The Impact of Industrial Wind Turbines on DeRuyter & Cazenovia, NY

PREPARED BY: IMPACTED TAXPAYERS, RESIDENTS AND NEIGHBORS

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About this report

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- About the Tucker Rd IWT
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WE ARE A GROUP OF HOMEOWNERS, FAMILIES AND NEIGHBORS RAISING LOCAL AWARNESS ABOUT THE HEALTH, ECONOMIC, LEGAL, WILDLIFE AND VIEWSHED ISSUES RELATED TO INDUSTRIAL WIND TURBINES (IWTs) AS WE FACE THE PROSPECT OF LIVING IN THE SHADOW OF A 750 FOOT TURBINE AT THE SOUTH END OF TUCKER ROAD, ON THE DERUYTER/CAZENOVIA TOWN LINE.

- This report is intended for **policymakers** in the Towns of DeRuyter and Cazenovia as they navigate complex issues related to Industrial Wind Turbines (IWTs).
- This report is also intended to inform the **community** about non-participating homeowner perspectives with regards to the proper siting of IWTs.
- This report does **not delve into politics** or take sides on the renewable energy v. fossil fuel debate.
- As you listen to our perspective, remember that, **unlike the Developer, we are not motivated by profit**. Rather, we are motivated to save our health and our rural way of life. **We are not anti-wind** but are for a common-sense approach to siting and development of renewable energy projects.

Executive Summary

- Borrego Solar, a California based solar company with no wind turbine experience and with significant investment from Taiwanese company Walsin Lihwa desires to construct a 5mW turbine in DuRuyter at the end of Tucker Road that would stand as high as 750 feet.
- The structure would tower over Cazenovia homes on Tucker Road and would dominate the viewshed of DeRuyter lake residents for a generation or more.
- This project is the result of NY State's 70% renewable energy objectives, which opened the doors to renewable energy projects in upstate NY. These projects supply energy to NY City and do not benefit local residents (other than those who sign lease agreements with developers).
- Renewable energy companies PAY NO TAX unless the local municipality follows the procedure to opt out of the tax exemption (rule 487). DeRuyter has not opted out, Cazenovia has. We strongly recommend that DeRuyter opt out of the rule 487 tax exemption and provided instructions below on how to accomplish that.

Executive Summary (cont.)

- Governor Cuomo created an agency called ORES to oversee the permitting process for renewable energy projects that exceed a certain threshold of energy output. Once that threshold is reached ORES controls the permitting process and the **local municipality loses all control**.
- **Strong local ordinances are the ONLY means by which a municipality can retain control over permitting on its own lands. DeRuyter does not have such ordinances and should obtain advice from legal experts who have assisted townships in drafting such ordinances (THE RESOURCES SECTION AT THE END OF THIS REPORT CONTAINS CONTACT INFORMATION FOR ATTORNEYS WHO HAVE HELPED MUNICIPALITIES DRAFT ORDINANCES TO PROTECT COMMUNITIES).**
- A common tactic of developers is to obtain a foothold in a community and then amend their permits to increase the quantity of turbines until the ORES threshold is reached **("trojan horse" concept)**. The Tucker Road industrial turbine is likely a trojan horse project for Borrego.

Executive Summary (cont.)

- There is much debate about the DIRECT health impacts of industrial wind turbines (IWTs). **What is indisputable is the consistency of the testimony of residents around the world (and in upstate NY), who live near the turbines and the INDIRECT health impacts they have experienced.**
- **Turbine noise is real**. Turbines produce mechanical noise as loud as a lawn mower, rotor noise as the blades "swoosh" through the air at speeds of over 100mph, and inaudible sound called "infrasound," which is low frequency sound that penetrates homes.
- **Noise impacts individuals in different ways. Those who are impacted consistently testify about sleep disturbance, stress, anxiety, reduction in quality of life and more.**
- The wind companies are dismissive about these complaints and categorize them as "annoyance" or worse, say they are attitude-drive ("nocebo effect").

Executive Summary (cont.)

- There are numerous problems with the way noise studies are performed in advance of turbine projects. For example, **rarely do they account for the introduction of noise in quiet, rural, nighttime settings**, and rarely do they measure noise for prolonged periods or from varying perspectives such as inside homes, downwind or upwind.
- And they **NEVER consider the human perception of noise** but instead rely on a number (decibels) to describe the loudness of sound compared to things like a refrigerator, lawn mower, air conditioner or vacuum cleaner.
- In reality science has proven that sound is influenced by many factors. For example, it gets louder downwind from the turbine and it reflects off hard surfaces and water. **Turbine noise will impact the life of residents of Tucker Road and DeRuyter lake for a generation or longer and the wind developer will do everything in its power to dismiss this issue.**

Executive Summary (cont.)

- Based on reliable, independent data (which is in fact cited by NY State), Industrial Wind Turbines should not be sited within 4 miles of a residence because there is no way to achieve the reduction in noise required to attain the perceived government standard for safety. All Tucker Road and DuRuyter lake residents are within range of unacceptable levels of noise.

- Viewshed impact will be significant. However, DeRuyter currently does not have local ordinances that clearly define the value of scenic areas that would be impacted by large turbines such as the Tucker Road turbine. We strongly recommend that DeRuyter seek experienced guidance in drafting clear language to define areas of aesthetic/scenic value – to include hilltops, lakes and public parks, otherwise the town will have no standing to oppose turbines based on viewshed impact.

- THE RESOURCES SECTION AT THE END OF THIS REPORT CONTAINS CONTACT INFORMATION FOR ATTORNEYS WHO HAVE HELPED MUNICIPALITIES DRAFT ORDINANCES TO PROTECT COMMUNITIES.

Executive Summary (cont.)

- **Wind turbines kill migratory birds, birds of prey and bats on the order of hundreds of thousands per year.** Wind companies point to a reduction in deaths as turbine size has increased – fewer turbines are installed and less birds are killed. The Tucker Road site can only support one large turbine and is therefore unaffected by any national reduction in bird/bat deaths.

- **The Tucker Road site is home to bald eagles** that travel between the site location and DeRuyter lake. There is a strong likelihood that the eagles will not survive long after the turbine is placed. Further, the area represents a frequent flight path for flocks of geese, who await the same fate.

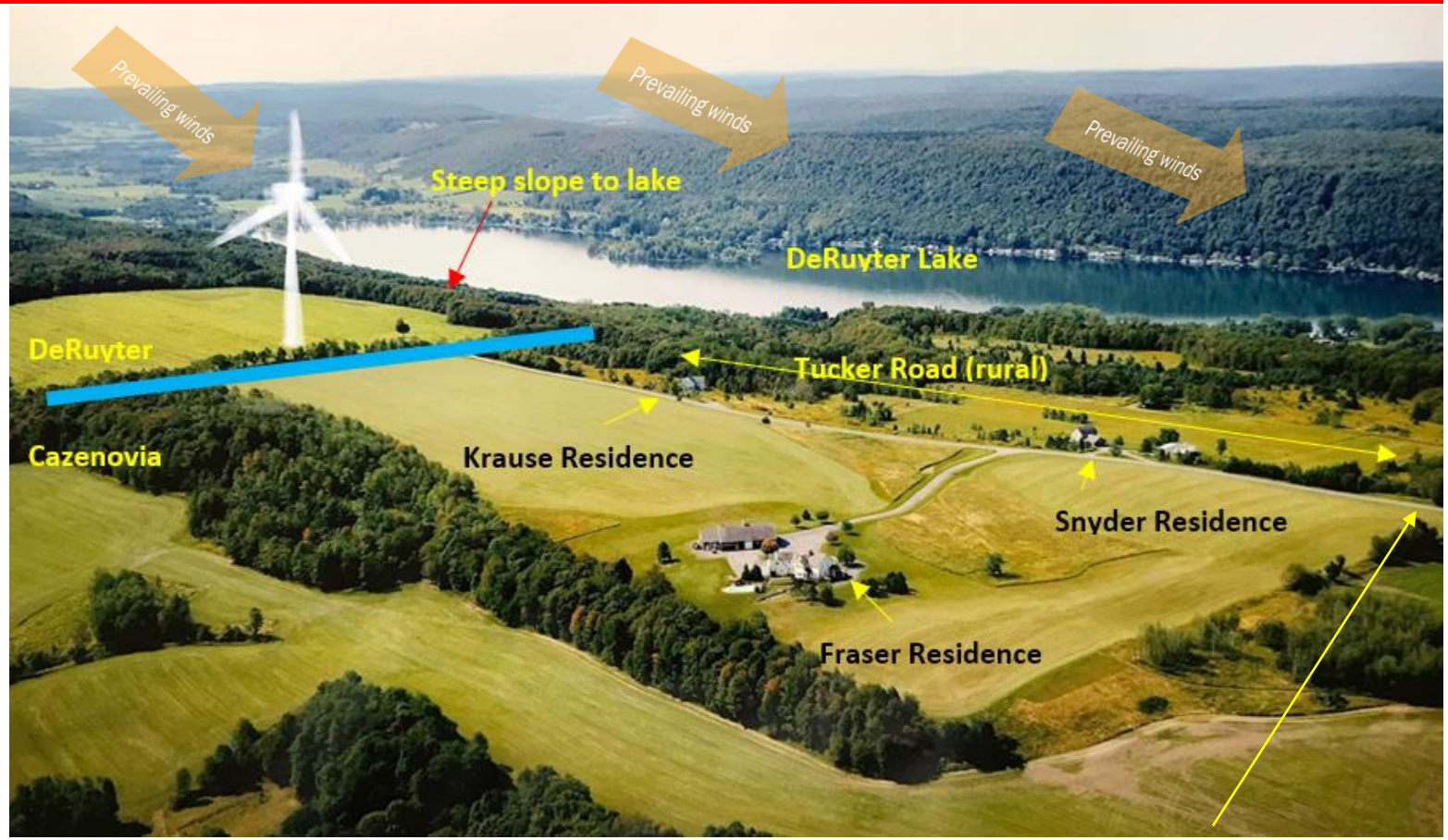
- **FINALLY, WE ASK THAT DERUYTER AND CAZENOVIA LOOK AT THE IMPACT THAT LARGE WIND PROJECTS HAVE HAD ON COMMUNITIES AROUND NY STATE. HUNDREDS OF OPPOSITION GROUPS HAVE FORMED, COMMUNITES ARE POLARIZED, LAWSUITS ABOUND AND MOST IMPORTANTLY, HUMAN BEINGS, THE RELATIVELY FEW INDIVIDUALS RESIDING IN CLOSE PROXIMITY TO TURBINES ARE SUFFERING. THEIR TESTIMONY CANNOT BE IGNORED. WE ASK YOU TO DO THE RIGHT THING AND FORCE THE INDUSTRIAL TURBINE PROJECTS TO REMOTE AREAS, MILES AWAY FROM RESIDENCES.**

Tucker Rd Industrial Wind Turbine Site

The turbine will permanently impact the quality of life and health of area residents.

The superimposed turbine stands at the site of the current meteorological – MET – tower.

Wind Turbine Shown Below – 650' blade tip to scale (hub at 450')
Proposed Wind Turbine – 750' blade tip (hub at 550')
Roof of Syracuse Carrier Dome (pre-renovation) – 165' above playing field



Aerial photo by H. Fraser

Residences of Dickson, Wolfanger, Frisbie, Hockstein, Hausser and others a short distance away on Tucker Rd, downwind from the site.

Rotor Diameter – 518.37 feet

Hub height – 331 feet to 528 feet

Total height – 590 feet to 787 feet

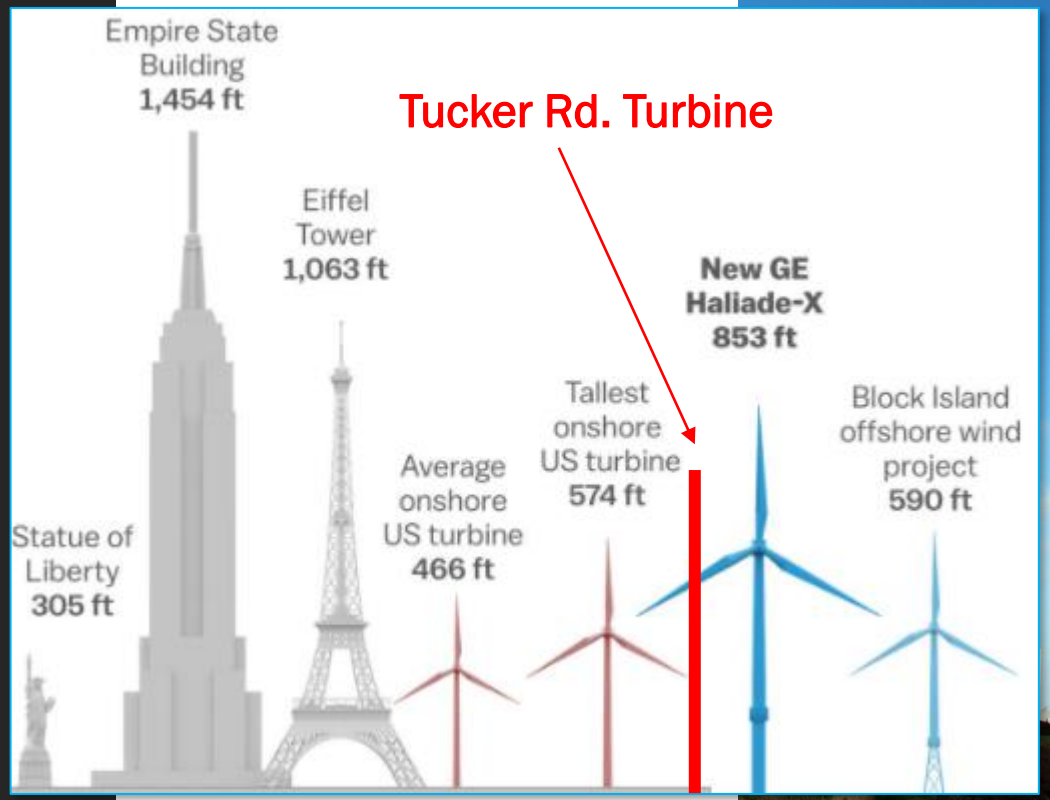
Frequency – 50/60 Hz

Requires a massive concrete foundation

How Big Is It?

Based on what we know, the proposed turbine will generate 5mW of energy at full capacity. The closest turbine to extract metrics from is the GE Cypress 5.3mW Onshore Turbine. This is only used for relative size comparison purposes.

https://www.ge.com/renewableenergy/wind-energy/onshore-wind/cypress-platform



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What is the CLCPA?

- The **Climate Protection and Community Protection Act (CLCPA)** was passed by Governor Cuomo and the NYS legislature in 2019.
- Cuomo's goal is to generate 70% of the electricity used in New York State from renewable energy sources (hydro, wind, geothermal, solar, etc.) by 2030. That is a very ambitious goal for a state that is only 30% renewable at present. This is the reason why there is currently a boom in large solar and wind farm projects in Upstate NY.
- **Much of Upstate NY is already close to 50% renewable, and areas like Buffalo and Massena are over 80% renewable. New York City is less than 20% and needs Upstate NY to produce renewable energy to meet the CLCPA goal.**
- **The CLCPA opened the flood gates to out-of-state and international developers.**

Opposition

There are dozens of opposition groups that represent the interests of thousands of New Yorkers who are fighting industrial wind turbine construction in their back yards – for good reason. Policy makers must consider the local, state, national and worldwide opposition to the big wind.

New Yorkers disagree with Albany's plans and have organized opposition groups in NY State

Advocates for Arkwright
Alliance for Bovina
Alliance for Meredith
Advocates for Prattsburgh
Advocates for Stark
Bethany Preservation Group
Center for Sustainable Rural Communities
Citizens for Maintaining Our Rural Environment (CMORE)
Citizens for Responsible Energy Development
Citizens of Lincoln
Clear Skies Over Orangeville
Cohocton Free!
Cohocton Wind Watch
Concerned Citizens for Cattaraugus County
Concerned Citizens for Sustainable Energy
Concerned Neighbors of Guilford
Concerned Residents of Hammond (CROH)
Delaware County Wind
Environmentally Concerned Citizens Organization (ECCO) of Jefferson County
Great Lakes Wind Truth - U.S.
Hamlin Preservation Group
The Heart of Henderson
Helderberg Community Watch
Home Rule
Indigenera
Jerusalem Preservation Association
Living in New York
Madison Matters
Meredith Defense Fund
North Country Advocates
Northern NY Wind
Naples Valley Bristol Hills Association
Pandora's Box of Rocks
Parishville Hopkinton Wind
Portland Wind
Prattsburgh/Italy Wind Turbine Information
Preservation of Howard
Protect Richfield
River Residents Against Turbines (River RATs)
Save Jones Beach Ad Hoc Committee
Save Ontario Shores
Save Sauquoit Valley Views
Save Western New York
Schoharie Valley Watch
Scipio Lake Property Owners Association
South Bristol Views
Springwater Preservation Committee
Stafford Preservation Group
We Oppose Windfarms (WOW)
Western Catskill Preservation Alliance
Wind Energy Ethics Group of Cape Vincent
Wind Farm Facts
Wind Jamber

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What is ORES?

https://ores.ny.gov/

https://ores.ny.gov/system/files/documents/2020/07/accelerated-renewables-fact-sheet.pdf

Accelerated Renewable Energy Growth and Community Benefit Act

- In 2020, in response to severe opposition from Upstate NY's rural communities, NYSERDA and Governor Cuomo forced the passing of the Accelerated Renewable Energy Growth and Community Benefit Act. The Act established Office of Renewable Energy Siting (ORES) and purports to be a benefit to local communities, but in reality is a tool to bypass opposition and overrule local municipalities. It is necessary to meet Cuomo's 70% initiative.

- The purpose of the agency is to fast-track large wind and solar projects that are 20 MegaWatts (mW) or larger, and bypass any local permitting, regulations, or restrictions. The NYS ORES has complete authority to greenlight projects larger than 20 mW, anywhere in NYS.

- As shown below, ORES is only required to "consider any applicable local law" – they do not have to adhere to it when granting permits. Further, the subjective nature of "substantive" and "significant" concerns gives wide latitude to ORES. DeRuyter and Cazenovia take a back seat to ORES in the permitting of large-scale industrial wind turbine projects. The best approach is to create STRONG LOCAL LAWS.

Opportunities for Local Input

Communities and local governments will have opportunities to provide valuable input throughout the new Siting Office review process:

- No application will be deemed complete without proof of consultation with the host community regarding procedural and substantive requirements of applicable local laws.
- Municipalities will be notified upon the publishing of an application's draft permit conditions and shall provide feedback on the draft permit conditions and the proposed facility's compliance with local laws within the subsequent 60-day public comment period. The Siting Office is required to consider any applicable local law when making a determination.
- If host community statements raise any substantive and significant issues that require adjudication, the Siting Office may establish a date for an adjudicatory hearing. If substantive or significant issues are raised and the Siting Office does not hold an adjudicatory hearing, a public hearing will be scheduled in the host community.

NYSERDA offers a variety of resources, including model zoning legislation, to support communities with responsibly siting clean energy projects. NYSERDA may update these resources, as necessary, to ensure alignment with any new standards.

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The TROJAN HORSE approach by companies like Borrego is designed to usurp local control.

- Projects over 20 MegaWatts (mW) are regulated and permitted by ORES, as noted above.
- The wind turbine in the town of DeRuyter proposed by Borrego is a 5mW, 650-700' high turbine similar to the GE Cypress on-shore turbine.
- **Any project under 20mW is under the regulation and permitting process of the locality. This provision is called "home rule."**
- Large renewable energy companies want to bypass the Home Rule provision to get to ORES as fast as possible. They do this by initially proposing a project at 5-10mW. **This acts like a "trojan horse," as the company then also proposes other similar sized projects in neighboring communities, until the collective project exceeds the 20mW threshold. THEN, ALL CONTROL IS LOST BY THE COMMUNITY AND GIVEN TO NY STATE.**

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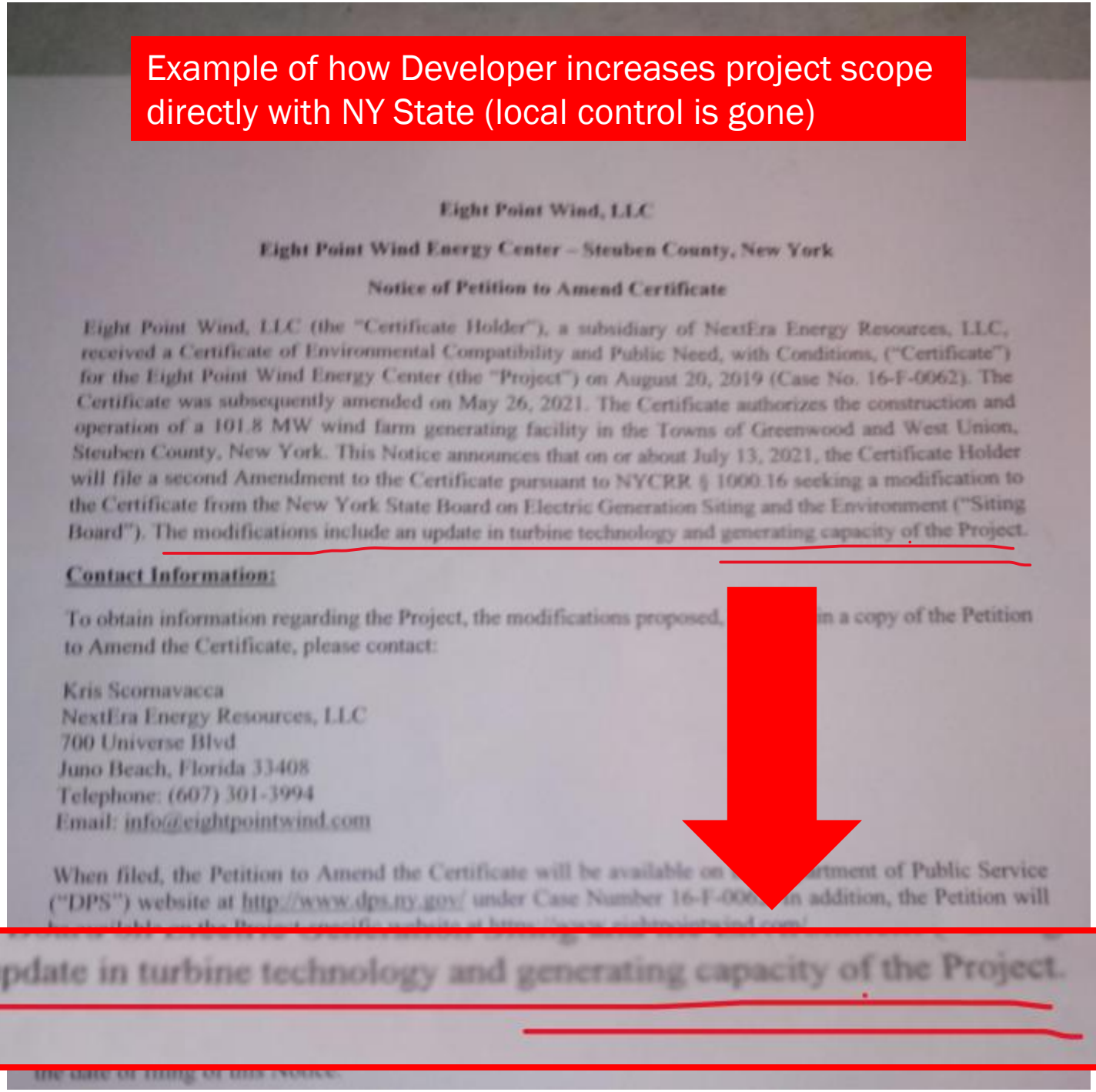
"The modifications include an update in … generating capacity of the Project."

To see the project map (an example from Steuben County that shows a single turbine is not the end game) go to:

http://eightpointwind.wpengine.com/wp-content/uploads/2019/04/EPWEC_Aerial_Size_E_2019_2.pdf



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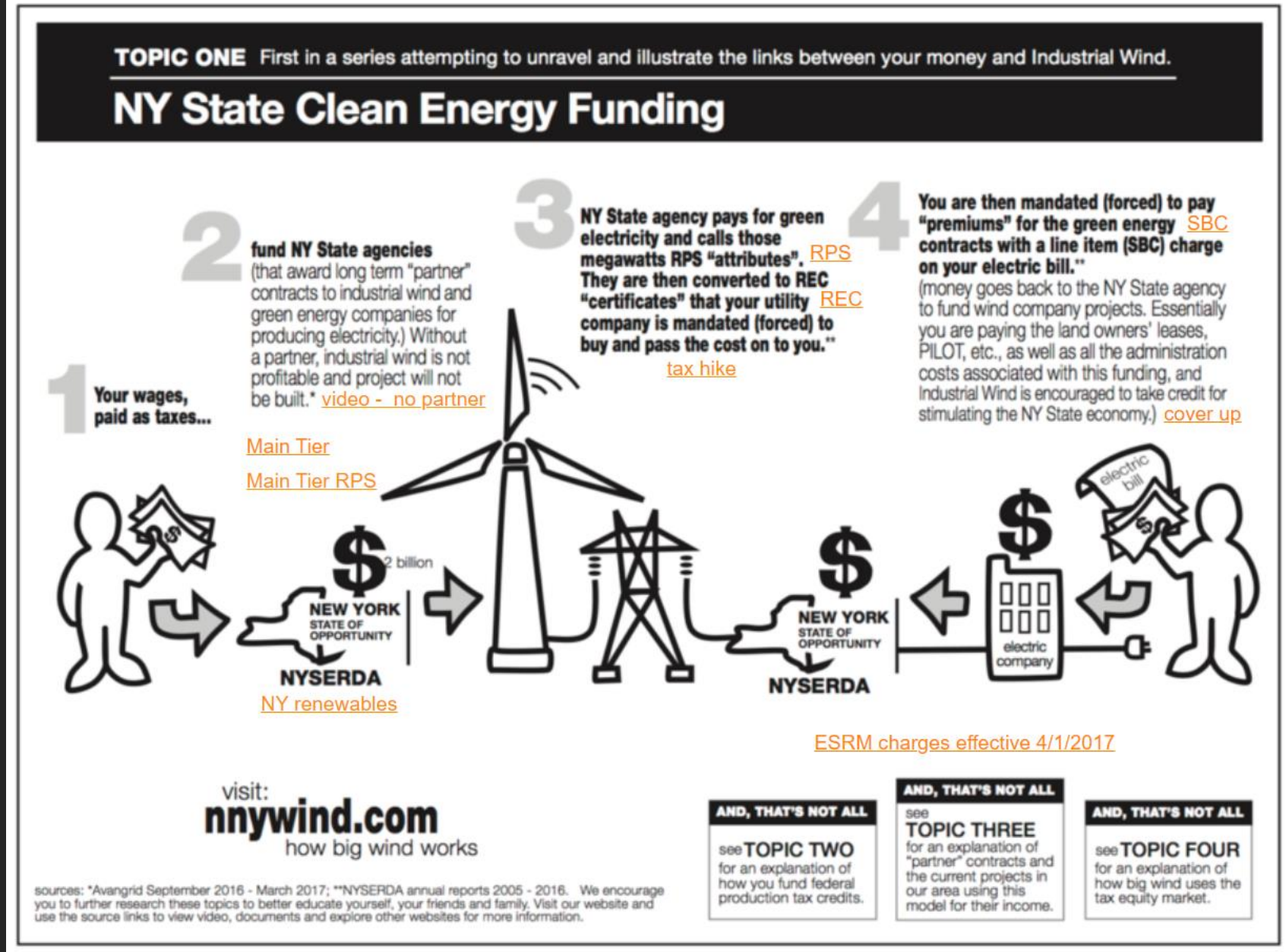
Will these projects lower electricity costs for the local area?

- No. They will do nothing to lower electricity rates. Conversely, as the number of large renewable energy projects increases, the more subsidies you cover as taxpayers and the higher electricity prices will go. At $0.13/ kWh, the US already has one of the lowest costs electricity in the world.
- The next three pages are borrowed from Northern New York Wind (nnywind.com) – a group of concerned citizens who have successfully opposed an Industrial Wind Turbine project in Parishville Hopkinton NY area for the same reasons we explain herein.
- **The group did an excellent job explaining why the IWT projects do not lower electricity rates for host communities.**

To view links go in the infographic go to:

http://nebula.wsimg.com/26ab7e295e0c3a6ac0ac6834cbf35aec?AccessKeyId=0E59A33F9043321304C0&disposition=0&alloworigin=1



To view links go in the infographic go to:

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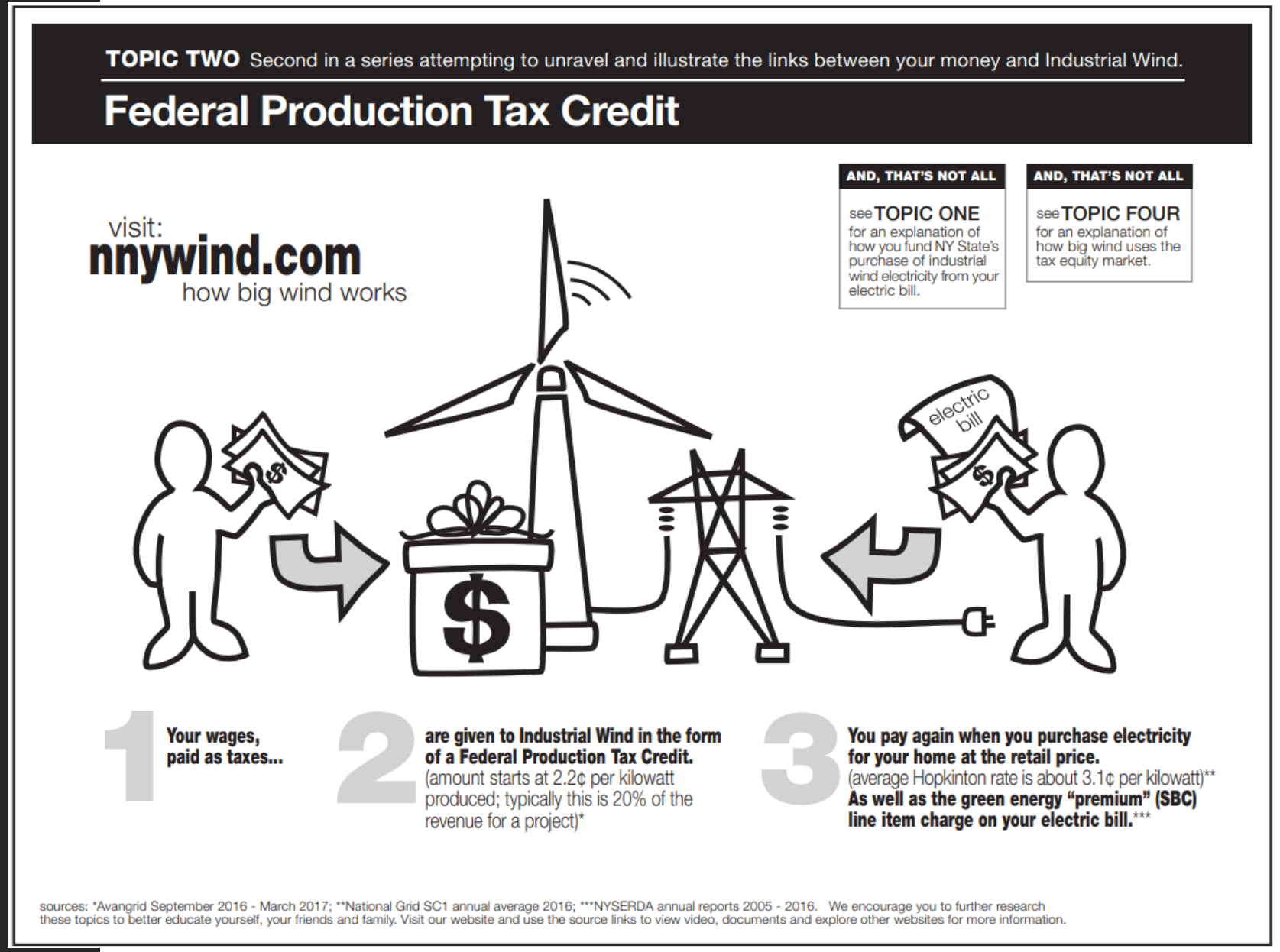


To view links go in the infographic go to:

http://nebula.wsimg.com/cbd766f5730eddc0603e934a1d493a90?AccessKeyId=0E59A33F9043321304C0&disposition=0&alloworigin=1

TOPIC THREE Third in a series attempting to unravel and illustrate the links between your money and Industrial Wind.

Renewable Portfolio Standard (RPS) - Main Tier Contracts

1 **Industrial Wind companies "prospect" for wind projects in our small communities.***

2 **Since Industrial Wind needs a market for their electricity, they have several options. Some are:**

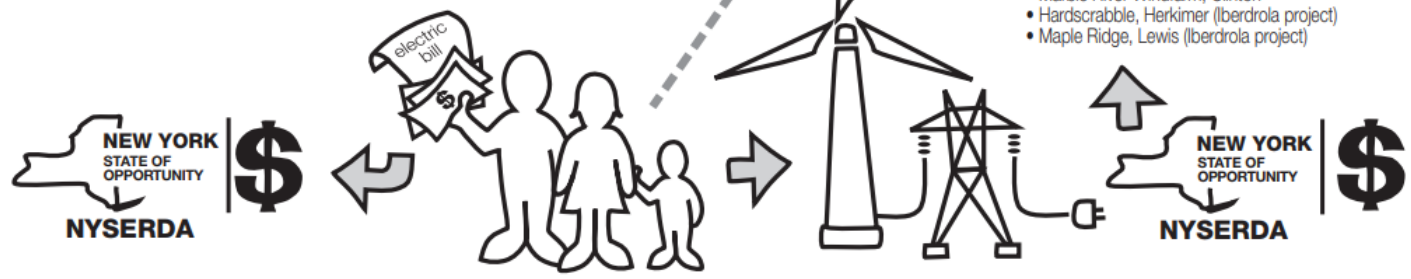
1. sell at spot price into wholesale market (NYISO). This is not reliably profitable, since the price fluctuates, and turbines may not be generating at the most profitable times to sell.
2. partner with a local manufacturer to receive and use the electricity. However, wind is unreliable and does not always provide power when the business may need it.
3. partner with NY State agency by being awarded an **RPS** contract for up to 95% of that electricity and calls those megawatts RPS "attributes". They are then converted to REC "certificates" that your utility company is mandated (forced) to buy and pass the cost on to you. You are then mandated (forced) to pay "premiums" for the green energy contracts with a line item (SBC) charge on your electric bill. Money goes back to the NY State agency to fund green energy projects. Essentially you are paying the land owners' leases, PILOTs, etc., as well as all the administration costs associated with this funding... and, Industrial Wind is encouraged to take credit for contributing to the NY State economy.**

3 **A big consideration in planning these projects is winning a contract to "partner" with taxpayer funded NY State agency for clean energy funding. If the "prospected" town's current laws do not support a large enough project to qualify for a Main Tier contract,*** the wind company will lobby NY State agency and the small town for changes to the local laws to accommodate their project.** Without a partner the project will not be built.*

Small town citizens must monitor changes to those same laws to ensure health, safety & property value protections. First, they must teach themselves about an entire mutli-billion dollar industry without any resources then, defend and present evidence from existing projects as justification for their concerns. The very same state agency that created this system with the wind industry† and your subsidy money have key seats on the board determining whether local laws will stand using Article 10 regulations and the power of all other state agencies at their disposal.****

Partial list of projects with NY State Main Tier contracts: **

- Chateaugay Windpark, Franklin
- Jericho Rise, Franklin
- Ellenburg Windpark, Clinton
- Clinton Windpark, Clinton
- Altona Windpark, Clinton
- Marble River Windfarm, Clinton
- Hardscrabble, Herkimer (Iberdrola project)
- Maple Ridge, Lewis (Iberdrola project)



sources: *Avangrid September 2016 - March 2017; **NYSERDA annual reports 2005 - 2016; ***Hopkinton Public Meeting- March 2017; †NYSERDA white paper and NY energy toolkit; ****PSC website 2011 Cuomo signs Article 10. We encourage you to further research these topics to better educate yourself, your friends and family. Visit our website and use the source links to view video, documents and explore other websites for more information.

visit: **nnywind.com** how big wind works

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Where will the electricity generated be channeled?

- **Downstate – mostly to New York City.** The state is scrambling fast to build new grid lines and connectors to pass electricity generated in Upstate new York to Downstate. You can see them in Cicero, Canton, outside of Utica, and near similar communities.

- **"Upgrading the system [Transmission Lines] will provide a significant economic boost for upstate power producers by providing them greater access to the downstate market."**

https://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/8b08bf48a0be4e4785257ad1006b5bad/$FILE/AC_TransmissionLinesFAQs.pdf

https://www.timesunion.com/business/article/Underground-transmission-line-from-Utica-to-NYC-12392007.php

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What is Section 487 RPT?

Section 487 – Real Property Tax (RPT)

- "Real property … shall be exempt from taxation to the extent of any increase in the value thereof by reason of the inclusion of such solar or wind energy system … for a period of fifteen years."

- As of July 2021, the Town of DeRuyter has not opted out of the 487 Exemption and will receive NO tax revenue from renewable energy projects.

https://www.nysenate.gov/legislation/laws/RPT/487

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Will these large projects generate tax revenue for the locality?

- **No! Quite the opposite.** Under a 1990 amendment to real property law known as Section 487, solar and wind facilities and certain other renewable technologies are automatically exempt from property taxes for 15 years – with two major exceptions.
  1. Any municipality can opt out of the 487 exemption.
  2. Municipalities that do not opt out can require a renewable energy developer to sign a PILOT agreement. A PILOT agreement is a Payment in Lieu of Taxes, which does not allow the company installing the renewable energy project to avoid taxes or payments altogether. The law doesn't specify how much the developer must pay under a PILOT except that it can't be more than it would pay in regular taxes.

- **Below is an informative article about Clay, NY and how they municipality lost 100% of the tax revenue from a large solar project because they did not understand the law.**

https://www.wind-watch.org/news/2021/06/17/cny-town-failed-to-demand-property-taxes-from-2-solar-farms-we-just-didnt-think-about-it/

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More about Section 487 and how to access the exemption form online.

Real Property Tax Law Section 487—Exemption from taxation for certain energy systems

- Under Section 487 of New York State Real Property Tax Law (RPTL), taxing jurisdictions are required to file copies of local laws and resolutions pertaining to the energy system exemption with the Department of Taxation and Finance and the New York State Energy Research and Development Authority (NYSERDA). **NYSERDA provides this portal for easy digital filing of these local laws and resolutions.**

Go here to complete the required form:
https://nyserda.seamlessdocs.com/f/RPTL487

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Why the Town of DeRuyter should opt out now

We strongly suggest the Town of DeRuyter to opt out of the Section 487 tax exemption immediately.

- This will at least ensure that Borrego, or any other developer, will not be able to install a renewable energy project without paying taxes - even if they bypass DeRuyter and get to the ORES.
- **Opting out of reg 487 is the single most important matter that the Town of DeRuyter Board should consider from a revenue standpoint.**
- **While we are strongly against the Tucker Road Industrial Wind Turbine Project for the reasons described herein, we are not "anti-wind," Hence, we support the Town of DeRuyter's effort to ensure responsible development, site selection and revenue generation.**

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Towns in Madison County, NY that have opted out of Reg 487.

Cazenovia opted out in 2004, DeRuyter should do so as well.

This table lists those municipal corporations in Madison County, NY that have filed with the Tax Department copies of local laws or resolutions opting out of the real property tax exemption for certain energy systems.

Madison County		
Towns		
Fenner	8/14/19	8/14/19
Lincoln	4/4/2020	4/4/2020
School districts		
Bridgewater-West Winfield	6/27/2006	
Canastota	2/26/1991 (purportedly rescinded for four parcels on 2/1/2004), 2/13/2018, 2/27/2019, 6/12/2019, 8/29/2019	2/13/2018, 2/27/2019, 6/12/2019, 8/29/2019
Cazenovia	6/21/2004	
Fayetteville-Manlius	8/15/2019	
Oneida	7/6/2018	7/6/2018
Madison	2/13/2007	
Morrisville-Eaton	2/25/2002, Rescinded on 2/13/2007, 1/22/19	1/22/2019
Stockbridge Valley	8/27/02, (purportedly rescinded for Airtricity Munnsville Project only on 2/13/07), 11/18/08	

For a list of all towns/municipalities that have opted out in NY, see https://www.tax.ny.gov/research/property/legal/localop/487opt.htm

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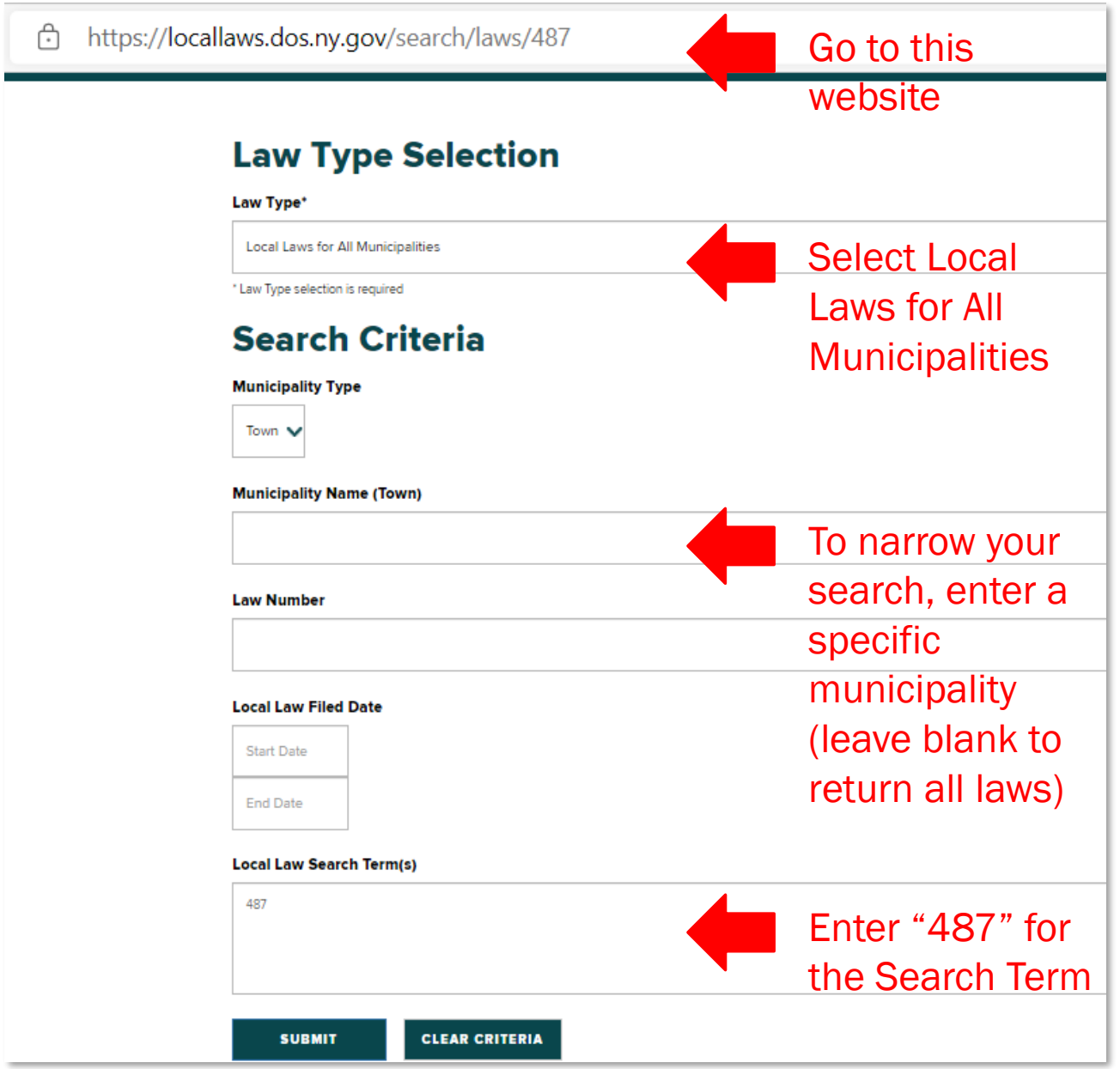
Both Cazenovia and DeRuyter can save time and get copies of a Town's 487 exemption law.



The search results will return links to copies of local 487 exemption laws.

Economics & Law

What happens when the wind doesn't blow?

Municipalities should weigh the 50-70% inefficiency against the impact to tax paying residents.

- Industrial Wind Turbines do not convert kinetic energy from the wind to mechanical energy (which ultimately adds electricity to the grid) unless the wind blows enough to spin the blades on the turbine.
- Estimates vary on how efficient an IWT is. The range seems to be 30-50%. **The turbine cannot reach 100% efficiency because the wind does not blow 100% of the time and when it does blow, the wind speeds are inconsistent.**
- **For this fact alone, NY state cannot dismantle other, less favorable, sources of power generation.** In essence, as a consumer and taxpayer, you will pay to maintain power plants that rely on other forms of power generation, including fossil fuels, while subsidizing Big Wind, until wind, solar and hydro power combined produce 70% of NY's energy RELIABLY.

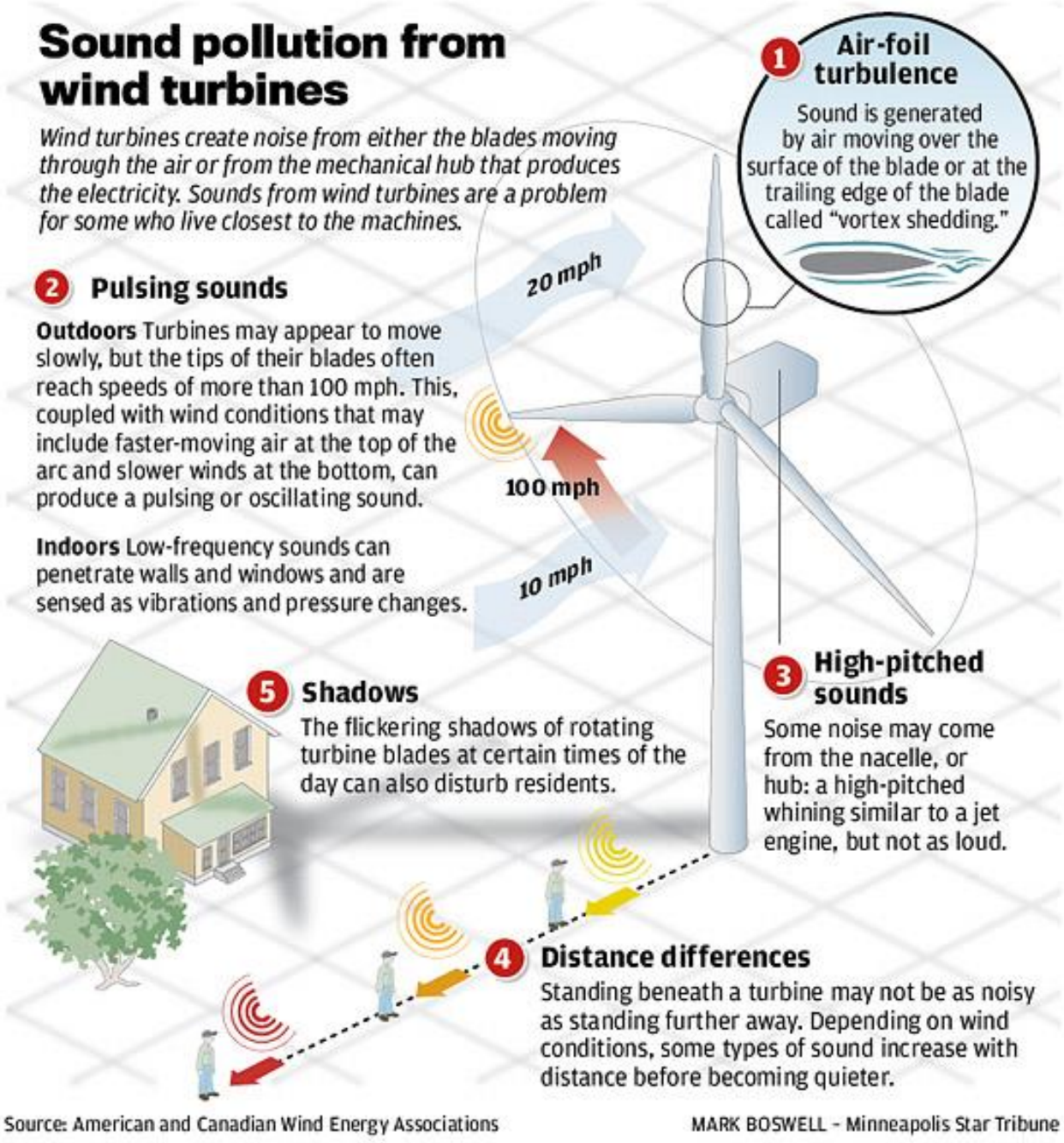
Health Impacts of Turbine Noise

Industrial Wind Turbines produce noise and light flicker.

Turbine noise often increases with distance.

Tucker Rd. neighbors are spread out but can hear normal voices at distance due to wind direction.

There are hundreds of first-hand accounts and reports, backed by scientific data about the disturbing and harmful effects of turbine noise to nearby residents.



Health Impacts of Turbine Noise

Noise is a complex issue.

Noise attenuation (reduction) is also complex because it is influenced by many factors.

Noise attenuation facts are provided by world noise environmental acoustics specialists Brüel & Kjær (copyright 2000). NYSERDA relies on their data.
https://www.nonoise.org/library/envnoise/index.htm

As a resident living nearby (within several miles) of a large wind turbine, 7 factors will influence noise attenuation:

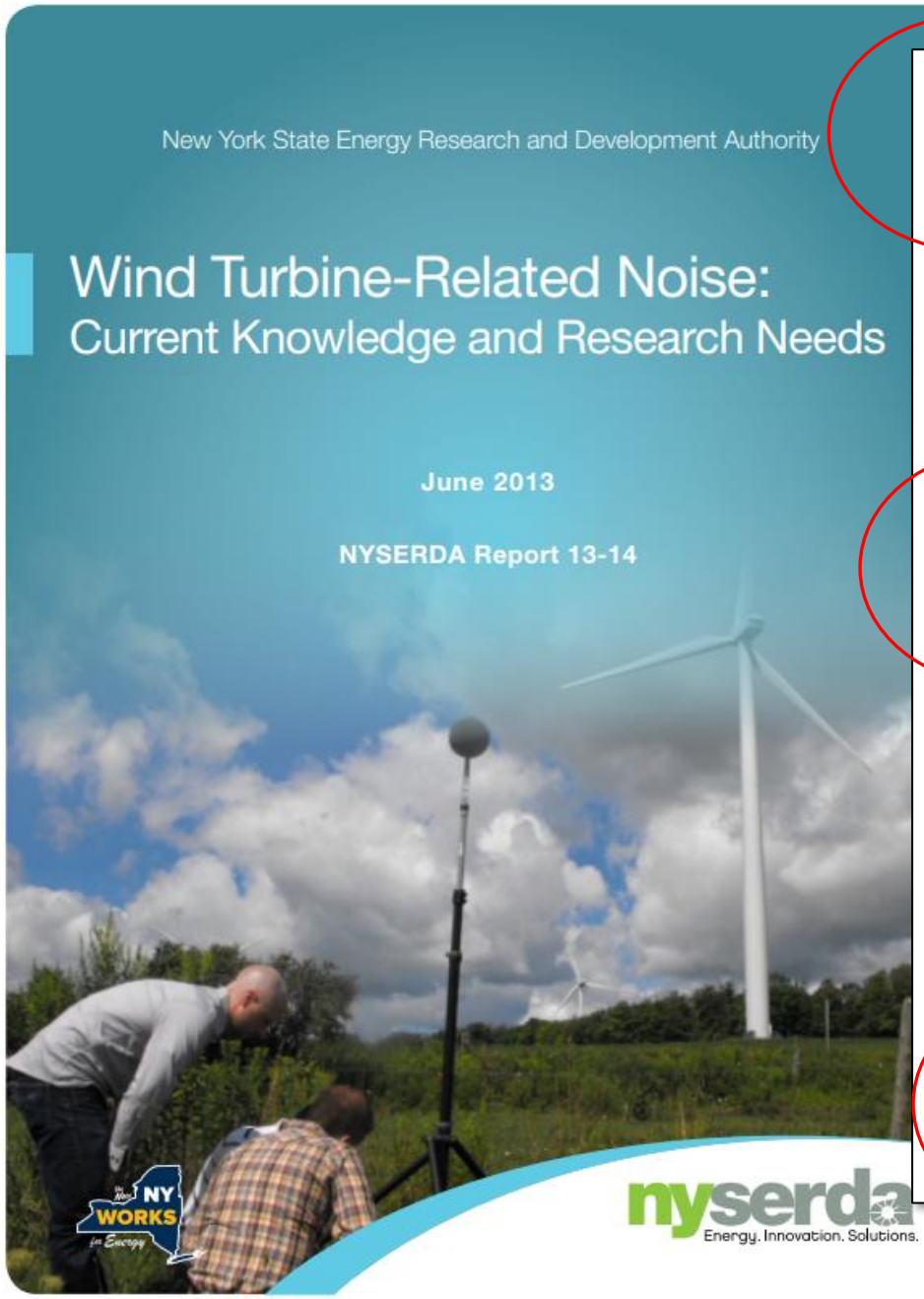
1. Barriers
2. Atmosphere
3. Wind
4. Temperature
5. Ground Effects
6. Reflection (e.g. hard surface of house or water)
7. Open or closed windows

To understand why Industrial Wind Turbines are not suitable for Tucker Road and are likely not suitable anywhere in the Towns of Cazenovia or DuRuyter we need to address each factor.

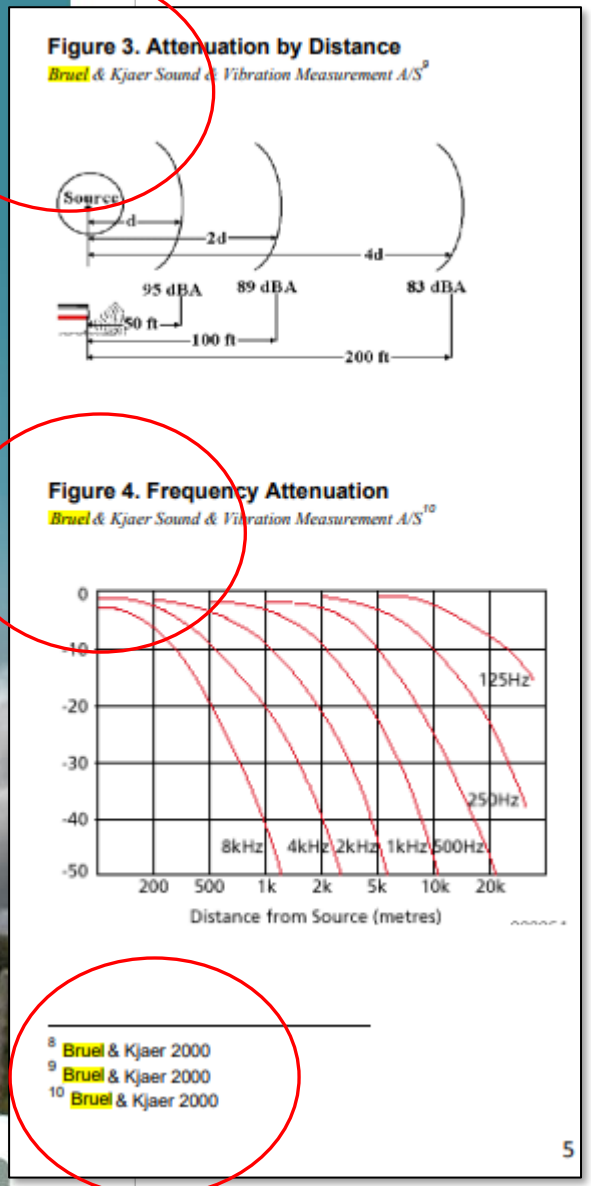
Health Impacts of Turbine Noise

NY State and the agency (NYSERDA) that is pushing Industrial Turbines into residential backyards **sites the Bruel & Kjaer study 8 times** yet ignores the results when pushing permits through in upstate NY.

https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Environmental/Wind-Turbine-Related-Noise.pdf



Excerpt



Health Impacts of Turbine Noise

Factors that influence Noise Attenuation (reduction)

Brüel & Kjær (copyright 2000). NYSERDA relies on their data. https://www.nonoise.org/library/envnoise/index.htm

BARRIERS

The noise reduction caused by a barrier depends on two factors:

1. The path difference of the sound wave as it travels over the barrier compared with direct transmission to the receiver.
2. The frequency content of the noise.

Low frequencies are difficult to reduce using barriers.

ATMOSPHERE

The reduction of noise as it passes through air is dependent on many factors including:

- Distance from source
- Frequency content of the noise
- Ambient temperature
- Relative humidity
- Ambient pressure

Low frequencies are not well attenuated by atmospheric absorption.

Health Impacts of Turbine Noise

Factors that influence Noise Attenuation (reduction)

WIND

Wind speed increases with altitude, which will bend the path of sound to "focus" it on the downwind side and make a "shadow" on the upwind side of the source. At short distances, up to 50 m, the wind has minor influence on the measured sound level.

For longer distances, the wind effect becomes appreciably greater.

A MORE DETAILED DISCUSSION, SUPPORTED BY DATA IS PROVIDED BELOW ON WIND IMPACT.

Health Impacts of Turbine Noise

Factors that influence Noise Attenuation (reduction)

Brüel & Kjær (copyright 2000). NYSERDA relies on their data. https://www.nonoise.org/library/envnoise/index.htm

TEMPERATURE

Temperature gradients create effects similar to those of wind gradients, except that they are uniform in all directions from the source. On a sunny day with no wind, temperature decreases with altitude, giving a "shadow" effect for sound. On a clear night, temperature may increase with altitude, "focusing" sound on the ground surface. NIGHTTIME NOISE IS ONE OF THE MOST COMMON COMPLAINTS FROM RESIDENTS BECAUSE IT IMPACTS SLEEP. SLEEP DISTRURBANCE IS A WELL DOCUEMNTED CAUSE OF ADVERSE HEALTH CONDITIONS.

GROUND EFFECTS

Sound reflected by the ground interferes with the directly propagated sound.
The effect of the ground is different for acoustically hard (e.g., concrete or water), soft (e.g., grass, trees or vegetation) and mixed surfaces.

Health Impacts of Turbine Noise

Factors that influence Noise Attenuation (reduction)

The result of a noise assessment is never simply a figure such as 77 db. It is the value of specific parameters or indicators obtained under known and documented conditions.

Brüel & Kjær (copyright 2000). NYSERDA relies on their data. https://www.nonoise.org/library/envnoise/index.htm

REFLECTION

When sound waves impact upon a surface, part of their acoustic energy is reflected from it, part is transmitted through it and part is absorbed by it. For homes, most of the sound energy is reflected. Typically, the level 1.6 feet from a plain wall is 3 dB(A) higher than if there was no wall. Regulations often require the exclusion of the effect of reflection from reported results. **Why should residents have to deal with LOUDER REFLECTED NOISE FROM THE TURBINE when gardening, relaxing or working around the perimeter of their homes?**

OPEN/CLOSED WINDOWS

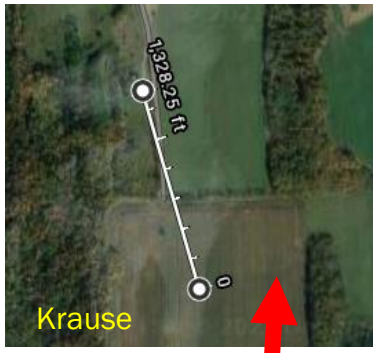
Disturbing noise in the environment is attenuated by the building, typically offering 20 - 30 dB of protection (façade sound insulation). Windows are often acoustically weak spots, **Open windows will cause the residents to experience the full effect of environmental noise. Why should residents have to live with their windows closed?**

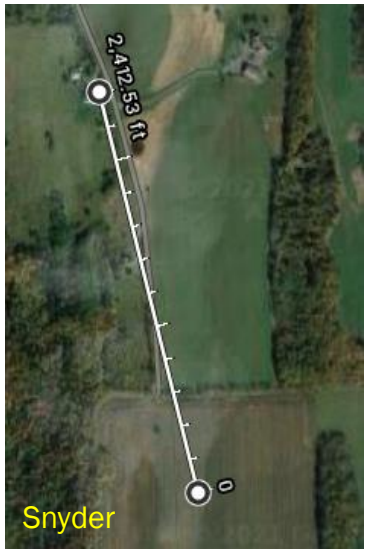
Health Impacts of Turbine Noise

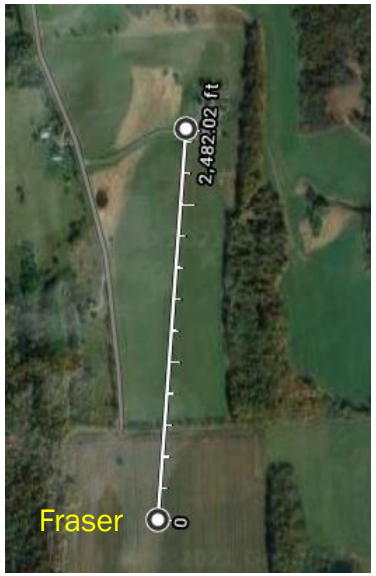
The 5 closest residences on Tucker Rd are within 3,300 feet of the Industrial Turbine and downwind – well within the range of disturbance from audible noise and infrasound.

From the center of the project site to residences on East Lake Rd, DeRuyter (lake) is about 3,200 feet, also well within the range of disturbing effects.

1 mile = 5,280 feet







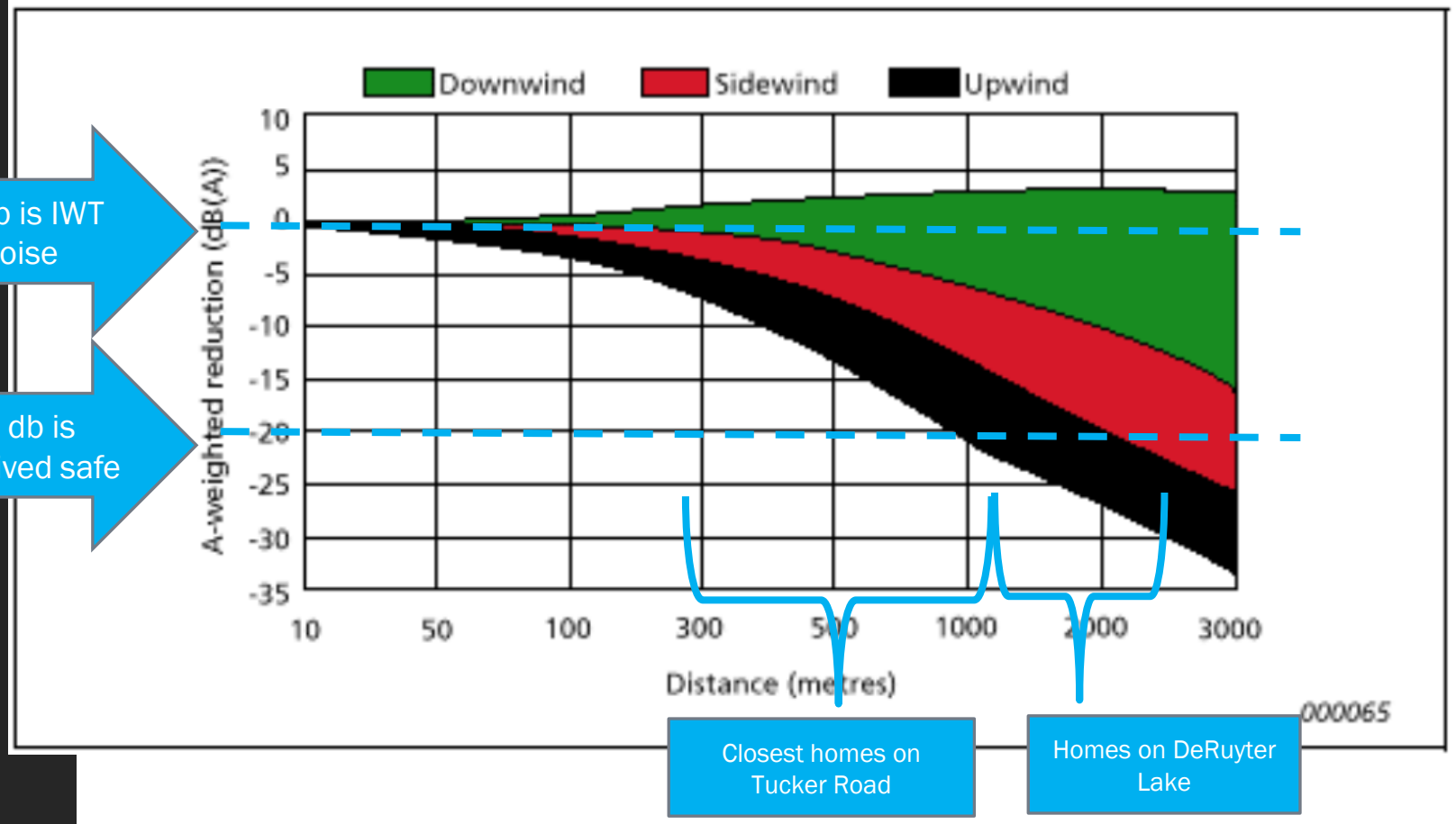
The closest residence to the Industrial Wind Turbine site is only 1300 feet from the center of the site. This family (and others nearby) will be severely impacted by the side effects of audible noise, infrasound and light flicker. As noted above, infrasound can penetrate homes that are miles away.

Health Impacts of Turbine Noise

THE MAJORITY OF TURBINE NOISE FOR DOWNWIND, SIDEWIND AND UPWIND LOCATIONS IS UNACCEPTABLE FOR RESIDENCES ON THE LAKE AND ON TUCKER RD. FOR DOWNWIND LOCATIONS NOISE CAN INCREASE (AS SHOWN ABOVE THE TOP DOTTED LINE)

Brüel & Kjær (copyright 2000). NYSERDA relies on their data. https://www.nonoise.org/library/envnoise/index.htm

Bruel & Kjaer data showing the impact of wind on sound attenuation



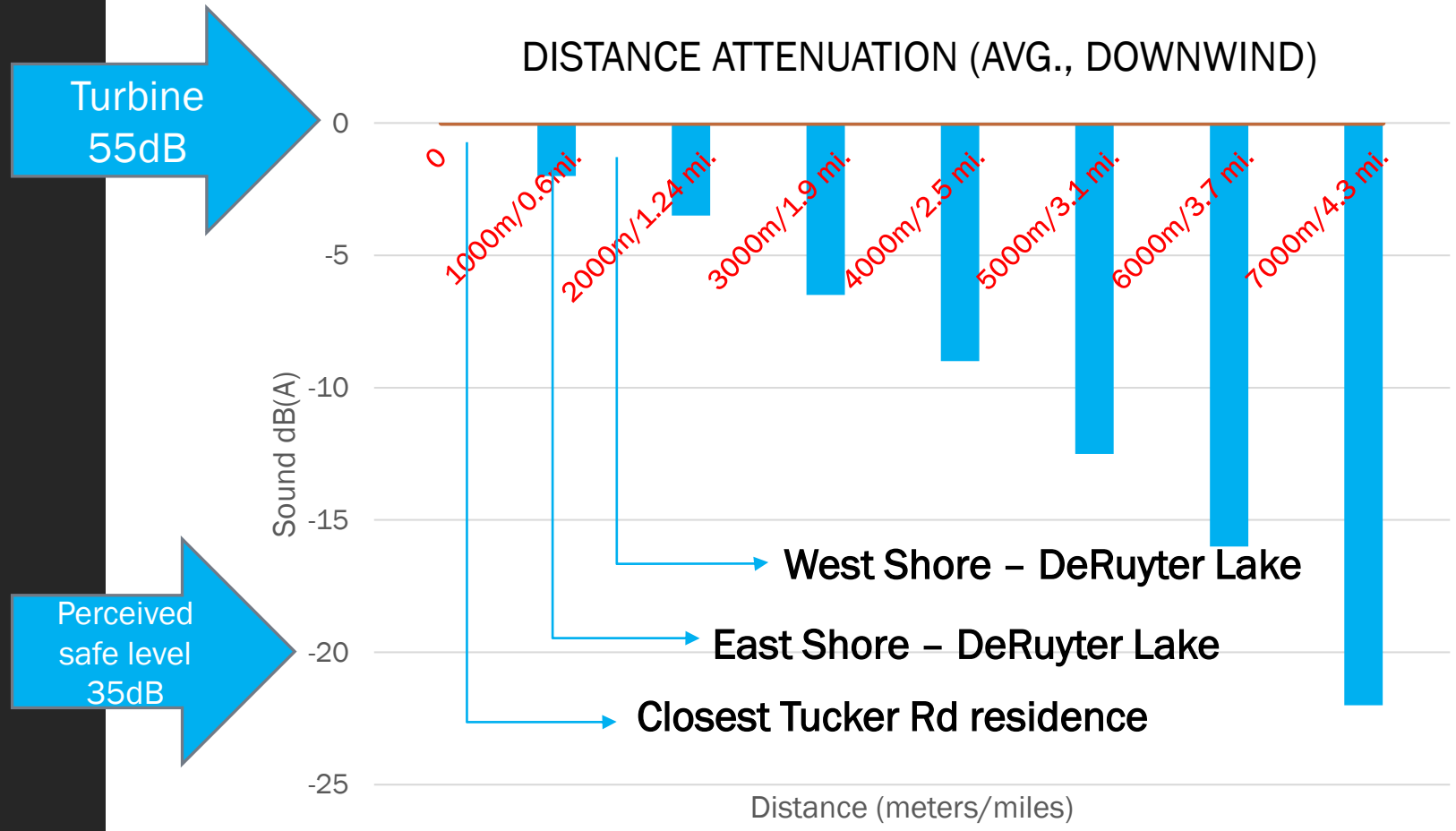
Health Effects of Turbine Noise

BASED ON DISTANCE ATTENUATION ALONE, TUCKER ROAD IS NOT A SAFE SITE FOR RESIDENTS OF DERUYTER LAKE OR TUCKER RD.

Based on Bruel & Kjaer Sound & Vibration Measurement A/S, extrapolated to 4.3 miles from the source.

THE DATA IS CLEAR– INDUSTRIAL WIND TURBINES MUST BE SITED OVER 4 MILES FROM RESIDENTICES (IN ALL DIRECTIONS) TO ENSURE SAFE LEVELS OF SOUND (WIND DIRECTIONS VARY IN THIS AREA).

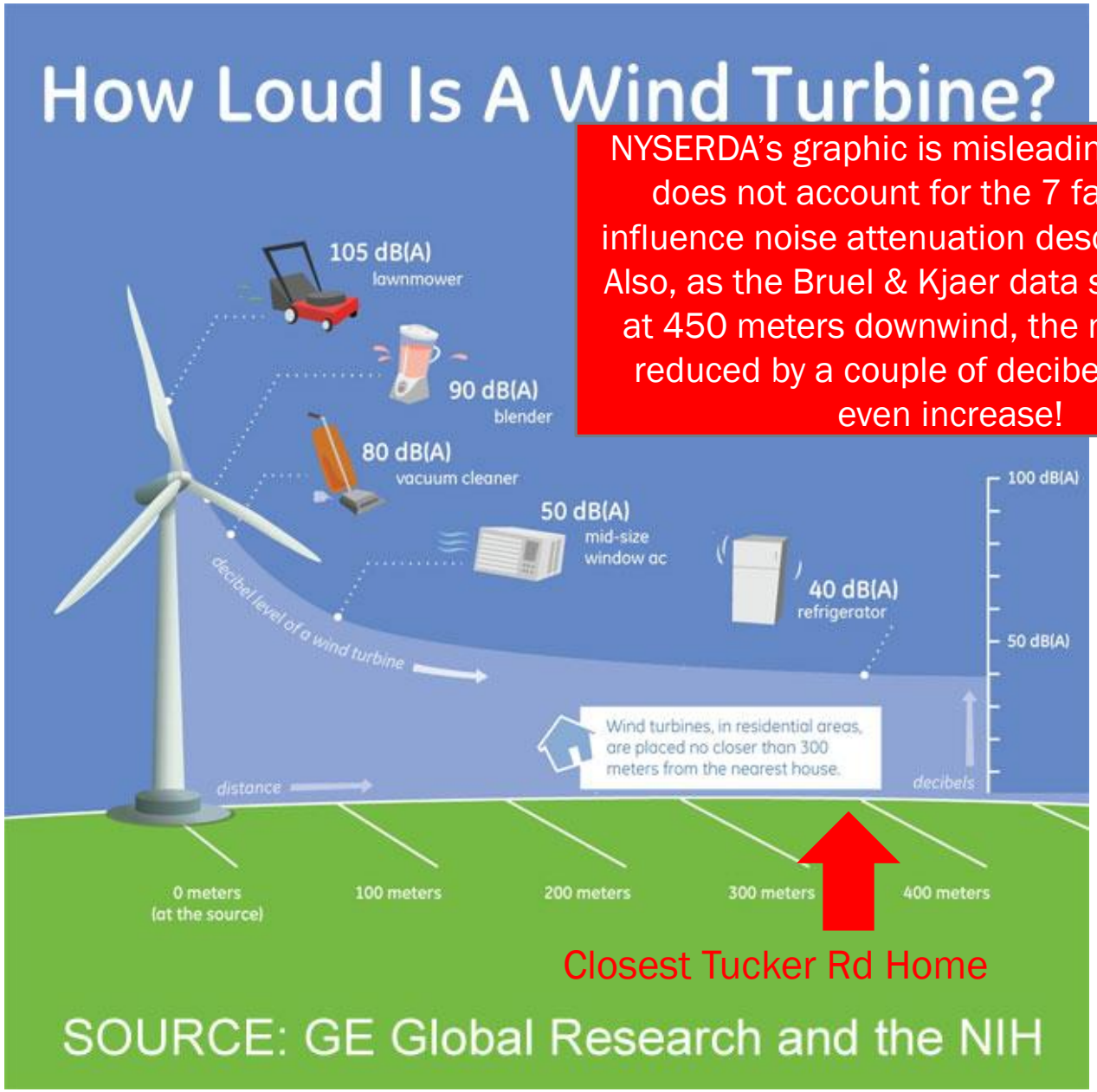
The graph shows the average sound attenuation only and does not account for the INCREASE in noise that occurs downwind, the DeRuyter lake topography (valley sound trap) or reflective properties of the water itself, which would further amplify sound.



Health Effects of Turbine Noise

NYSERDA IMPLIES THAT 45dB NOISE IS OKAY IN A QUIET COUNTRY SETTING, AT NIGHT WHEN YOU ARE TRYING TO SLEEP!

https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/wind-turbine-noise-community-response.pdf



NYSERDA's graphic is misleading because it does not account for the 7 factors that influence noise attenuation described above! Also, as the Bruel & Kjaer data shows above, at 450 meters downwind, the noise is only reduced by a couple of decibels and may even increase!

Health Impacts of Turbine Noise

Information about Industrial Wind Turbine noise is overwhelming, detailed and hard to decipher.

No matter what studies are done the common denominator is that Industrial Wind Turbines disturb, annoy, disrupt, impact and harm the health of nearby residents in different ways. Statements from affected individuals are consistent around the world and enough studies confirm their claims to warrant serious consideration by policy makers.

Problems with studies

- Failure to measure the full sound spectrum, in particular **ignoring the very low frequencies**, which are likely responsible for many of the reported adverse health effects.
- They **assume a constant sound pressure and tone, not at all like the impulsive sound produced by large turbines** which has its own distinct signature that differs from other environmental sources (planes, trains, automobiles, wind, leaves rustling, etc.).
- **Sound levels are often averaged over an hour, or longer**, making it possible for periods of very loud intrusive sound to fall within an "acceptable" calculated level.
- **Measurements are usually not taken indoors**, where the sound may be more intrusive due to the well-established resonance effects of low frequency sound.
- Most importantly, the **large studies fail to focus their investigations on those households that are most severely affected**.
- One study even admitted that the **10-minute monitoring conducted inside the home was not representative of the residents' actual experience** and therefore was likely to have skewed the results – despite producing a 192-page report!
- Noise measurements for most studies and environmental assessments have been **limited to the measurement of audible sound outside homes– using dBA weighted monitoring which is insensitive to infrasound frequencies**. Some studies and environmental assessments have even relied on projected audible sound averages from computer produced models.

https://www.nyserda.ny.gov/-/media/Files/Publications/Research/Biomass-Solar-Wind/wind-turbine-related-noise-wny.pdf

https://vtdigger.org/2016/01/24/sandy-reider-health-effects-of-turbine-noise-all-too-real/

http://docs.wind-watch.org/Infrasound-wind-turbines-4-August-2015.pdf

Health Impacts of Turbine Noise

Perspective of a former Lieutenant Governor, Commercial Airline Captain / Pilot, Retired Colonel / United States Air Force Reserve, Farmer and more.

Lt. Governor, Brian Dubie, Vermont, 2015

- "So, when you think of industrial wind turbines on a ridge line, **envision an airport with a line of airplanes that are holding for take-off**. The airplanes are powered by chainsaw engines that have run up their engines to full power. But, unlike planes at an airport, the turbines never take off. Now, **imagine this at two o'clock in the morning."**

- "Noise attenuation is also dependent on many topographical and meteorological factors**. For example if you are downwind from the turbines (chainsaws) the noise is greater. If the turbines (chainsaws) are located on high ground, the noise carries farther."**

- "To compensate for this, **some wind operators hire experienced professionals to come in for a week or two every year to monitor their noise and to assure the neighbors that they are imagining things**."

- "**Industrial wind turbines also produce low frequency sound that you cannot hear but you can feel**. When a turbine blade passes the wind tower on a large turbine it generates a low frequency pulse. These pulses are typically below 20 Hz and are called **infrasound**."

- "**Turbine infrasound can be detected inside homes as far away as six miles**."

- "**There is medical research that demonstrates that pulsating infrasound can be a direct cause of sleep disturbance. In clinical medicine, chronic sleep interruption and deprivation is acknowledged as a trigger of serious health problems.**"

Excerpts from: https://vtdigger.org/2015/10/04/brian-dubie-wind-turbine-noise-what-you-cant-hear-can-harm-you/

Health Impacts of Turbine Noise

Infrasound – the harmful, low frequency sound produced by Industrial Wind Turbines that you cannot hear.

Infrasound: Low Frequency Noise and Industrial Turbines

- "**The health risk of infrasound from wind turbines has been dismissed by the wind industry as insignificant.** It has maintained that since the typical loudness and frequency of wind turbine sound within a home is not audible, it cannot have any effect on human health."

- "**Such observations and projections fail to take appropriate account of the distinguishing signature of the sound from a wind turbine**. Unlike the more random naturally occurring sounds (such as wind or lake waves which may themselves have an infrasound component), the sound from wind turbines displays characteristics that produce a pattern that the ear and audio processing in the brain recognize. Our hearing is strongly influenced by pattern recognition."

- "One recognizable wind turbine pattern is a **tonal signal of sharply rising and falling pulses** in the infrasound range, (typically about 0.75 Hz, 1.5 Hz, 2.25 Hz, 3.0 Hz, and so on). It is produced by the blade passing the tower. At this frequency these pulses may be "felt or sensed" more than "heard" by the ears."

- "The second recognizable pattern is the **amplitude modulation**. This is the typical "swoosh" rising and falling that is audible."

- "We now know that subaudible pulsating **infrasound can be detected inside homes near operating wind turbines. It can also be identified up to 10 kilometers distant**. We know also that very low levels of infrasound and LFN are registered by the nervous system and affect the body even though they cannot be heard. The research cited in this report implicates these **infrasonic pulsations as the cause of some of the most commonly reported "sensations" experienced by many people living close to wind turbines including chronic sleep disturbance, dizziness, tinnitus, heart palpitations, vibrations and pressure sensations in the head and chest etc."**

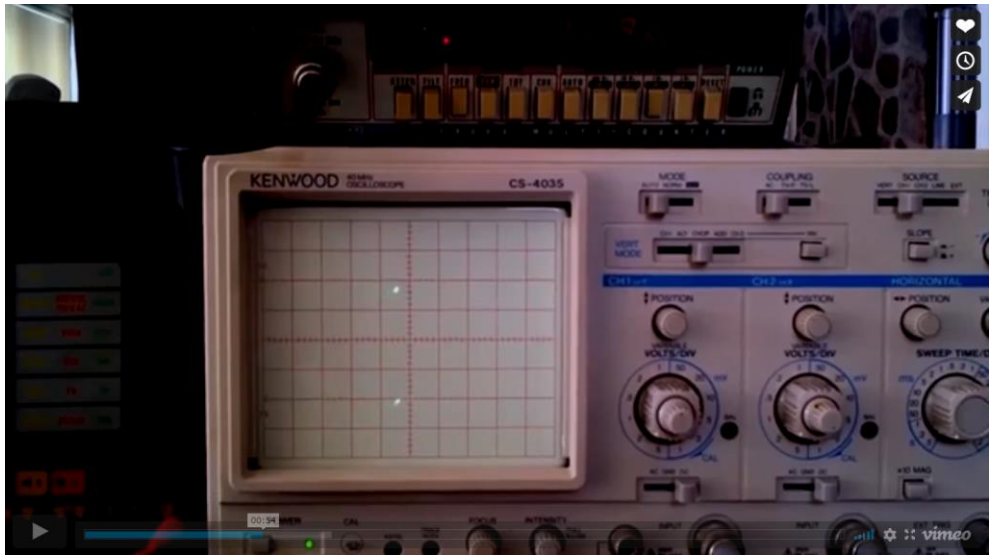
Excerpts from: http://docs.wind-watch.org/Infrasound-wind-turbines-4-August-2015.pdf

Health Impacts of Turbine Noise

In the video snapshots to the right, the dots travel across the Oscilloscope screen in pulsating fashion, in response to changing pressure inside the home over time.

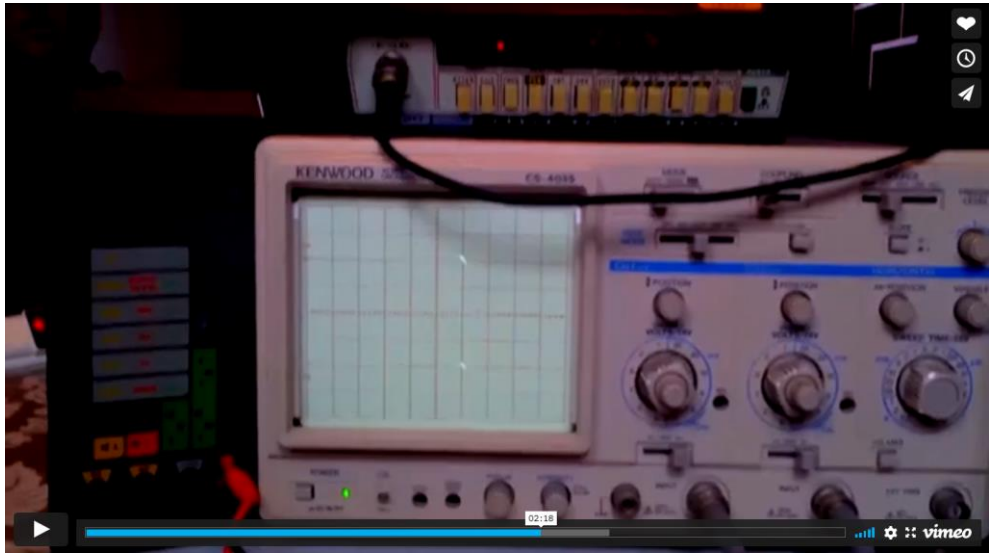
The frequency of the oscillations (dots) occurs at the EXACT frequency of the blade passing turbines near the homes.

Infrasound from Wind Turbines is Measurable



Turbine Farm

- Oscilloscope is located in a home that is **500m (1640 ft) from nearest turbine**, a 1.75 MW turbine – farther than the closest residence to the Tucker Rd turbine.
- The blade frequency in this case is .72Hz, or .72 cycles per second.
- **This frequency is FAR below what humans perceive as sound but well within the sensitivity of our eardrums.**



Single Turbine

- **Similar results from a .5 MW turbine located about 2km (~1.5 mi) from the home** – farther than DeRuyter lake and most Tucker Rd residents will be from the turbine.
- The blade frequency in this case is 1.4Hz., or 1.4 cycles per second.
- Pressure fluctuations are amplified by reflections from nearby objects.
- The SE wind also increases the pressures.

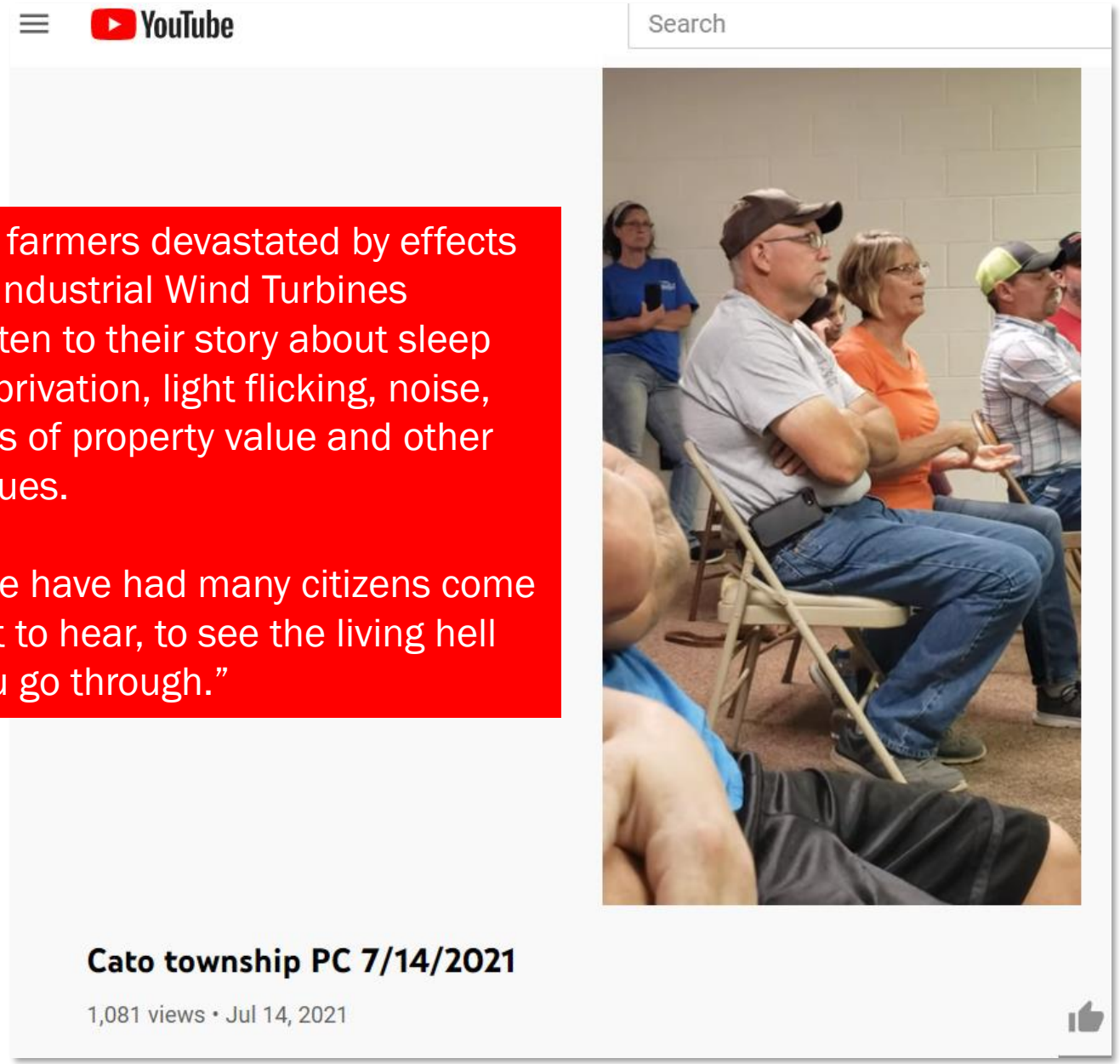
https://kevindooleyinc.com/wind-energy/

Recent Testimony from Upstate New York Farmers

https://www.youtube.com/watch?app=desktop&t=240&fbclid=IwAR0zsd5tGk9MMMGex9Gajc4g_hiq67GGPamAaEckqONRAHIU1QwEmDhVlCQ&v=JMRTqGDNC28&feature=youtu.be

NY farmers devastated by effects of Industrial Wind Turbines
Listen to their story about sleep deprivation, light flicking, noise, loss of property value and other issues.

“We have had many citizens come out to hear, to see the living hell you go through.”



Big Wind Says No Health Issues

The tone of Big Wind is dismissive and condescending toward individuals and groups who have experienced health problems and who are not equipped financially or legally to stand up to the counter-arguments presented by the big wind industry.

We urge a common-sense approach to assessing the risk of health and quality of life impacts when deciding on site-selection criteria for IWTs in DeRuyter and Cazenovia. The simple solution is to site IWTs miles from any humans.

The Wind Energy's website (cleanpower.org) does not have one supportive study about the health impacts of audible and infrasound noise.

Do your own search for they keyword "noise" on this site. Below are some quotes that highlight the position of Big Wind on the noise/health issue:

- "The results of this study confirm what experts around the world continue to find, **that audible and inaudible sounds emitted from wind turbines do not represent a human health risk…**"

https://cleanpower.org/blog/independent-study-confirms-wind-sound-and-health-claims-are-unfounded/

Further, **the site dismisses the symptomatic experiences of impacted people** by framing contrary viewpoints as a misinformation campaign. Further, Big Wind blames the *negative view* of wind-energy for the symptoms reported by nearby residents.

- **"There is no question that wind turbines create sound, and that in some circumstances this sound can be heard at nearby residences**…Rigorous noise standards are designed to give a reasonable level of protection against sleep disturbance, taking into account the location of turbines, the model, and existing background noise…While this is good enough for most people, some still find the residual noise levels annoying. At this point, **noise level alone isn't a good predictor of annoyance–personality and existing attitudes tend to dominate.**"

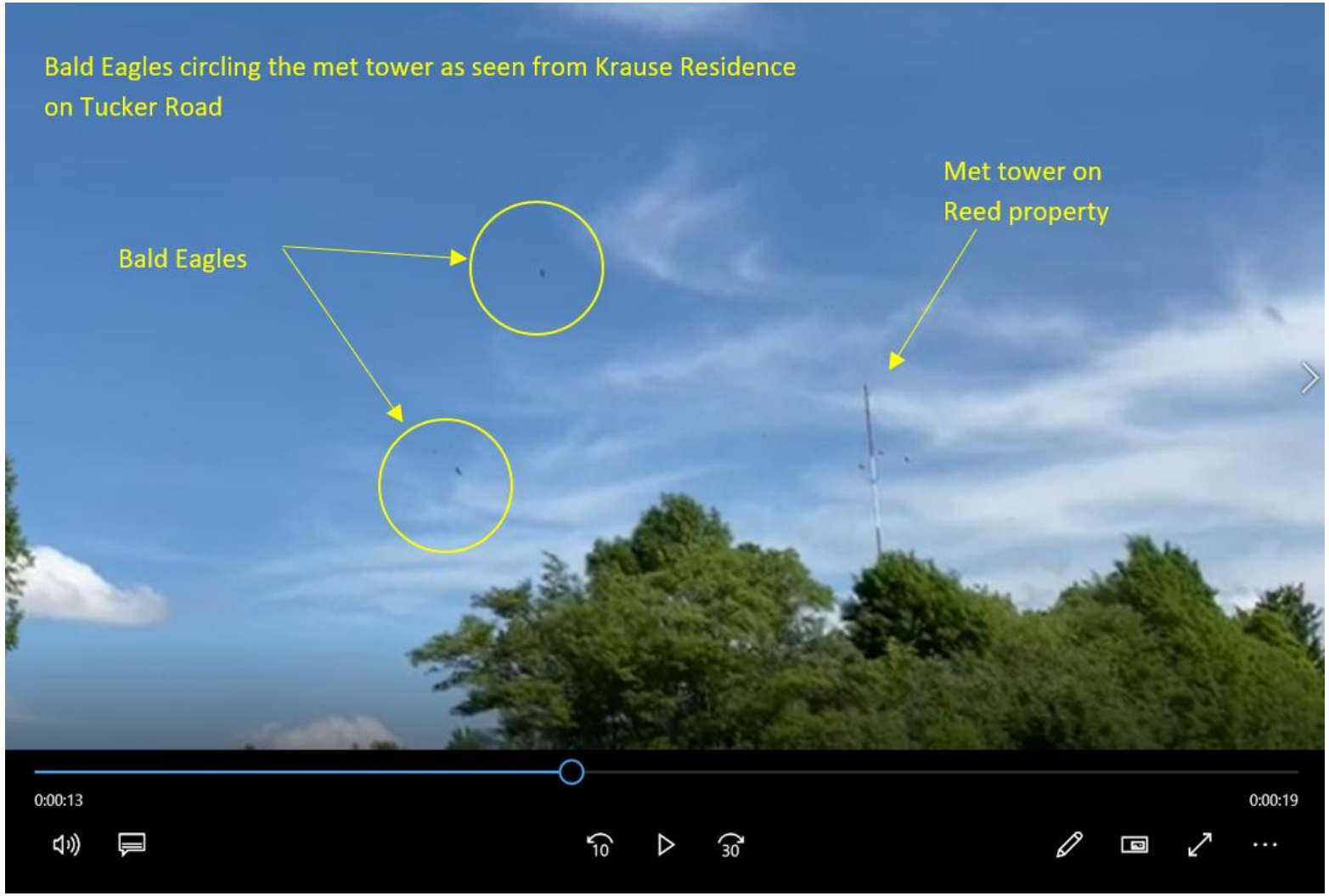
https://cleanpower.org/blog/the-nocebo-effect-and-why-its-much-more-dangerous-than-wind-turbines/

Wildlife Impacts of Turbines

The Tucker Road turbine site experiences frequent visits from Bald Eagles.

In the video, the Bald Eagles pass close to the tower, which would be well within the blade coverage (circumference) of the turbine.

Industrial Wind Turbines kill birds of prey



Video taken by T. Krause on 6/20/2021, 5:05 PM.

Wildlife Impacts of Turbines

Audubon NY supports wind energy, but only if birds are not put at risk.

https://ny.audubon.org/wind-power-position

Audubon New York opposes wind farm development on sites determined to be of high risk to bird populations, including:

1) sites of known local bird migration pathways or in areas where birds are highly concentrated during migration;

2) sites in habitats known to be important to state and federally listed bird species;

3) Important Bird Areas (IBAs) and Bird Conservation Areas (BCAs) identified for their importance to large numbers of migrants, either raptors or nocturnal migrants; and

4) IBAs and BCAs where construction of the turbines (i.e., the footprint) would significantly lower the habitat value of the site.

Wildlife Impacts of Turbines

Smallwood's research addressed the discrepancies in bird/bat fatality reports. The full report is accessible for a fee, and it states that:

"Beginning in 2010, an increasing number of fatality monitoring reports have been kept confidential. Transparency is important to science, however, so this trend needs to be reversed. Furthermore....only a small fraction of the available reports have been peer reviewed..."

Wildlife Society Bulletin 37(1):19–33; 2013; DOI: 10.1002/wsb.260

888,000 bats killed/yr
573,000 birds killed/yr

Wind Energy and Wildlife Conservation

Comparing Bird and Bat Fatality-Rate Estimates Among North American Wind-Energy Projects

K. SHAWN SMALLWOOD,[1] *3108 Finch Street, Davis, CA 95616, USA*

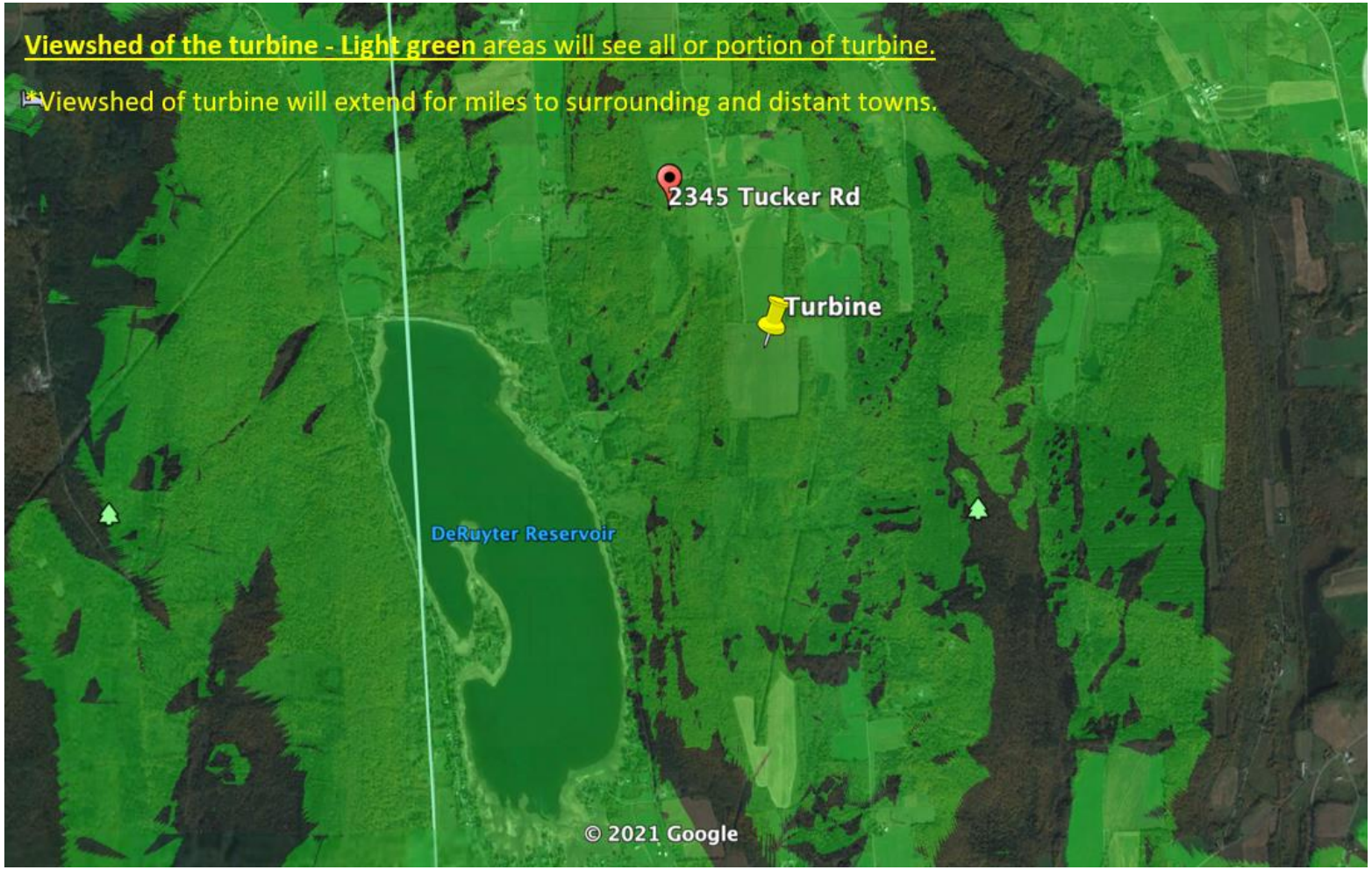
ABSTRACT Estimates of bird and bat fatalities are often made at wind-energy projects to assess impacts by comparing them with other fatality estimates. Many fatality estimates have been made across North America, but they have varied greatly in field and analytical methods, monitoring duration, and in the size and height of the wind turbines monitored for fatalities, and few benefited from scientific peer review. To improve comparability among estimates, I reviewed available reports of fatality monitoring at wind-energy projects throughout North America, and I applied a common estimator and 3 adjustment factors to data collected from these reports. To adjust fatality estimates for proportions of carcasses not found during routine monitoring, I used national averages from hundreds of carcass placement trials intended to characterize scavenger removal and searcher detection rates, and I relied on patterns of carcass distance from wind turbines to develop an adjustment for variation in maximum search radius around wind turbines mounted on various tower heights. Adjusted fatality rates correlated inversely with wind-turbine size for all raptors as a group across the United States, and for all birds as a group within the Altamont Pass Wind Resource Area, California. I estimated 888,000 bat and 573,000 bird fatalities/year (including 83,000 raptor fatalities) at 51,630 megawatt (MW) of installed wind-energy capacity in the United States in 2012. As wind energy continues to expand, there is urgent need to improve fatality monitoring methods, especially in the implementation of detection trials, which should be more realistically incorporated into routine monitoring.

KEY WORDS fatality monitoring, fatality rate estimates, scavenger removal, search radius, searcher detection, wind energy, wind turbines.

Viewshed Impact of Turbine

The Tucker Road turbine is so large (~750 feet to blade tip) that nearly all locations around DeRuyter lake and Tucker Rd will see parts of the structure.

The Tucker Hill ridgeline will be dominated by the turbine from miles away and for a generation or longer.



By Joseph Dickson via Google Earth Pro

Viewshed Impact of Turbine

The importance of defining aesthetic value.

https://www.cesa.org/wp-content/uploads/CESA-Visual-Impacts-Methodology-May2011.pdf

DeRuyter and Cazenovia should create strong viewshed laws that clearly identify and describe aesthetic and scenic resources. In this region, such resources include hilltops, lakes, parks and farmland.

- Public documents that identify and describe aesthetic or scenic resources are invaluable to developers, concerned citizens, and to permitting bodies as they can provide clear guidance as to the particular values of natural and cultural landscape features.
- To be considered an aesthetic "standard," however, there must be clear and unambiguous language as to particular aesthetic values that are to be protected.
- **The use of a "clear written standard" places responsibility on communities and state agencies to clearly define the resources they wish to protect through a public process.**

Viewshed Impact of Turbine

The importance of local law.

https://www.vermontjudiciary.org/sites/default/files/documents/2007-456.pdf

The importance of local laws that clearly define scenic value cannot be understated. Without them, the town has no standing on the basis of viewshed alone, regardless of impact.

- Vermont utilizes a regulatory "test," called the Quechee Test, to determine if a turbine project will have an adverse aesthetic impact.
- The example case is provided to show how the absence of a clear aesthetic standard in local law provides citizens with minimal ability to influence a project based on viewshed arguments.
- **"...it was undisputed that UPC's project would have an adverse aesthetic impact, the Board focused its analysis on whether the negative effect would be undue."**
- **The Town of Sutton argued that its laws were clear but the Board disagreed because local law only described the desire to preserve the "rural" characteristic instead of a clear, written community standard, with language "intended to preserve the aesthetics or scenic beauty of the area' where the proposed project is located and [it] must apply to specific resources in the proposed project area."**

Viewshed Impact of Turbine

DOMINANCE in the landscape

https://www.cesa.org/wp-content/uploads/CESA-Visual-Impacts-Methodology-May2011.pdf

The following factors affect the degree of dominance, but it is nearly always a combination of these factors that results in unreasonable visual impacts:

- **Viewed in close proximity** – the closer to the turbine the greater the impact (Tucker Rd and DuRuyter residents will live in the shad of this ~750' structure)
- **Long duration view** – The turbine will be visible to hikers in Highland Park, DeRuyter State Park and boaters on DeRuyter Lake.
- **Expectation of natural or intact landscape setting** – **The Tucker Road area is incompatible with a structure this size.**
- **Unique scenic resource** – The ridgelines in the Cazenovia/DeRuyter area are scenic resources that should be protected. **Allowing structures of this size virtually eliminates objection to any structure in the area.**
- **Project Viewed Directly Ahead in Typical Direction of Travel** – **The turbine is directly ahead of motorists** traveling South from Cazenovia on Rt. 13 and will dominate the skyline.
- **Large Numbers of Turbines Visible in Many Views** – The Fenner turbines are visible to the North by many residents. **As the proposed Tucker Rd turbine is likely a trojan horse project, consideration should be given to the future state of the area and the potential for a region dominated by industrial turbines.**

NIMBY

Why does this matter?

NIMBY underscores the problems with Industrial Wind Turbines and is a tacit reminder of the impact to humans. Siting considerations need to prioritize locations that are miles from residences with negligible environmental/wildlife degradation.

Not-In-My-Back-Yard (NIMBY) is a real phenomenon in the renewable energy craze that has swept NY, the Northeast and the US.

NIMBY matters because some of the biggest proponents of industrial wind energy are the same people who refuse to allow turbines to impact their own lives.

For local residents who support turbines the size of the proposed Tucker Road turbine, would you want it in your back yard? NIMBY supporters of industrial wind turbine projects ask others, like us, to sacrifice health and quality of life so they don't have to. The most infamous example of NIMBY is cited below.

John Kerry, Special Presidential Envoy for Climate, in opposition to the Cape Wind project, 2010.

- "I've always said that I think Senator Kennedy has raised very legitimate issues with respect to the siting process and with respect to location. I've also suggested that it's my opinion **there may be even better locations for it.** I've sat with Jim Gordon [president of Cape Wind], I've sat with other folks, I've met with Coast Guard people. I've tried to do due diligence on it, and **I'm not sure there aren't both windier and, you know, more accessible areas.**"

Note that the Koch brothers (Republicans) were also strongly opposed to the Cape Wind project. We did not quote them here because they are generally opposed to renewable energy although it can be argued that their opposition to Cape Wind was influenced by impact to personal property and less so by ideology.

https://www.forbes.com/sites/larrybell/2012/04/03/massachusetts-affordable-energy-prospects-are-blowing-in-the-wind/?sh=295c204c7c09

What we know about Borrego Solar

- ❑ Headquartered in California.
- ❑ Office in Latham, NY.
- ❑ No experience in wind projects.
- ❑ Foreign backed (Taiwan).
- ❑ Privately held.
- ❑ About 500 employees.

Borrego has obligations to foreign investors

REUTERS

World Business Markets Breakingviews Video More

GREEN BUSINESS NEWS AUGUST 3, 2009 / 12:03 AM / UPDATED 12 YEARS AGO

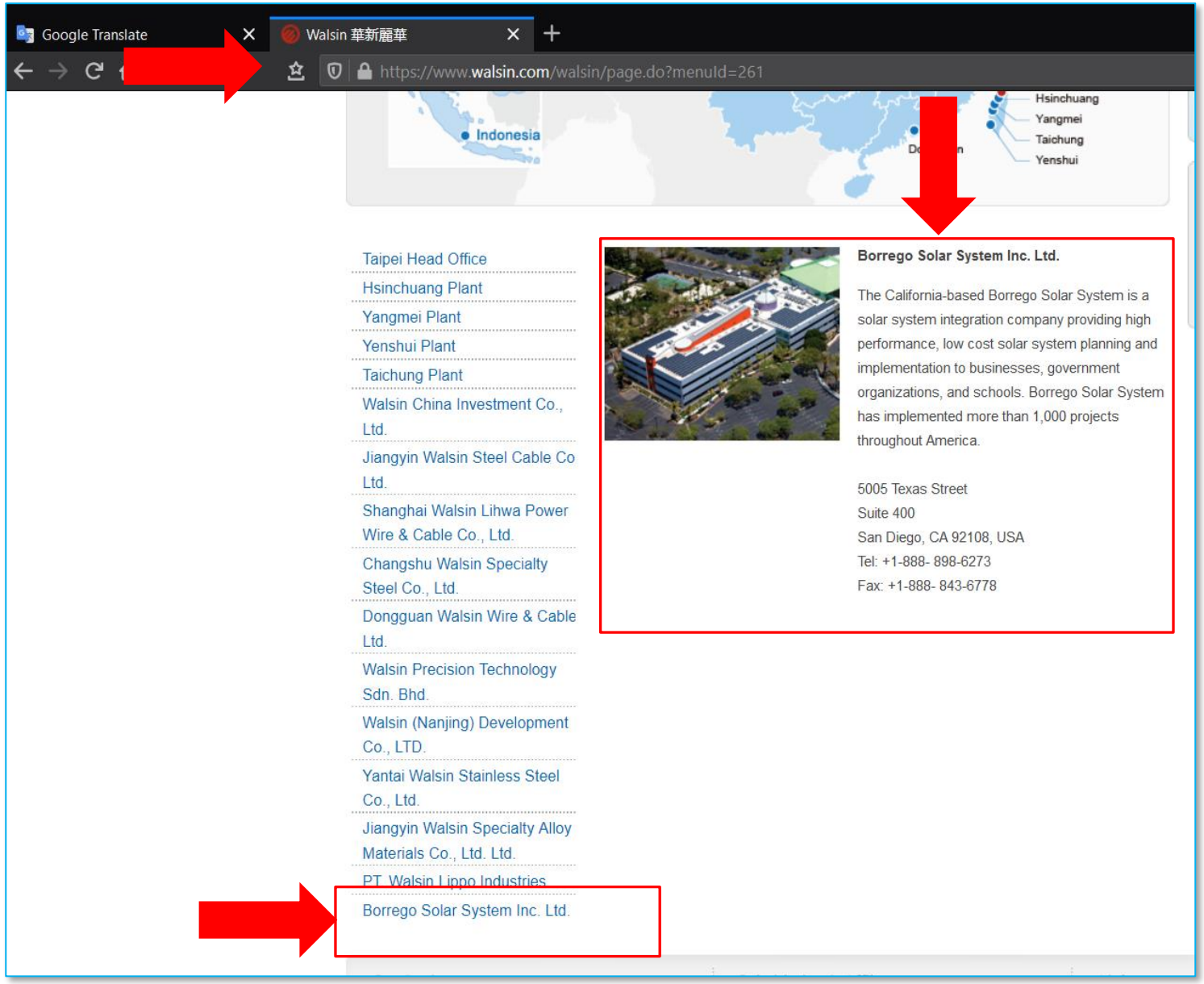
Borrego Solar gets $30 million for solar financing

By Poornima Gupta 2 MIN READ

SAN FRANCISCO (Reuters) - U.S. solar power system installer Borrego Solar Systems said it has received $30 million from Taiwan's Walsin Lihwa to offer financing to solar power project customers.

Walsin Lihwa

Walsin writeup on Borrego solar - translated using Google Translate service online

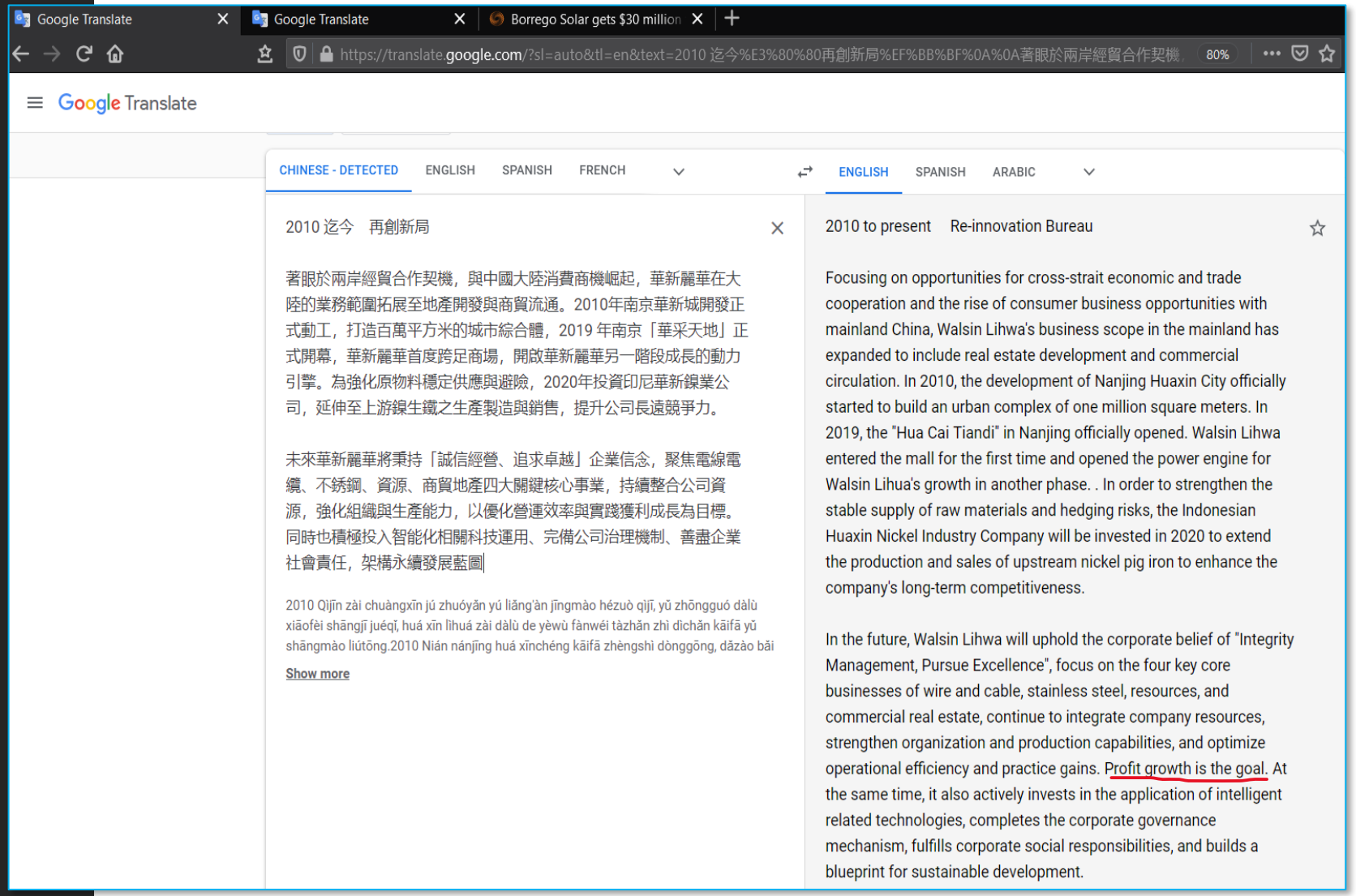


Walsin Lihwa

"Profit growth is the goal."

From Walsin Lihwa's website, translated via Google Translate

Walsin & Borrego are NOT here for the residents of DeRuyter and Cazenovia – they are here to make money, period.



Additional Resources

Learn what others have to say.

Get help drafting local ordinances.

Informative Online Resources

https://www.saveguilford.com/
http://www.nnywind.com/concerns---page-by-page.html
https://www.energy.gov/eere/wind/advantages-and-challenges-wind-energy
https://stopthesethings.com/tag/opposition-wind-power-new-york/
https://wind-watch.org/
https://www.virginiansforresponsibleenergy.org/wind-power-issues/quality-of-life/
https://www.nonoise.org/library/envnoise/index.htm

Legal Resources for Municipalities

Gary Abraham	Attorney - has written laws against poorly located large renewable energy	Rochester, NY	(716) 790-6141	gabraham44@eznet.net
Paul Curtain	Attorney - has written laws against poorly located large renewable energy	Cazenovia, NY	(315) 815-4221	
Benjamin Wisniewski	Attorney with Zoglin law firm in Rochester, NY - has crafted laws for townships prohibiting large turbines	Rochester, NY	(585) 434-0790	benjamin@zoblaw.com

Borrego Solar Contact

David Strong	Borrego project manager – Tucker Road turbine project	Albany, NY	(518) 217-8342	dstrong@borregosolar.com