

## Understanding Wind Energy Questions Posed to the Experts

### Sound/Noise Level

- Noise issues—will they be addressed?
- How loud will it be?
- Will I be able to hear it?
- Can you describe the sound the turbines make?
- What does the turbines sound like from approximately 1400 feet away? 1000 feet? 1/2 mile? Is there an accurate recording?
- What do the turbines sound like when it interacts with a home or building? Are there recordings from inside a house at a specific distance?
- Describe how the pitch of the turbine blade affects the noise emitted from the turbines?
- Does ice on the turbine blades affect the sound?
- Are the people who will live near these windmills aware that there is considerable and constant noise associated with the spinning of the blades? Do they know that huge, heavy chunks of ice fall from the blades in the winter?
- Can you hear turbine sounds from inside a home?
- People who live near the Mackinaw City wind turbines complain about the noise they make and they cannot sleep. I have stood near them and a couple of blocks away and cannot hear anything except swishing sounds. What sounds do they make that are bothering people?
- Are noise ordinances that are in place considered for the noise factor these turbines create? What is the decibel they will be running at?
- Are we allowed to enact a noise ordinance that covers all industry?
- Can we require that an industrial wind turbine project does not raise our daytime and/or nighttime ambient levels of sound in our ordinance?
- Should a noise limit in an ordinance set two limits, night time and day time? What are the recommended dB (A) limits to not disturb non-participating residents?
- Has the State of Michigan recommended ordinance limits on sound pressure levels related to wind turbines? Have any Michigan universities made recommendations? What are those recommendations?
- Can the community/township regulate noise produced by a turbine be kept at current ambient noise levels at the property line of the lease unit or non-participating lot line?
- Duke has said they will not exceed 45dB (A) at the outside of a home. The World Health Organization night time sound study provides the relative levels of disturbance of night time sound stating sleep disturbance can be measured at sound levels around 35dB (A). As sound get louder the disturbance gets greater. If people want to sit out and enjoy an evening on the deck during the summer they should not have to be disturbed by sounds from the wind turbines. Should the night time noise standard in an ordinance be not to exceed 30dB (A) at the property line of the participating property owner? This would protect the residents from unnatural sounds and not degrade their quality of life.
- Is the sound coming from wind turbine be considered nuisance noise if the sound goes beyond the participating property line and interferes with the sleep and enjoyment of a not participating land owner?
- Duke has said they will not exceed 45dB (A) at the outside of a home. Why shouldn't the sound limits be at the property line of the participating property owner rather than at a house of a neighbor (or of a non-participating resident)?
- If there are multiple towers within earshot of homes, is the combined decibel level of these towers less than or greater than decibel levels that are damaging and not merely disturbing.

- Is there evidence of hearing damage directly caused by proximity to wind turbines? I don't mean correlational evidence – where wind sound is measured and hearing damage is imputed to people living or working in proximity to wind turbines. Same question for infrasound?
- Vestas, the manufacturer you are considering using, recommends governments supplement relative noise limits with a low absolute maximum limit in the areas of very low background noise (i.e. countryside). Most countryside dB (A) levels are 25-30. Will you be adhering to the manufacturer's recommendations?
- Technology on wind turbines, including analysis of sound frequency—do they produce low frequency sound?
- Some wind energy companies say that the new upwind generators produce no infrasound (low frequency sound). There are many acoustical engineers (Rick James) who state there is low frequency sound from the large (1.8-2.5 MW) upwind generators. Who is correct? If there is no infrasound (low frequency sound)? Should the township ordinances include a low frequency sound limit of zero?
- Is there evidence of technological changes in wind turbine design that can mitigate the sound emitted from the turbines?
- Are you able to identify any original, follow-up, legitimately scientific research on “wind turbine noise syndrome” other than articles that simply quote Nina Pierpont's work and assume that it is either true or probably true?
- What test methodologies are used for verifying compliance with sound limits?
- Why can wind energy be placed anywhere in any zoning district without regard to noise generation and height restrictions?
- Are there any zoning ordinances anywhere that require there be no more than 40 dB of noise from a proposed project (any project—roads, factories, shopping centers, nightclubs, farms, etc....not just wind), at a property owner's property line? Would, in your opinion, such a requirement be enforceable, or would it amount to exclusionary zoning?
- What are the current zoning restrictions on sound for other land uses in Benzie and Manistee Counties (i.e. oil & gas, farming, manufacturing, highways, railroads, shipping centers, etc.), and what sound levels can be expected from these uses?
- What is turbine whistle?
- What causes that high pitch whistling? Is this a mechanical problem or just the sound turbines make?
- Is there a sound difference between different topographies?
- If wind generators are located on a ridge will the sound (audible and low frequency) travel further than sound traveling on flat land (fields)?
- Is the sound from one tower audible from another tower?
- If sound limits are set too stringently, could they effectively preclude utility-scale wind farm development in Benzie and Manistee Counties?
- What are the noise level comparisons of windmill construction and producing into the power grid with oil/gas well construction and producing into the grid?
- What is the noise level of an operating 500 foot windmill compared to an oil/gas compressor facility?
- In Blaine Township there are areas zoned residential or are predominately residential. What should be the setback from the residential areas so residents are not impacted by noise, both audible and low frequency?
- What wind farm design and ambient factors other than setback can minimize the sound level at a receptor?

## **Wildlife**

- Can flight paths of birds and bats be controlled?
- Will migration patterns be studied for birds in the area of Lake Michigan, Bear Lake, Glovers Lake, Mud Lake, Arcadia Lake, Upper and Lower Herring Lakes? Will it be a local Forest Representative or someone from Duke Energy who wouldn't truly know the area?

- Has the Duke project done a formal study of bird migration routes as related to the likely sites of the turbines? Are there design possibilities that would mitigate potential dangers to wildlife? Are flashing lights required at night?
- There are migratory flyways from Platt Lake, to Crystal Lake, Betsie Bay to Upper and Lower Herring Lakes and on down to Bear and Glovers Lake. What should be the setbacks of wind turbines from these lakes with migratory flyways?
- Can we mandate that no turbines be placed in the areas of migratory bird paths?
- Why do bats get the bends near wind turbines?
- If bats are killed in large numbers and the industrial wind projects are within orchards, what will be the impact on the orchard from the loss of the bat population?
- Bats are extremely susceptible to wind turbines. Studies have shown they do not have to strike the wind turbine since the pressure drop caused by the blades causes the bat's lungs to rupture. What are the mitigation measures that can be used to protect the bat population?
- Is there any real danger to wildlife? What about migrating birds? Do they know that birds have been and will be killed by the spinning blades? Protected species?
- What will the action be if all the experts and all the planning indicate minimal effect on wildlife but it turns out otherwise?
- Other than Altamont, could you identify other sites where there has been excessive bird and bat kill?
- What is the impact of wind turbine sound on wildlife living in the industrial wind project area?
- Is there a definitive or exemplar study available regarding the health and wildlife impacts, both positive and negative?
- What is the typical time period that environmental studies cover? One year to cover spring and fall migration—nesting and breeding periods?
- Does environmental impact on wildlife, investigation, birds, etc. last for 1 year. Are there actual fixed studies done?
- The FWS recommends at least a 5-mile setback distance from any active bald eagle's nest. Will the developers apply for a permit to "take" a certain number of bald eagles so they will not be in violation of the Bald and Golden Eagle Protection Act?
- We only have a few bald eagles. What can be done to protect them?
- Will the developers apply for a "take" permit for endangered species of birds and bats so they will not be in violation of the Migratory Bird Treaty Act and the Endangered Species Acts?
- Would the bats and bald eagles in the area potentially be threatened by the wind turbines?
- How do ridge/valley sound and vibration affect fishery, birds, etc. in Blaine Township?
- Are there Best Management Practices for avoiding and/or mitigating invasive species proliferation caused by the development? (For example, the development of dirt roads can often spread invasive species from one location to another).
- Are we allowed to enact ordinances that protect the wildlife habitats currently in our areas?
- Can the township require or make it mandatory that the applicant follow all US fish and wildlife recommendations?
- Can the township require the applicant to follow US fish and wildlife wind siting guidelines?
- Can the township require that the applicant study the impact of wind turbines on bees and their pollination ability, as well as bats?
- Has the impact of industrial wind farms on beekeeping ever been researched? And what is that impact? Do wind revolving tower blades create a vortex that disorients bees and/or tears their wings?
- Will the towers be lit in a way that will not attract migrating birds? What other protections will be considered for birds?
- How many birds die from windmills compared to airplane, automobiles, or window panes?

- What guidelines are being followed regarding effects on wildlife, in particular avian? Is anyone consulting with the national Audubon organization? Reputable sources/best experts must be consulted when any siting decision is made. While the towers may be sited away from regular migration paths, there could be a problem with lights on those towers especially with many towers.
- Are proponents and developers aware that the Lake Michigan coast from Benzie to Allegan counties is declared an important bird area by national Audubon? Rafts of 5,000 to 35,000 long-tailed ducks are seen offshore regularly. Wind tower siting in the lake must consider this.
- What ramifications to our ecosystems would there be if many birds and bats are eliminated by large wind turbines?
- What are the known impacts from turbines, roads, power lines and other associated infrastructure, including but not limited to displacement & avoidance behaviors and direct collision/mortality on the species listed in "Attachment 1?"

### **Health and Safety**

- What does the scientific literature say about the health/mental effects of shadow flicker?
- What are the effects of people who experience shadow flicker in a home?
- Is there a safety hazard if turbines cast shadow flicker over a road or highway?
- What are the scientifically documented effects of shadow flicker on those living and working in proximity to wind turbines?
- Have the people who will be living near these windmills been informed of the side-effect called 'shadow flicker'? This is the constant shadow/light/shadow/light that is very visible (and annoying) inside a home when the home is in the shadow of the windmill.
- How much of each day and at what distance would a resident living or employee working in proximity to a wind turbine experience shadow flicker?
- How many hours are appropriate for shadow flicker on a residence?
- When there is a "flicker" problem that affects someone's domicile, typically how many days a year does this occur, and for how long each day?
- What will be done to protect owners and homes and land from the "flicker" effects of the wind turbines?
- What kind of liability does the developer have if blade throw or failure causes damage to life or property?
- For a turbine with a hub height of 330 feet, and a total blade tip height of 485 feet, what is the theoretical limit for ice throw?
- Ice throw in northern climates is an issue. How do you calculate a safety zone to prevent injuries from ice throw?
- Has the icing effect been taken into account during our long winters?
- Does living with a wind turbine really affect people's health and safety when compared with normal, everyday environmental factors?
- Please present honest and truthful studies that these turbines can be harmful to health of humans and people. Those studies are out there, please present both sides. Will you show both sides of the coin? Flicker effect, noise, sleep deprivation, etc.
- The health hazards as we get older are a real concern for us, plus the shadows and sound that these will generate. Please don't ruin this quaint little town. (Arcadia)
- Why does the wind industry continually try to discredit the physicians and audiology professionals studying wind turbine syndrome?
- How does the township board plan to deal with "competing experts" – conflicting testimony regarding medical impacts?
- If there's a turbine fire and it causes a wildfire and destroys property can the developer be held responsible?
- Who is responsible for any ecological, physiological, or medical consequences of wind?
- What is the speed (MPH) of the blade tips at maximum revolution for a 495 foot turbine?

- What is the maximum wind speed that contemporary turbines are designed to withstand?
- Are the fumes toxic if one of these catches fire?
- Can the township require that utility grid systems have fire suppression systems since there is no fire equipment that will reach that high?
- The wind industry says that wind turbines do not cause health effects, numerous doctors and studies provide evidence of health impacts. Should the wind industry use residents as guinea pigs or should definitive medical studies be completed before wind developers are allowed to be built?
- Re: Ethics of the Wind Industry in regards to the dismissal and denial of any ill effects on people living within the wind project footprint. This is a fundamental public health issue. Rather than be responsive and better understand exactly what the effects are in order to determine appropriate siting the wind industry in general seems to be taking the stance that there are no ill effects. It cannot be ignored that people do have problems associated with living in close proximity to large wind facilities. An in-depth and scientific inquiry needs to be pursued regarding rural wind farms and health effects. How can a community or an individual help to initiate such an inquiry?
- What types of insurance and how much per turbine should the township require for the wind developer to carry?
- What percentage of people living within 1500 foot of a large industrial turbine reported sleep loss?
- The ordinance should specify that Duke or subsequent owners will reimburse the township and its residents for any costs associated with handling any turbine-related emergencies – e.g. fires started in turbines, etc.
- Do industrial wind turbines interfere with emergency communications?
- What would the impact of the wind turbine-generated noise be on people, pets, and wildlife?

### **Township Governance**

- What type of authority do townships have to regulate and control wind farm developments?
- How do townships ensure corporations are doing business within an ordinance?
- Will Township officials for both Manistee and Benzie counties have ordinances in place to manage this wind turbine industrial development?
- Should both counties have the same elements in their ordinances to address similar problems if they arise?
- What right does a township have to make ordinances? How are these rights defended?
- What is the process for the township's decisions on the wind ordinance? I do not know if any township officials have signed personal contracts with Duke; however, I have strong concerns about Duke signing non-disclosure contracts with any township official who will be making decisions about any ordinance regarding wind turbines. It is definitely a conflict of interest and raises questions of ethics. Has an attorney reviewed this issue? Any official with a signed contract should recuse him/herself from any votes related to the Gale project. I am not accusing anyone of misconduct, but the potential situation raises serious concerns.
- Aside from such protections stipulated in wind royalty lease arrangements, can the local authority impose its own? Are such stipulations ever used for other kinds of development—such as shopping malls, industrial applications such as gravel pits, processing plants, amusement parks or other large developments that strongly affect the local landscape?
- How are rights of corporations and townships controlled to ensure intimidation doesn't happen?
- Will our townships be able to defend against intimidation tactics by wind developers? Are there funds available on the state or federal level to defend our enacted ordinances?
- What kind of language can be put in the township ordinance to protect itself from an applicant going bankrupt during the lease/install, etc.?
- What kind of language can be put in the township ordinance to protect itself from mid-project pull out? For example, if subsidies are taken away and the company decides to stop the project.

- How can a township protect itself from a large corporation suing and bankrupting the township in order to get what it wants?
- How do townships protect themselves legally from liability if a participating land owner's home is too close to a wind turbine and it results in sleep disturbance and eventually health effects?
- What is the liability and exposure to officials?
- Regarding planning, zoning, and permits, what type of legal and financial liability exists for local units of government, for the unit and individual elected officials?
- Who in the townships is qualified and who will work with the energy company and stand up to it/negotiate as need be on behalf of the township? Is this job too big for the people we have available now. Will the township have to spend money on more lawyers, consultants, etc.?
- How do officials ensure they are educated on issues?
- Should townships go to other communities for best practices?
- Are we allowed to enact ordinances that hold to a specific vision of our townships even if it does not include industrial wind energy generation facilities?
- Should township officials be allowed to be leaseholders, people who benefit from the decisions made about wind energy, can they hold leases and earn direct money from them when they are overseeing them? What are the safeguards against corruption, if that is what the above is? We should define "corruption" first.
- Will there be a public hearing regarding the placement of these turbines? Public comments welcomed?

### **Wind Energy Companies**

- How do these corporations live up to promises? Are they a good corporate citizen?
- Does Duke have arrangements with Consumers Energy or Cherryland Electric? Should these be in place before they break ground?
- What approaches have wind energy companies taken that do not succeed in communities?
- What can we do to protect ourselves against the deep pockets of the energy companies? There have been stories in the press about their unresponsiveness. Do companies have to pay fines for operating outside of agreed hours, ignoring resident complaints, not paying taxes, etc.? Will there be some sort of fine system and will there be a "fund" of some kind to ensure that money is available for these things?
- Is Duke Energy proposing a master plan for all of these counties, or is this a first step and we can expect to see, once they have their toe in the door so to speak, that more turbines will be proposed? Is there a way to look at the whole counties and hear what they plan in total for the future?
- Can you build a legitimate business model for wind as a private, viable, competitive, profitable, and sustainable enterprise?
- Why did the wind developer conduct a POST-lease signing survey about community support? Why was this not completed prior?
- Are there alternative companies [to Duke Energy]?
- Are there sources available that give credibility, ethical, and financial information of companies?
- What legal or moral right does Duke or any other wind turbine company have to take out noise free quiet, clear starry nights, and loss of property value to force these massive obtrusive wind towers onto our rural community?
- How can an energy company submit a proposal to a power purchasing requester if the current area being considered for the proposal is under a moratorium and therefore, no rules are yet in place to determine key questions asked on those proposal submittals?

### **Setbacks**

- What are Duke Energy's setbacks based on (scientific data, etc.)?
- What are GE's setback recommendations for a wind turbine not to be heard in a rural area?
- Setbacks—who determines the appropriate setback for the placement of a turbine, by a lake, house, etc.? Township officials or Duke Energy? Should those setbacks be uniform across the counties?
- Can AES or MAP look into other countries for their turbine setbacks? Denmark, Germany, Australia, Canada and UK?
- I would like to see in one document a listing of the setbacks that have been used by other government entities for wind farms as large (both turbines and number of turbines) as the proposed one, including those countries in Europe and elsewhere where wind energy is more advanced and where longer term results could be helpful. I would also like to see a document which includes the above and addresses how setbacks may have changed over time, as a result perhaps of larger turbines, larger installations, or resident considerations/complaints.
- If sound levels are limited by ordinance, what is the purpose of physical distance setbacks for wind turbines, and what setback would be protective for a wind turbine?
- I would like to understand how often and where a wind farm of this size (both turbines and size of farm) fits into communities which look like Benzie and surrounding counties in their land size, surrounding towns and homes. If setbacks were increased to a certain level, would this project go away because the economy of scale could not be reached? What is that break even setback? Do we need to be mindful of profit motive which may lay behind Duke's proposed setbacks?
- What is the average setback from residences for industrial wind turbines of 500 feet, 400 feet, and 300 feet?
- What are the average setbacks globally?
- Will the developers abide by the 1-2 mile setback recommended in all of the recent literature on setbacks from people's homes?
- GE, a manufacturer of turbines, says that in a rural area, for a turbine not to be heard, they must be placed one mile away. Can a township require that setback?
- What are the recommended and required setbacks for Duke's proposed wind turbines from Lake Michigan, its shore, and other sensitive or protected lands, including conservancy-protected land?
- Re: Setbacks – Considering the World Health Organization recommendation of a 6600 ft. setback, the French National Academy of Medicine recommended setback of 1500 m, approximately 1 mile, the U.S. National Research Council recommended setback of 2500 feet, Vesta manufacturer's manual recommendation that workers wear a hard hat if within 1300 ft. of a turbine, and many, many other recommended setback distances in order to protect people from noise, ice and blade throw, etc. How does the wind industry consider a 1000 ft. minimal setback defensible? Where does this 1000 ft. setback come from? How does a community determine exactly what is a reasonable and responsible setback?

### Property Leases

- Explain the pooling arrangements Duke will make with some farmers. How will they affect the locals around the turbine who don't have a lease? Do they benefit in any way?
- Are the landowners hosting the windmills being fairly compensated?
- How much money will landowners make?
- Who is really getting rich from this? Duke or the farmers/land leasees?
- What parties will benefit the most financially from this project?
- Property owners with leases for the wind turbines receive a financial benefit. What compensation process is available to an adjacent property owner who may encounter health issues or property devaluation due to the turbine's existence?
- Why are federal and state lands not being considered for industrial size wind turbines?
- Why aren't public lands considered for locations?

- How many acres of public land will be taken for the proposed project and what will be the remuneration for taxpayers and citizens of Michigan for taking land that is currently in the public trust?
- Can the township restrict already conserved property in any way?
- I own 30 acres in Luce County and am willing to allow windmills to be installed, but I understand inland isn't be looked at and small parcels aren't considered. Is this true? Couldn't adjoining properties, if all gave consent, create a large enough buffer?
- I would like to know how I can find out if my property is a good wind site. Is it possible to "test" the site somehow? Rent a turbine for 6 months or so and see the results? And how much can that cost? And lastly, is there a directory that I can use to choose a business in my area?
- How does a lending institution, such as a local bank, recognize this long-term lease and its equitable value? Could a leaseholder borrow 80% of the projected \$12,000/100 acres? What is the REAL value of this lease?
- Would there be an option for landowners to renegotiate certain terms of a lease after this report is published and new information is learned? Is this something a wind developer would be open to?
- Are non-disclosure clauses in wind royalty leases that cover items other than payment schedules both legal and typical?
- Are wind rights severable? That is can someone sell property and keep the wind rights? Can someone speculate in wind rights? If a lease is signed for a piece of property does the lease stay with the property, or can the original lessee sell the property and continue profiting from the lease?

### **Environmental Impacts**

- Will there be any effort to document the ecological impacts of the project once developed? If yes, will the information be made public?
- FERC and state wildlife agencies have roles in determining the ecological impacts of certain power generating facilities. Does FERC or the State of Michigan regulate or otherwise have a role in determining the ecological impacts that a wind energy development may cause?
- Are there either State or Federal requirements or voluntary measures that are or can be undertaken to mitigate ecological harm (e.g. habitat restoration)?
- What are the environmental benefits of wind energy compared to coal, oil, natural gas and nuclear?
- Looking at Duke Energy's Gail Windpower Project proposal as an example, what trees would be removed, land excavated, roads constructed, electricity delivery poles or pylons placed in order to support the turbine system and connect it to the national grid? In other words, what will be the total impact that could result in losses to the existing natural/agricultural/residential environment? I am especially concerned about trees being cut down and habitats disturbed. Do cable trenches connecting turbines usually run 'as the crow flies', slicing across hills, fields, forests and creeks?
- Will the earth return to its natural state? Platforms removed and plants restored?
- Clean up of any contamination allotted for? Restore to natural settings—plants, trees, grasses, food for the animals, so they return?
- What are the Environmental Impact methods, Migratory Bird Study methods that should be followed? Are there ASTM Methods or other standard protocols that should be followed for these environmental studies?
- How does the environmental impact of having wind energy compare with those of solar, coal, natural gas, oil, and nuclear?
- The US Fish and Wildlife Service suggest a 3-mile buffer along the Lake Michigan shoreline within which wind turbines should be construction. Could the Wind Initiative find out what data was used by USFWS to establish this buffer?
- Is there less impact to the environment and communities if a large wind project is constructed off-shore in Lake Michigan vs. on-shore?

- Will the developer be held responsible for any erosion or run-off from cleared lands and new roads and any other effect on stream and lake water quality? Who will monitor this effect?
- Can the community/township require that the applicant share all wind data and environmental studies so that the township expert can examine and determine whether the data warrants turbines?
- What are the environmental and social impacts of large wind farms?
- Could the massive foundation for the turbines have an impact on groundwater?
- Are we allowed to use supporting documentation and/or guidelines and recommendations from the Dept. of Interior, DNRE and/or National Park Service in order to enact ordinances in our township that restrict development of wind energy facilities near lakeshores, inland lakes and sensitive wildlife habitats?

### **Maintenance and Maintenance Costs**

- Once they are in the area, will a “live” person be available for troubleshooting or to take calls from concerned citizens that have valid complaints? How quickly will these issues be addressed, i.e.—noise, dead birds and animals, etc.
- What are the maintenance requirements (lubrication, parts & labor) of the turbines?
- What about vandalism? Will extra police be added to the already low road coverage to protect these turbines for hunters or kids with guns?
- What is the blade-attachment failure rate for turbines installed in the past five years (i.e., the most modern variety)?

### **Tourism**

- Data to show the impacts on tourism and economic development.
- Are there studies that look at areas where tourism is a factor?
- Do large wind projects (100+ turbines) negatively impact tourism?
- If a wind farm is placed in a mixed use resort/residential/agriculture/natural beauty area, what is the true potential for loss of existing resort and tourism economies in such an area?
- How will trout fishing and tourist activities be effected by large-scale turbines over designated trout streams and lakes?
- Our economy is primarily tourist based and relies heavily on our natural and scenic landscapes. What guarantees will you provide that there will not be more jobs lost than those gained?
- How will tourism be measured if they are in place? What will bring someone to see 112 windmills? What’s the draw? Will the hotels, motels, restaurants, party stores, police forces be ready for the influx of tourists?
- My concern is, given the importance of tourism to the region, that Duke Energy's enthusiasm to reap subsidies is not permitted to outrank the local considerations of a tourism-based economy.
- We visit this area for about 5-6 months of the year and this will not be a pleasant place if these wind energy come to close to the area. We will need to find a more pleasant place to visit.

### **Property Value**

- Compare property values by similar density (i.e. homes per square mile vs. turbines per square mile).
- Provide data/studies on the impact of property values (evaluate based on proximity, view corridor, visual impact, etc.).
- I would like to see a compilation of all the studies done on the effects on property values. There is so much floating around, I don't know what to believe.
- What analysis, if any, has been done to examine the property value and resulting tax reduction for the township? I realize the study Duke cites says there is no adverse impact on property value. But, I understand the

housing in that study was not reflective of Benzie County. How will the schools, already in dire economic situations, be impacted?

- Would the government be able to condemn property by eminent domain where transmission lines and substations are to be placed? If so, how are properties valued when taken by eminent domain?
- Re: Property Value Issue. The Takings Clause of the 5<sup>th</sup> Amendment states that serious sustained physical invasions of property requires payment of compensation equal to the difference between market value prior to and after invasion. How does this apply to the wind industry's use of private land and the effect on non-participating property owners and the community in general, in regards to a property value issue, specifically devaluation of property and a township's ability to protect/guarantee property value through its zoning ordinance? Is noise pollution a taking? Consider the scale of the project: encompassing approx. 25 square miles, 4 townships, thousands of property owners, one hundred and twelve 500 ft. tall industrial wind turbines, associated access roads, transmission lines, sub-stations, etc. and the length of the project, a 25 year lease in this case.
- If a wind farm is placed in a mixed use resort/residential/agriculture/natural beauty area, such as this, what is the true potential for real property value loss?
- There are claims that wind farms harm property values in "mixed use" settings, but not in strictly or strongly agricultural settings? Is that what the extant studies say, as far as you can tell?
- Property values are bound to go down, how will this be addressed? Will studies be performed in this area?
- In a decade or more, would having a wind farm (several turbines) nearby be a positive or negative for selling a home and/or piece of property? In other words, if you live next to a wind farm, is that going to negatively or positively affect your ability to get a good price for your home or farm?
- Are there ordinances that have a property value guarantee? Can you reference these community ordinances? Have they been challenged?
- Do homes loose property value if they are located within a one mile radius of an industrial wind energy project with 100+ turbines?
- Will non-participating property value increase if within one mile of an industrial wind energy facility? Can you provide examples?
- The DOE/Lawrence Berkeley Study on Residential Property Values states that wind farms have no impact on residential property values. There have been several examinations of this report. Mr. Albert Wilson (AR Wilson, LLC specializes in environmental financial risk management and impaired value analysis) examined the methodology used in the analysis. He states, "As stated in the title, the primary basis for the conclusions drawn in the report are hedonic analysis of residential real estate sales data. A hedonic analysis in turn is based on the assumption that the coefficients of certain explanatory variables in the regression represent accurately the marginal contribution of those variables to the sale price of the property." He further states, "If the regression does not conform to recognized standards then we have no independent assurance of the accuracy or reliability, as in this case." This study was done for the "Wind Industry." The Wind Industry funded the study and the wind industry got the results they wanted. One critical flaw in the study is that less than 10% of the properties had any view of the turbines with only 2.1% of the property rated the view greater than minor. 64% of the properties were 3 miles or more from the wind farm and the turbines could not be seen at the properties. This skews the data significantly where little impact on property values is measured. The study was also too short a period. Is the conclusion of the Lawrence Berkeley study that there is not impact on property values from wind farms correct, or are there deficiencies in the study?
- Keeping in mind the current state of dropping home values in general, is it valid to say that property values increase or decrease after a wind farm is developed?
- I have a smaller parcel of land I want to build a home on in the future. It is surrounded by adjacent property owners that have signed wind leases. If wind turbines are constructed closer to my property because presently there is no structure on my property, my parcel is now worthless. I or no one else would want to build on my

parcel, with wind turbines so close to my parcel. How am I compensated for the loss of a buildable parcel that no one would consider constructing on, with industrial wind turbines so close to it?

- Some residents argue that the sight of a Wind Farm would lower their property values. Articles that I have read suggest that property values may decrease during the construction phase, but return to normal and increase after the wind turbines are operational.
- Are there actual decreased property values of those residences that are non-participating?
- Can an ordinance include a Property Value Guarantee? If not specifically excluding wind but pertaining to any industrial application?
- Will the total number of property studies used to determine property values impacts from wind development be disclosed?

### **Alternative Forms of Energy**

- Can you provide a comparison matrix of energy sources including but not limited to coal, wind, solar, nuclear, and natural gas that addresses cost, carbon footprint, subsidies, health risks, historical costs associated with health and environmental impacts, etc.?
- How does wind compare with other green energy options based on cost, energy efficiency, and environmental impacts?
- What forms of renewable energy might respect the independence and pride of small rural, agricultural communities such as Frankfort, allowing the residents and landowners to take the lead in energy development that would benefit them? The current process in which huge corporations such as Duke Energy use state-of-the-art methods to market their product and project, and the massive size of the turbines themselves, dominates the local people and leaves them dependent on the corporation to make good on its claims. This is not the way of Benzie County's people.
- Gas looks better than coal, but rock fracturing is hard on the ecosystem 3. Hydro also destroys lots of ecosystems 4. Nuclear - Safety problems could be solved, but we need to deal with waste and the mining of the uranium ore 5. Solar - a long way from economical 6. Geothermal, fuel cells, biofuels 7. Wind - compared to above, maybe we should give it a chance.
- Coal is not yet clean, and the mining of it is destroying vast land areas ("mountain top removal") in the east.
- Can wind compete with coal or nuclear without subsidy?
- Compare and contrast wind energy to coal (emissions).
- If we don't go with this form of wind energy, what else is being discussed for the area? Offshore wind farms? Solar?
- Is there something out there that is more expensive for Duke Energy but would affect taxpayers/residents less?
- Recommendations made in the *Final Report of the Michigan Wind Energy Resource Zone Board*, October 15, 2009, are being cited as reason to support extensive utility wind turbine development in 4 of Michigan's prime natural areas: Allegan County, Charlevoix County, Huron County ("The tip of the thumb") and Benzie/Leelanau Counties ("The little finger"). What form of renewable energy might be more compatible than utility turbines with the longstanding statewide priority to protect and promote "Pure Michigan" (See: michigan.org)? What form of renewable energy will assure that these lands remain free of industrial development, that their beauty is preserved and that the ecosystems are supported?
- Are there any permits being considered to drill the deep well fracturing sites in our area? Are there any Q and A meetings proposed on this technology? What footprint will these facilities leave to drill, fracture, and produce? How many are being considered?
- Does wind power in Michigan have real potential to reduce or eliminate the current base load power supplied by more consistent sources of power, like coal, natural gas, and nuclear? Has wind power been verifiably credited with reducing traditionally reliable base load sources of power anywhere in the world?

- How is power currently generated for Benzie and Manistee Counties? Does the existing infrastructure use the newest technology to protect the environment or are they grandfathered under older laws that are less restrictive? What is their carbon footprint and what are their plans to reduce it?
- What happens when other alternative energies are more viable than wind turbines?
- Are there other fuel sources that are more consistent than wind energy?
- What are the comparisons of traditional energy sources and wind energy based on cost, energy efficiency, and environmental impacts?
- How does a cap and trade, a tax on carbon or a clean energy standard impact the economics of a wind generator relative to the economics of a coal, oil or natural gas plant? What is the likelihood that a cap and trade, tax on carbon, or clean energy standard will be enacted in the next 25 years?
- Why would we move forward with any utility turbine projects that will spoil our extraordinary natural heritage when there are new renewable energy products/processes rapidly emerging that are less invasive, sized to be more manageable, more versatile, and comparably or more efficient? (See: flat panel wind generators, accioenergy.com; solar shingles, dowsolar.com).
- Could we find common ground for serious dialogue that leads to a good plan, and implementation of that plan through community action, by agreeing that we will strengthen the renewable energies that guarantee we will never develop nuclear power in the Benzie or Leelanau areas? Surely, this will require compromise on all sides. Those who are enthused about utility wind turbine development will need to listen to and accept higher setbacks from residences, lakes/rivers/creeks, shorelines, park/forest preserves. Those who are grieving the loss of pristine panoramas, unspoiled natural acreage and loss of a peaceful, undisturbed environment will need to listen to and accept the mandate to support reasonable local development of clean energy. There will be losses for everyone, but greater gains for all are a hope worth striving for.

### Decommissioning

- Is there an ironclad agreement for someone to remove the towers when and if they become obsolete for any reason?
- Are there any agreed upon ways to structure a decommissioning escrow fund that guarantees sufficient funds if a wind farm needs to be decommissioned?
- How are decommissioning costs determined? What is the best way to determine accurate decommissioning costs? Do subsequent purchasers of an energy project automatically become liable for decommissioning costs? If not, what language should there be in our ordinance for that to happen?
- How can the township make sure there are funds to insure the wind project is decommissioned properly and the land restored back to normal when the wind projects life is completed?
- Can the community/township ask for cash only on a decommissioning fund?
- What kind of escrow protections are typically used to protect landowners and the communities from abandonment of a turbine or wind farm?
- What assurance do we have for the decommissioning procedure? Is there a bond that will be imposed? If the contract includes decommissioning and removal, why would this be a “deal breaker?”
- What is the proper language regarding decommissioning of turbines, specifically bonding certified letters of credits from agencies or companies that are familiar with decommissioning large projects such as landfills, etc.?
- What type of bond should be required from the energy companies to ensure proper decommissioning and/or resolution is funded?
- Once the “life span” of 20-25 year of the wind turbine is up, will these bonds be there for demolition?
- What controls are in place that will ensure these don’t become abandoned if any of the companies installing and/or using the wind turbines should fail?

- What will happen to the equipment if a particular facility is abandoned and what will happen to the base the equipment sits on should the facility be abandoned?
- How long is the anticipated life of a wind turbine tower? Who will clean them up when their original owners are gone?
- What is the life of a turbine? What happens when the turbine ceases to work, or is superseded by a more efficient means of generating power? Are there plans in place to dismantle the windmills if and when they become obsolete, or will they be a landmark/eyesore on our Lake Michigan skyline forever?
- Wind turbines are audio-ally, visually, and perhaps ultrasonically polluting, who dismantles or is responsible for these devices after their service life?
- Who becomes responsible for their removal once they are no longer used?
- How many projects in the country are there currently that have not been properly decommissioned beyond a one year time limit of their suspension? What is happening to those projects?
- As green technology advances and the inevitable loss of subsidies and tax incentives, the likelihood of the turbines becoming obsolete is a real concern. Therefore, proper decommissioning ordinance language and acceptable funding methods to remove the obsolete turbines is needed. What guarantees will be provided from Day 1 for decommissioning and removal?
- Are there any examples where a good job of decommissioning was done?
- When would the wind turbines be removed? Would removal include removing the poured foundations & access roads?

### **Economic Impact**

- Are the generators/windmills manufactured/built in the USA? In Michigan? What power company is involved? How much are they paying, and how much is government funded?
- If wind power projects locate in Benzie and Manistee Counties, will that increase the chance that wind related manufacturing operations will locate there too? Does the city of Manistee have manufacturing, workforce and infrastructure capacity to support new wind-related industries? Do wind manufacturing facilities tend to locate near wind power projects?
- Can a community/township develop a renewable energy program that only allows Michigan made products or county-made products?
- What economic benefits have been recognized by communities who have participated in wind energy projects?
- What analysis has been done on the economic impact on the township and county, overall? Other than the landowners who will get a payment for the use of their land, what other economic benefits will be gained for the township? I understand these payments mean a lot to these people.
- If the turbines are built, how will it affect future growth in the county? Let's say for example, landholder A puts up turbines on his property and then his neighbor B wishes to sell his property for residential development. But B has lots of property that cannot be built because it is within the setback of turbines on property A. Has anyone looked at the potential conflicts that might arise in these situations and also how this might affect the growth patterns in the county?
- Would it be prudent for the township to look into the future as to how they see their community with or without wind turbines and project? How each would further or limit the growth or vision of the community? If it is determined that grid-scale wind turbine development inhibits the future of the community, can they exclude them or confine them to a small area?
- At the end of this discussion, what will our bottom line be? I have seen editorials written by the owner of Crystal Mountain Resort in which he says he knows the situation isn't perfect, but we need to get started and "do something" anyway, a sort of plunge in because it's better than being beholden to oil attitude. The second school of thought I have seen takes a more cautious approach, which is that even if alternative energy is out there, it should fit the needs of the community at its most local level, and if it doesn't we should have the courage to pass for now. WHAT DOES THE COUNTY WANT AS ITS BOTTOM LINE APPROACH?

- Data to show the impacts on tourism and economic development.
- If a wind developer is stating that it is going to create so many dollars and so many local jobs for the community, can we make it mandatory?
- What have been the job and tax revenue losses in Benzie and Manistee Counties over the last 3 – 5 years? How many construction jobs, full-time operations jobs, and indirect service jobs could be gained by Benzie and Manistee counties if the proposed 200 MW Gail Windpower Project and other future wind project developments locate in the counties? What potential tax revenue could be gained if the proposed 200 MW Gail Windpower Project and other future wind project developments locate in the counties?
- Re: Cost-Benefit Analysis of Industrial Scale Wind Energy – Where is the hard data and evidence of viability, actual performance rather than “capacity”? What is the cost and CO2 emission of the entire process including mining of all materials involved, manufacturing of all components of a large wind industry facility, including turbines, concrete bases, access roads, transmission lines, transportation, installation, environmental impact on natural rural areas, and actual performance balanced against all. What is the impact on land, wildlife and citizens? How much CO2 emission is actually being offset? How “green” is industrial wind energy? Does it really cut coal use by any significant amount? If it comes down to a very small contribution, is it really justifiable to pursue this scale of industrialization of rural areas and otherwise natural environments, or to place the burden of this industrialization on small rural communities? At what cost – in both tangible and intangible ways?

### **Job Creation/Impact**

- What are the temporary jobs created for this project? What are their qualifications? Will these be new jobs or existing workers (concrete service)? What are the long-term jobs, their qualifications, and have these jobs been promised to people already?
- How many full time jobs will the Gail Wind Project produce?
- For a wind project that has about 100 turbines, how many permanent jobs are typically generated?
- For a large (100 turbine) wind project how many jobs with the construction phase generate?
- How many locally-filled jobs will be created for the erection and maintenance of these windmills?
- Will there be that many local jobs to satisfy the unemployment rate of Benzie/Manistee counties? Long term benefits? Short term ramifications?
- How many jobs, what percent, are likely to be filled by local workers and what percent are specialize jobs that will likely be from outside the local area?
- Would a local ordinance with a “hire local first” requirement for erecting, operating, and maintaining a wind farm be legally enforceable? Are there precedents for this?
- If wind is successful, what is the negative impact on jobs from other energy sources?
- I would like to see the economics laid out for the dollar benefits to the county. I have read stories about how wind energy does not increase jobs long term (and the hotel/restaurant surge will only happen during construction, and since it is very capital intensive, perhaps we should question this claim).

### **Energy Conservation**

- Is there a way to conserve or ration energy consumption?
- Can a township encourage conservation through an ordinance?
- Is there any organized, concerted effort at electrical power conservation being pushed by any agency anywhere? I'm not thrilled with the idea of putting up a bunch of wind towers so folks can continue to take electricity for granted no matter what the source. I really don't need to listen to Willy Nelson when I'm gassing up my vehicle at Wesco. The solution is not always “more.”
- If consumers could be persuaded and/or educated into conserving energy, could the energy demand be reduced such that neither industrial wind, nor additional coal-fired plants are needed?

- Is serious consideration being given to effective conservation education and persuasion?

### **Energy Grid**

- If there is excess power generation, can the power be placed onto the grid?
- How does wind energy work on the MISO grid? Presumably when the wind blows wind farms spike electric production to the grid. How is that spike handled by the grid operator? Is the power integrated into the grid and used later when demand is there? Is the power lost if the wind spikes production and grid demand? Is the power lost if the wind spikes production and grid demand remains steady or decreased? Does the extra power fill the pump storage facility in Ludington?
- What percentage of energy from wind farms will go into the grid?
- Wouldn't it offer some added acceptance if local residents used the power produced in their back yards rather than ship it away via the grid?
- Does Duke have the necessary infra-structure in place to connect to this grid? How much construction will that entail? Will this entail more forests to be removed? More equipment on roads? More roads to be cut through woods?
- What are the current regulations on wind generated power from private property...can it be fed back into the grid with the property owner receiving compensation?
- Can the community/township only allow grid tied units in certain zoning districts, like industrial areas or agricultural zone for large tracts?

### **Zoning**

- Is it legal for a township to have no zoning?
- Since it is going to be a wind farm, should it be treated as a "farm" or an industrial park? (Farms are totally different than an industrial setting and there should be regulations in place to address this.)
- At what point would land zoned as agriculture become commercial/industrial and be taxed as such?
- Accommodate in zoning for wind. Can/cannot be zoned out.
- Wind turbines are very different from other industrial equipment in a township. Should a wind ordinance be written to stand alone or should it be tied (reference) to other zoning ordinance sections?
- In its final report, the MWERZB stated that grid scale wind power may not be an appropriate land use in all communities. In his testimony before MPSC, the chair of the MWERZB reiterated the same assertion: that wind power is a community decision and that it may not be an appropriate land use in all communities. The final report of the MPSC again reiterated that statement and, additionally, did not include the Manistee/Benzie or Leelanau areas as high potential wind resource zones, even though they were included in the MWERZB report to the MPSC. Given these statements, would a decision that wind power is not an appropriate land use in their community and ordinance language prohibiting the use be "exclusionary zoning?"

### **Efficiency**

- What is the actual efficiency of these wind turbines? I have seen numbers generated by the Mackinac Group that show these turbines operating below 10% of the rated capacity on an annual basis. It seems that a 90% loss on investment is a terrible idea.
- How efficient are they?
- What is the efficiency of industrial turbines located and operating in MI?
- Is wind energy a consistent energy source?
- Can you compare the energy return on energy invested for wind, solar, coal, natural gas, oil, and nuclear?

- How much of a normal urban setting (residences and small businesses) can be supported by wind generation? In the case of some industrial uses, can a turbine supply three-phase electricity?

### **Subsidies/Tax Incentives**

- If there were no energy subsidies available to these projects, do you think wind developers would be installing them?
- What if tax incentives weren't offered—would this project be feasible?
- How much of the proposals for wind power are dependent on governmental subsidies? If there were no government subsidies (our taxpayer dollars) available for wind power, would putting windmills in this area be affordable?
- Are wind project sustainable without subsidies and tax breaks?
- Without government subsidies, are your turbines cost effective?
- If the U.S. Government does not renew the current renewable energy tax credit or grant, how does that affect a wind power project that was already under construction under such a regime?
- Can you outline all the subsidies and tax breaks a large wind project can get from the federal, state and local governments?
- What state, federal, and local tax incentives are being offered to Gail Wind? What incentives are offered to oil/gas producers?
- If tax incentives are allowed, once the initial investor on a project receives a subsidy, are the subsequent purchasers of that project able to also take those same incentives/subsidies again on the same project? If in fact they do receive the subsidies again, do the subsequent purchasers also have the option of accelerated depreciation on the remaining balances not subsidized?
- Wind developers promise local government (county and township) will see a big boost in tax revenue. How do we ensure that this money is guaranteed with changing tax incentives for “renewable energy companies?”
- Subsidies on ethanol has been shown to be a huge mistake since it takes more energy to produce a gallon of ethanol than you get from a gallon of ethanol. Wind energy is not profitable without subsidies. What happens to wind farms when subsidies stop and the wind farms are not profitable?
- The state government of Michigan is on its knees financially. What help, in terms of consulting, legal, research, enforcement etc., are they able/required to give us long term? Is this something that could be cut from state budget and leave the local governments high and dry?

### **Height**

- Can the community/township place height limitations just like they do in all current zoning districts?
- Can the community/township place height limitations of 199' in order to keep lights off units (night sky preservation)?
- Can we restrict the height of wind turbines in an effort to preserve our night skies (so that no lights are mandated by the FAA or other agencies)?
- Is it within the rights of a township to restrict the height of a turbine so they do not require FAA lighting? This would be to protect the dark night time sky.
- Does the FAA issue variances on height if the turbines are determined to be too tall or are they made to stay at the restricted height? Under what circumstances is an energy company entitled to a variance, for say height of wind turbines from the FAA?
- Where in the U.S. are there taller wind turbines than Duke's proposed ones here? How much taller? Are any of them in close proximity to homes?
- How tall would these wind turbines be to their nose and to the top the blade's highest reach?

## View Shed

- Can a community/township identify and protect certain view sheds?
- Are we allowed to enact a scenic view shed ordinance that protects our view sheds?
- Can you provide innovative examples of turbine siting not based solely on the zoning of a parcel that take natural resources into consideration, specifically resources that are not protected by existing regulations, such as view sheds?
- Will the view spaces be considered before turbine placements on ridges?
- Do people have any legal right over their view of other residents' property?
- What is the overall width of the proposed wind towers (base and at the top)? At what distance will you be able to see a portion of these towers? I am trying to understand the percentage of property in Benzie County that will have sightings of these towers.

## Costs of Wind Energy

- How much does wind energy cost to produce in comparison to other forms of energy?
- How does the cost of wind power compare to that of a new coal plant?
- Is the price of energy from wind as volatile as energy prices from fossil fuels?
- Are consumers paying for the "cost" of green energy?
- What is the cost if we don't switch to green, renewable energy?
- What is the true cost of wind energy? Will it raise our cost of energy?
- Why does Denmark, who gets 20% of their energy from wind, pay the highest rates for electricity in the world?
- What exactly is the savings in energy costs for a household in the areas affected? I understand that landholders will benefit directly from the value of their leases, but what will the effect be on the typical resident of a town?
- How about some cost/benefit figures? Is the power generated by the windmills worth the expense of the installation and the actual cost of purchasing the windmills?
- What are the facts that support wind energy as a financially viable source of power? Has Duke Energy, DTE, Consumers Power, GE or others produced reliable financial projections that demonstrate the viability and affordability of wind energy?
- What will be the projected increase in utility bills for residents of the area and in the State of Michigan?
- If a wind project is built in a township there will be significant administrative costs to the township. Can you make an estimate of the cost per turbine that should be required by the developer to put in escrow to pay for township administrative costs?

## Social Impacts

- Have any of the panelists ever read the "living with turbines" blog about the family in DeKalb, IL? If so, what do they conclude it's like living within close proximity of industrial energy facilities?
- Have they offered to arrange for local people to visit and talk with folks who actually live with a wind farm comparable to the proposed wind farm? Has anyone who has offered an opinion, or taken a position either pro or con, actually stood under a 500 foot turbine, observed a landscape with comparable ratios of population density and turbine numbers, or visited?
- Can AES or MAP find similar wind projects that have similar densities of turbines per square mile, as well as residents per square mile, and determine what impacts on those residents have taken place, i.e. survey/study?
- What are impacts on homes that are 1/4 mile away from active turbines in a variety of wind speeds and weather conditions?
- What are the environmental and social impacts of large wind farms?
- Do industrial wind turbines create television interference?

- Do industrial wind turbines interfere with cell phone reception?
- What could developers do to ensure there are no negative impacts on health, safety, property values, wildlife and habitats?
- Duke Energy and a small number of landowners will reap millions of dollars, all at the overwhelming majority of other landowners' expense. These turbines generate little electric at far more expense than all other forms of electric generation. The existing coal generating plants in Michigan will still have to be in place to generate electric. All the townships in the effected turbine area presently do not have industrial wind turbines with constant noise, daytime flicker, nighttime flashing lights, massively tall towers, and loss of property values. My question is: why do we want them?
- Compliance with ordinances by Duke or subsequent Gale Wind Project owners should not require limitations by residents. For example, Duke's compliance with any sound or shadow flicker limits should not require that residents have windows or curtains closed. It makes no sense to require residents to close windows or curtains to avoid sound or shadow flicker problems, and then need to turn on air conditioning to be comfortable in the summer. Decibels should be measured outside, not inside the house.

### Oil/Gas Industry

- How much electricity is produced by foreign oil in the United States?
- How do Oil and Gas companies (Jordan Development, Presidium Energy) feel about Duke Energy coming in and offering more on a wind turbine lease per year, than on a gas/oil lease?
- How many of the four township boards are currently making a living (50% or better) from oil/gas production?
- How many full time jobs do gas/oil production support in the same four townships? How many of these jobs will be lost due to wind power coming to our area?
- What percentage of oil/gas production is being used for electric production? What percentage is being stored? What percentage is being exported from Michigan?
- Can the windmill project in any way restrict the production of oil or natural gas?
- How many waste disposal sites from oil/gas production are in our 4 townships? (Large pits with rubber liners to contain waste products.) How long will they remain? What permits are needed to place one on a property? Does the public get a question and answer opportunity to place a waste storage area? Can this waste contaminate our drinking water wells?
- Are there any bi-products from oil/gas production or use that can be recycled to produce anything useful?
- How much property does it take to build a natural gas electric generating facility? Are there any of these being built in our area or in Michigan? How many are being proposed?
- Is the price of energy generated from fossil fuels expected to go up in the future? Are fossil fuel generators exposed to price risk on fuel inputs and emission outputs (i.e. SO<sub>2</sub>, NO<sub>x</sub>, Carbon and Mercury)? Do wind energy generators have price risk on either fuel input or emission output? Can wind energy replace some of America's dependence on foreign countries for its energy needs?

### Michigan Renewable Energy Mandate

- Are we getting "sucked into" a big surge of activity that has to do with MI's law requiring 10% of energy to come from alternative sources? If this law didn't exist, would we be moving in this direction with confidence?
- How much of state mandate for renewable energy has been met?
- In meeting the 10% renewable energy by 2015 Michigan mandate, is the required 10% renewable energy to be measured as the rated capacity of the source, or the actual net production output?
- Does state law require that townships allow wind energy (i.e. industrial)?
- Why should Michigan be asked to produce so much energy (more than Michigan itself needs)?

- How can the state require large wind developments not have any accompanying legislation to protect its citizens?
- Can a community/township develop its own renewable energy program to meet the mandates which may or may not include wind?
- Is renewable energy generation required by the state of Michigan? Relative to the rest of Michigan, do Benzie and Manistee counties contain a good source of wind energy? Do Benzie and Manistee Counties have a competitive advantage in this area that it could use to create a new industry and jobs?

### **Energy Efficiency**

- What is the actual net production output as a percentage of the rated capacity of other sources of energy such as solar, coal, natural gas, and nuclear?
- What is the actual net production output of the Ubyly (Thumb Michigan) wind farm as a percentage of rated capacity? How about Stoney Corners or other operating Michigan wind farms?
- What would be the net production output as a percentage of the rated capacity of a wind farm, such as Duke's proposed Gail Wind project? (The wind doesn't blow all the time; thus, if wind powered a turbine 25% of the time a 100 mw capacity system would produce 25 mw net, not considering maintenance shutdowns, etc.)
- What is the efficiency of wind energy and what are its effects on transmission loss, coal plant shut downs, and the grid?
- What percentage of the electric generation for Michigan can be realistically produced by wind turbines?

### **Property Rights**

- How far from an adjacent property does the turbine have to be without infringing on neighbor's rights?
- What is the role/weight of individual property rights in decision making?
- Who will protect homeowners from wind turbines' excessive noise, daytime flicker, night time flashing lights, massive tower heights, and huge loss of property values if local townships do not have a wind ordinance established?
- As a resident of the southernmost part of Gilmore Township, apparently only yards from the presumed locations of a cluster of the turbines, I'm concerned about my "rights" and "protections" from the impacts -- whatever they may be -- of the turbines in Blaine Township. If zoning and permitting are done on a strictly township by township basis, what provision is there for providing protections to an adjacent or nearby residence in a different township? It appears that I could be impacted far more than most of the people in the two townships identified by Duke Energy as its target area, yet I have not seen anything in the media about Gilmore Township participation in the zoning and planning discussions.
- Will the concerns of other property owners be considered, if they are not interested in having a turbine in their backyard? How good of a neighbor will Duke really be?
- If these turbines adversely affect the leaseholder's crops (ex: no bees for pollination) are the growers still eligible for subsidies?
- Do farmers and landowners in general have the right to use their land to generate income from wind, oil and gas, farming or forestry?

### **Tax Issues**

- How will a township benefit financially from the placement of a wind farm?
- How will property taxes be derived from each turbine installation? Will there be an income stream to local government based on the energy generated?
- Project tax revenues assuming impact.

- Are wind turbines (structure) currently taxed? Are transmission lines and substations taxed? If so, at what approximate rate?
- If the state's Personal Property Tax is eliminated, how much will this decrease the tax revenue to local governments?
- Have any large energy companies entered into community-based profit-sharing agreements that go beyond the tax encumbrances attached to the development, usually through a property tax?
- Can we require pay in lieu of taxes in the event that the way they are currently taxed gets altered in such a way that it takes money away from the county and township?
- Can we require the developer not have the choice to opt-in (?) to no taxes paid to the school fund?
- What are some of the tax breaks given to the townships, counties? What will they do with this money? Fix roads? Keep schools open? Where will that money go?

### **Turbine Location and Placement**

- Is it better to build large wind projects (100+ turbines) off-shore or on-shore? Please compare the pros and cons of each location?
- How close can turbines be to Lake Michigan?
- Can we join together to assure that a wide corridor (5-10 miles) of land running along the Lake Michigan shoreline be declared off-limits to utility wind turbines or any other industrial energy development that would spoil our unique land trust? This land already has its mandated purpose: natural recreational retreat. Considering the critical need for places where whole-person health may be restored, this use of Michigan's northwestern lands deserves to be our first priority. Industrial energy production belongs in places where the land is open, plain and uninhabited. Many other states are better suited for utility wind development, such as Texas.
- Are the numbers of turbines limited at this time to 112 or can the number increase higher and higher?
- Is there or will there be some sort of density restrictions so we don't end up with continuous wind towers along the entire West Michigan coast and in the lake itself?
- How can we control widespread development, versus contained development, of utility turbine projects to prevent them weaving in and through our most beautiful, pristine lands? How can we limit the expanse of acreage developed and the footprint of developments? How can we put a cap on, or set a maximum allowance for the number of turbines in a project, preventing unlimited future growth and guarding against increasing dominance of an agricultural/residential/natural region?
- Can an overlay district for wind only include certain areas of the township?
- Can you provide innovative examples of turbine siting that address residential areas within agricultural districts, taking into consideration density, parcel size, etc.?
- What is the distance between each tower?
- When you see large turbine installations out west or in Indiana near the highway or in other states, you don't see any residential units near them. Why would it be okay for a large industrial wind energy project to be placed near residential homes?
- Why is Denmark proposing banning on-shore wind?
- I would like to know whether Duke Energy, or any other energy company, has developed plans, or is in process of developing plans, to install industrial wind towers in Leelanau County.
- For that matter, how do we know that the Blaine-Gilmore township boundary is the real and firm northern boundary of the project and that Duke hasn't tried to secure leases outside those two townships? I understand the property rights involved in this situation, but the secrecy does not contribute to a transparent and trustworthy process that you and others are working to create.

- Are thousands of 400 foot-plus, wind towers in our agricultural community an acceptable answer to our energy needs?
- According to the 2007 Michigan wind siting document, designated scenic areas are not to be encroached upon; is the township authorized to designate this or is there some other way it has to be designated?

### **Wind Energy Production**

- Can electrical transmission lines be buried underground from the wind turbine to the substation?
- Can the electrical transmission lines be buried from the substation to the high voltage transmission lines?
- Do the turbines take electricity to operate?
- Where will the transmission lines that will connect these turbines and existing transfer stations be placed? Will the transmission lines be underground or overhead? How wide will they be if they go overhead? Will they cross non-participating properties? Will the property be condemned or seized by eminent domain? Will there be a map that shows the placement of transmission lines before erected?
- Will the transmission lines for the grid be underground?
- Can the township require transmission lines to be buried? Can the township do anything to limit the impact of substations on a non-participating land owner?
- What is the total distance the new power lines will run?
- Who will benefit from the generation of power by the windmills? Is it used locally?
- Will the power generated locally be used locally? Can it be?
- Does the majority of the population that is leasing their property to Duke realize that this power they generate does not “benefit” our area? Do they know it’s for Detroit Edison?
- Does the public realize that Duke is supplying to Detroit Edison?
- Is there any guarantee that we can require that the electricity generated in our community stays in our community?
- How much land would be cleared for power lines and other utilities?
- What infrastructure improvements will be necessary to support and connect the proposed turbines and who will pay for this?
- Will Duke be sharing roads, power lines, etc. with already established companies?
- At what speed does the tip of a blade on a wind turbine rotating at its maximum go? How fast before the breaking system kicks in?
- Are the turbines speed limited, and if so, why? Is there an RPM limit at which the current output does not increase appreciably?
- Since it can only supplement energy under the right circumstances, why is it worth it?
- How would wind projects in Benzie and Manistee Counties fit into and help maximize the \$800 million upgrade investment planned by Consumers Energy and DTE for the Ludington Pumped Storage Facility?
- What happens to the energy produced by a wind turbine if it’s not being required? Is it stored?
- Can we limit the amount of energy generated by a project in our township ordinance? Say, 2.5 times what our township used last year?
- Since Michigan has lost 1,000,000 million people and many manufacturing companies, we actually have a surplus of electricity. Why do we need any industrial wind turbines in our area? Where will the energy actually go?
- Can a community/township develop a renewable energy program that only allows community wind or limits the amount of MWH produced by the community, like 1.5 times what the community uses, or restrict it to the communities’ benefit only?
- For each tower's total carbon footprint, which includes road building, transportation of materials, and transmission lines, how long does it take to "work off" the negative of carbon footprint versus the positive of "pollution-free" energy generation?

- Can radio-active wind produce energy for a windmill?
- We have always been very supportive of wind energy, but, not too long ago, we were coming through an area in northern Indiana (I believe this is where it was) and over half the windmills were turned off! Why would this be?
- Would wind energy be considered an essential service?
- Can a community/township say that only point of use wind or solar would be allowed, i.e. at home or business and not large grid-tied units?

### **Conflict Resolution**

- If conflicts arise, what type of conflict resolution requirements should be in the ordinance?
- One of the citizen concerns is regarding a proper complaint resolution process that would include penalties in order to enforce any wind developer to comply or mitigate potential problems such as noise, flicker, critical habitat impacts, property value impact, etc.
- Are we likely to get into situations where neighbors end up in litigation? What happens to the neighbor who doesn't want a turbine/s on their property and ends up living close to one on their neighbor's property, say 1500 feet, and begins to exhibit symptoms such as sleeplessness, depression, or already is compromised by these conditions when the turbine is installed and things get worse for them, etc.? Will that neighbor have to move from their property?
- I would like to understand how conflicts might be resolved and who would pay for any resolutions of conflicts that involved removal or relocation of turbines. For example, once the turbines are installed does the township have any recourse for non-payment of taxes, turbines that are installed in a manner not according to contract, turbines that are installed under false pretenses (suppose the company says that the turbine will not sound like more than a humming refrigerator and that turns out not to be the case)? What can be done? What government entity has controls over the companies and what are the specific controls. Could this pit the state government against the township government and cause a gridlock that will be harmful to residents.
- What should be a complaint resolution process if people living close to wind turbines have a complaint on sound?

### **Bonds**

- Will the necessary bonds be in place for construction and decommissioning, prior to even breaking ground for a single or first wind turbine? Will those bonds be placed in local banks, or ones in North Carolina that are under Duke's jurisdiction?
- Can the community/township require bonding for the installation of the project and road damage?

### **Questions on the Experts**

- What are the qualifications of the people answering these questions? What precautions were taken to ensure that they are unbiased? What documents and studies did they rely on?
- How are neutral experts defined and found?
- Will a full bibliography of reference and research studies be disclosed to the public?
- Will the total number of PhDs and M.D.s that have studied health and noise effects of turbines be disclosed? (i.e. number who see harmful effects vs. numbers who see no effect)
- How many are making wages from Gail Wind Project?
- For each of the panelists: Do you stand to gain in any way from a wind energy facility in any form?
- Have any of the panelists ever received contributions or any type of payment or incentive from anyone connected to the wind energy industry or a wind energy producing company?

- Has anyone who has offered an opinion, and taken a position either pro or con, actually stood under a 500 foot turbine, observed a landscape with comparable ratios of population density and turbine numbers, or visited homes that are 1/4 mile away from active turbines in a variety of wind speeds and weather conditions (sunny day vs. cloudy day)?

### **Construction Issues**

- Are the roads in both counties in good enough condition to handle the weight of all the equipment that is involved in the assembly of these turbines? Will Duke pay for the repairs due to washouts on gravel/dirt roads, ruts in winter? Will there be a county road commission fund established by Duke for necessary repairs?
- What is the amount of road widening and new roads (including access roads during construction) that will occur? Will access roads be paved?
- Can we require the wind energy developers to bring our road conditions to better repair than they are currently at?
- When under construction, how many acres of land are disturbed for the wind generator site, access roads, and infrastructure?
- What is the quantity of Green House Gases (GHG) that is emitted from the manufacturing, transportation to the construction site and erection of a 495ft wind turbine? How does this compare with the GHG for solar energy?
- How much concrete will it take to make this concrete pad?
- What is the cubic area of the concrete pad of each tower?
- How much cost will the public bear in emergency response, roads, and other necessary public upgrades?

### **Duke and Gale Wind Specific**

- What is Duke's total project cost?
- How much investment and how much profit would Duke make in this project?
- Has Duke Energy offered area residents and County and Township officials the opportunity to tour wind farms comparable with this proposed project in terms of equipment, set-backs, and noise level?
- Has Duke Energy offered area residents and County officials the opportunity to tour comparable wind farms in terms of equipment, set-backs, noise level, etc.? Have they offered to arrange for local people to visit and talk with folks who actually live with a wind farm comparable to the proposed wind farm?
- What are you able to discern about Duke Energy's track record responding to noise, flicker, property value, tax, and other real, not theoretical, disputes in the other communities where it has erected wind turbines?
- Will Duke really be a good neighbor? What proof can they provide?
- Duke should maintain a physical presence in northwest Michigan permanently to handle any problems that arise for Dukes installations – or be able to have a representative in the county within 24 hours? (This may be overkill, but since Duke is an out-of-state company, I do not want them building and leaving.)
- Has there been any thought of Duke providing funding for energy-related education programs for the county – technical training so that local people are trained to do the maintenance on the turbines? I don't know the ethics of this, but paying \$20,000 or whatever the contract says to the landowners does not off-set the potential disruption to the residents. Local people should at least be trained and hired for the jobs.
- If the FAA does not approve the site, what is Duke's next step to get a waiver or approval?
- What is the total number of Duke-proposed wind turbines in all phases of stages of the project in Benzie and Manistee Counties?
- Is Duke studying other sites in Benzie, Manistee, Leelanau, or Grand Traverse Counties for additional wind turbines?

### **Township Financial and Legal Protections**

- Any ordinance should include language that Duke or subsequent owners should bear the financial responsibility of investigations into allegations regarding violations of the ordinances. The financial responsibility should not fall on the township or its residents. It might be appropriate to bundle allegations into one or two investigations a year to be fair to Duke.
- The ordinance should specify that Duke or subsequent owners will reimburse the township and its residents for any costs associated with handling any turbine-related emergencies – e.g. fires started in turbines, etc.
- What safeguards can communities and local units of governments put into place to provide to protect themselves from financial and legal liability associated with large scale developments, such as pooling resources, to create a fund for future legal fees?
- Can the community/township ask for administration funds from the applicant to hire experts, attorneys and administration/enforcement to review applications?
- Are there examples from other states or projects in which mitigation was a requirement by the local unit of government via zoning or a landowner via their lease?
- When does it become a referendum issue?

### **Miscellaneous**

- Will Michigan remain a regulated state?
- How much electrical energy (MWH) is being used annually in Benzie and Manistee counties? This will help people to get a better grip on their consumption as well as the scale of power supply needed for the 21st century assuming certain growth characteristics. I think you could get this data from Cherryland and Consumers Energy. Somehow we need to help people to better understand how their consumption has impacts to someone, somewhere and that we need to be willing to accept these responsibilities for our consumption as opposed to exporting the impacts.
- What is a “Taking?” If a landowner is denied their right to develop their land for a grid WES does that constitute a “Taking?”
- The wind project in the “thumb” of Michigan has been sold three times in just over 6 years of operation. What is the reason for the sale of the wind project?
- New Coast Guard station tower is 400’ and has a strobe light. Is the same type of lighting, or what type of lighting would be on one of the turbines?

## Attachment 1

<i>Accipiter cooperii</i>	Cooper's Hawk	
<i>Accipiter striatus</i>	Sharp-shinned Hawk	
<i>Actitis macularia</i>	Spotted Sandpiper	
<i>Aegolius acadicus</i>	Northern Saw-Whet Owl	
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	
<i>Aix sponsa</i>	Wood Duck	
<i>Ammodramus caudacutus</i>	sharp-tailed sparrow	
<i>ammodramus henslowii</i>	Henslow's sparrow <b>(SE)</b>	SE
<i>Ammodramus leconteii</i>	LeConte's sparrow	
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	SC
<i>Anas acuta</i>	northern pintail	
<i>Anas americana</i>	American Widgeon	
<i>Anas clypeata</i>	northern shoveler	
<i>Anas crecca</i>	Green-winged Teal	
<i>Anas discors</i>	Blue-winged Teal	
<i>Anas platyrhynchos</i>	Mallard	
<i>Anas rubripes</i>	American Black Duck	
<i>Anas strepera</i>	Gadwall	
<i>Anser albifrons</i>	Greater White-Fronted Goose	
<i>Anthus rubescens</i>	American Pipit	
<i>Archilochus colubris</i>	Ruby-throated Hummingbird	
<i>Ardea herodias</i>	Great Blue Heron	
<i>Asio flammeus</i>	Short-Eared Owl	
<i>Aythya affinis</i>	lesser scaup	
<i>Aythya americana</i>	redhead	
<i>Aythya collaris</i>	ring-necked duck	
<i>Aythya valisineria</i>	canvasback	
<i>Bartramia longicauda</i>	Upland Sandpiper	
<i>Blarina brevicauda</i>	Northern Short-tailed Shrew	
<i>Bombycilla cedrorum</i>	Cedar Waxwing	
<i>Bonasa umbellus</i>	Ruffed Grouse	
<i>Botaurus lentiginosus</i>	American Bittern <b>(SC)</b>	
<i>Branta canadensis</i>	Canada Goose	
<i>Bubo virginianus</i>	Great-Horned Owl	
<i>Bucephala albeola</i>	bufflehead	
<i>Bucephala clangula</i>	common goldeneye	
<i>Bufo americanus americanus</i>	Eastern American Toad	
<i>Buteo jamaicensis</i>	Red-Tailed Hawk	
<i>Buteo lagopus</i>	rough-legged hawk	
<i>Buteo lineatus</i>	Red-shouldered Hawk	
<i>Buteo platypterus</i>	Broad-winged Hawk	T
<i>Butorides virescens</i>	Green Heron	
<i>Caladris pusilla</i>	semi-palmated sandpiper	
<i>Calidris alba</i>	Sanderling	
<i>Calidris alpina</i>	dunlin	
<i>Calidris bairdii</i>	Baird's sandpiper	
<i>Calidris canutus</i>	red knot	
<i>Calidris fuscicollis</i>	white-rumped sandpiper	
<i>Calidris himantopus</i>	stilt sandpiper	
<i>Calidris mauri</i>	western sandpiper	
<i>Calidris melanotos</i>	pectoral sandpiper	

<i>Calidris minutilla</i>	Least Sandpiper	
<i>Calidris pusilla</i>	Semi-Palmated Plover	
<i>Canis latrans</i>	Coyote	
<i>Cardinalis cardinalis</i>	Northern Cardinal	
<i>Carduelis flammea</i>	Common Redpoll	
<i>Carduelis pinus</i>	Pine Siskin	
<i>Carduelis tristis</i>	American Goldfinch	
<i>Carpodacus mexicanus</i>	House Finch	
<i>Carpodacus purpureus</i>	Purple Finch	
<i>Casmerodius albus</i>	cattle egret	
<i>Cathartes aura</i>	Turkey Vulture	
<i>Catharus fuscenscens</i>	Veery	
<i>Catharus guttatus</i>	Hermit Thrush	
<i>Catharus minimus</i>	Gray-Cheeked Thrush	
<i>Catharus ustulatus</i>	Swainson's Thrush	
<i>Certhia americana</i>	Brown Creeper	
<i>Ceryle torquata</i>	belted kingfisher	
<i>Chaetura pelagica</i>	Chimney Swift	
<i>Charadrius semipalmatus</i>	semipalmated plover	
<i>Charadrius vociferus</i>	Killdeer	
<i>Chen caerulescens</i>	snow goose	
<i>Chen rossii</i>	Ross's goose	
<i>Chlidonias niger</i>	Black Tern ( <b>SC</b> )	SC
<i>Chordeiles minor</i>	Common Nighthawk	
<i>Circus cyaneus</i>	Northern Harrier	
<i>Cistothorus palustris</i>	Marsh Wren ( <b>SC</b> )	SC
<i>Cistothorus platensis</i>	Sedge Wren	
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	
<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	
<i>Colaptes auratus</i>	Northern Flicker	
<i>Coluber constrictor foxi</i>	Blue Racer	
<i>Condylura cristata</i>	Star-nosed Mole	
<i>Contopus virens</i>	Eastern Wood Pewee	
<i>Corvus brachyrhynchos</i>	American Crow	
<i>Corvus corax</i>	Common Raven	
<i>Cyanocitta cristata</i>	Blue Jay	
<i>Cygnus buccinator</i>	Trumpeter Swan ( <b>ST</b> )	T
<i>Cygnus columbianus</i>	tundra swan	
<i>Cygnus olor</i>	Mute Swan	
<i>Dendroica caerulescens</i>	Black-Throated Blue Warbler	
<i>Dendroica castanea</i>	Bay-Breasted Warbler	
<i>Dendroica coronata</i>	Yellow-Rumped Warbler	
<i>Dendroica fusca</i>	Blackburnian Warbler	
<i>Dendroica magnolia</i>	Magnolia Warbler	
<i>Dendroica palmarum</i>	Palm Warbler	
<i>Dendroica pensylvanica</i>	Chestnut-Sided Warbler	
<i>Dendroica petechia</i>	Yellow Warbler	
<i>Dendroica pinus</i>	Pine Warbler	
<i>Dendroica striata</i>	Blackpoll Warbler	
<i>Dendroica virens</i>	Black-Throated Green Warbler	
<i>Didelphis virginiana</i>	Opossum	
<i>Dolichonyx oryzivorus</i>	Bobolink	
<i>Dryocopus pileatus</i>	Pileated Woodpecker	
<i>Dumetella carolinensis</i>	Gray Catbird	

<i>Egretta caerulea</i>	little blue heron	
<i>Empidonax alhorum</i>	alder flycatcher	
<i>Empidonax flaviventris</i>	Yellow-Bellied Flycatcher	
<i>Empidonax minimus</i>	Least Flycatcher	
<i>Empidonax traillii</i>	Willow Flycatcher	
<i>Eremophila alpestris</i>	Horned Lark	
<i>Erethizon dorsatum</i>	Common Porcupine	
<i>Euphagus carolinus</i>	rusty blackbird	
<i>Falco columbarius</i>	Merlin	
<i>Falco peregrinus</i>	Peregrine Falcon	T
<i>Falco sparverius</i>	American Kestrel	
<i>fulica americana</i>	American coot	E
<i>Gallinago delicata</i>	Common Snipe	
<i>Gallinula chloropus</i>	common moorhen <b>(ST)</b>	
<i>Geothlypis trichas</i>	Common Yellowthroat	
<i>Grus canadensis</i>	Sandhill Crane	
<i>Haliaeetus leucocephalus</i>	Bald Eagle	
<i>Hirundo pyrrhonota</i>	cliff swallow	SC
<i>Hirundo rustica</i>	Barn Swallow	
<i>Hylocichla mustelina</i>	Wood Thrush	
<i>Icterus galbula</i>	Baltimore Oriole	
<i>Ixobrychus exilis</i>	least bittern <b>(ST)</b>	T
<i>Junco hyemalis</i>	Dark-Eyed Junco	
<i>Lanius excubitor</i>	northern shrike	
<i>Lanius ludovicianus</i>	Loggerhead Shrike	
<i>Larus argentatus</i>	Herring Gull	
<i>Larus delawarensis</i>	Ring-Billed Gull	
<i>Larus fuscus</i>	lesser black-backed gull	
<i>Larus glaucoides</i>	Iceland gull	
<i>Larus hyperboreus</i>	Glaucous Gull	
<i>Larus marinus</i>	great black-backed gull	
<i>Larus philadelphia</i>	Bonaparte's gull	
<i>Larus pipixcan</i>	Franklin's gull	
<i>Limnodromous griseus</i>	short-billed dowitcher	
<i>Limosa fedoa</i>	marbled godwit	
<i>Limosa haemastica</i>	Hudsonian godwit	
<i>Lophodytes cucullatus</i>	hooded merganser	
<i>Loxia curvirostra</i>	Red Crossbill	
<i>Lyrus hyperboreas</i>	glaucous gull	
<i>Marmota monax</i>	Woodchuck	
<i>Melanerpes carolinus</i>	Red-Bellied Woodpecker	
<i>Meleagris gallopavo</i>	Wild Turkey	
<i>Melospiza georgiana</i>	Swamp Sparrow	
<i>Melospiza lincolnii</i>	Lincoln's sparrow	
<i>Melospiza melodia</i>	Song Sparrow	
<i>Mephitis mephitis</i>	Striped Skunk	
<i>Mergus merganser</i>	Common Merganser	
<i>Mergus serrator</i>	Red-Breasted Merganser	
<i>Mniotilta varia</i>	Black-and-White Warbler	
<i>Molothrus ater</i>	Brown-Headed Cowbird	
<i>Myiarchus crinitus</i>	Great-Crested Flycatcher	
<i>Numenius phaeopus</i>	whimbrel	
<i>Nyctea scandiaca</i>	Snowy Owl	
<i>Nycticorax nycticorax</i>	black-crowned night heron <b>(SC)</b>	SC

<i>Odocoileus virginianus</i>	White-tailed Deer	
<i>Oporonis philadelphia</i>	Mourning Warbler	
<i>Oxyura jamaicensis</i>	ruddy duck	
<i>Parula americana</i>	Northern Parula	
<i>Parus atricapillus</i>	Black-Capped Chickadee	
<i>Passerculus sanwicensis</i>	Savanah Sparrow	
<i>Passerina cyanea</i>	Indigo Bunting	
<i>Passerina iliaca</i>	Fox Sparrow	
<i>Paus bicolor</i>	Tufted Titmouse	
<i>Pelecanus erythrorhynchos</i>	American white pelican	
<i>Peromyscus leucopus</i>	White-footed Mouse	
<i>Peromyscus maniculatus</i>	Deer Mouse	
<i>Phalacrocorax auritus</i>	double-crested cormorant	
<i>Phalaropes tricolor</i>	Wilson's phalarope <b>(SC)</b>	SC
<i>Phasianus colchicus</i>	Ring-Necked Pheasant	
<i>Pheucticus ludovicianus</i>	Rose-Breasted Grosbeak	
<i>Picoides pubescens</i>	Downy Woodpecker	
<i>Picoides villosus</i>	Hairy Woodpecker	
<i>Pipilo erythrophthalmus</i>	Eastern Towhee	
<i>Piranga olivacea</i>	Scarlet Tanager	
<i>Plactrophenax nivalis</i>	Snow Bunting	
<i>Plethodon cinereus</i>	Red-backed Salamander	
<i>Pluvialis dominica</i>	American golden plover	
<i>Pluvialis squatarola</i>	black-bellied plover	
<i>Podilymbus podiceps</i>	pie-billed grebe	
<i>Poecile atricapillus</i>	Black-capped Chickadee	
<i>Poocetes gramineus</i>	Vesper Sparrow	
<i>Porzana carolina</i>	Sora	
<i>Procyon lotor</i>	Common Raccoon	
<i>Quiscalus quiscula</i>	Common Grackle	
<i>Rallus limicola</i>	Virginia Rail	
<i>Recurvirostra americana</i>	American avocet	
<i>Regulus calendula</i>	Ruby-Crowned Kinglet	
<i>Regulus satrapa</i>	Golden-Crowned Kinglet	
<i>Riparia riparia</i>	Bank Swallow	
<i>Sayornis phoebe</i>	Eastern Phoebe	
<i>Sciurus carolinensis</i>	Eastern Gray Squirrel	
<i>Scolopax minor</i>	American Woodcock	
<i>Seiurus aurocapillus</i>	Ovenbird	
<i>Setophaga ruticilla</i>	American Redstart	
<i>Sialia sialis</i>	Eastern Bluebird	
<i>Sitta canadensis</i>	Red-Breasted Nuthatch	
<i>Sitta carolinensis</i>	White-Breasted Nuthatch	
<i>Somatochlora tenebrosa</i>	Clamp-tipped Emerald	
<i>Spermophilus tridecemlineatus</i>	Thirteen-lined Ground Squirrel	
<i>Sphyrapicus varius</i>	Yellow-Bellied Sapsucker	
<i>Spizella arborea</i>	American Tree Sparrow	
<i>Spizella pallida</i>	Clay-Colored Sparrow	
<i>Spizella passerina</i>	Chipping Sparrow	
<i>Spizella pusilla</i>	Field Sparrow	
<i>Stelgidopteryx serripennis</i>	Northern Rough-Winged Sparrow	
<i>Sterna caspia</i>	Caspian Tern	

<i>Sterna forsteri</i>	Forster's tern <b>(ST)</b>	T
<i>Strix varia</i>	Barred Owl	T
<i>Sturnella magna</i>	Eastern Meadowlark	
<i>Sturnus vulgaris</i>	European Starling	
<i>Sylvilagus floridanus</i>	Eastern Cottontail	
<i>Tachycineta bicolor</i>	Tree Swallow	
<i>Tamias striatus</i>	Eastern Chipmunk	
<i>Tamiasciurus hudsonicus</i>	Red Squirrel	
<i>Toxostoma rufum</i>	Brown Thrasher	
<i>Trimerotropis huroniana</i>	Lake Huron Locust	T
<i>Tringa flavipes</i>	lesser yellowlegs	
<i>Tringa melanoleuca</i>	greater yellowlegs	
<i>Tringa solitaria</i>	solitary sandpiper	
<i>Troglodytes aedon</i>	House Wren	
<i>Troglodytes troglodytes</i>	Winter Wren	
<i>Turdus migratorius</i>	American Robin	
<i>Tyrannus tyrannus</i>	Eastern Kingbird	
<i>Ursus americanus</i>	Black Bear	
<i>Vermivora chrysoptera</i>	Golden-Winged Warbler	
<i>Vermivora peregrina</i>	Tennessee Warbler	
<i>Vermivora ruficapilla</i>	Nashville Warbler	
<i>Vireo atricapillus</i>	Black-Capped Vireo	
<i>Vireo flavifrons</i>	Yellow-Throated Vireo	
<i>Vireo gilvus</i>	Warbling Vireo	
<i>Vireo olivaceus</i>	Red-Eyed Vireo	
<i>Vireo philadelphicus</i>	Philadelphia Vireo	
<i>Vireo solitarius</i>	Blue-Headed Vireo	
<i>Vulpes vulpes</i>	Red Fox	
<i>Wilsonia canadensis</i>	Canada Warbler	
<i>Wilsonia citrina</i>	Hooded Warbler	
<i>Wilsonia pusilla</i>	Wilson	
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird <b>(SC)</b>	SC
<i>Zenaida macroura</i>	Mourning Dove	
<i>Zonotrichia albicollis</i>	White-Throated Sparrow	
<i>Zonotrichia leucophrys</i>	White-Crowned Sparrow	