 2nd ballot.

HC Campaign intense. From the absurd…

DTE Electric's CEO Trevor Lauer came to Huron County to campaign for the project.

He promised that if HC voters would allow just one more wind project, they would never build another in Huron County.



...to the menacing:

A PAC in the NextEra project footprint threatened people of Sand Beach Township with expensive litigation if they voted for stronger wind zoning.
With NextEra's ongoing suits in Tuscola County, it was no idle threat.

HC residents fought back:

Campaign Spending:

Campaign disclosures revealed that DTE and NextEra spent a combined $875,000.00 on the campaign.

The local folks spent about $3,700.00

Countywide Results?

Huron Wind LLC's Overlay District Propo	(0)	0/16	0.00%
YES		1,120	36.67%
NO		**1,934**	**63.33%**
	Total ...	**3,054**	**100.00%**
DTE's Overtlay District Proposal	(0)	0/16	0.00%
YES		1,110	36.60%
NO		**1,923**	**63.40%**
	Total ...	**3,033**	**100.00%**

Further:

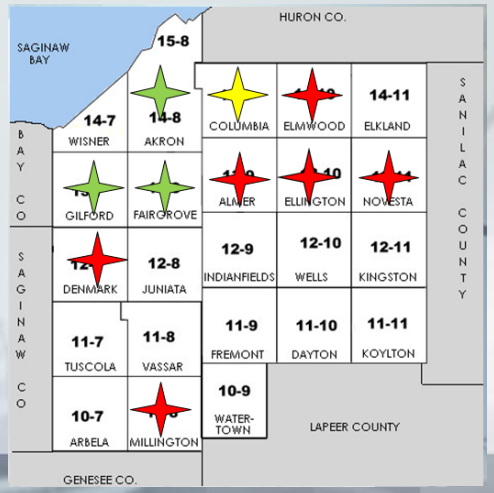
Wind losing at the ballot box despite lopsided campaign expenditures is not rare.

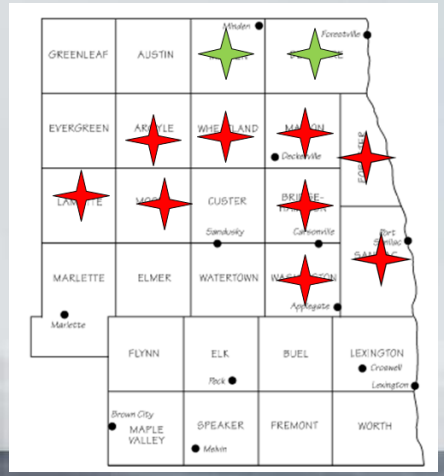
Since 2009, wind has *never* won a township referendum:

	% against	% in favor
Meade	60	40
Lake	62	38
Paris	64	36
Riga	64	36
Palmyra	55	45
Seneca	51	49
Reading	71	29
Wheatland	63	37
Moore	57	43
Argyle	53	47
Almer	55	45
Lincoln	58	42
Sand Beach	84	16
Sherman	63	37
Joyfield	53	47
Marion	55	45
Bridgehampton	63	37

Statewide rejection of wind:

Since 2009, more than 40 townships and 4 counties have rejected wind energy including Mason, Emmet, Shiawassee and Schoolcraft. More are following suit including most of Tuscola and Sanilac Counties in the Thumb.



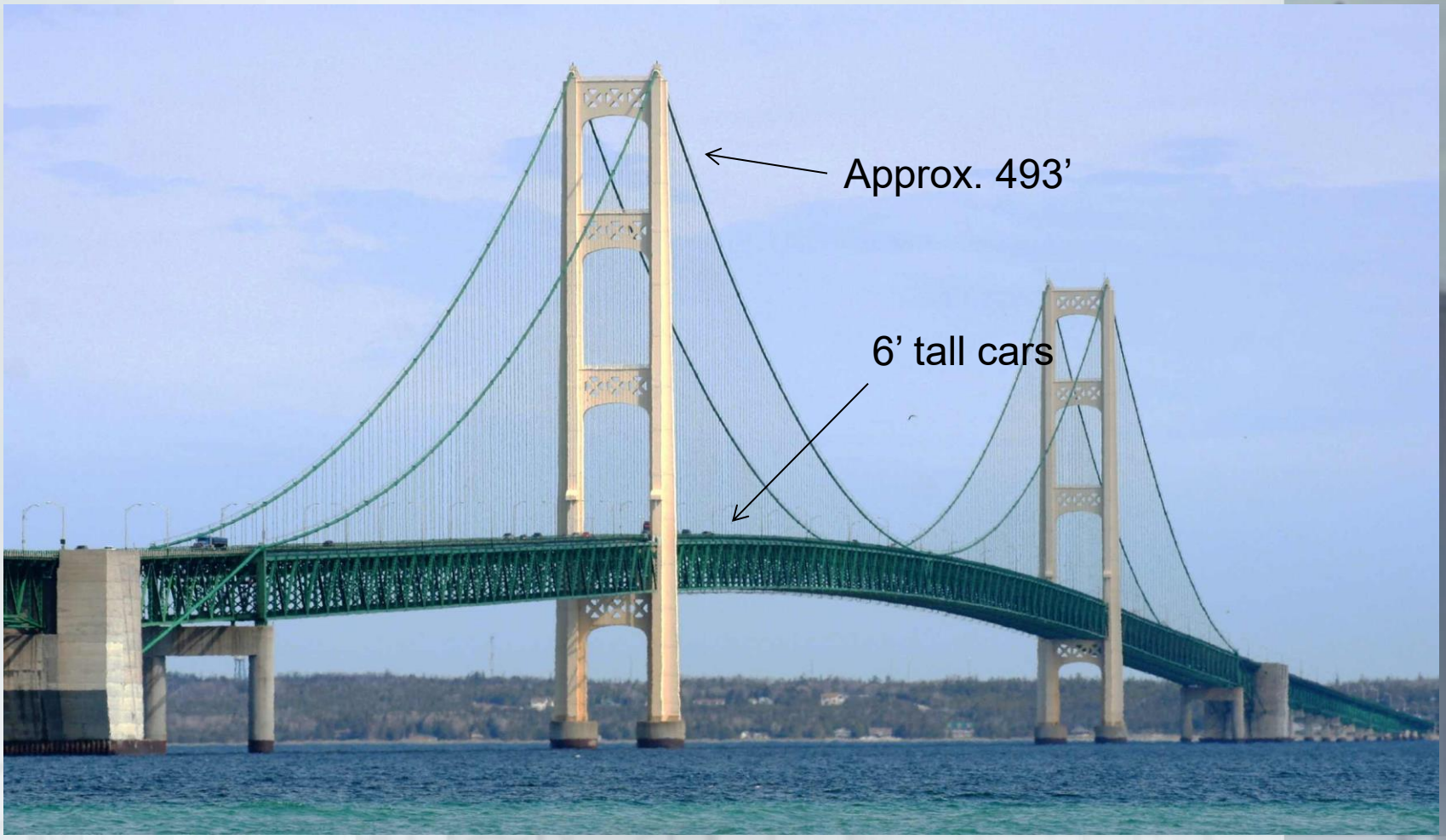


Delta County:

Current Delta County zoning is conducive to wind development on terms very favorable to the developer.

How big are they?

- These towers are 552’ above water



VESTAS V-100

1,139’ setback to home

BTW: newest turbine designs now 750+’ tall

Gamesa Turbine in Garden

DTE concedes visual impacts:

- **“Certainly there are some pristine places in Michigan where you don’t want to impact the viewshed…. You take a situation like Leelanau County or the Old Mission peninsula here in our region. Certainly there are areas where it just-while it would be perfect economic sense and perfect placement for utility turbines- we probably don’t want [them] as a region there.”**

-Steve Rawlings, DTE

DTE Echo Wind Plant
Huron County

Interesting:

Curiously, wealthy regions in Michigan like Leland and Centreville Townships in the Leelanau Peninsula have adopted very stringent wind ordinances without fanfare or protest despite a demographic that claims to heavily support renewable energy.

DTE Echo Wind Plant
Huron County

Qeustion:

So we have just heard that many people and places have deep concerns about wind development. Is there data revealing the nature and scope of the objections?

LBL Report:

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results

"In 2015, the U.S. Department of Energy funded Lawrence Berkeley National Laboratory (LBNL) to lead a 4-year project collecting data from a broad-based and representative sample of individuals living near U.S. wind power projects. The aim was to broaden the understanding of how U.S. communities are reacting to the deployment of wind turbines, and to provide insights to those communities considering wind projects."

https://emp.lbl.gov/sites/default/files/paw_summary_results_for_web_page_v6.pdf

LBL Report Concern:

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results

While the data appears sound, the impacts are severely diluted by including people up to 5 miles away from wind turbines. That is nearly an entire township away.

Note: We have never claimed that people that far away have any profound impact from wind turbine development.

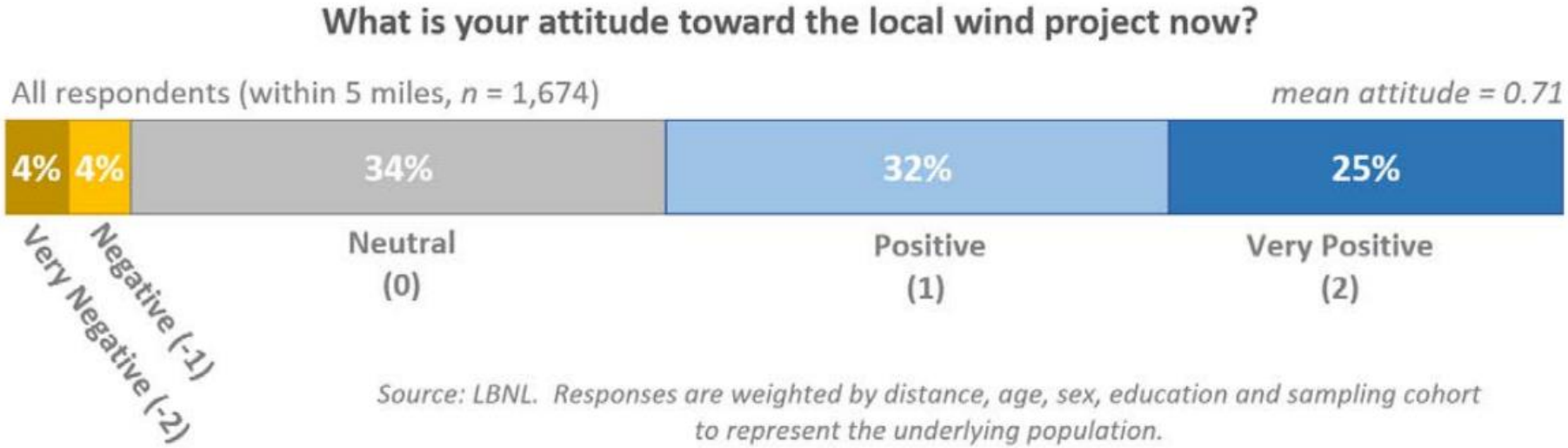
Fortunately LBL broke most of the data down into various distances which restores its' utility.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP | SUMMARY OF PROJECT RESULTS | emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



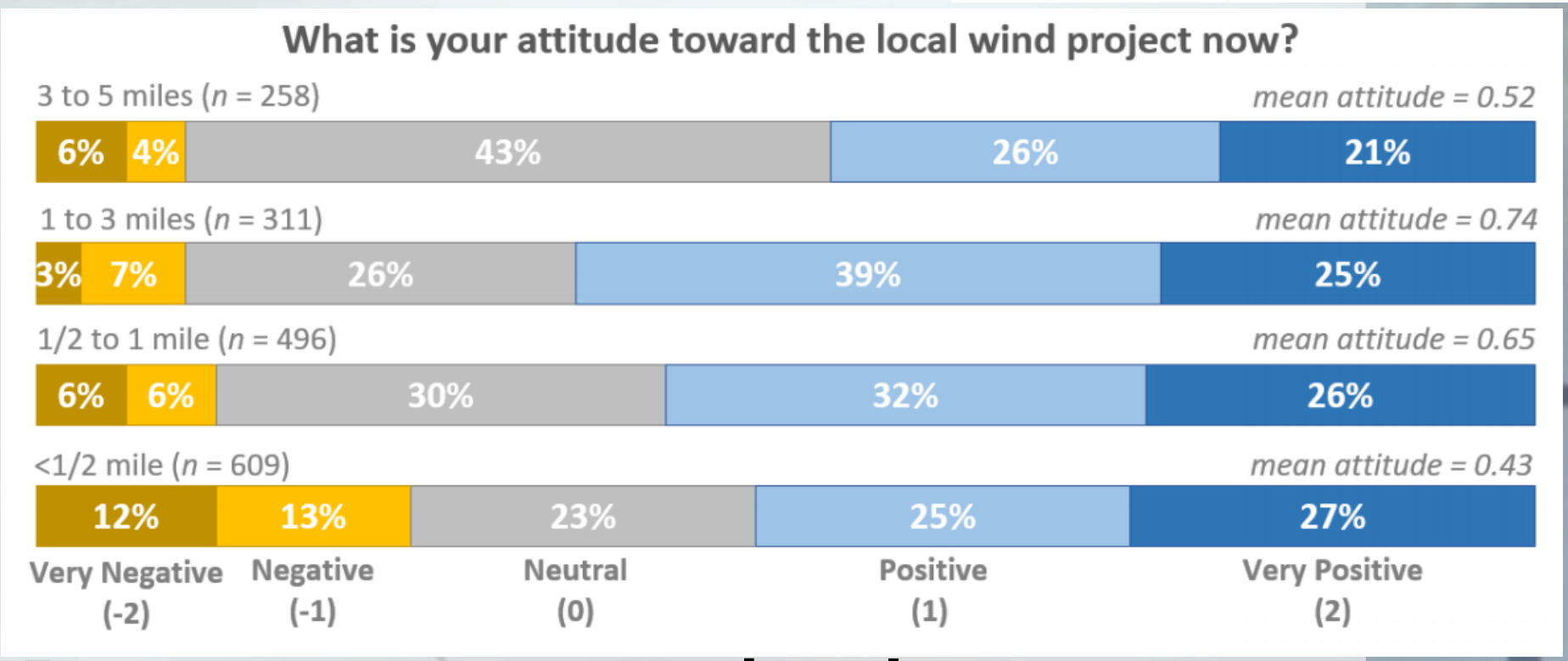
Wind companies only quote this part. It includes people up to 5 miles away from the project. It misleadingly suggests that almost no one objects.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP | SUMMARY OF PROJECT RESULTS | emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



But as you can see, the closer you are, the more negatively you view it.

1 of 4 within a half mile have a negative attitude.

What did LBL discover?

Note: Virtually everyone inside a project footprint will be within a half mile of a turbine.

This means 25% of the people living near turbines will not like it. That could be many hundreds of people.

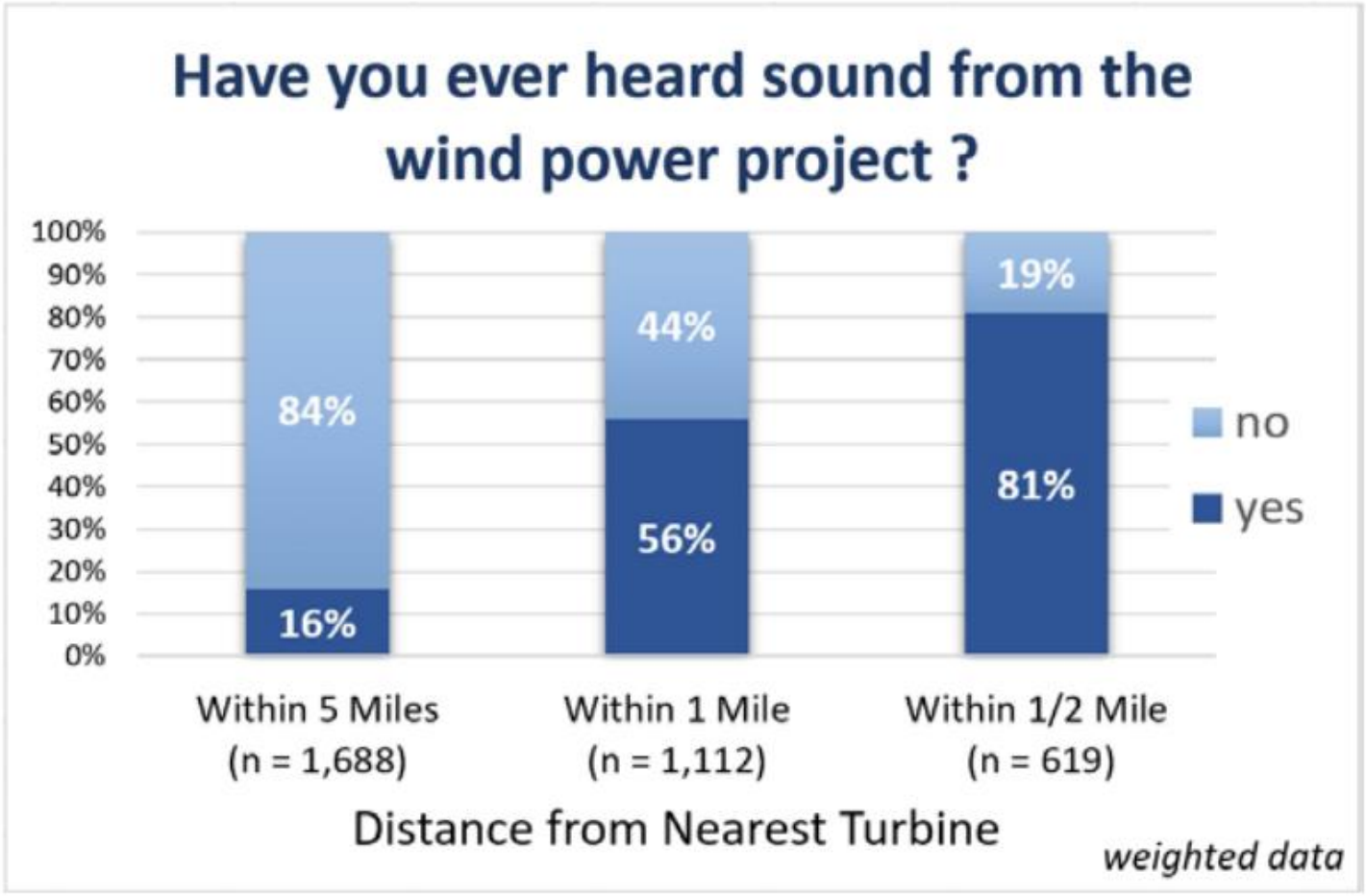
Currently, of course, 0% of the people without turbine development are annoyed.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP | SUMMARY OF PROJECT RESULTS | emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



Wind turbines are not silent.

What did LBL discover?

Those who reported ever hearing sound (16% of all respondents) were asked if they heard sound from the turbines from inside their home "with the windows open" or "with the windows closed."

- To the question of whether turbines can be heard with the windows open, 60% said yes, and 40% said no. Thus, 10% of all respondents (within 5 miles of a turbine) reported hearing turbine sounds inside their home with the windows open.
- To the question of whether turbines can be heard with the windows closed, 33% said yes, and 67% said no. Thus, 5% of all respondents within 5 miles of a turbine reported hearing turbine sounds inside their home with the windows closed.

Nearby turbine neighbors can hear turbines inside their homes with windows open and closed.

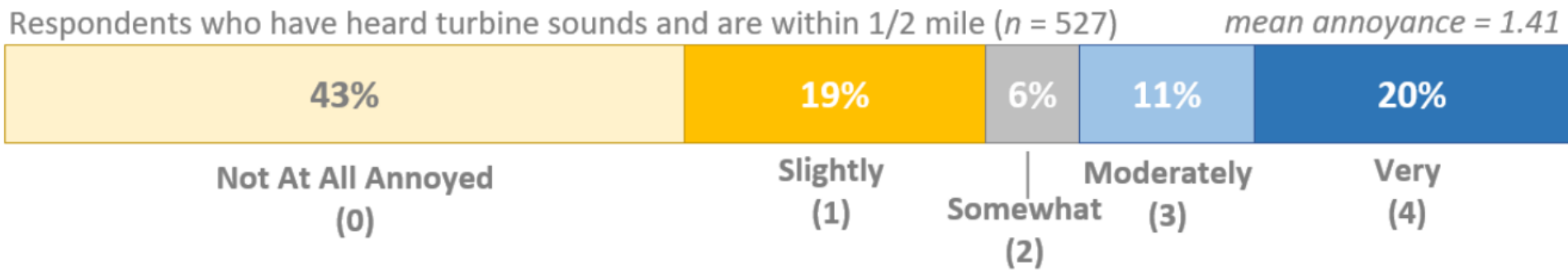
So if you stood under one and "didn't hear anything" it was not at full power.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP SUMMARY OF PROJECT RESULTS emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



Source: LBNL. Responses are weighted by age, sex, education and sampling cohort to represent the underlying population.

Figure 7: Distribution of respondents reporting annoyance to turbine sounds

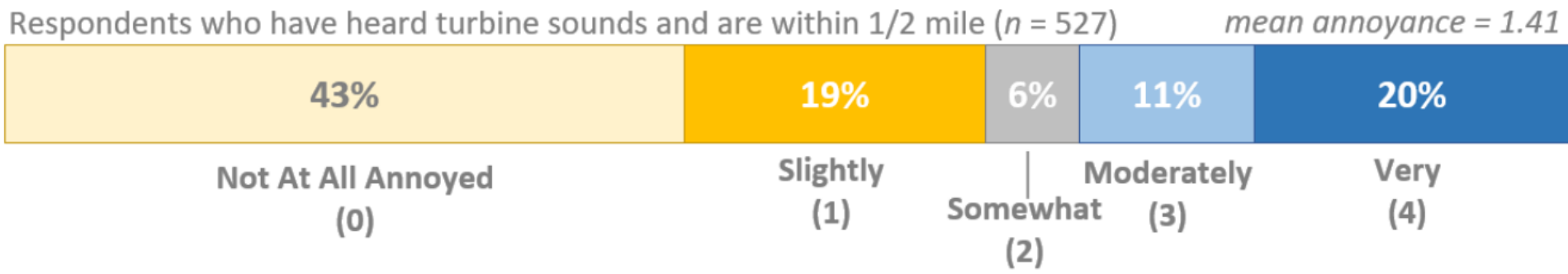
Of the 81% of people living within ½ mile who report being able to hear turbine sounds, 57% percent report annoyance and 31% are moderately to very annoyed.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP | SUMMARY OF PROJECT RESULTS | emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



Source: LBNL. Responses are weighted by age, sex, education and sampling cohort to represent the underlying population.

Figure 7: Distribution of respondents reporting annoyance to turbine sounds

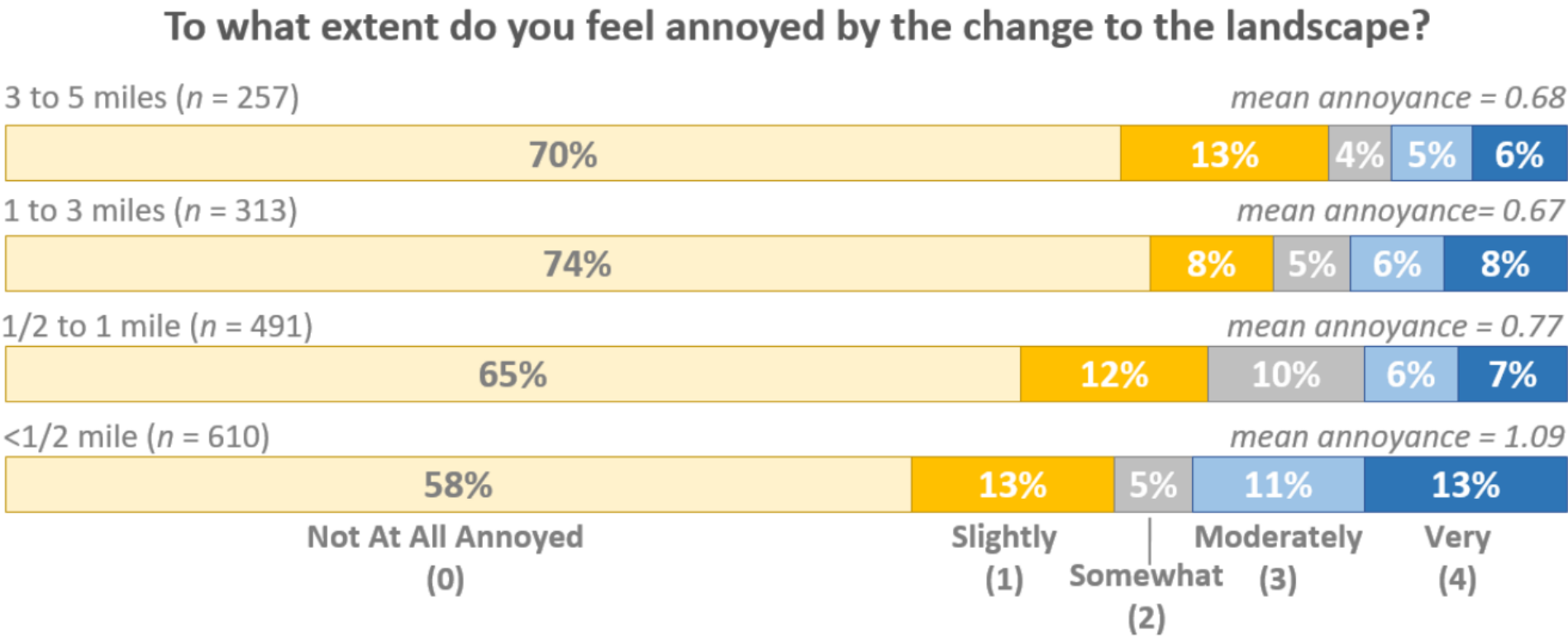
Again: currently 0% of communities without wind development annoyed by wind turbine sounds.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP | SUMMARY OF PROJECT RESULTS | emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



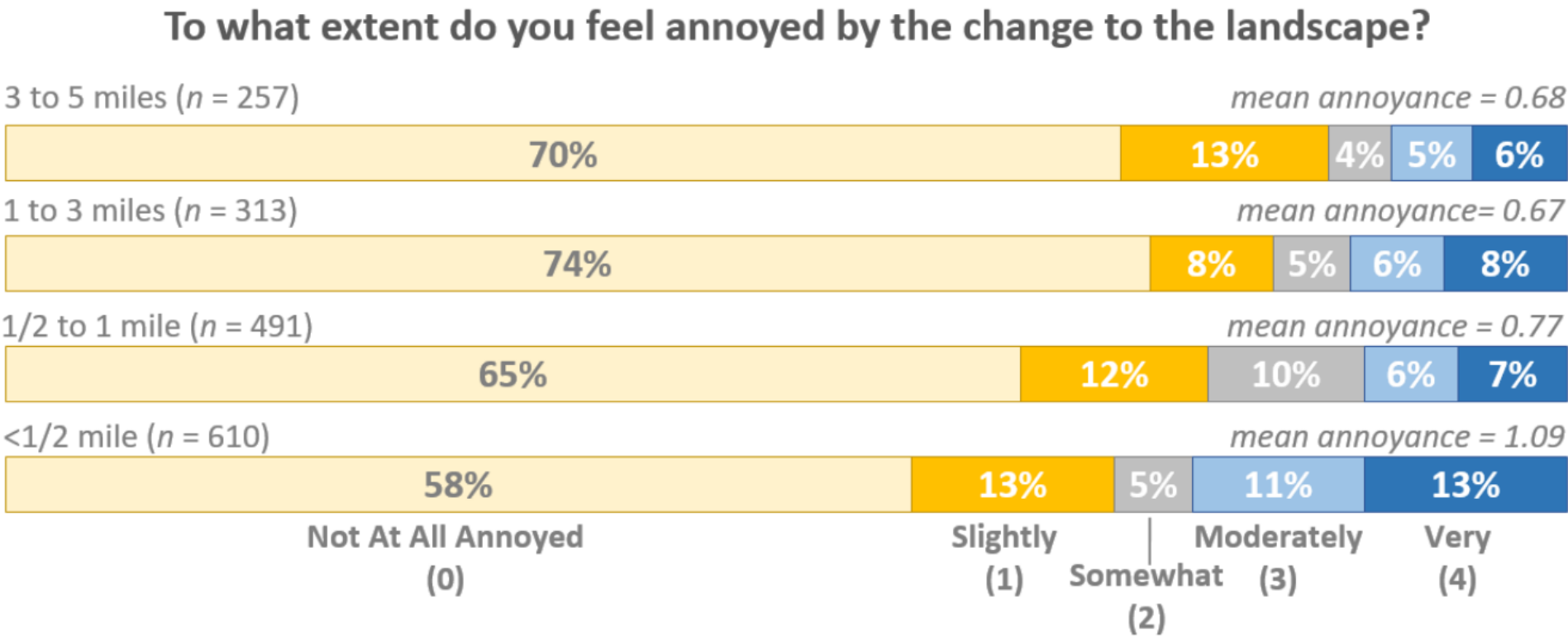
And a large percentage of people do not like the visual impacts of wind turbines, 42% within one half mile.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP | SUMMARY OF PROJECT RESULTS | emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



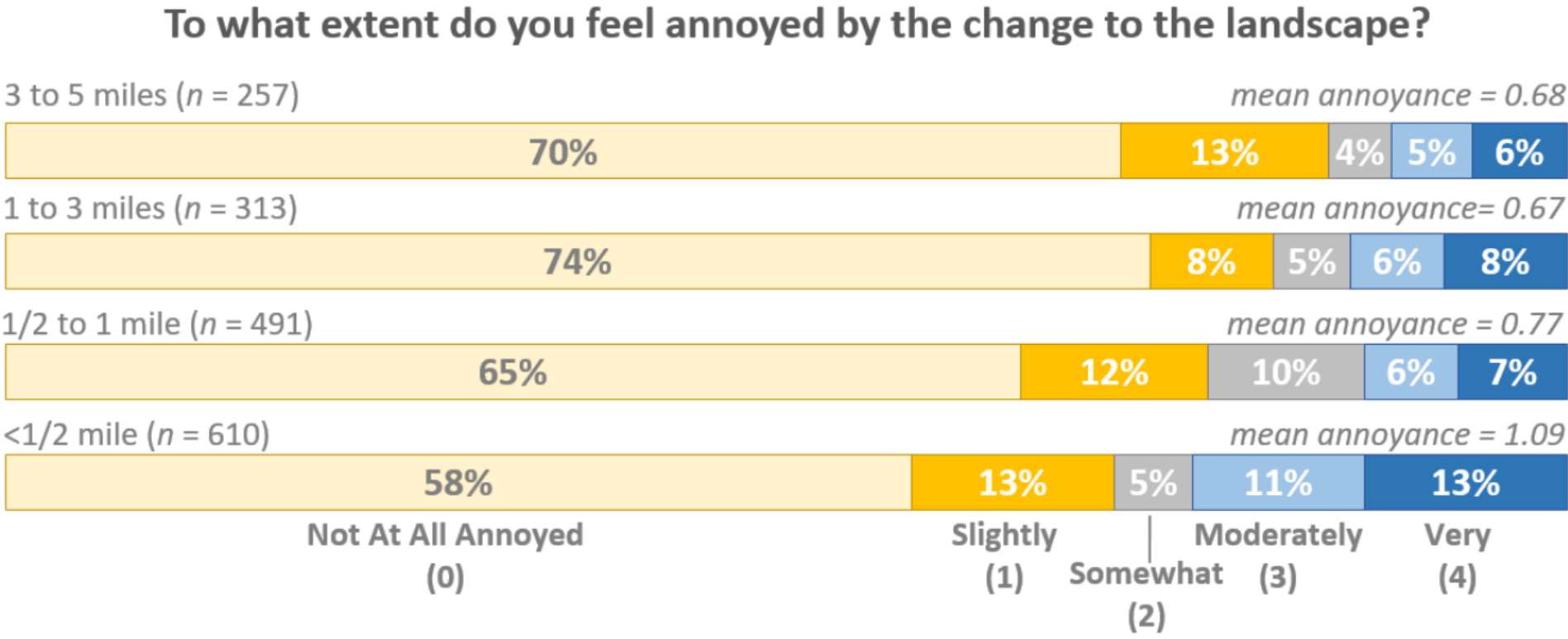
But even 3-5 miles away 30% of people are annoyed by the site of wind turbines.

What did LBL discover?

BERKELEY LAB Bringing Science Solutions to the World | ELECTRICITY MARKETS & POLICY GROUP | SUMMARY OF PROJECT RESULTS | emp.lbl.gov

January 2018

National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results



Again: no one is annoyed by wind turbine landscape impacts where they do not exist.

My point:

LBL's study has validated everything I have been saying for years:

1. **Wind turbine noise is loud enough to be heard inside homes.**
2. **A large percentage of people living within a mile of wind turbines are annoyed by both the sight and sound of turbines**
3. **Even at a great distance, wind turbines are a visual stigma to many turbine neighbors**

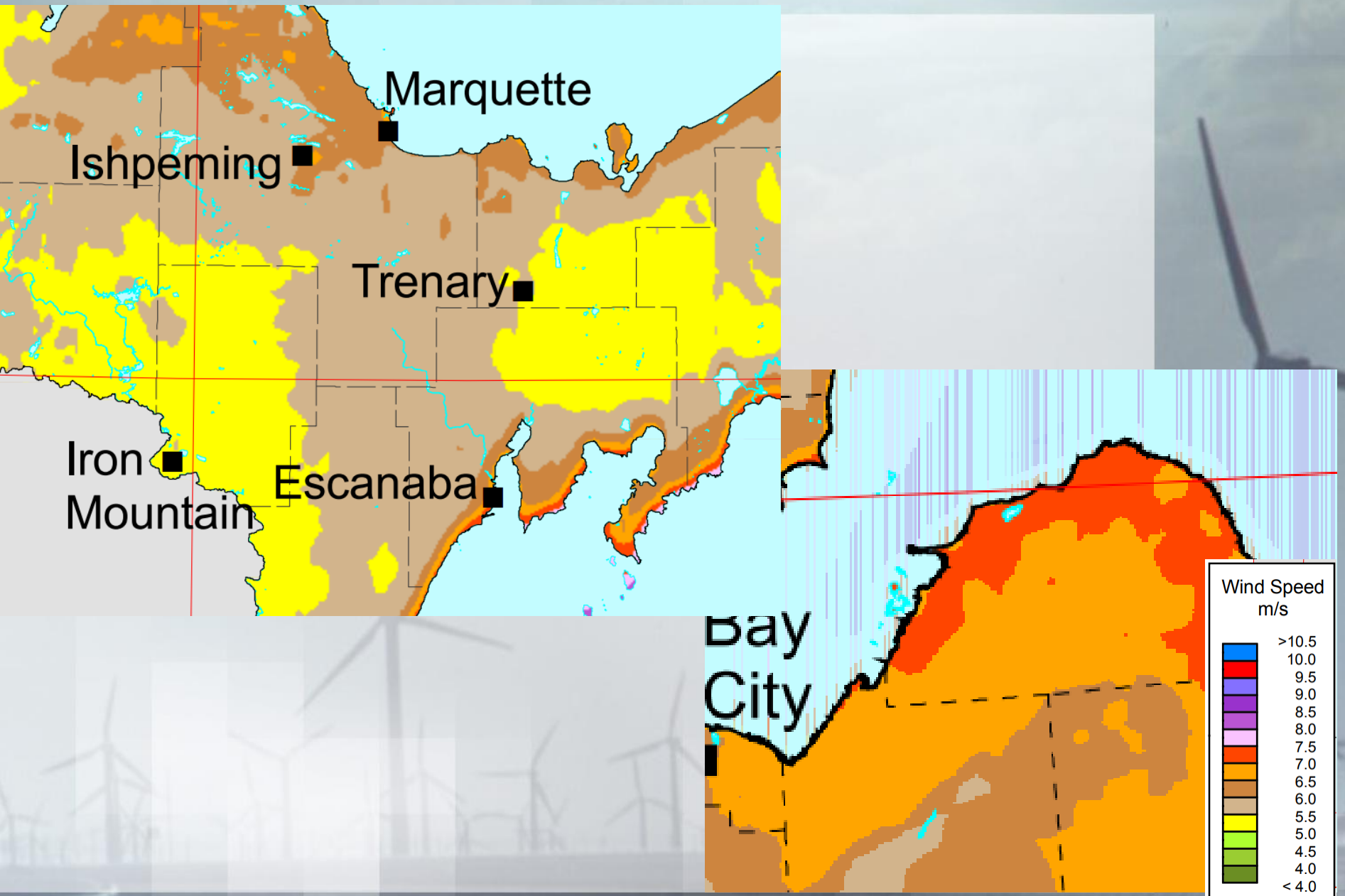
Why should you care?

The history of wind development across Michigan is one of dissent, division, litigation and political upheaval.

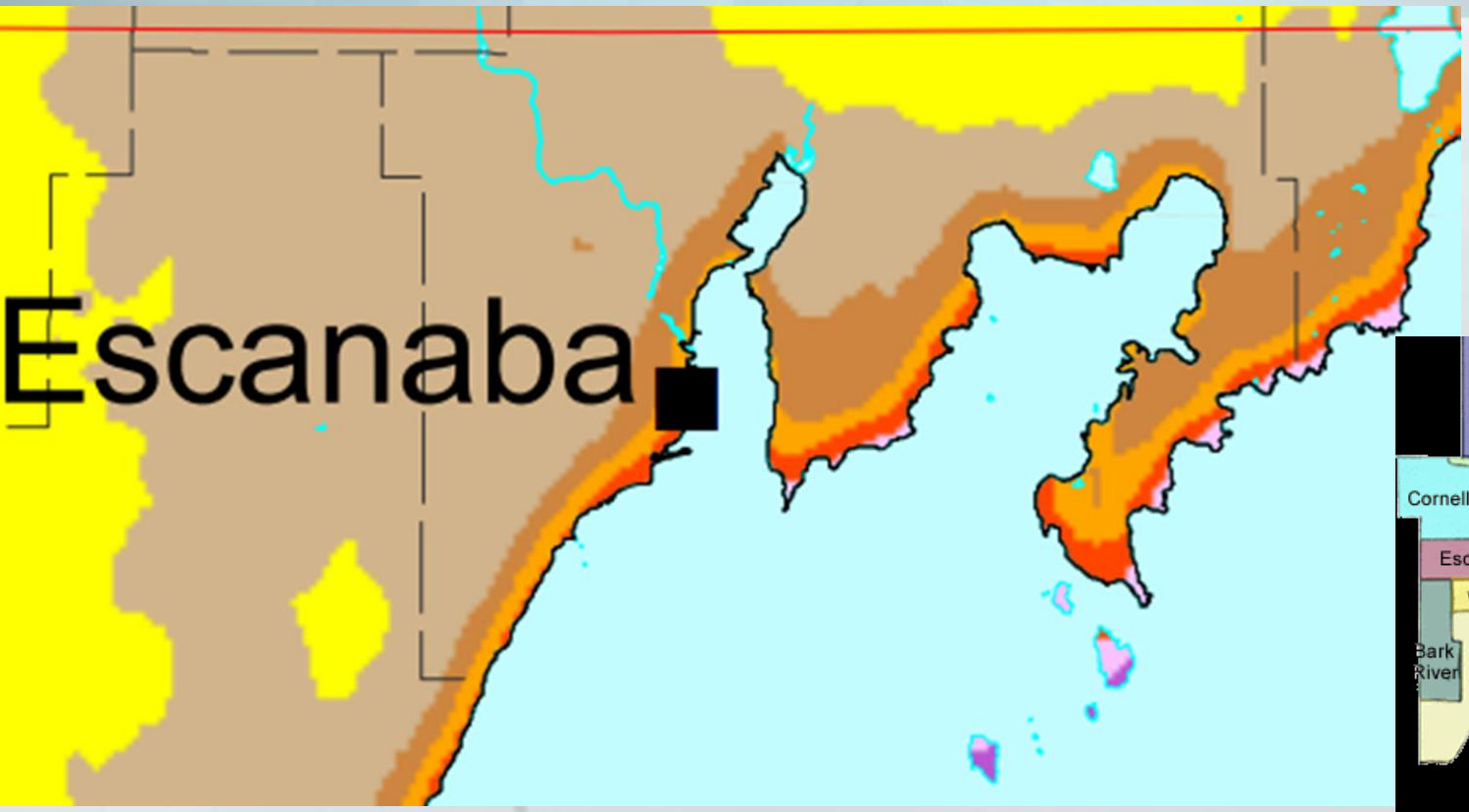
And as wind companies are driven out of stronger wind regions, areas once thought safe from development are now being targeted.

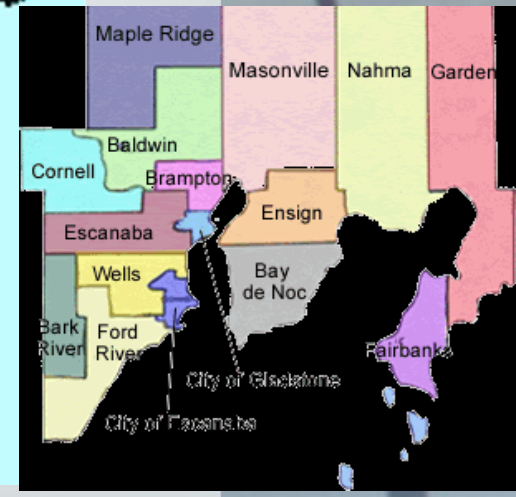
Experience shows us that the best way to protect your community from this conflict is to adopt zoning regulations before the first lease is ever signed.

UP vs. HC wind:


Marquette
Ishpeming
Trenary
Iron Mountain
Escanaba
Bay City
Wind Speed m/s
>10.5
10.0
9.5
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
< 4.0

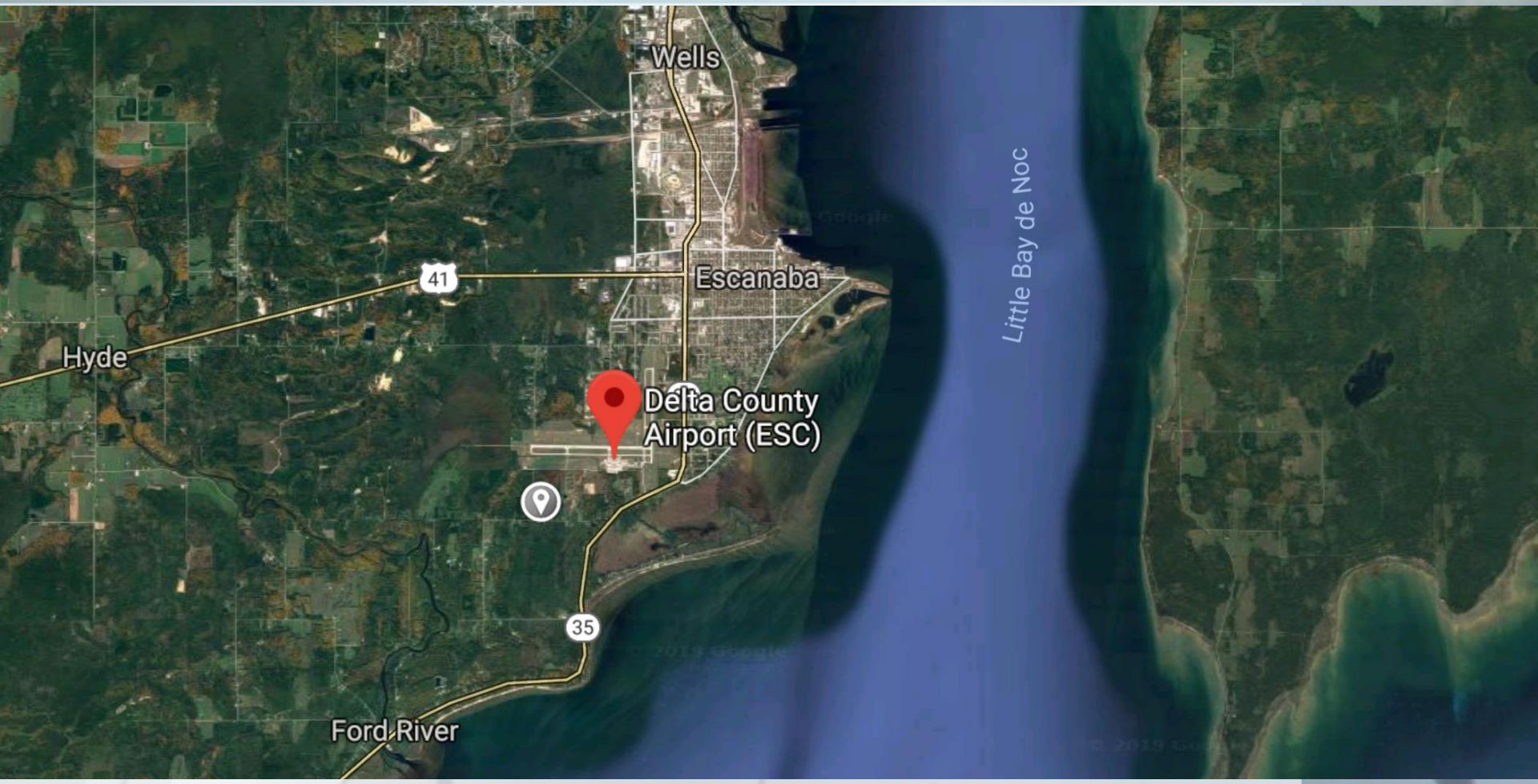
And:





Substantial regions in Delta County have adequate wind resources for wind development. And as wind developers are being driven out of the Thumb and Bay Regions, marginal regions being target by wind developers.

And:



Depending upon airport zoning and FAA determinations, the airport does offer some protection from wind development.

However:

Wind developers routinely flaunt airport zoning and FAA regulations.

They will not hesitate to ratchet up pressure on airport zoning boards.

And FAA determinations of hazard alone are not enough to protect some airports. Developers have built in spite of those determinations.

Is there any good news?

I believe that reasonable wind energy zoning regulations driven by the principles of *consent* and *compensation* can place the burden of deciding whether a given community hosts utility scale wind development upon the wind developer rather than the zoning authority.

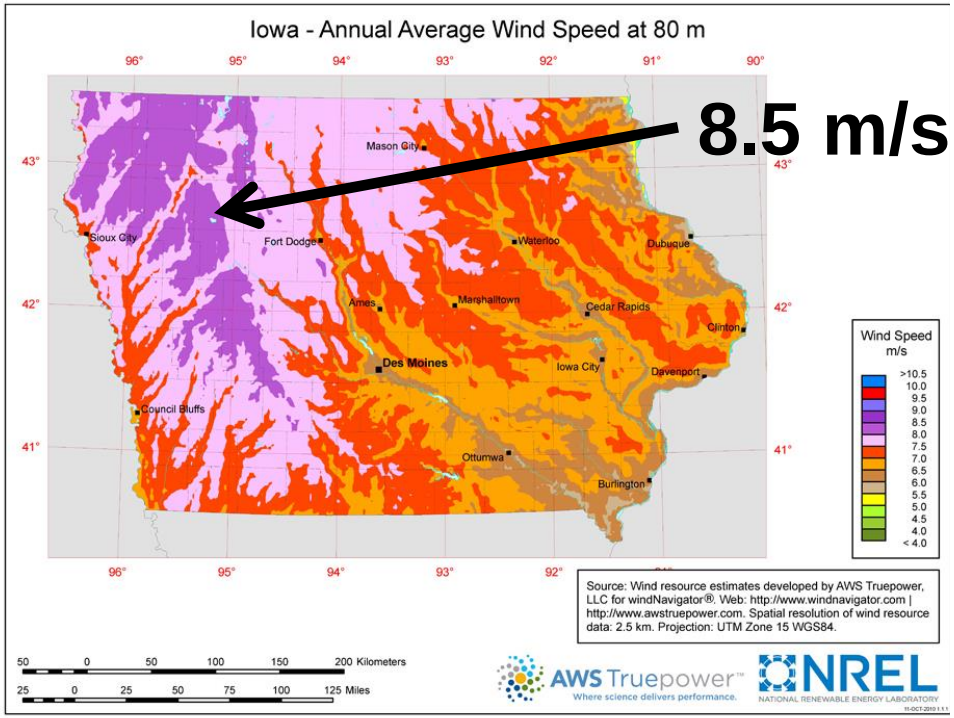
This is the key to stopping the division and rancor.

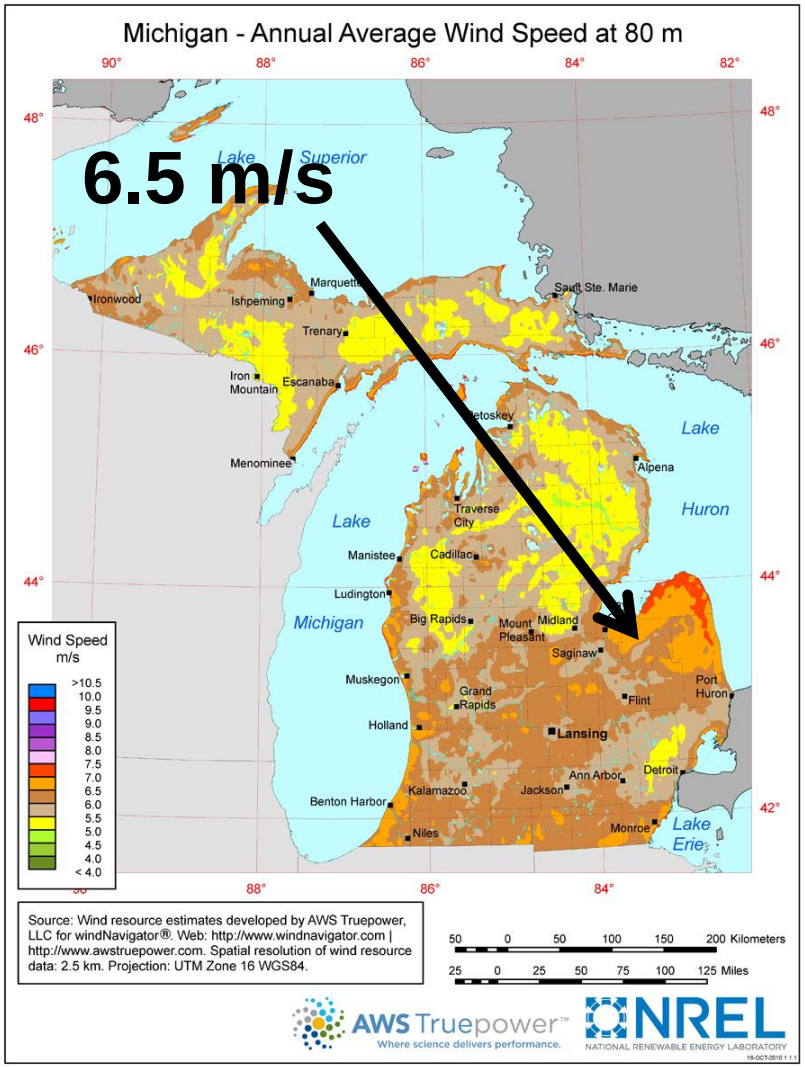
A couple non-zoning matters:

As noted already, wind developers like to sell communities and lease holders on the economic advantages of wind development as a tool to gain approval for their projects.

Let's briefly analyze wind economics from the macro level.

MI wind noncompetitive

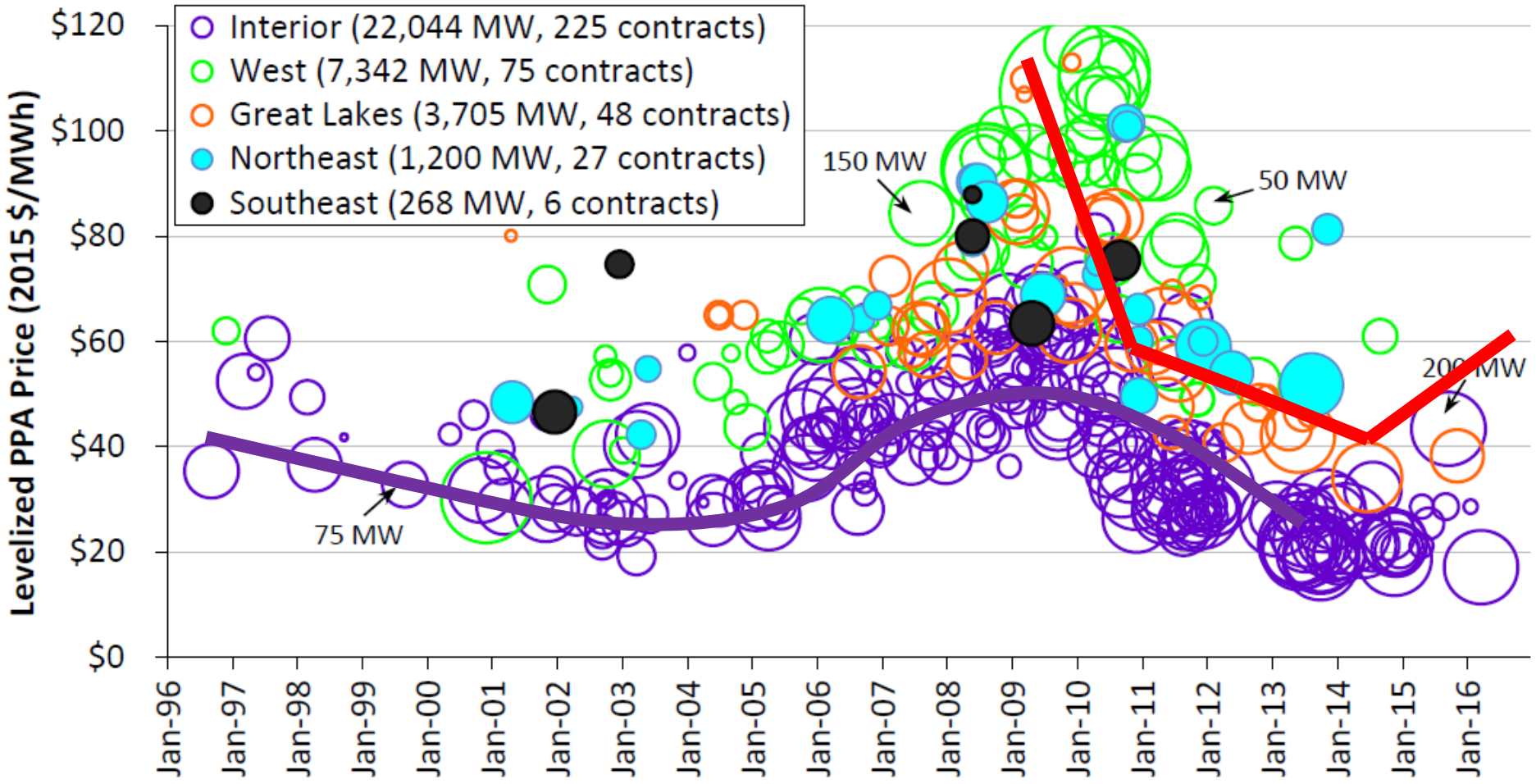




IA has large regions of 8.5m/s wind potential. MI has none, even @ 100m.

IA will produce ~2x the energy from each turbine as MI, <u>a permanent 2:1 price disadvantage for MI</u>

Red: Michigan
Purple: MISO Peers



MI wind remains very expensive relative to peers.

MI PPA prices vs. the Prairie States

Weighted Average Cost Comparison		
Commission Approval	**Company Owned**	**Power Purchase**
2015	$50.00	$45.00
2014	N/A	N/A
2013	$55.95	$50.04
2012	$52.50	$49.25
2011	$67.16	$60.90
2010	$104.00	$97.33
2009	N/A	$115.00
Total	**$74.49**	**$73.58**

MI wind contracts average $75.00/MWh.

https://www.michigan.gov/documents/mpsc/PA_295_Renewable_Energy_Report_2-12-16_514511_7.pdf

MI PPA prices vs. the Prairie State

Figure 3: Bidders for the Missouri Utilities Latest Wind RFP – *Who are the Players?*

Bid/Wind Project	MW Bid	Price ($/MWh)	Price Fixed or Escalating	Location
Apex - Grant Plains	50	$ 21.95	Fixed	Grant County, OK
AV3 - Green Hills	64	$ 50.00	Esc. - 1.0%	MO
Duke - Fronties City	200	$ 17.20	Esc. - 2.5%	Kay County, OK
Duke - Fronties City	150	$ 17.35	Esc. - 2.5%	Kay County, OK
Duke - Fronties City	100	$ 17.50	Esc. - 2.5%	Kay County, OK
Duke - Fronties City	200	$ 20.99	Fixed	Kay County, OK
Duke - Fronties City	150	$ 21.24	Fixed	Kay County, OK
Duke - Fronties City	100	$ 21.49	Fixed	Kay County, OK

https://neo.ubs.com/shared/d1Cr2SzL8AK/

Yet our cheapest contracts are TRIPLE the price of contracts offered in Missouri. Michigan wind energy offers no advantage to ratepayers.

CMS Concurs:

"In its report to state regulators, [Consumer's Energy] said it believe[s] that opposition to wind farm developments in Huron County, and poor wind speeds in counties west of the Thumb region, mean that "wind built in Michigan may not be cost-effective or a feasible option."

*https://www.michigancapitolconfidential.com/michigans-local-wind-farm-opposition-may-drive-new-developments-to-iowa

What about CO2?

People concerned with CO2 emissions talk about the "social cost of carbon".

The Obama administration calculated that the economic harm of CO2 emissions is $40/ton* of CO2 emitted.

*http://www.sciencemag.org/news/2017/08/trump-s-attack-social-cost-carbon-could-end-hurting-his-fossil-fuel-push

MISO on CPP and wind mitigation:

Reference case & Phase 1 scenarios

Scenario	EPA Assumptions and Methodology	Cost per ton of CO_2 reduction ($/ton) *
Reference Case	MISO's MTEP-15 Business As Usual future assumptions**	-
Building Block 1	In 2020, apply a 6% heat rate improvement to all the coal-fired units at a capital cost of $100/kW (amortized over 10 years).	5
Building Block 2	Calculate and enforce, starting in 2020, a minimum fuel burn for existing CC units to yield an annual 70% capacity factor.	53
Building Block 3	Calculate and add the equivalent amount of wind MWs to meet the incremental regional non-hydro renewable target.	237 Present value calculation for costs is the driver for the higher cost.
Building Block 4	Calculate the amount of energy savings for the MISO footprint and incorporate it as a 20-year EE program in the model.	70
All Building Blocks	Application of all building blocks.	60

http://www.eenews.net/assets/2014/09/18/document_ew_01.pdf

Wind benefits 1

People often ask "Why don't you mentions the benefits of wind development?"

There is a substantial financial benefit for wind developers both in terms of guaranteed energy sales as well as long term tax sheltering from the Production Tax Credit for Wind Energy.

Wind benefits 2

The second benefit is local lease payments and some increased tax revenue.

But these benefits must be placed inside a larger context.

$$$ vs. Land Use

Wind developers often speak of promises of great financial benefit to landowners and township or county coffers as an inducement for permissive wind energy zoning.

(They do this even though tax revenue is an erroneous zoning criteria.)

Remember:

Not only are revenue factors irrelevant, all the financial promises made to your community in the form of new taxes and landholder lease payments are recovered from Michigan ratepayers, employers and from the US Treasury.

There is no free lunch.

In other words:

Save the family farm?

There are ~56,000 farms in MI.
My best guess is that around 500 farmers have a wind turbine and get the big "turbine host" check.

That means less than 1% of Michigan farms receive substantial wind $$$.
The other 99% of farms pay for the 1%'s benefit through higher utility bills, especially energy intensive dairy operations.

Wind is land use intensive:

- **Fermi II Reactor- ~1100 Mw**

1100 MW from wind at 3.6 MW/sq mile w/30%CF

2 Vestas V-100 turbines per square mile

....and a couple of these for July, August, etc.

Or, 36 Square miles of this…

...could be equaled by one of these:

TM2500 Mobile Gas Turbine Generator

- Output: 21.8 MW @ 50 Hz; 22.8 MW @ 60 Hz (ISO)
- Dual Frequency – 50/60 Hz quick conversion (no reduction gear)
- Heat Rate: 9800 Btu/kW-hr @ 50 Hz; 9500 Btu/kW-hr @ 60 Hz (ISO)
- Voltage: 11.0kV (50Hz); 13.8 kV (60Hz)
- Liquid or natural gas fuel capability
- Brush Air-cooled 2-pole generator with brushless excitation
- Multiple units started/controlled through a single desktop PC
- Low emissions with demineralized water injection 25 ppm (gas); 42 ppm (liquid)
- Woodward Micronet® control system
- Inlet air heating/cooling provisions
- Electro-hydraulic starting system
- Single unit footprint ~110' x 70'
- Sound level at 3 ft. 90 dBA

Zoning for wind:

Michigan has over 1,500MW of wind turbines installed

In 2008 the State recommended 1,000' setbacks from homes and 55dBa noise limits. Although it was not a binding recommendation it became an informal standard often proposed by wind developers.

What have we learned since then?

Why do we zone?

MI Zoning Enabling Act:

"A zoning ordinance shall be based upon a plan designed to promote the public health, safety and welfare…"

Put another way: if the proposed activity cannot be performed in our communities in keeping with Health Safety and Welfare, it must not be permitted.

REMEMBER: A d*eveloper's primary commitment is to bottom line and their "recommendations" are designed to maximize ROI*

Or:

Put another way: if the proposed activity cannot be performed in our communities in keeping with <u>Health Safety and Welfare</u>, it must not be permitted.

REMEMBER: A d*eveloper's primary commitment is to bottom line and their "recommendations" are designed to maximize ROI*

But a planning official's single commitment must be to H, S and W

Limits to zoning:

- **Zoning regulations must have a rational relationship to protecting H, S and W.**
- **They must not be arbitrary or capricious.**
- **If a zoning regulation meets those criteria it is almost unassailable in court**

Remember: Reasonable zoning is strong!

Regulating wind installations:

There are many impacts associated with placing utility scale wind turbines in proximity to human habitation.

The most common are height, physical setbacks and noise limits.

Others may include aviation impacts, RF interference or environmental impacts like birds and bats.

I will mainly focus on height, setbacks, noise, property values and decommissioning.

Typ. developer recommendations:

1. 500’ height limit
2. 45-55dBa at homes
3. 1,320’ setbacks to homes
4. 30 hours shadow flicker
5. 1.1 setback to property lines and roads

Height Limits

- In general communities are free to regulate the height of structures simply on the basis of appearance.
- Many zoning ordinances restrict homes to only 2 or 3 stories even though 4 or 5 story homes can be built safely.
- Wind turbines are no different than any other lawful use. You may restrict their size for the sake of appearance.

We regulate billboards on appearance:

"The purpose of regulating signs in the county is to provide for a visually pleasant environment and minimize potentially unsafe conditions while also offering opportunities for public and private information and advertising." SCZO

So how tall is too tall?

Just like any other land use, it's up to you.

Worldwide setbacks & "industry standard":

Table I. Safety distances of wind turbines from human structures as practiced in different regions of the world.[17]

Authority/source	Safety distance [m] (ft)
France	1609 (5280)
Germany	1609 (5280)
Rural Manitoba, Canada (1981)	(6500)
US National Research Council	762 (2500)
IL, USA	457 (1500)
Riverside County, CA, USA	**3218 (10560)**
MI, USA	**304 (1000)**

Source: Analysis of throw distances of detached objects from horizontal-axis wind turbines, Sarlak and Sorenson, *Wind Energy* 2016

Minimum Setbacks-who to trust?

- **From Vestas "Health & Safety Instruction":**

  "If a runaway operation should occur, the plant must be evacuated immediately by running upwind, and access to the surrounding area in a radius of at least **500 metres** must be restricted"-**1640'**

- **Nordex:**

  "In case of a fire in the nacelle or on the rotor, parts may fall off the wind turbine. In case of a fire, nobody is permitted within a radius of 500 m from the turbine**."-1640'**

In real life? ~1500' Debris Field

Sense of scale:

Safety manuals:

- **My earlier slide quoted safety and operations manuals from Nordex and Vestas.**
- **Wind developers now claim that the basic safety information in those manuals is proprietary and they will not release them to planning commissioners.**
- **We feel that responsible wind ordinances should require the submission of those documents in un-redacted form.**

Ice Throw Jan 23rd, 2018:

Skylight damaged when ice flies off wind turbine at Mount Wachusett Community College

MOST POPULAR

1. Sewage backup creates bad smell at public housing complex in Worcester
   Jan 23 at 8:58 PM
2. Judge reverses decision blasting Worcester police promotions
   Jan 24 at 5:45 AM
3. Skylight damaged when ice flies off wind turbine at Mount Wachusett Community College
   Jan 24 at 9:28 AM
4. Icy conditions prompt 2-hour delay for Worcester schools on Wednesday
   Jan 24 at 9:21 AM

▲ HIDE CAPTION

One of the two wind turbines at Mount Wachusett Community College in Gardner, with the school's new science complex in the foreground. [T&G File Photo/Rick Cinclair]

Wind Energy paper on throw events:

Wind Energy

WIND ENERGY
Wind Energ. 2016; **19**:151–166
Published online 19 February 2015 in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/we.1828

RESEARCH ARTICLE

Analysis of throw distances of detached objects from horizontal-axis wind turbines

Hamid Sarlak and Jens N. Sørensen

Section of Fluid Mechanics, Department of Wind Energy, Technical University of Denmark, DK-2800 Lyngby, Denmark

Wind Energy paper on throw events:

"It is found that, while at tip speeds of about 70 m/s (normal operating conditions), pieces of blade (with weights in the range of approximately 7-16 ton) would be thrown out less than 700m [2,300'] for the entire range of wind turbines, and turbines operating at the extreme tip speed of 150 m/s may be subject to blade throw of up to 2 km [1.2 miles] from the turbine. For the ice throw cases, maximum distances of approximately 100 [328'] and 600 m [2,000'] are obtained for standstill and normal operating conditions of the wind turbine, respectively, with the ice pieces weighting from 0.4 to 6.5 kg. The simulations can be useful for revision of wind turbine setback standards, especially when combined with risk assessment studies"

This peer reviewed paper published in an wind industry journal demonstrates that ice throw and component liberation are real risks inside a range of distance from 328' for a standing-still turbine up to 1.2 miles for blade throw during an overspeed event.

Developer's wishes:

Despite published safety data like that in the earlier slides,

wind developers routinely demand turbine setback distance ranging from 1,000 to 1,400' from neighboring homes (not property lines), leased or unleased, for turbines in the 400-500' class.

The root of the conflict: Trespass Zoning

By demanding that the setbacks distances for wind turbines be measured from home on adjacent properties rather than from the property line (which is typical of virtually all other land use regulations) the wind developer is in essence asking the regulatory body to grant them an easement or trespass privileges on unleased property.

We call this Trespass Zoning.*

https://limaohio.com/opinion/columns/167093/william-j-seitz-and-kevon-martis-trespass-zoning-is-wind-energys-secret-subsidy

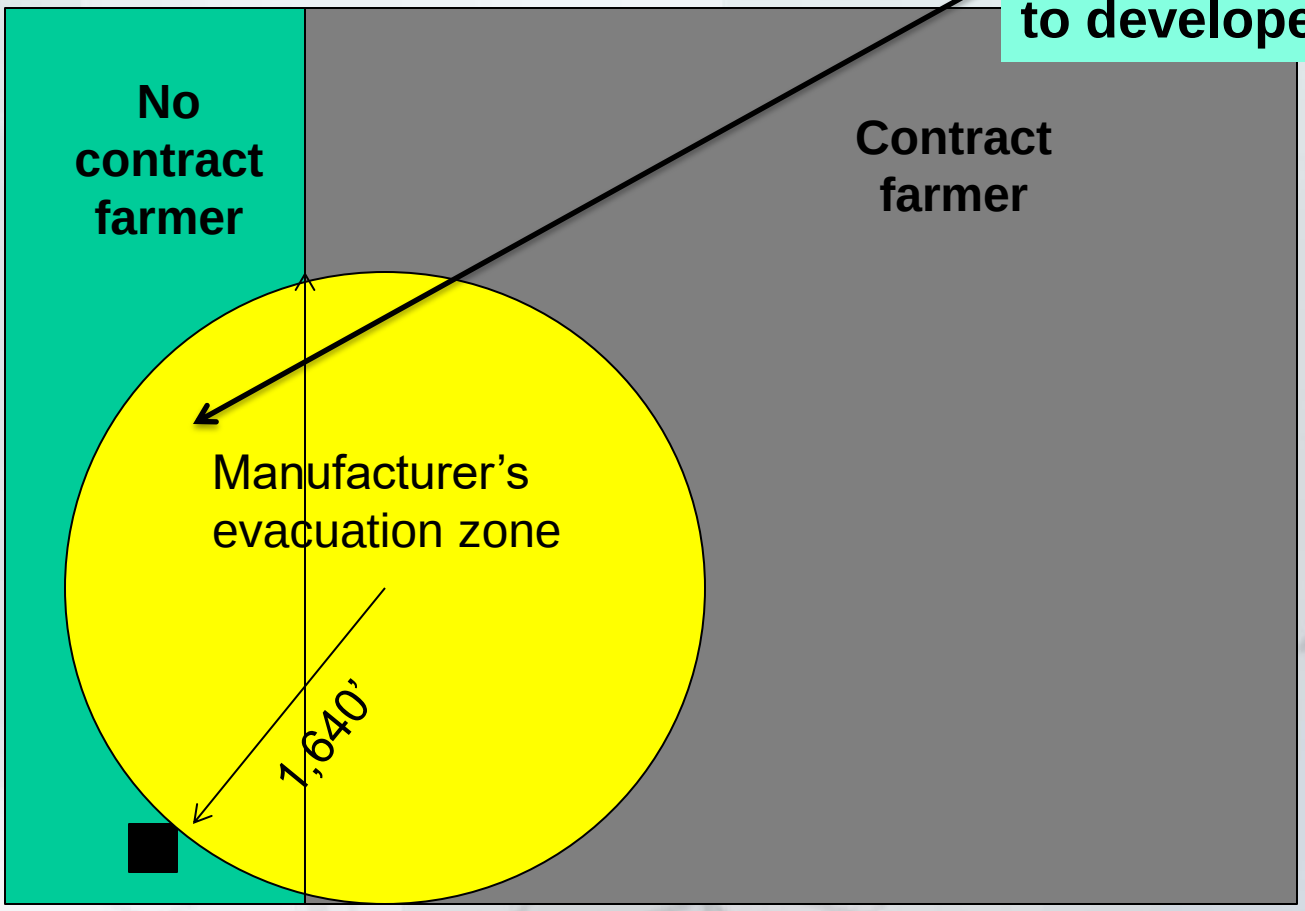
Trespass Zoning:

(Not to scale)

Setback to structure:

(Not to scale)

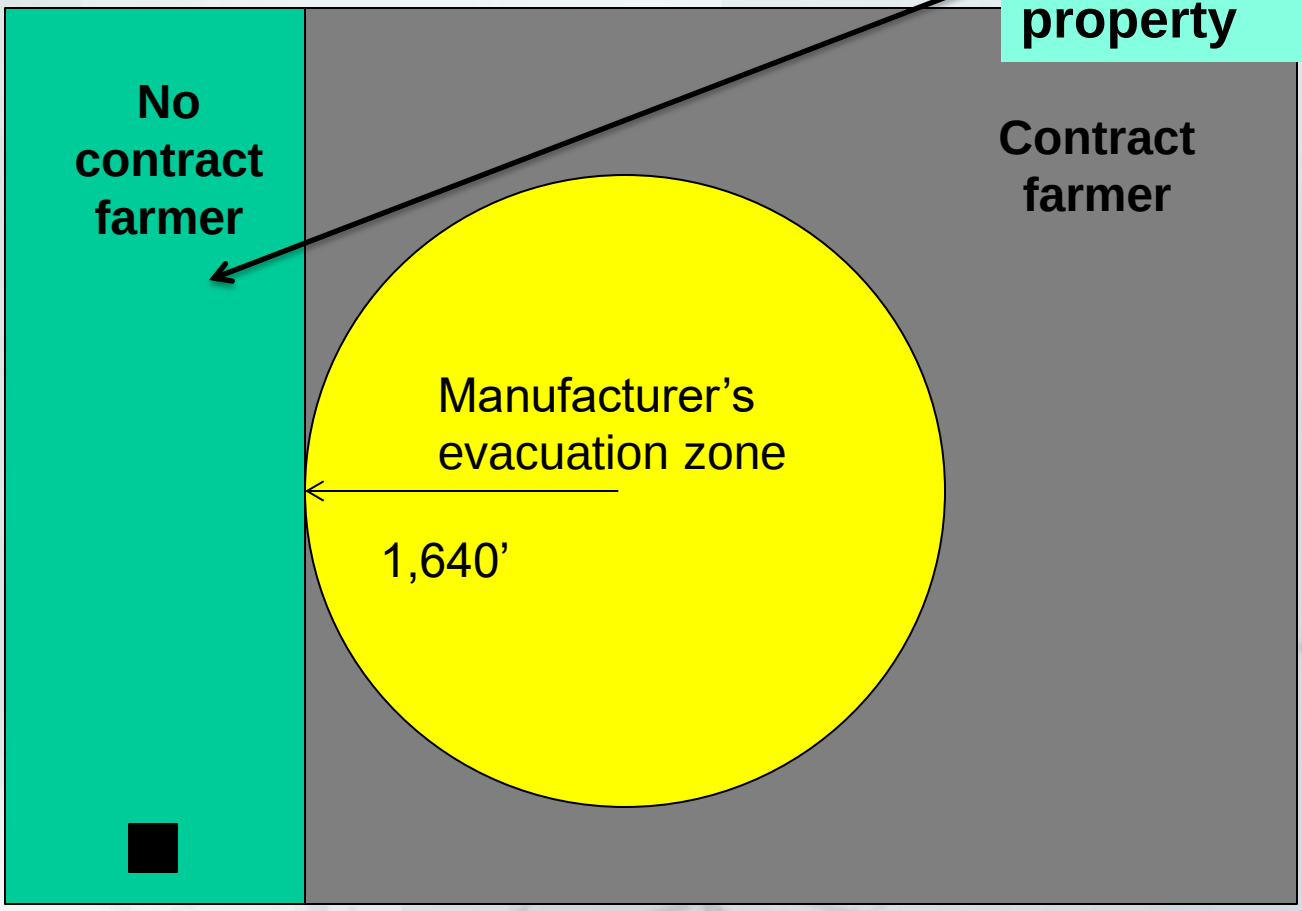
Green "no contract" farmer gives future development rights to developer for free



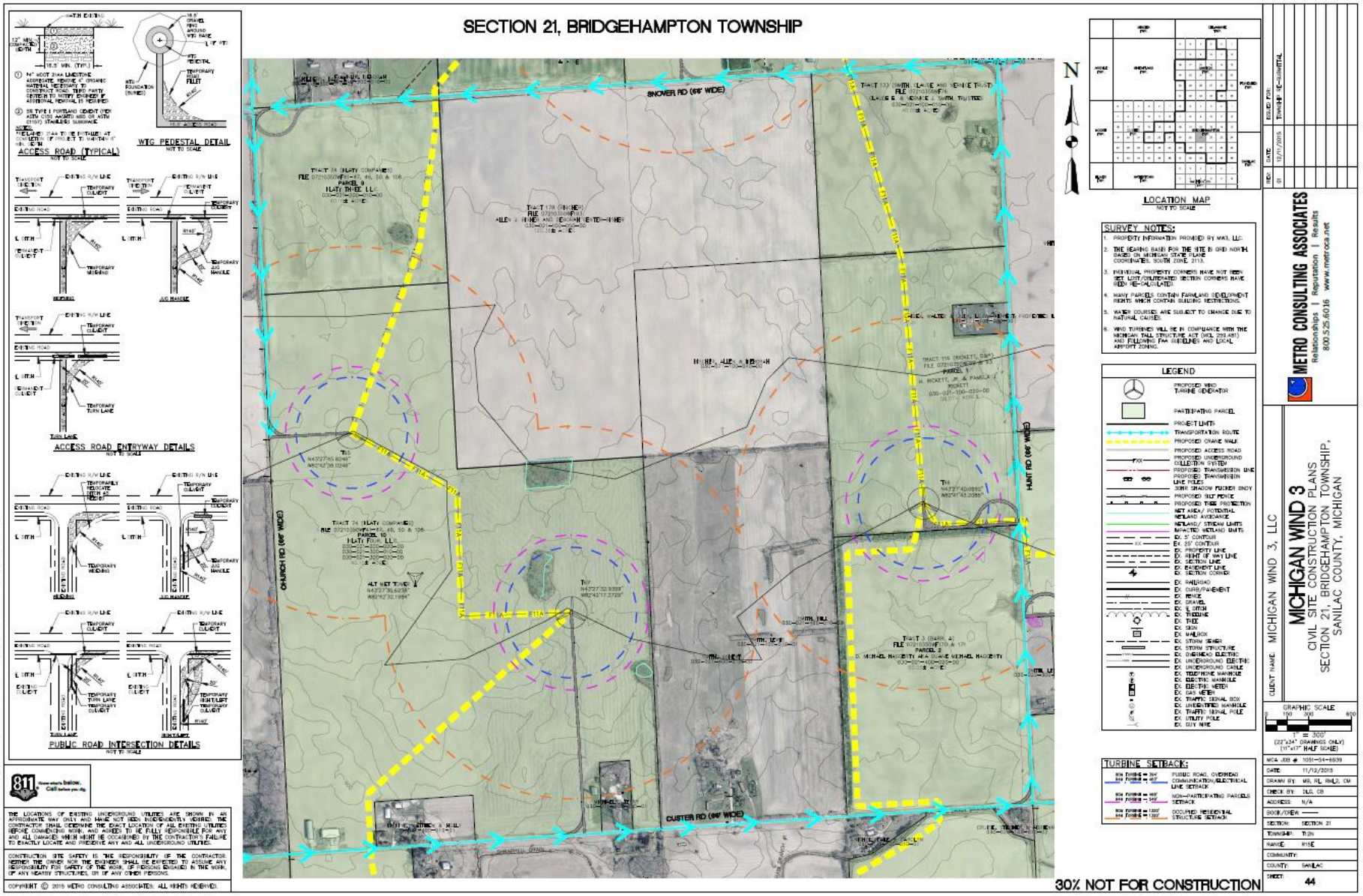
Setback to property line:

(Not to scale)

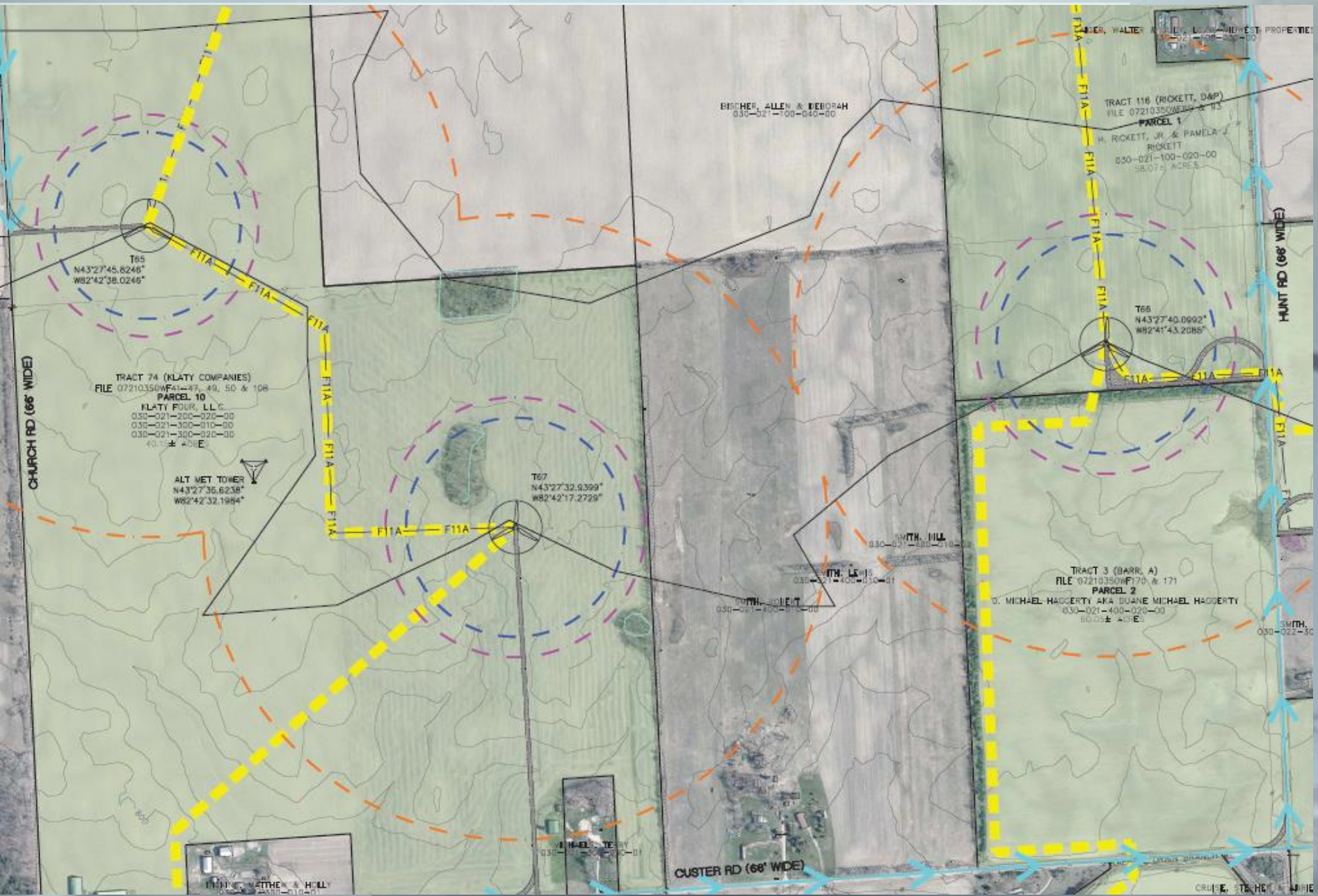
Green "no contract" farmer can safely build on his whole property



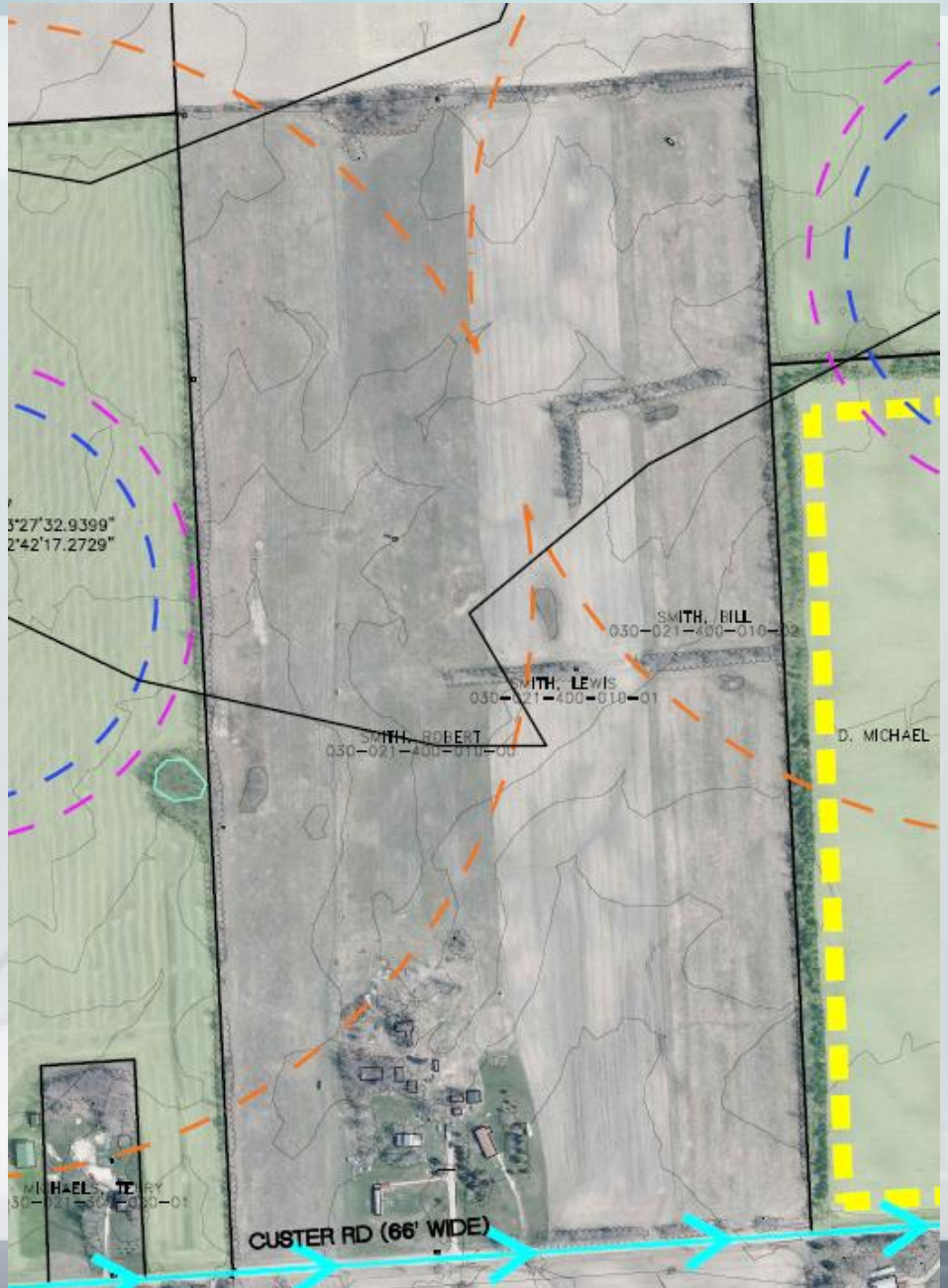
Actual examples of Trespass Zoning:



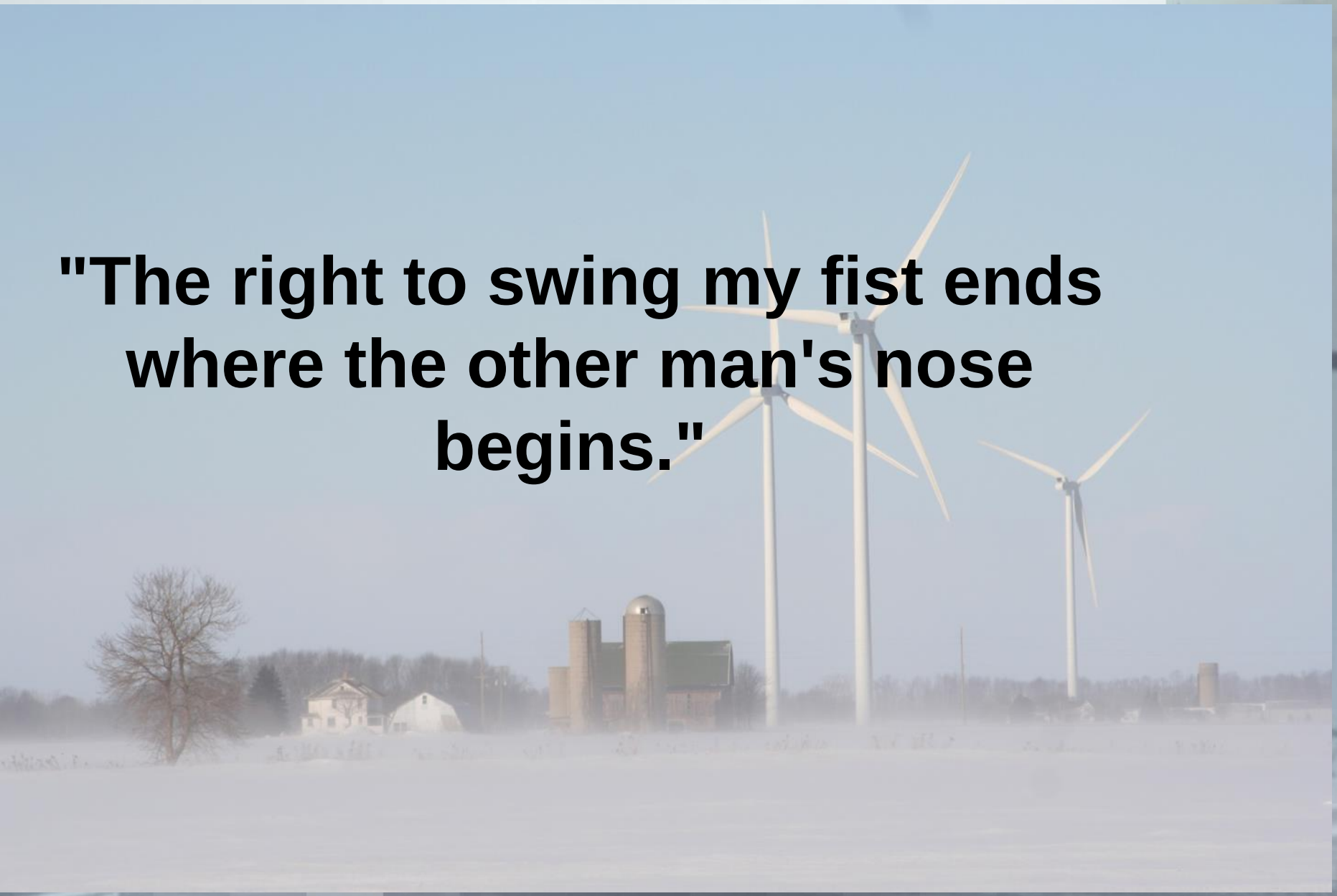
Green is leased, gray is not:



Nearly 50% of unleased land impacted:

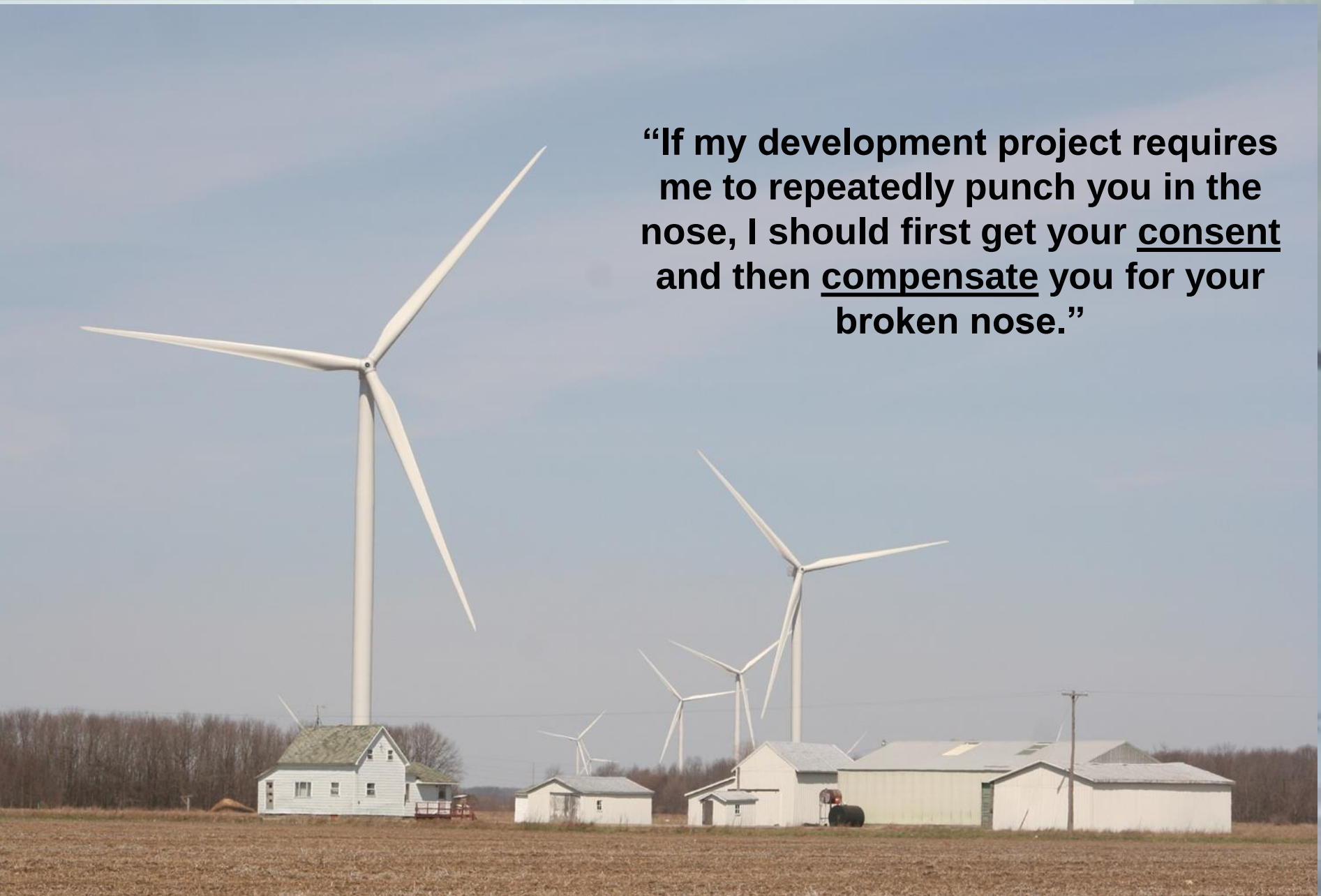


Oliver Wendell Holmes/Prop. Rights



"The right to swing my fist ends where the other man's nose begins."

Kevon Martis Corollary



“If my development project requires me to repeatedly punch you in the nose, I should first get your consent and then compensate you for your broken nose.”

Trespass Zoning:

The expressed goal of zoning regulations is to separate conflicting land uses from each other.

By establishing setbacks (and noise limits) from neighboring *homes* rather than *property lines*, the conflicting use is actually granted legal access to the neighboring property without consent or compensation.

<u>This is fundamentally unjust.</u>

But what is the right setback distance?

If you are regulating setbacks to protect families from fire or rotor failure, 1,640’ or a multiple of turbine height equal to 1,640’ as measured to property lines would be reasonable minimum for 500’ class turbines.

But what is the right setback distance?

And in view of the recent peer reviewed research on blade and ice throw, far bigger property line setbacks are now reasonable as well.

Riga's solution:

As a compromise, Riga Township chose 4x height to non-participants' property line, ¼ mile to participants residence, <u>with these larger setbacks reducible with a waiver.</u>*

*http://gallery.mailchimp.com/be5a7d58cda36e183b67eed5d/files/Wind_Generation_Ordinance___Clean__7_8_11_1_.pdf

My recommendation cont'd:

Important that setback to non-participant to be at property line or the ordinance is *essentially awarding an uncompensated nuisance/safety easement to developer at non-participants' expense.*

Equitable wind energy zoning should not forcibly donate unleased property to the neighboring landowner's tenant.

The waiver is the key:

The two stage setback with a waiver is what empowers your residents to be able to negotiate on their own behalf with the wind developer.

It requires them to negotiate with all residents bearing the direct impact of wind development instead of just a few large-and often absentee-landowners.

Noise:

How loud is too loud and who do you believe?

Heritage Wind Noise Complaints:

73 names

October 8, 2012

Delta County Building and Zoning
310 Ludington Street
Escanaba, MI 49829

Dear Building and Zoning Board:

The sounds generated by the turbines erected on the Garden Peninsula have caused a great deal of the distress to those of us who live near this wind farm. Residents were told that the sound would not exceed levels of <45 dB(A) at occupied buildings, which was no louder than a dishwasher. Unfortunately, residents do not believe that is case. The sounds are so obnoxious and disturbing that it is causing individuals to have to resort to lifestyle changes that should not have to be endured.

Inside their homes people hear the sounds when they are conversing, watching TV, or simply going about their daily lives, thus increasing stress levels, as well as increasing their concerns over possible hearing loss. All which are bringing the issue of overall health to the forefront. When trying to sleep at night the noise awakens people, and some have a difficult time getting to sleep, making sleep deprivations a real concern.

Outside our home the sound and the feel of the turbulent air movement is further cause for concern. Working in our yards and gardens is no longer a relaxing time. Headaches, earaches, equilibrium issues and an overall uncomfortabel feeling is now what is being endured when spending our time outside our homes. It is unconscionable that these turbines were placed so close to homes in an area of such importance to wildlife and people, with little regard to what the effects would be.

We have been advised that studies continue regarding the killing of birds and bats. We also worry about taking away more area for all wildlife. Many of us have noticed far fewer birds in the area. The turbines are like enormous moving scarecrows that also create very uncomfortable sounds and vibrations.

These turbines are too noisy and causing much more distrubance than Heritage promised. We are requesting assistance in measuring the noise levels in question. Individuals living near the turbines are having difficulty proving this issue, and bringing in experts with the sound equipment is very expensive. Therefore, we are respectfully requesting the county to bring in the audio equipment they have at their disposal to help us learn if the sounds we are hearing indeed does exceed recommendations. There may also be a need to re-evaluate the permitted noise levels for future zoning. We would like to see setbacks much further homes. Also, the concerns from the Dept. of Interiors need to be considered regarding the Garden Peninsula.

Delta County, as well as the entire State must be educated as to what having turbines near home and wildlife will do in the long run. Perhaps this type of information will improve regulations made in turbine placement in the future.

Jerry F. Collins — Jean Collins
Susan Rockefort 18th Rd Garden
Margaret Richard — Calvin J Richard

1

3

Freddie Tackett
Jacqueline Tackett 15963 Delta Ave.
Richard Monissette 15608 17th Rd.
Mike Hearns 15834 17th RD
Jeff Tatrow 16.5 RD
15860 17th Rd
15740 17th RD
Robert Casey 15837 17th RD
P.O. BOX 45 Garden
Anne Thousand P.O Box 202 Garden, 49835
John C Thousand P.O BOX 202 GARDEN 49835
6477 Winter Ave Garden, Mi 49835
Walter W. 6477 Winter Ave Garden, Mi 49835
Ethel Eva Harbinski 15769 17th Rd. Garden, Mi 49835
Nancy Leaton
Brenda Chase 15712 17th Rd
Travis Harris
Marie Westover 6889 PP Rd

4

Shannon Williams 16405 18th rd
Denise Ansell 16405 18th Rd
P.O. Box 22 Garden, mi
Francis A. Ansell 16405 18th Rd.
Scott Williams
18th Rd Garden
Gordon L. Found 15640 17th RD GARDEN
6400 2nd Ave. Garden MI.
Stacy Miller 7779 00.25 Rd Garden, MI
Mary Gollakner 6386 1st Ave. Garden, MI
6157 Garden Bay Ln
Stu Craig
Earl F Ansell
Nicole Young 7028 00.25 Rd Garden, MI 49835 906 450 5042
Bill Bedell
E. Delores Haas
Jeremy J Ansell 15940 Delta Ave.
Rik LeMoine
19.5 Rd
Jeanne Angell 5694 LL Rd Garden, Mi
Carolyn Winter 16087 Water St Garden
Tom Jacques

5

Warren J. Hazzard 6490 Winter Ave Garden
Mary Marion Pazzila 6490 Winter Ave. Garden
BRUCE TATROW 6457 Winter AVE Garden MI
15748 18.5 Rd. Garden Mi
15670 18.5 Ln. Garden, Mi
Violet L. Rodick 15670 18.5 Ln Garden MI
15694 18.5 Ln Garden, Mi
15694 18.5 Ln. Garden, MI 49835
15893 mill St. Garden, MI 49835
Heather Guertin 6335 State St. Garden, Mi 49835
6327 State St. Garden, Mi 49835
Sarah Jones 15878 Mill St. Garden, MI 49835
6327 State St. Garden, Mi. 49835
Nicole Guertin 6327 State St. Garden, Mi 49835
Vicky Janes 6384 State Street GARDEN MI 49835
JoAnne LaMoine 15975 Garden Ave Garden MI 49835
16080 Water ST Garden MI 49835
16080 Water St Garden MI 49835

73 people living inside the wind energy plant's 14 turbine cluster signed petitions asking for relief.

Noise:

Vacuum Cleaner	70dB
Average Office Noise, Sewing Machine	60dB
Normal Conversational Speech	50dB
Refrigerator	40dB
Whisper	30dB
Rustling Leaves	20dB
Average Threshold of Normal Hearing	0 – 25dB

Wind developers ask for noise limits of 45-55dB (leq) at your home.

However:

Vacuum Cleaner	70dB
Average Office Noise, Sewing Machine	60dB
Normal Conversational Speech	50dB
Refrigerator	40dB
Whisper	30dB
Rustling Leaves	20dB
Average Threshold of Normal Hearing	0 – 25dB

What they don't tell you is 55dBa is a much higher noise level than you currently experience in the quiet parts of your community.

Ask WHO? (WHO, 2009) Nighttime Noise Guidelines

- **$L_{night,outside}$ up to 30 dBA: No substantial biological effects observed.**
- **$L_{night,outside}$ of 30-40 dBA: Body movements, awakening, sleep disturbance, arousal.**
  While average effects may be modest, young, chronically ill, and elderly populations are affected to a greater degree.

Courtesy E-CS

World Health Organization (WHO, 2009) Nighttime Noise Guidelines (Continued)

- **$L_{night,outside}$ of 40-55 dBA: Sharp increase in adverse health effects, exposed populations have to adapt coping mechanisms, and vulnerable groups are severely affected.**
- **$L_{night,outside}$ above 55 dBA: Adverse health effects occur frequently, high percentage of population is highly annoyed, and limited evidence suggests that human cardiovascular system is stressed.**

Courtesy E-CS

Major 2018 WHO update:

For many years wind developers have been stating that the WHO guidelines do not consider wind turbine noise

Further, wind developers have denied any claims that wind turbines impact human health.

The new 2018 guidelines released address these two points clearly:

Major 2018 WHO update:

3.4 Wind turbine noise

Recommendations

For average noise exposure, the GDG **conditionally** recommends reducing noise levels produced by wind turbines below **45 dB** L_{den}, as wind turbine noise above this level is associated with adverse health effects.

To reduce health effects, the GDG **conditionally** recommends that policy-makers implement suitable measures to reduce noise exposure from wind turbines in the population exposed to levels above the guideline values for average noise exposure. No evidence is available, however, to facilitate the recommendation of one particular type of intervention over another.

http://www.euro.who.int/__data/assets/pdf_file/0008/383921/noise-guidelines-eng.pdf

GDG= “Guideline Development Group”

Lden:

Lden is an important descriptor that modifies the dB limit.

In this case, the “den” stands for Day-Evening-Night and is an average.

When we adjust the Lden number to the more common Leq number, it roughly translates to just under 40 dB Leq, the common hourly average.

40dB Leq is a noise limit I have been recommending for 8 years and is supported in lots of other literature:

Dave Hessler in MN, Oct. 2011

- **"Based on the observed reaction to typical projects in United States, it would be advisable for any new project to attempt to maintain a mean sound level of 40 dBA or less outside all residences as an ideal design goal."**
- **"It is important to note that a project sound level of 40 dBA does not mean that the project would be inaudible or completely insignificant, only that its noise would generally be low enough that it would probably not be considered objectionable by the *vast majority of neighbors*."***

*https://www.michigan.gov/documents/energy/MLUI9_NARUC_420200_7.pdf

NextEra concurs with 40dBa:

“The Ontario Ministry of Environment’s Sound Guidelines for rural areas establish maximum permissible sound levels at residences of 40 decibels, which is consistent with the standards set by the United States Environmental Protection Agency.”*

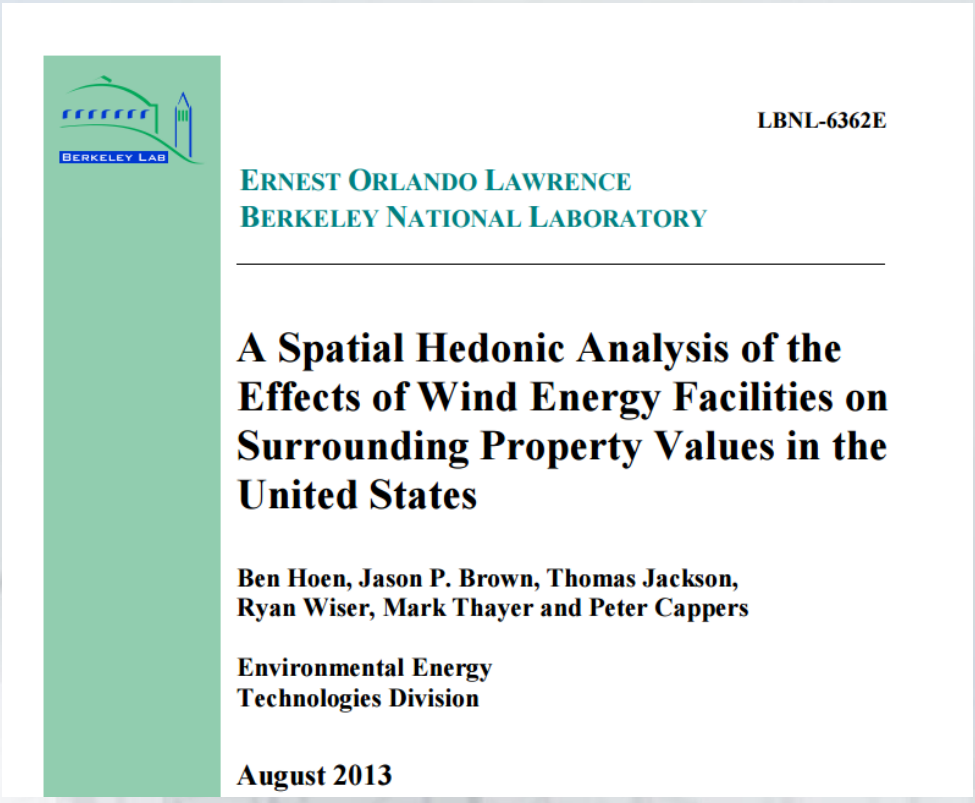
*http://www.nexteraenergycanada.com/faq.shtml

Noise Limit Recommendation

- **Riga Township has adopted 40dBa night time noise limit at non-participating property lines**
- **Riga Township has adopted 45dBa daytime noise limits**
- **They added a 55dBc limit as well for LF noise protection**
- **These were considered a reasonable compromise with developer's desire and HSW concerns**

Property Values:

Wind developers rely upon this report to support their claim that wind turbines do not harm property values:



LBNL-6362E

ERNEST ORLANDO LAWRENCE
BERKELEY NATIONAL LABORATORY

A Spatial Hedonic Analysis of the Effects of Wind Energy Facilities on Surrounding Property Values in the United States

Ben Hoen, Jason P. Brown, Thomas Jackson,
Ryan Wiser, Mark Thayer and Peter Cappers

Environmental Energy
Technologies Division

August 2013

Hoen on Hoen:

“I think one of the things that often happens is that (wind) developers put our report forward and say look property values aren’t affected, and that’s not what we would say specifically. On the other hand, they have little ground to stand on if they say we won’t guarantee that.”

Ben Hoen,

https://www.wind-watch.org/documents/ben-hoen-on-need-for-property-value-guarantee/

Industry funded studies claim no loss:

Wind Industry Funded Studies						
Canning & Simmons	Appraisers (CANWEA)	2010	Ontario	Regression Paired Sales	Viewshed (6)	(7%-13%) (9%) No SS
Hinman	Academic ISU - REP Student thesis	2010	Illinois	Pooled Regression Realtor survey	3 miles ½ mile	No SS (11.8%) (7)
Hoen	USDOE funded LBNL	2009	9 states	Pooled regression	5 miles 3k ft – 1 mile	No SS (5.6%) (8)

Footnotes:

(1) Lansink Resale study uses resales from developer to private buyers, with Easement in Gross condition of sale. Buyer accepts noise impacts, etc., waives liability

(2) Lots only. No pooling of data

(3) McCann Illinois study & research updated, multiple states

(4) Kielisch regression lot sales; Realtor survey residential

(5) Committee compared actual sale prices vs. AV and found homes up to 1 mile sold @ 76% of AV, and > 1 mile @ 104% of AV

(6) Usually cited as being a study that found no impact. However, all methods used yielded negative numeric indication. Author concludes no statistical significance.

(7) Cites Realtor who believes no impact on value > 3 miles. Concludes some results indicate "wind farm anticipation stigma" (11.8%)/Pg.55. Author states "the results neither support nor reject the existence of a wind farm nuisance stigma after the wind farm achieved commercial operation…..likely due to only 11 properties selling during operations within 1 mile of wind farm." Good neighbor payments to some nearby neighbors. Values near wind farm appreciated $13,524 after operation, following $21,916 decline measured under anticipation stigma theory. (Net loss of $8,392 pre- vs. post operation./Pg. 120.

(8) Study excludes developer resales with 36% & 80% discounts from buyout price. Pooled data from 9 states 24 projects insures lack of statistical significance for value loss examples near turbines. Other sales nearby excluded due to deviation too far from mean and resale.

Independent studies show 14-59% loss:

LITERATURE REVIEW

Summary Wind Turbine - Property Value Impact Studies						
Independent Studies						
Author	Type	Year	Location	Method	Distance	Impact %
Lansink	Appraiser	2012	Ontario	Resale (1)	< 2 miles	(39%) Avg. 23%-59%
Sunak	Academic RWTH Aachen University	2012	Rheine & Neuenkirchen	OLS Geographic Weighted Regression (2)	2 Km	(25%)
Heintzelman Tuttle	Academic Clarkson University	2011	Upstate NY	Regression Resale & Census Block	1/10 to 3 miles	Varies to > (45%)
McCann	Appraiser	2009 -2013	Illinois, (3) MI, MA, WI, OH	Paired Sales & resale	< 2 miles	(25%) 20% - 40%
Gardner	Appraiser	2009	Texas	Paired Sales	1.8 miles	(25%)
Kielisch	Appraiser	2009	Wisconsin (4)	Regression & Survey	Visible vs. not visible	(30-40%) (24-39%)
Luxemburger	Broker	2007	Ontario	Paired Sales	3 NM	(15%) $48,000
Lincoln Twp.	Committee (5)	2000-2002	Wisconsin	AV ratio 104% v. 76%	1 mile	(28%)

Decommissioning:

Decommissioning is a financial guarantee to take care of the removal of inoperable turbines.

I recommend language that requires bond to be posted in an amount equal to the cost of decommissioning as determined by a third party engineer as selected by the municipality and paid for by the developer.

It should include a reassessment every 3 years.

My point cont'd:

By coupling the ice and blade throw data from the wind industry journal with the LBL report, we see that the industry is finally having to face the simple fact that we have been maintaining for years: utility scale wind development adversely affects a large number of people when placed to closely to homes. The question is no longer 1,000 feet or 1,320'. It is clearly a question of ½ mile or 1.25 miles.

BTW:

Many Michigan counties and townships have adopted regulations that protect their residents from irresponsible wind energy development.

And wind developers often state that they will sue over "exclusionary" zoning. They made this threat in Riga Township in 2010 and it regularly occurs around the State.

But I know of only 1 instance since the adoption of PA295 in 2008 and it was dismissed because the applicant did not have standing.

Threats are common: litigation is rare.

Demonstrated Need in Tuscola Case:

"Wind turbines produce energy, which is, of course, needed by the Almer Township community. But …[NextEra's Tuscola Wind project] cannot reasonably argue that the Township will have inadequate access to energy absent the wind energy project."

Accordingly, it is **ORDERED** that Defendant Almer Township Board's denial of Plaintiff Tuscola Wind III, LLC's, SLUP application is **AFFIRMED.**

Dated: November 3, 2017

s/Thomas L. Ludington
THOMAS L. LUDINGTON
United States District Judge

Wrapping up:

- **Most land use changes are pretty benign-minimum lot sizes, sign ordinances, etc.**
- **Due to their size, wind turbines impacts are disproportionately large**
- **Riga felt that the change of land use policy was so massive and the impacts so profound that they should not occur without *consent* of <u>all</u> impacted parties**

...continued

Two stage setbacks with waiver option for both noise and distance require the developer to negotiate with ALL impacted citizens. It is fair and equitable and reduces community division

Ever heard this?

No one has ever come before a planning commission and said “The light coming through my windows is too steady, could you make it flicker? The night time noise level is too quiet, could you raise it to 55dBa from 25dBa? My property values are too stable, could you build some 50 story industrial machines next door to put that value at risk?”

The “bottom line” of zoning:

“We were here first. We get to decide.”

Only two type of wind ordinance:

- **Wind developers ask communities to adopt zoning language that essentially awards free safety and nuisance easements across non-participating properties**
- **Reasonable wind zoning demands that those easements be negotiated individually and privately between the developer and the impacted landowners rather than forced upon them by zoning regulation**

Who decides?

- The wind developer prefers to place the difficult decision of “do we let wind in or not?” in the hands of the zoning authority alone.
- By creating two stage zoning and setting those limits at the property line the decision as to whether the project proceeds or not is now in the hands of the private property owners and the developer.

What next as a township official?

If you think the zoning recommendations I have made are more reasonable then those in the current Delta County zoning ordinance, what is your best course of action?

What next as a township official?

If you have township zoning, you are not under Delta County zoning. If you wish to update your wind zoning, you can adopt a moratorium prohibiting wind development that could last a few months or even a year or two. This would give you time to amend your zoning ordinance in a fashion that suits your residents desires.

What next as a township official?

If you do NOT have township zoning, you can still adopt a moratorium prohibiting wind development.

You can then take action to adopt township zoning to regulate land use as you see fit including wind development regulations like those I proposed in this talk.

What next as a township official?

And in any event, you can support amendments to the Delta County wind zoning regulations like those adopted in Escanaba.

Passing a resolution of support at the township board level sends the strongest message.

Is it too late?

We often here official say “The wind company has already signed leases. We cannot stop them now, they have a contract.”

Under Michigan case law, developers have no vested rights in your zoning ordinance until two things have occurred:

1. **A building permit has been issued**
2. **Substantial exterior work has begun**

Riga Township Ordinance:

My talk is based upon the Riga Township wind ordinance which is available here:

www.rigatownship.com

Q's? Email me at kevon@kevonmartis.com