Good evening. My name is Per Anderson. I live in Moorhead and am a charter member of Moorhead's "Capture the Wind" program. I am a small CRP landowner in Tansem Township. I have lived in Minnesota for over 40 years, a state with a high quality of life, including good governance.

The Noble Flat Hill Windpark is the first large wind energy project to seek approval in Clay Country. Two other projects are under development near Rollag. Clay County faces an important moment, and I want to speak to good governance.

In 2007, the National Research Council of the National Academy of Sciences published a scientific study of the environmental impacts of wind turbine projects. The council was charged to do a comprehensive case study of four Mid-Atlantic States, to develop a framework for evaluating impacts and to identify research and development needs. The study characterized the state of governmental regulation and planning in the US as "relatively immature" and found little coordinated planning, policy, and regulation at all jurisdictional levels.

Minnesota fits this analysis—we are not where we need to be today with planning, policy, and regulation. I want to speak to two concerns—1) the absence of robust citizen and community participation and 2) the absence of science-based regulation for turbine siting.

The regulation problem is urgent, and Minnesota needs to take one of two steps. I commend the step taken by the USFWS in 2003 when it created interim, precautionary guidelines for avoiding and minimizing wildlife impacts. In 2007, it created the Wind Turbine Guidelines Advisory Committee which includes key interest groups and which will address governance needs.

In the same way, Minnesota needs to adopt stringent and precautionary interim guidelines for turbine siting with respect to human health and environmental protection. It needs to call upon the Department of Health to render an authoritative judgment about adverse human health effects attributed to conventional siting regulations, which Minnesota uses.

A moratorium on project approval is another option. But because we have precautionary siting standards such as those proposed by George Kamperman and Richard James, this option is unnecessary. Above all, we need scientific study of wind turbine impacts and we need to build regulation on sound science.

Major studies are underway on wildlife impacts. To date, no systematic epidemiological field studies of human impacts have been done. Yet, extensive anecdotal evidence of adverse health effects calls out for study. Several authorities now agree. I will say more later.

The problem of citizen and community participation is also an urgent matter. I appreciate the opportunity to speak publicly tonight. But this meeting comes late. Minnesota, like other states, is using private initiative and investment to build a wind energy sector.

Developers establish land leases through private contact. Participants sign leases with confidentiality clauses. Meetings are held at the discretion of the developer. Townships

and county officials know what the developer chooses to disclose. The general public is the last to know. Public, participatory deliberation about important questions has no place in the formative stages.

If my information is correct (it is not public), 350 towers are currently planned for construction in Clay County. Plans for hundreds more could be on corporate drawing boards. Agreed--we need wind turbines to address global warming. And private capital may be the only way to get there.

But citizens have questions like, how many shall we have in Clay County? Where should they go? What about visual impacts? What about property values? These are fair questions, and they need to be addressed at the local level—in county commission rooms, township halls, churches, farm yards.

Consider visual impacts. In its application, Noble Environmental Power (hereafter, NEP) tends to dismiss the question by observing that visual impacts are "subjective" and conditioned by several variables (5.4.2; 5.21). NEP acknowledges the possibility that transmission lines and turbines will be visible from some vantage points within the Buffalo Ridge State Park and TNC's Bluestem prairie. And such a viewshed "may diminish the natural quality of those areas and the experience of those persons utilizing the areas."

NEP goes on: "While it may be true to some extent that the ability to see the turbines in the background intrudes upon the purity of the experience, the same can be said of other infrastructure such as distribution lines and telephone lines in the area."

Telephone lines are not moving, 400-foot structures. Again, as citizens, we can ask: how many shall we have in Clay County? Where should they go? These are public questions of planning and zoning. Minnesota needs regulation that allows citizens to debate such questions. Market forces and private decision should not drive development alone.

Minnesota law needs to cede some jurisdictional authority to the local level. The people and communities who will live with these decisions have interests that need to be heard. More local authority is needed to support robust participation in decisions that will have major, lasting impacts. Country and township government can serve.

Planning and zoning needs to happen at the local level. However, siting law and environmental protection need to stay with state and federal agencies, because they can deploy science-based oversight. Minnesota law requires developers to address 18 environmental impacts.

In the case of Noble Flat Hill Windpark, input from the USFWS, MNDNR, TNC, and other parties caused the developer to move the project west of MN Highway 9, outside areas with rare and unique flora and fauna. The interests of over 20 protected species have been taken into account and respected.

I want to return now to turbine noise and adverse human health effects and the need for science-based siting. The NEP application reflects the need for precautionary regulation while scientific study addresses critical questions. If you look at the NEP website, you find information about noise and human health that is misleading or simply untrue.

It states that the noise problems of first-generation turbines are much improved and that turbines today at 750-1000 feet are “no noisier than a kitchen refrigerator or a moderately quiet room.” In answer to the question whether low-frequency sound poses a risk to health, the website claims that “the medical community” says no.

It goes on: “Currently, there are some 68,000 wind turbines in operation worldwide. Some of these turbines have been producing energy since the 1980s! There is no medically-documented evidence of wind turbines having a negative effect on people’s health or well-being for any reason, including low-frequency sound or infrasound.” This information comes from an industry paper, which claims that the absence of any ill effects proves the benign nature of this technology.

NEP knows that these matters are more complex and uncertain and tacitly acknowledges this in the application (paragraph four of section 5.3.2) when it deals with the phenomenon of increased noise under certain stable nighttime conditions. Most noise annoyance is reported at night, and the application indicates that on some nights, people outside the project “may” hear noise as well.

It does not say how much or how often. It does not talk about the impulsive, thumping or booming quality that people report and that has been studied by Frits van den Berg and others. It does not say how far this sound travels at night. And it does not say whether some people have trouble sleeping with this sound.

NEP says little about noise annoyance and nothing about adverse health impacts because they do not seem to be environmental impacts of concern for the State of Minnesota at this time.

In conclusion, I want to cite some authorities that are calling for attention to people who suffer in proximity to wind turbines (contrary to what they were told to expect) and who claim a variety of health symptoms, mostly complaints about chronic sleep deprivation. While there have been no definitive studies to date of adverse health effects, some credible voices in the scientific and medical community should compel the state to assess the safety of its L 50 50 dBA siting standards.

One voice is the National Research Council report which examined one of Nina Pierpont’s first papers on what she now calls “wind turbine syndrome” and concluded: “More needs to be understood regarding the effects of low-frequency noise on humans” (159). This report calls for setbacks of a “half mile or so”. Per state law, NEP is proposing 700-foot minimums for this project.

In response to the NRC, Nina Pierpont will soon release a peer-reviewed, book-length case series of ten families to advance her observations that low-frequency noise from wind turbine projects built since 2004 are causing a complex of symptoms in some people up to .9 miles. She indentifies risk factors and proposes causal mechanisms in the body.

Pierpont calls for scientific confirmation of her findings--more medical research. Pierpont thinks that people should live at least 1.25 miles (or 2 km) away from turbines. (She also embraces the precautionary sound limits proposal of Kamperman and James.)

In 2006, the French National Academy of Medicine released a study claiming that health effects of wind turbines have been “insufficiently assessed.” As an interim standard, this report calls for 1.5 km (or 1 mile) setbacks from human populations.

In 2007, the WHO issued night noise guidelines for Europe that are more stringent than standards proposed in 2000. In 2007, the WHO recommends that populations should not be exposed to outside noise levels higher than 30 dBA—20 dBA lower than Minnesota law. Above 30, a number of adverse health effects begin to appear.

In 2007, WHO released another study indicating that chronic noise of 50 dBA and higher contributes to coronary heart disease. Neither of these studies addressed wind turbines, but both reports claim sufficient evidence to establish a causal relationship between noise exposure and health effects.

Finally, 2008 saw publication of the WINDFARMperception project in Holland, which seeks to measure and explain different experiences of turbines. Among reported health effects, the study documents patterns of sleep disturbance and diabetes.

These studies and reports do not establish that turbines produce adverse health effects for some people. But they render false wind developer claims that wind turbines have proven to be safe. There is evidence they are not safe for some people under certain conditions. We need more study. We need to determine safe siting in the absence of definitive knowledge.

I urge the state to adopt precautionary standards while the medical community establishes why some people have bad experiences with turbine noise. Such people are sometimes dismissed as people with bad attitudes or psychosomatic problems. Maybe, maybe not; in any case, they are suffering people.

I urge the Public Utilities Commission to charge the Department of Health with the task of evaluating existing evidence of health risks and of supporting additional research. Meanwhile, we need interim siting standards that insure that no one is harmed.

Minnesota is a great state with a great quality of life. As with all major change, we have work to do to insure that wind turbines and wind energy development contribute to the well being of all. Thank you for this opportunity to speak and for any response that NEP and PUC officials wish to offer.

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