

# HAWAII STATE ENERGY OFFICE STATE OF HAWAII

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## Testimony of **SCOTT J. GLENN, Chief Energy Officer**

before the  
**HOUSE COMMITTEE ON FINANCE**  
Monday, February 24, 2020  
1:00 PM  
State Capitol, Conference Room 308

### Comments in consideration of **HB 2188, HD1** **RELATING TO WIND ENERGY FACILITIES.**

Chair Luke, Vice Chair Cullen, and Members of the Committee, the Hawaii State Energy Office (HSEO) offers comments on HB 2188, HD1, which establishes a one-mile setback from the nearest existing farm dwelling or residential dwelling unit for certain wind energy facilities in agricultural districts and requires a study on the effects of noise production by wind energy facilities on the health of residents and students.

HSEO's comments are guided by its mission to promote energy efficiency, renewable energy, energy resiliency, and clean transportation to help achieve a decarbonized economy. HSEO supports wind turbine setback requirements that balance human health, ecological, environmental, cultural, and economic considerations. Determining an appropriate setback requires considerable thought, information analysis, and stakeholder input. HSEO prefers a setback requirement for wind turbines that is set at a ratio of the height of the turbines (an approach taken in several other states) to more appropriately provide community protections while enabling wind energy to contribute towards Hawaii's renewable energy mandate. HSEO notes that three counties in Hawaii – the City and County of Honolulu, the County of Maui, and the County of Hawaii – require wind turbines in certain zones to be set back from the property line at least as far as the height of the turbines, or a 1:1 setback. Other ratios are used in different areas (examples of 1, 1.1, 1.5, 2.5, 3.1, and 5.5 are provided in the attachment). HSEO does not have a specific ratio to suggest at this time, but acknowledges that a 1:1 setback is likely insufficient in areas that are not vacant and notes special consideration is needed to account for proximity to homes, schools, emergency storm shelters, other occupied areas, and less tangible local values of importance to communities.

HSEO believes that this is an important issue and looks forward to the discussion of appropriate setback requirements. A compilation of wind energy facility siting requirements in

other states, prepared by the National Conference of State Legislatures in 2016, is attached to this testimony for your information.<sup>1</sup>

Regarding the noise effects study in HD1, HSEO takes seriously the human and environmental health concerns expressed by Hawaii communities near large wind turbines. HSEO supports all efforts that will help inform and address the human and environmental impacts from large-scale renewable energy projects, and would like more information on the longitudinal study proposed in HD1. Specifically, it would be helpful to identify in the scope the number of wind energy facilities subject to study, the identification and coordination of the pool of “noise-exposed residents” from whom data would be collected, and possible next steps depending on the results. HSEO supports section 2 of the bill provided that its passage does not replace or adversely impact priorities indicated in the executive budget. HSEO defers to the relevant agencies on administration and implementation.

Thank you for the opportunity to testify.

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<sup>1</sup> National Conference of State Legislatures, <https://www.ncsl.org/research/energy/state-wind-energy-siting.aspx>



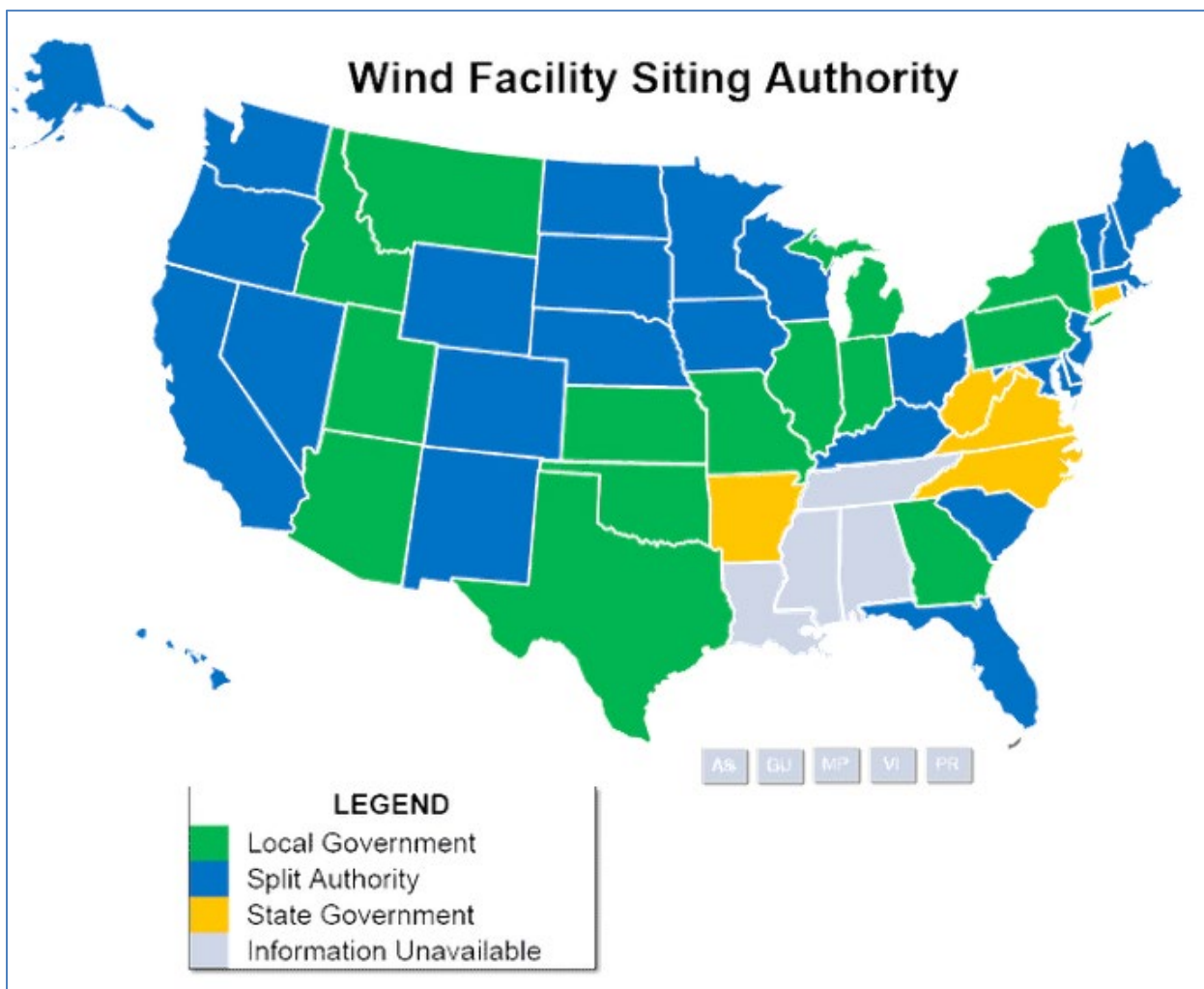
## **State Legislative Approaches to Wind Energy Facility Siting**

Jesse Heibel and Jocelyn Durkay 11/1/2016

States are recognizing the benefits of wind energy as a renewable energy resource that can diversify energy portfolios, meet renewable portfolio standards and reduce greenhouse gas emissions. As wind continues to expand, wind turbines are getting closer to more property owners, leading to contentious debates in some communities. To address this situation, many states have investigated statewide wind siting requirements or guidelines to bring clarity and uniformity to the siting process, rather than leaving siting entirely in the hands of local jurisdictions.

States approaches to wind facility siting vary widely but can be categorized by two general approaches.

- The first approach designates siting authority to state agencies—including public utility commissions or siting councils and boards—often in conjunction with local authorities. A majority of states that adopt this approach may limit local authority through state law, such as setting generating capacity thresholds before state regulatory involvement is authorized. In 25 states, the siting of wind facilities require approval by state or local government bodies depending on size while five states reserve the power to regulate the siting of all wind facilities, regardless of size.



- The second approach, most often found in “home rule” or “local control” states, cedes siting authority to local governments. In these states local governments have substantial autonomy to regulate the siting of most wind facilities through their traditional land use authority. Local governments in 20 states have substantial autonomy to regulate the siting of wind facilities, with 15 of those states having no process or legislation specifically addressing wind facilities.

In the absence of state legislation defining local government powers, the development of wind facility projects may be stifled due to an unintended regulatory maze created by a lack of uniform procedures and standards. Several states have addressed this issue by assigning siting responsibilities to local governments with specified content and limits to local regulation. For example, Connecticut, New Hampshire and Ohio have legislatively-directed siting boards and commissions to develop statewide regulations for wind siting that include standards for setbacks, wildlife, noise, decommissioning, ice throw and other issues.

## Setback Requirements

States take several approaches to establishing a “setback” for wind turbines, which defines the minimum distance between wind turbines and neighboring structures or property lines. These differences largely depend on whether—and to what degree—state government is involved in the wind energy siting. Of the 20 states with substantial local autonomy, only two states have established a statewide setback. Additionally, 15 of those states have no statewide process or legislation specifically addressing wind facilities, and therefore have no statewide setback requirements. Localities, however, can adopt setback requirements. Dekalb County, Alabama, for example, requires turbines to be setback at least 2,500 feet from neighboring and adjacent property lines, as well as setback 1.5 times the height of the tower from any overhead powerlines and .5 times the height of the tower for underground powerlines (Ala. Code §45-25-260.05). In contrast, four states reserve all siting authority for wind energy and an additional 24 states have both state and local siting provisions. Of these states, 12 have statewide setback requirements for wind turbines and one state clarifies that any locally-established setback cannot be an unreasonable restriction on wind energy development.

Setbacks are calculated based on the height of the tower or the turbine (which includes the height of the blade) and often measured against adjacent property lines or structures.

Another tool states have employed for local government guidance on wind siting decisions are model ordinances. Ten states have adopted some form of model ordinances which details local land use regulation, considerations in siting wind facilities and examples of other local government actions.

State	Statute	Summary
Alabama		According to the American Wind Energy Association, there is no installed capacity in Alabama. NCSL was unable to locate statutory authority for statewide wind energy siting. State legislation has been adopted for DeKalb County wind energy siting.
Alaska		The Regulatory Commission of Alaska issues a Certificate of Convenience and Necessity to any utility or independent power producer serving 10 or more people. Depending on site land ownership and environmental impacts, permits for turbine siting are handled by some cities and municipalities or the Alaska Department of Natural Resources and Division of Wildlife.
Arizona	Ariz. Rev. Stat. Ann. <a href="#">§9-461 et seq.</a> ; <a href="#">§11-801 et seq.</a>	No state level approval is needed for siting wind facilities. Wind facilities must obtain siting and zoning approvals at the municipal or county level.

<b>Arkansas</b>	Ark. Stat. Ann. <a href="#">§23-3-201 et seq.</a>	Wind siting is conducted at the local level of government. Utility facilities providing a public service are authorized by the Public Service Commission
<b>California</b>	Cal. Government Code <a href="#">§65100-65107</a> ; <a href="#">§65893-65899</a> ; Cal. <a href="#">Public Resource Code §2100-21006</a>	Land-use decisions, including wind siting, are determined by local governments. Additionally, the California Environmental Quality Act requires local governments to analyze wind generator environmental impacts. Counties are authorized to adopt an ordinance that provides for the installation of wind generators 5 megawatts (MW) or smaller, conditioned on maximum restrictions for tower high, parcel size, setbacks, public notice and noise level.
		While localities can adopt wind siting ordinances, the state has established that minimum setbacks can be no further from the property line than the system height. Further setbacks are authorized to comply with fire setback requirements. Additionally, the state has an extensive siting process for wind turbines and nearby <a href="#">military facilities</a> .
<b>Colorado</b>	Colo. Rev. Stat. <a href="#">§30-28-106(3)(a)(VI)</a> ; <a href="#">§40-5-101</a> ; <a href="#">§29-20-108(2)</a>	In Colorado, both the local and state government permit the siting of wind facilities. The Public Utilities Commission issues a certificate before the construction of new facilities, which requires local permits to be obtained. If local governments deny a permit for a wind facility there is an option to appeal to the PUC.
<b>Connecticut</b>	Conn. Gen. Stat. Ann. <a href="#">§ 16-50j</a> ; <a href="#">Connecticut Siting Council Wind Regulations</a>	The Connecticut Siting Council has promulgated wind siting regulations that include provisions addressing tower height, distance, flicker, decommissioning, ice throw, noise and public hearings. The Siting Council also provides a certificate for all renewable electricity generating facilities 1 MW or larger.  The legislatively-established Connecticut Siting Council has developed siting regulations for facilities 1 megawatt (MW) or larger. On setbacks specifically, facilities greater than 65 MW in total capacity must comply with the greater of 2.5 times the height of the turbine or the manufacturer's recommended setback from any property lines. Facilities less than 65 MW must comply with the greater of 1.5 times the height of the turbine or the manufacturer's recommended setback from any property lines. Note: facilities 65 MW in capacity are not designated in either category. Provides exceptions for this under specific circumstances.

<b>Delaware</b>	Del. Code Ann. tit. <a href="#">29 §80-8060</a>	The state prohibits local governments from passing restrictions that prohibit land owners from using wind systems on residential properties. Otherwise wind power generation is governed by local zoning ordinances. Establishes that setbacks are 1.0 times the height of the turbine (defined as the tower plus the length of one blade).
<b>Florida</b>	Fla. Stat. Ann. <a href="#">§403.501-.518</a>	Florida does not have a statewide siting authority for wind facilities. Local governments have authority over most siting decisions, but the Siting Coordination Office has broad authority for certifications of power generating facilities over 75 MW.
<b>Georgia</b>	Ga. Code Ann. <a href="#">§ 36-70-1 et seq.</a>	Georgia has no specific siting authority for wind generation. Local governments have primary authority over most types of siting.
<b>Hawaii</b>	Hawaii Rev. Stat. <a href="#">§201N</a>	In Hawaii, local government sites most wind facilities. The state authorizes renewable energy facilities, including wind, 5 MW or larger to pursue a streamlined permitting process through state agencies.
<b>Idaho</b>	Idaho Code <a href="#">§67-6504</a>	Idaho has no specific siting authority for wind at the state level. Local governments, through city councils or county commissioners, have siting authority.
<b>Illinois</b>	Ill. Rev. Stat. ch. <a href="#">55 §5/5-12020 (County); Ill. Rev. Stat. ch. 65 §5/11-13-26 (Municipality)</a>	Illinois has no specific siting authority for wind at the state level. A county cannot require a wind tower or other renewable energy system that is used exclusively by an end user to be setback more than 1.1 times the height of the renewable energy system from the end user's property line.
<b>Indiana</b>	Ind. Code <a href="#">§36-7-1</a>	Indiana has no specific siting authority for wind facilities at the state level. Local governments have authority to regulate siting.
<b>Iowa</b>	Iowa Code Ann. <a href="#">§476A.1 et seq.</a>	In Iowa, zoning and permitting for facilities greater than 25 MW is under the jurisdiction of the Iowa Utilities Board. Facilities less than 25 MW are sited on a county or municipality level.
<b>Kansas</b>	Kan. Stat. Ann. <a href="#">§12-741 et seq.</a> ; <a href="#">Kansas Energy Council Handbook</a>	In Kansas, local governments have authority to regulate wind siting through the state's planning and zoning statutes. The Kansas Energy Council has produced a handbook for local governments that includes regulations, considerations and examples.
<b>Kentucky</b>	Ky. Rev. Stat. <a href="#">§278.700 et seq.</a>	Approval by the Kentucky State Board on Electric Generation and Siting or Public Service Commission is required for generating facilities that sell wholesale power with a generating capacity of 10 MW or greater. Facilities with lower generating capacity are sited on the local level. Requires

facilities to be at least 1,000 feet from the property boundary of an adjoining property owner and 2,000 feet from any residential neighborhood, school, hospital or nursing home facility.

<b>Louisiana</b>	La. Rev. Stat. Ann. <a href="#">§33:101 et seq.</a>	According to the American Wind Energy Association, there is no installed capacity in Louisiana. NCSL was unable to locate statutory authority for wind energy siting.
<b>Maine</b>	Me. Rev. Stat. Ann. tit. 38, <a href="#">§481-490</a> ; <a href="#">tit. 35A§3401-04</a> ; <a href="#">§3451-59</a> ; <a href="#">Maine Model Wind Facility Ordinance</a>	All municipalities have the power to pass ordinances to regulate wind power projects within their boundaries. The Department of Environmental Protection regulates the construction of developments with a footprint exceeding 20 acres or over 10 MW generation capacity. The Maine Wind Energy Act also provides for expedited siting. It authorizes both the Maine Department of Environmental Protection and Land Use Regulation Commission to be the permitting authority at the state level only when there is no local, incorporated municipal government in the area. Maine has developed a model zoning law for local governments.
<b>Maryland</b>	Md. Public Utility Code <a href="#">§7-207- 208</a>	In Maryland, local governments have authority to regulate siting for wind facilities 70 MW or less, subject to limited interconnection approval from the Public Service Commission. Wind facilities greater than 70 MW require a Certificate of Public Convenience and Necessity from the Public Service Commission.
<b>Massachusetts</b>	Mass. Ge. Laws Ann. ch. <a href="#">164</a> , <a href="#">§69H</a> ; <a href="#">Massachusetts Model Bylaw</a>	The Energy Facilities Siting Board regulates construction of power plants greater than 100 MW. Smaller energy projects are regulated by local governments. The State has developed model zoning by-laws that municipalities can enact.
<b>Michigan</b>	Mich. Comp. Laws <a href="#">§125.3101 et seq.</a> ; <a href="#">Model Wind Ordinance</a>	Local governments manage land use and several have adopted ordinances regarding the siting of wind power specifically. The state has developed a model zoning law for local governments.
<b>Minnesota</b>	Minn. Stat. <a href="#">§216F</a> ;  Minn. Admin. Rules <a href="#">§7854.0200</a>	The Minnesota Public Utility Commission has permitting authority for wind facilities greater than 5 MW. Counties have siting authority for facilities 5 MW or less but can assume responsibility for facilities up to 25 MW subject to the PUC's specific set of requirements for siting.
<b>Mississippi</b>	Miss. Code Ann. <a href="#">§17-1-1 et seq.</a>	According to the American Wind Energy Association, there is no installed capacity in Mississippi. NCSL was unable to locate statutory authority for wind energy siting.



<b>Missouri</b>	Mo. Rev. Stat. <a href="#">§89.010 et seq.</a>	Local governments have authority in setting siting requirements for wind energy facilities.
<b>Montana</b>	Mont. Code Ann. <a href="#">§70-20</a> ; <a href="#">§76-2-201</a> ; <a href="#">§76-2-301</a>	For most purposes local governments in Montana control zoning. The Department of Environmental Quality may regulate certain components of siting, such as transmission.
<b>Nebraska</b>	Neb. Rev. Stat. <a href="#">§70-1001</a> ; <a href="#">§66-913</a> .	The local utility district must first approve wind power facilities in Nebraska. If the project is over 70 MW it is must also receive Power Review Board approval. Recent legislation modified this requirement for private developers to require notification, not receive approval, of projects. Local governments have authority to include considerations for the encouragement of wind energy in their zoning regulations and ordinances.
<b>Nevada</b>	Nev. Rev. Stat. Ann. <a href="#">§704.820 through 704.900</a> ; <a href="#">§278.250(2)(n)</a> ; <a href="#">§ 278.02077</a>	Nevada requires local governments to promote wind systems and prohibit restrictions of private property owners from utilizing wind energy. The Public Utilities Commission issues permits for the construction of electrical facilities, including renewable energy generating facilities greater than 70 MW. States that a governing body shall not adopt regulations and ordinances that unreasonably restrict the development of wind energy.
<b>New Hampshire</b>	N.H. Rev. Stat. Ann. <a href="#">§162-H</a> ; <a href="#">§674:63</a>	The New Hampshire Siting Evaluation Committee provides a certificate for energy facilities greater than 30 MW. Developers of facilities between 30 MW and 5 MW can opt-in to the SEC process to preempt local jurisdiction. All other wind facilities fall under local jurisdiction. State law also prohibits municipalities from adopting unreasonable ordinances or regulations relating to small wind generation.  Prohibits localities from adopting ordinances that require setbacks more than 150 percent of the system height from property boundaries. Allows for individual project circumstances to be considered in modifying this requirement.
<b>New Jersey</b>	N.J. Rev. Stat. <a href="#">§40:55D-4</a> ; <a href="#">55D-7</a> ; <a href="#">55D-66.12</a> ; <a href="#">55D-70(d)</a> .	Wind developers can gain variances to local zoning ordinances, as wind generation is defined as having an “inherently beneficial use.” Local governments cannot adopt ordinances regulating small wind energy systems that unreasonably limit wind generation development.  State laws authorize municipalities to adopt local ordinances, so long as they do not unreasonably limit or hinder small wind energy systems. Localities cannot restrict tower or system

height through a generic ordinance or regulation that does not specifically address allowable tower height or system height of a small wind energy system. Localities cannot establish setbacks greater than 150 percent of the system height. This distance serves as the standard setback in absence of a local ordinance stating otherwise.

<b>New Mexico</b>	N.M. Stat. Ann. <a href="#">§62-9-3</a> ; <a href="#">§3-21-1</a>	The New Mexico Public Regulation Commission has jurisdiction over electricity generating projects over 30 MW. Counties regulate wind power siting through zoning but can be preempted by the commission if finds it unreasonable restrictive.
<b>New York</b>	N.Y. Pub. Ser. Law <a href="#">§160</a> ; <a href="#">N.Y. Energy Law §21-106</a> ; <a href="#">Wind Energy Model Ordinance</a>	Local governments manage land use, including wind energy development, through zoning permits or enacting wind power specific provisions in municipal code. Siting decisions are subject to environmental review regulations required by state law. The State Public Service Commission is responsible for approval of construction of facilities over 25 MW. The state has developed a model ordinance for local governments looking to site wind generation facilities.
<b>North Carolina</b>	N.C. Gen. Stat. <a href="#">§143-215.115</a>	North Carolina law prohibits the construction or operation of a wind energy facility without a permit from the Department of Environment and Natural Resources.  Establishes that turbines be setback at least .5 miles from the boundary of an adjacent property owner. Additionally, the state has an extensive siting process for wind turbines and nearby <a href="#">military facilities</a> .
<b>North Dakota</b>	N.D. Cent. Code <a href="#">§49-22-16</a>	North Dakota Public Service Commission regulates siting of wind power facilities greater than 500 kilowatts (kW) by providing a Certificate of Site Compatibility. This is the sole permit needed but cannot supersede local governments regulations or zoning.
<b>Ohio</b>	Ohio Rev. Code Ann. <a href="#">§4906.13</a> ; <a href="#">§4906.20</a>	Ohio Power Siting Board preempts local jurisdiction and provides a certificate of environmental compatibility and public need for the construction of an “economically significant wind farm” (between 5-50 MW). Smaller facilities are subject to local jurisdiction. For “economically significant wind farms” (between 5 and 50 MW) setbacks must be at least 1.1 times the total height of the turbine, measured from the base to the tip of the highest blade, and at least 1,125 feet from a property line, measured from the turbine’s blade nearest to the adjacent property. Wind facilities 50 MW in capacity or greater are designated as “major utility facilities” and subject to broader siting regulations.

<b>Oklahoma</b>	Okla. Stat. tit. 17 <a href="#">§160.11 through §160.19</a>	In Oklahoma, siting for wind development is determined by local governments. A notice of intent must be filed with the state Corporation Commission. Aspects such as decommissioning, royalty payments and liability insurance are governed by the state.  The state has setback requirements for facilities located near airports.
<b>Oregon</b>	Or. Rev. Stat. <a href="#">§469.300 through §469.560</a> ; <a href="#">Model Ordinance</a>	Siting for wind generating facilities less than 35 MW are regulated by zoning laws of local government. Oregon’s Energy Facility Siting Council has approval of site certificates for wind power plants 35 MW or greater. The state has developed a model ordinance for local governments.
<b>Pennsylvania</b>	Pa. Cons. Stat. tit. <a href="#">53 §101 et seq.</a> ; <a href="#">Model Ordinance</a>	Local government has the authority to plan and regulate land use including the siting of wind generation facilities. The state has developed a model ordinance for local governments
<b>Rhode Island</b>	R.I. Gen Laws <a href="#">§42-98-1</a> ; <a href="#">§45-24-27 et seq.</a>	Rhode Island Energy Facility Siting Board licenses energy facilities 40 MW or greater. Local governments regulate the siting of smaller facilities.
<b>South Carolina</b>	S.C. Code Ann. <a href="#">§58-33-10 et seq.</a> ; <a href="#">§6-29-310</a>	The Public Utility Commission has licensing power over utility facilities greater than 75 MW. Local governments regulate the siting of smaller facilities.
<b>South Dakota</b>	S.D. Codified Laws Ann. <a href="#">§49-41B-2</a> ; <a href="#">41B-4</a> ; <a href="#">41B-25</a> ; <a href="#">41B-35(3)</a> ; <a href="#">§43-13-21 through 24</a> ; <a href="#">Model Ordinance</a>	In South Dakota, any construction of a wind facility greater than 5 MW must give notice to the Public Utility Commission of the facility’s location, size and interconnection. The PUC has siting authority of facilities greater than 100 MW. Siting for facilities less than 100 MW are outside of the Commission’s authority and instead lie with local governments. The state has developed a model ordinance for local governments.  Turbines with towers smaller than 75 feet must be set back at least 1.1 times the height of the tower from any surrounding property line. All larger turbines must be set back at least 500 feet or 1.1 times the height of the tower, whichever is greater, from any surrounding property line.
<b>Tennessee</b>		According to the American Wind Energy Association, all installed wind capacity in Tennessee is contracted through the federally-owned Tennessee Valley Authority. NCSL was unable locate to statutory authority for wind energy siting.
<b>Texas</b>	Tex. Local Govt. Code Ann. <a href="#">§7-</a>	In Texas, all zoning and siting is left to local government.

<b>Utah</b>	<p><a href="#">A-211; §7-B-231-A</a></p> <p>Utah Code Ann. <a href="#">§10-9a-501</a>; <a href="#">§17-27a-501</a>; <a href="#">Model Wind Ordinance</a></p>	<p>In Utah, all zoning and siting is left to local governments. The state has developed a model ordinance for local governments</p>
<b>Vermont</b>	<p>Vt. Stat. Ann. tit. <a href="#">30 §248(2)(A)</a>; tit. <a href="#">24 §4412(6)</a></p>	<p>The Vermont Public Service Board provides a certificate for all wind power facilities except where it is operated solely for on-site use. Municipalities and regional planning councils have the opportunity to engage in siting decisions with the Public Service Board. Local governments are required to regulate the height of wind turbines with blades less than 20 feet in diameter.</p>
<b>Virginia</b>	<p>Va. Code <a href="#">§56-265.1 to .9</a>; <a href="#">§67.103</a></p>	<p>The Virginia State Corporation Commission provides a certificate for the siting of all new utility facilities including wind. State statute also establishes requirements for any local wind facility ordinances.</p>
<b>Washington</b>	<p>Wash. Rev. Code <a href="#">§80.50.020</a>; <a href="#">§80.50.060</a></p>	<p>The Energy Facility Site Evaluation Council has regulatory authority over energy facilities greater than 350 MW and any sized renewable energy facilities that choose to participate in the EFSEC review process. Local governments permit smaller projects and those that choose not to go through the EFSEC review.</p>
<b>Washington, D.C.</b>		<p>NCSL was unable to locate statutory authority for wind energy siting.</p>
<b>West Virginia</b>	<p>W. Va. Code <a href="#">§24-2-1</a></p>	<p>The West Virginia Public Service Commission has sole authority to regulate all generation of electrical energy for service to the public. Siting wind facilities for on-site consumption would be regulated at by local governments.</p>
<b>Wisconsin</b>	<p>Wis. Stat. <a href="#">§193.378(4g)</a>;          Public Service Commission  <a href="#">Wind Siting Rules</a>; <a href="#">Model Wind Ordinance</a></p>	<p>The Wisconsin Public Service Commission is tasked with promulgating rules, under the advice of the Wind Siting Council, for wind energy siting. No local government may impose any restriction on a wind system that is more restrictive than the PSC rules. The state has developed a model ordinance for local governments.</p>
		<p>Wind turbines must be located at least 3.1 times the maximum blade tip height from occupied community buildings and nonparticipating residences, and at least 1.1 times the maximum blade tip height from participating residences, nonparticipating property lines, public road right-</p>

of-way and overhead communication and electric transmission or distribution lines... Small wind energy systems (combined systems smaller than 300 kW or individual systems smaller than 100 kW) must be located at least 1.0 times the maximum blade tip height from overhead communication and electric transmission or distribution lines, occupied community buildings and nonparticipating residences and property lines...

## Wyoming

Wyo. Stat. [§18-5-501 through 504](#)

Wyoming requires any wind facility of 500 kW or more to obtain a permit from the board of commissioners in the county where the facility is located. The statute also lists a number of "minimum standards" for siting determinations by county commissioners.

The base of any tower must be located at least 110 percent of the maximum height of the tower from any property line adjacent to the facility or from any public road right-of-way. Any tower or other structure must be set back at least 5.5 times the maximum height of the tower (and at least 1,000 feet) from any subdivision. The base of any tower must be located at least 5.5 times the maximum height of the tower (and at least 1,000 feet) from a residential dwelling or occupied structure. The base of any tower must be located at least .5 miles away from the limits of any city or town.

## References

- Association of Fish and Wildlife Agencies, "Wind Power Siting, Incentives, and Wildlife Guidelines in the United States," (2007).
- Debora Donovan, "Wind Siting Regulations and Guidelines in Northeast, A Brief Update," Northeast Wind Resource Center (2015).
- Environmental Law Institute, "State Enabling Legislation for Commercial-Scale Wind Power Siting And The Local Government Role," (2001).
- Kevin McCarthy, "[Standards In Other States for Siting Wind Projects](#)," (2011).
- The National Association of Regulatory Utility Commissioners, "Wind Energy & Wind Park Siting and Zoning Best Practices and Guidance for States," (2012).
- Patricia E. Salkin, "[Renewable Energy and Land Use Regulation \(Part 2\)](#)," (2011).

**HB-2188-HD-1**

Submitted on: 2/21/2020 4:09:03 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Sunny	Individual	Support	Yes

Comments:

Aloha, My name is Sunny Unga and I am writing in strong support for HB 2188 HD1 with recommendations. A minimum set back of 1-mile for a for all wind turbines is essential to protect our communities right to a healthy and safe living environment. In addition, we recommend that all turbines over 350' tall to comply with a setback of 15' for each foot of vertical height. I further recommend that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

The current set back regulation, which is height of the turbine, is completely inadequate and insufficient to protect human health and wellbeing. The closer people live to wind turbines, the greater the negative impacts on them because it increases exposure to noise pollution, and other risks and annoyances. Increasing the set back from residential homes, schools, and farm dwellings is imperative to protect community members from harm.

Wind turbines create both audible and inaudible noise. The audible noise emitted from wind turbines rotating blades are repetitive which is a source of greater annoyance and separates them from other environmental noises. (Schäffer et al., 2016) "*The burden of environmental noise with wind turbines is not episodic or random: for the most part its effects are **constant and unrelenting**. nothing like an occasional aircraft over the house, nor the 70 plus dB experienced at a concert for a few hours. **This is an undeniable health pressure of enormous magnitude.***"

This long term exposure to noise is a stressor that causes adverse health effects. This leads to auditory injuries such as hearing loss and tinnitus. Non auditory effects on health are psychological and physiological distress.

In addition, peer-reviewed scientific studies have proven the existence of inaudible noise infrasound from wind turbines. (McPherson). Although infrasound is inaudible, it is known to cause health problems. (Salt and Kaltenbach), (Salt and Lichtenhan). This is now being more established through sound studies in Brown County, Wisconsin and the Cape Bridgewater Wind Farm in Australia.

Many reports and studies, such as Ambrose, Rand and Krogh (2012), Bolin, Bluhm, Eriksson and Nilsson (2011), Nissenbaum, Aramini, and Hanning (2012), Jefferey

(2013), Salt and Lichtenhan (2014), Salt and Hullar (2010), Alves-Pereira and Branco (2007), Phillips (2011), and Laurie (2015), conclude that there are adverse health effects stemming from noise, infrasound, or shadow flicker from wind turbines.

Residents that live in close proximity to turbines from the U.S., Canada, European countries, Japan and Australia have been speaking out about the health effects they have been experiencing. Sleep disturbances, tinnitus, headaches, migraines, nausea, dizziness, irritability, stress, increase epileptic seizures are detrimental health effects experienced by residents who live near wind turbines. Their testimonies serve as a warning that more safety precautions need to be made to ensure the safety of residents first, in addition to the need for more research.

Even if AES or wind turbine companies deny these facts, the concept of international law and trade and environmental agreement is the Precautionary Principal which states that if scientific evidence is inconclusive it is always best to err on the side of human health.

Furthermore, there are safety risks, such as blade throw and tower collapse (as was experienced by the Auwai wind farm on Maui in 2016), stray voltage, and toxic fires that cannot be extinguished (as was experienced by the Kahuku community in 2012) that must be understood and properly mitigated to secure health and safety of our residents. The City of Lincoln Nebraska noted, "Because of widespread concerns about health and safety, many jurisdictions scattered around the United States and Canada have adopted larger setbacks in recent years" ([lincoln.ne.gov](http://lincoln.ne.gov), 2015).

Increasing the set back from residential homes, schools, and farm dwellings is imperative to protect community members from harm and adverse health effects from industrial scale wind turbines. The only proven safety measure is to have a safe and adequate set back distance. Given that there is no current regulation and protection against infrasound, a greater set back distance is needed and we strongly believe that this bill is the step in the right direction.

As North Shore resident, I understand need for clean energy, but strongly believe that renewable energy projects should be implemented responsibly and must not come at the cost and destruction of human health and wellbeing.

Unfortunately, the latest project, the Na Pua Makani wind project was so poorly developed that over 200+ members of the community were arrested protesting its construction. One of the main reasons the community was so upset was the poor siting done by the developer. Three of the 568 feet turbines being sited less than 1,700 feet away from homes and schools. Existing, farm dwellings are less than 700 ft away from these industrial scale wind turbines because the current set back regulations excludes homes of farmers on agricultural land. Which subjects the community and children from the unrelenting noise from wind turbines. In addition, it has recently come to light that the City and County of Honolulu likely violated the law when approving a waiver for

minimum setbacks, it is clear that more regulation relating to the siting of wind turbines is needed. HB 2188 is a step in the right direction.

I further suggest that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

Therefore, I ask that you pass HB 2188 Relating To Wind Energy Facilities with the aforementioned recommendations requiring a minimum one mile setback and discussed additions to the proposed study, is the least the state can do to move towards safe, equitable and just implementation of its energy initiatives.

Thank you for this opportunity to testify.

[http://www.euro.who.int/\\_data/assets/pdf\\_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1](http://www.euro.who.int/_data/assets/pdf_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1)

<https://lincoln.ne.gov/city/plan/dev/wind/working-group-info/chapman-6.pdf>



**HB-2188-HD-1**

Submitted on: 2/21/2020 4:44:04 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
emily bradshaw	Individual	Support	No

Comments:

I support this bill. As one whose children are in the kahuku district, I believe the industrial turbine setback should be at least 1 mile (as recommended by the World Health Organization). I think this is important legislation as Hawai'i attempts to meet ambitious energy goals. Let us do it in socially responsible ways, with deference to individual health and property.

**HB-2188-HD-1**

Submitted on: 2/21/2020 10:14:36 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
John-Howard Chang Wo	Individual	Support	No

Comments:

I support HB2188.

**HB-2188-HD-1**

Submitted on: 2/22/2020 12:28:28 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Fifita Unga	Individual	Support	No

Comments:

Aloha,

My name is Fifita Unga and I have lived in Kahuku 37+ years. I am writing in strong support for HB 2188 HD1 with recommendations. A minimum set back of 1-mile for a for all wind turbines is essential to protect our communities right to a healthy and safe living environment. In addition, we recommend that all turbines over 350' tall to comply with a setback of 15' for each foot of vertical height. I further recommend that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

The current set back regulation, which is height of the turbine, is completely inadequate and insufficient to protect human health and wellbeing. The closer people live to wind turbines, the greater the negative impacts on them because it increases exposure to noise pollution, and other risks and annoyances. Increasing the set back from residential homes, schools, and farm dwellings is imperative to protect community members from harm.

Wind turbines create both audible and inaudible noise. The audible noise emitted from wind turbines rotating blades are repetitive which is a source of greater annoyance and separates them from other environmental noises. (Schäffer et al., 2016) "The burden of environmental noise with wind turbines is not episodic or random: for the most part its effects are constant and unrelenting. nothing like an occasional aircraft over the house, nor the 70 plus dB experienced at a concert for a few hours. This is an undeniable health pressure of enormous magnitude."

This long term exposure to noise is a stressor that causes adverse health effects. This leads to auditory injuries such as hearing loss and tinnitus. Non auditory effects on health are psychological and physiological distress.

In addition, peer-reviewed scientific studies have proven the existence of inaudible noise infrasound from wind turbines. (McPherson). Although infrasound is inaudible, it is known to cause health problems. (Salt and Kaltenbach), (Salt and Lichtenhan). This is now being more established through sound studies in Brown County, Wisconsin and the Cape Bridgewater Wind Farm in Australia.

Many reports and studies, such as Ambrose, Rand and Krogh (2012), Bolin, Bluhm, Eriksson and Nilsson (2011), Nissenbaum, Aramini, and Hanning (2012), Jefferey (2013), Salt and Lichtenhan (2014), Salt and Hullar (2010), Alves-Pereira and Branco (2007), Phillips (2011), and Laurie (2015), conclude that there are adverse health effects stemming from noise, infrasound, or shadow flicker from wind turbines. Residents that live in close proximity to turbines from the U.S., Canada, European countries, Japan and Australia have been speaking out about the health effects they have been experiencing. Sleep disturbances, tinnitus, headaches, migraines, nausea, dizziness, irritability, stress, increase epileptic seizures are detrimental health effects experienced by residents who live near wind turbines. Their testimonies serve as a warning that more safety precautions need to be made to ensure the safety of residents first, in addition to the need for more research.

Even if AES or wind turbine companies deny these facts, the concept of international law and trade and environmental agreement is the Precautionary Principal which states that if scientific evidence is inconclusive it is always best to err on the side of human health.

Furthermore, there are safety risks, such as blade throw and tower collapse (as was experienced by the Auwai wind farm on Maui in 2016), stray voltage, and toxic fires that cannot be extinguished (as was experienced by the Kahuku community in 2012) that must be understood and properly mitigated to secure health and safety of our residents. The City of Lincoln Nebraska noted, "Because of widespread concerns about health and safety, many jurisdictions scattered around the United States and Canada have adopted larger setbacks in recent years" (lincoln.ne.gov, 2015).

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As North Shore resident, I understand need for clean energy, but strongly believe that renewable energy projects should be implemented responsibly and must not come at the cost and destruction of human health and wellbeing.

Unfortunately, the latest project, the Na Pua Makani wind project was so poorly developed that over 200+ members of the community were arrested protesting its construction. One of the main reasons the community was so upset was the poor siting done by the developer. Three of the 568 feet turbines being sited less then 1,700 feet away from homes and schools. Existing, farm dwellings are less than 700 ft away from these industrial scale wind turbines because the current set back regulations excludes homes of farmers on agricultural land. Which subjects the community and children from the unrelenting noise from wind turbines. In addition, it has recently come to light that the City and County of Honolulu likely violated the law when approving a waiver for

minimum setbacks, it is clear that more regulation relating to the siting of wind turbines is needed. HB 2188 is a step in the right direction.

I further suggest that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

Therefore, I ask that you pass HB 2188 Relating To Wind Energy Facilities with the aforementioned recommendations requiring a minimum one mile setback and discussed additions to the proposed study, is the least the state can do to move towards safe, equitable and just implementation of its energy initiatives.

Thank you for this opportunity to testify.

[http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1)

<https://lincoln.ne.gov/city/plan/dev/wind/working-group-info/chapman-6.pdf>

**HB-2188-HD-1**

Submitted on: 2/22/2020 1:13:24 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Noel Morin	Individual	Support	No

Comments:

Proper siting of wind farms is critical to our ability to expand our renewable energy infrastructure, while ensuring the safety and well-being of neighboring communities.

I'm in **strong support** of this HB2188 HD1.

Noel Morin - Hilo

**HB-2188-HD-1**

Submitted on: 2/22/2020 3:48:50 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Jessica dos Santos	Individual	Support	No

Comments:

I am writing in strong support for HB 2188 HD1 with recommendations. A minimum set back of 1-mile for a for all wind turbines is essential to protect our communities right to a healthy and safe living environment. In addition, we recommend that all turbines over 350' tall to comply with a setback of 15' for each foot of vertical height. I further recommend that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

The current set back regulation, which is height of the turbine, is completely inadequate and insufficient to protect human health and wellbeing. The closer people live to wind turbines, the greater the negative impacts on them because it increases exposure to noise pollution, and other risks and annoyances. Increasing the set back from residential homes, schools, and farm dwellings is imperative to protect community members from harm.

Wind turbines create both audible and inaudible noise. The audible noise emitted from wind turbines rotating blades are repetitive which is a source of greater annoyance and separates them from other environmental noises. (Schäffer et al., 2016) "The burden of environmental noise with wind turbines is not episodic or random: for the most part its effects are constant and unrelenting. nothing like an occasional aircraft over the house, nor the 70 plus dB experienced at a concert for a few hours. This is an undeniable health pressure of enormous magnitude."

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(2013), Salt and Lichtenhan (2014), Salt and Hullar (2010), Alves-Pereira and Branco (2007), Phillips (2011), and Laurie (2015), conclude that there are adverse health effects stemming from noise, infrasound, or shadow flicker from wind turbines. Residents that live in close proximity to turbines from the U.S., Canada, European countries, Japan and Australia have been speaking out about the health effects they have been experiencing. Sleep disturbances, tinnitus, headaches, migraines, nausea, dizziness, irritability, stress, increase epileptic seizures are detrimental health effects experienced by residents who live near wind turbines. Their testimonies serve as a warning that more safety precautions need to be made to ensure the safety of residents first, in addition to the need for more research.

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Furthermore, there are safety risks, such as blade throw and tower collapse (as was experienced by the Auwai wind farm on Maui in 2016), stray voltage, and toxic fires that cannot be extinguished (as was experienced by the Kahuku community in 2012) that must be understood and properly mitigated to secure health and safety of our residents. The City of Lincoln Nebraska noted, "Because of widespread concerns about health and safety, many jurisdictions scattered around the United States and Canada have adopted larger setbacks in recent years" ([lincoln.ne.gov](http://lincoln.ne.gov), 2015).

Increasing the set back from residential homes, schools, and farm dwellings is imperative to protect community members from harm and adverse health effects from industrial scale wind turbines. The only proven safety measure is to have a safe and adequate set back distance. Given that there is no current regulation and protection against infrasound, a greater set back distance is needed and we strongly believe that this bill is the step in the right direction.

As North Shore resident, I understand need for clean energy, but strongly believe that renewable energy projects should be implemented responsibly and must not come at the cost and destruction of human health and wellbeing.

Unfortunately, the latest project, the Na Pua Makani wind project was so poorly developed that over 200+ members of the community were arrested protesting its construction. One of the main reasons the community was so upset was the poor siting done by the developer. Three of the 568 feet turbines being sited less then 1,700 feet away from homes and schools. Existing, farm dwellings are less than 700 ft away from these industrial scale wind turbines because the current set back regulations excludes homes of farmers on agricultural land. Which subjects the community and children from the unrelenting noise from wind turbines. In addition, it has recently come to light that the City and County of Honolulu likely violated the law when approving a waiver for minimum setbacks, it is clear that more regulation relating to the siting of wind turbines is needed. HB 2188 is a step in the right direction.



I further suggest that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

Therefore, I ask that you pass HB 2188 Relating To Wind Energy Facilities with the aforementioned recommendations requiring a minimum one mile setback and discussed additions to the proposed study, is the least the state can do to move towards safe, equitable and just implementation of its energy initiatives.

Thank you for this opportunity to testify.

My husband and I live at Sunset Beach, three miles downwind from the existing Kahuku Wind Farm and we are adversely affected by the 12 existing 2.5 MW wind turbines. We are building a safe room in our garage so we will have a place to get away from the wind turbine low-frequency sound pulses. Below I provide my thoughts about the proposed research and invite the researcher to contact us because a poorly-designed wind turbine health effects study would be inconclusive and a waste of money – a well-designed study could be costly and would take more than six months to develop (purchase equipment, conduct, and analyze). I think the most important thing this legislation should do is require the wind farms to disclose their hourly operations data for each turbine to greatly simplify/reduce the cost of any wind turbine health effects study. Because the public now understands wind turbines are a public nuisance and can be removed through litigation, it's a waste of valuable agency and HECO time and money to build turbines near residential areas where they will be removed – a five-mile buffer may be a safe distance for the existing smaller turbines, but as turbine blade length increases, former buffer distances based on health/annoyance may become outdated – a 40 dB, 8 Hz (low-frequency sound limit, rather than a set distance limit) could be used now and in the future to avoid adverse wind turbine effects to residents.

**My husband and I are building a wind turbine safe room:** I live at Sunset Beach three miles downwind from the 12 existing 2.5 MW turbines of the Kahuku Wind Farm and I have been taking time off from work this month to build a small safe room in the garage, with 10 layers of sheetrock (walls, ceiling), to give us a safe place to get away from the low-frequency sound pulses of the existing "small" wind turbines. When the current wind turbines are on, under average wind conditions, I get approximately 30 minutes of REM and deep sleep during my regular nine hours of sleep and I feel quite tired (and often I wake up with stiff neck/shoulders and sometimes I wake up with a headache or the feeling pressure in my head) - and when most of the turbines are off at night (like they were Christmas through January 25, 2020), I get the normal three hours of REM+deep sleep in the normal eight sleep cycles, wake feeling well-rested, and my neck is not stiff. In addition, in January, I felt like my short-term memory deficit that I'd been experiencing for a few years, resolved – I didn't forget what I was looking for when I went into a room after a few weeks of lower turbine operation. We are building the safe room because a sleep specialist my doctor sent me to (to confirm I don't have sleep apnea or other sleep disorder that would cause this) is concerned because REM and deep sleep are important in relation to dementia and memory (amyloid plaques and tau proteins apparently accumulate in your brain tissue unless they are cleared during REM and deep sleep). My primary care physician prescribed the sleep Rx Ambien, and I've tried taking ½ an Ambien on three nights and all three nights, I got normal deep sleep after I took the Ambien, but I didn't get REM sleep.

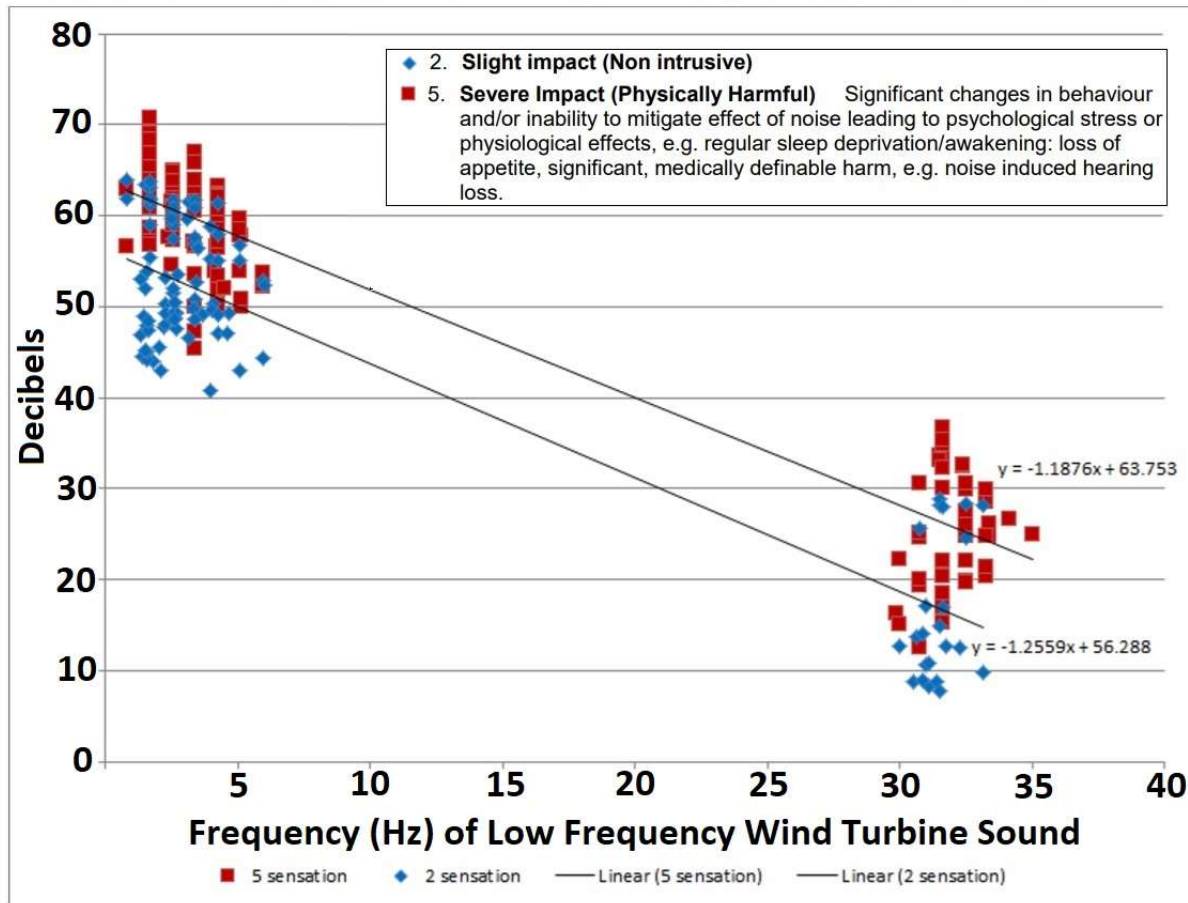
We sleep normally when most of the turbines are kept off: My husband and many of our neighbors are also experiencing effects of the existing wind turbines and I think it's possible several homeowners who recently moved away may have left (one became disabled by headaches and is now losing her home in foreclosure) because of health effects caused by the wind turbines (my impression is the most sensitive residents have already moved away). The effects here at Sunset Beach, based on the January shut-down and what our neighbors reported, appear to primarily be sleep problems/tiredness and headaches. In January when most of the Kahuku Wind Farm turbines were kept off at night, neighbors who are not really monitoring their sleep quality remarked that they had noticed they were dreaming at night and that dreaming

is unusual for them (since the turbines have been on most nights since January 2013), and when the turbines were turned back on full-blast in late January, other neighbors talked with me to try to figure out headaches their family members were experiencing. These same 2.5 MW Clipper turbines at the existing Kahuku Wind Farm have been declared a public health hazard in Wisconsin where they adversely affect public health a distance of 4.2 miles.

**Suggestions for Wind Turbine Health Effects Research Study Design:** Poorly-designed wind turbine sound studies are inconclusive – I have the following study design suggestions your researchers should address to avoid wasting their time/money: Regarding what I know about a longitudinal health study that someone at UH has proposed (which might be the basis for this funding request based on my conversation with Rep. Quinlan) - My understanding is the scientist proposes to measure audible sound and relate that to distance from the turbines. I don't have the contact information for the researcher so I'm jotting down a few notes here for them: You may know that as distance from the turbines increases, audible sound also increases because Kamehameha Highway causes a high level of audible sound. You might also be aware that because of the audible sound level of Kamehameha Highway, the residents at this distance from the wind farm are likely to be disadvantaged to begin with and may therefore be in poorer health in the absence of the turbines, than residents closer to the wind farm. A retirement community, also at a farther distance from the turbines, would additionally confound a "longitudinal" - type study. May I suggest that rather than a longitudinal study, where distance from the wind farm is the dependent variable, or a study of audible sound level in relation to resident health (which, for the reasons noted above, I believe would be a waste of money/effort), the researchers instead undertake the following:

I suggest your research include measurement of low-frequency wind turbine sound level for at least three weeks during the winter and at least three weeks during the summer in each community (including, on Oahu - Pupukea, Kawaihoa, Foodland Pupukea area, Sunset Beach, Haleiwa, Kahuku) and during those weeks, have residents enter data in a Google sheet or on an app you develop, or in a diary, their level of discomfort (and their children's level of misbehavior, etc). The low-frequency sound that seems like the best choice is 7-9 Hz. (The turbines produce a 0.5-1.5 Hz fundamental frequency sound, and that sound and its harmonics (2, 3, 4, 5, 6, 7, 8, 9, etc Hz) are readily obvious on sonograms. Wind noise is often obscuring the 0-2 Hz area of the sonogram - the 8 Hz harmonic is obvious - in readings from Kahuku, Sunset Beach, and Pupukea, wind noise blots out the 1 Hz fundamental sound on most areas of any sonogram). A minimum of \$30,000 should be included in the budget to collaborate with Robert Rand, Rand Acoustics, from the mainland. (Mr. Rand turned down a job to be Hawaii's health department sound branch director, he's a private consultant, he's been to Hawaii, and he is a wind turbine sound expert.) Resident discomfort should then be assessed in relation to the decibel level of the 8 Hz sound (I list an example questionnaire on my nonapua.com website). A useful graph, which the researchers could essentially replicate with local residents and legislators could use to set wind turbine sound limits - discomfort level in relation to the low-frequency sound level is shown below. In this graph, from the Cape Bridgewater study, funded by a wind farm (which makes it difficult to read – my nonapua.com website has a link to the Cape Bridgewater study), sensation "5" was extreme discomfort - like missing work because it was so bad).

**Wind Turbine Low-Frequency Sound Decibel Levels Recorded when Residents Journals Noted "Slight Impact" (Blue) and "Severe Impact" (Red), Cape Bridgewater Wind Farm Acoustic Testing Funded by Energy Pacific (2014).**



**FIGURE 49: Human response to sound pressure of wind turbine signature and 31.5 Hz wind turbine amplitude modulation (both do not occur in the ambient environment) [https://drive.google.com/open?id=180jlKaO\\_Z9pdWpQ64z8EFEh1vYdiqrp](https://drive.google.com/open?id=180jlKaO_Z9pdWpQ64z8EFEh1vYdiqrp)**

Low-frequency sound measurement microphone/computer systems are costly (\$11,000 each, and take three months to obtain. Note the turbines are shut completely off when wind is less than around 11 mph April through October to reduce the number of endangered bats they kill, so those are good days to get good data - but you also need to include nights when it's windy (because I guess it's possible high wind might be uncomfortable for someone, even if the turbines are off - the wind farm could be required to cooperate with your study - also the turbines are off for a few days after one of them gets struck by lightning - so those are windy days that give us good data). In my experience, I get three hours of REM and deep sleep when the 8 Hz sound pulses from the wind turbines is 40 dB (maybe also at 43 dB) and I sleep very poorly and only get a few minutes of REM and deep sleep when the 8 Hz turbine sound level is 50 dB (I sleep like a log when the 8 Hz sound level from the surf is 60 dB - surf and traffic sound (and loud AC sound in an inexpensive hotel room I was recently in for work) does not affect my REM

and deep sleep). There seemed to be a lag time between the start of the turbine shut-down period (when most of the turbines were off) and people noticing they were dreaming – some people may not have normal sleep until after a few consecutive days of turbine shutdown (there was a few week lag in my recovery of my short-term memory function during the January “shut down”/low operation period. Also, when I’ve experienced one night of quality sleep, sometimes the sleep the three nights prior to that was so bad (because some nights it’s so windy and the 8 Hz sound level at our house is well above 50 dB and I feel so exhausted after three days of this, that one night of good sleep is great, but I would still classify myself as feeling tired because it takes a few nights of good rest to feel well-rested.

A complexity where there is existing low-frequency sound: Decibel scale is logarithmic and that sound is additive – the 50 Hz surf sound, plus the 50 Hz wind turbine sound, causes a 53 dB wind turbine sound pulse signature, (I feel these nights are much worse than a 50 dB night in terms of sleep disturbance) – whereas very very loud surf (like the two very big days this year, seems to drown out the wind turbine pulses so we sleep very well those giant surf nights, even if the turbines are on – it’s a complexity that calls for additional restrictions to wind turbine pulse decibel level if you want to protect residents in areas where there is a background sound of low-frequency sound – remember, sound is additive and the existing sound will make the wind turbine sound louder than it would be if the background sound were not there).

Once you have identified residents who are severely affected by the wind turbine sound, you could measure the sound in the room in their house where they have the trouble – because resonance (vibration) of a structure or room in their house from the wind turbine pulses (something that’s not related to turbine distance), may cause sound to be much higher in their room than it is outdoors. Because of resonance (a very unfortunate characteristic of every part of a structure – walls, rooms themselves) the level of low-frequency (like 8 Hz) sound I have measured inside some rooms of some homes is 10-20 dB HIGHER than the 8 Hz sound level out in the yard next to the house (so the 8 Hz sound in someone’s bedroom at Sunset Beach could be much higher than the 8 Hz sound outdoors in the closest residences to the wind farm, just because of the house’s resonance). In addition, my understanding from conversations with acoustic specialists is the sound that often causes the discomfort can often be a resonance of the home at 31 Hz or above 100 Hz (audible sound) that occurs when the house resonates when it is exposed to the low-frequency wind turbine sound pulses and harmonics. I am very lucky that the sound levels in my house have essentially been identical to the sound levels outdoors because this has enabled me to figure out the effects of the wind turbine sound pulses quiet efficiently (after three months of monitoring) – but I have measured rooms that had such bad resonances from the wind turbines the residents would be better off sleeping out in a tent in their yard than they are in that room. In our living room and bed room where I’ve measured, the 0-20 Hz (low-frequency) sound levels inside our house are essentially the same as the sound levels outside in the yard at those frequencies - our standard double-wall construction walls (two layers of siding (original wood and layer of newer Hardieboard) and one layer of sheet rock, double-pane windows, solid door) and our ceiling (2" tongue and groove fir with 3/8 sheathing and shingles (since the turbine low-frequency sound also comes from above) do not block much, if any of sound below 20 Hz – above 20 Hz, our walls block 15-20 dB of audible sound (dBA – our bedroom dBA is below 33 with the window/door closed). Mass between the person and the outside roof/wall seems worth noting – the number of layers of protection (one layer of most

things weigh about 2.2 lb/sq ft (5/8 sheet rock, Hardiboard (1/32" lead sheet, 3/4 plywood) all weigh about 2.2 lb/sq ft) the resident's bedroom has could be included in the questionnaire because I've noticed the downstairs rooms of some homes on our street register 10 dB lower 8 Hz wind turbine sound pulse levels than outside because they already have 10 layers between the downstairs room and the outside (because of interior walls/staircases, and soundproofing floor/ceiling to rent out a spare bedroom, etc), and when I tested sleeping (on a thin temporary relatively uncomfortable mattress on the floor) in one of those rooms when the turbines are on, my REM/deep sleep is perfect/normal. When you do your study, my safe room will be done, so I'll be reporting that I sleep great, except that I will be relegated to sleeping in an unfinished tomb/bunker, away from my bathroom and my bedroom with its windows and egress/air quality safety (at least for the next 11 years, til the Kahuku Wind Farm turbines are taken down at the end of their 20-year operation period, when we'll look forward to being able to live in our house again – note that because it would take 10 years to litigate to get the existing Kahuku and Kawailoa turbines taken down and both wind farms are scheduled for removal in about 11 years, there's no point going through all that effort, but my sense is that if the Na Pua Makani turbines are permitted to operate, I think the public (200 plaintiffs, or whatever) will get all three wind farms removed because they are a public nuisance). Certainly, one reason to use a safe wind turbine setback distance is to avoid spending so much agency staff and HECO staff time/money working with these wind developers only to have the thing taken down because they are a nuisance to residents miles away.

In my limited experience, the current sound pressure level of the pulses from the current wind turbines is 63 dB in the upper residential area of Kahuku (I don't think you can really build a safe room to block that much sound – maybe you could if you built a new foundation to hold all the mass you'd need – or if you spent a lot of money to use limp materials like mass-weighted vinyl or lead – they block low-frequency sound very effectively but they are quite a bit more costly than sheet rock). My sense is the headache, sleep disturbance, and children's behavioral aspects are quite a bit more severe in Kahuku than they are at Sunset Beach. According to the EIS, the sound level the proposed Na Pua Makani Wind Farm would cause in the town of Kahuku would be 83 dB at 8 Hz, and I've read that blocking 30 dB of low-frequency sound requires three feet of wet sand (like an underground bunker).

**Suggestion for edit to the wind turbine distance portion of this legislation:** Rather than legislate specific wind turbine buffer distance (such as one mile, which is an odd choice since adverse health effects extend much farther than that), I suggest (and I think a study such as the one I outline above will indicate) that you should set a limit on the low-frequency (such as 8 Hz) sound pressure level from wind turbines - certainly in residential-zoned areas where the public expects safety. My understanding is that small turbines produce lower levels of the low-frequency sound - so limiting the sound level rather than using a set distance would mean the small wind turbines (less than 1 MW) could be installed closer to residential (or ag home) areas without adversely affecting public health. In addition, as turbines get larger (such as the Na Pua Makani turbines), what was once considered a safe distance, such as five miles, becomes obsolete as turbine blade lengths increase. As I mentioned, I slept well in January when most of the Kahuku Wind Farm turbines three miles away were kept off at night and on nights like last night... when the turbine 8 Hz sound pulses were around 40 dB, and I sleep very poorly when the 8 Hz wind turbine sound is 50 dB. Regarding the one-mile buffer distance, below is a copy of the

letter the Sunset Beach Community Association recently sent requesting a 5-mile wind turbine setback distance:

Sunset Beach Community Association  
P.O. Box 471  
Haleiwa HI 96712

01.16.2020

Honolulu City Council  
Honolulu Hale  
530 South King Street, Room 203  
Honolulu, Hawaii 96813

Dear City Council Members,

The Sunset Beach Community Association is writing in support of City and County Resolution 19-305, proposing a Land Use Ordinance Amendment to Change the Setback of Wind Turbines to Five Miles from Surrounding Boundary Lines.

In addition, the two existing North Shore wind farms should be required to shut down at night to avoid killing endangered bats, consistent with state endangered species law. This night shutdown will also reduce adverse health effects to our residents resulting from the wind turbine operation.

Sincerely,



Andrea Woods  
Corresponding Secretary  
Sunset Beach Community Association

cc: Councilmember Tsuneyoshi  
Honorable David Ige, Governor  
Mayor Kirk Caldwell  
North Shore Neighborhood Board  
Senator Gil Riviere  
Representative Sean Quinlan

**Most efficient edit to the wind turbine health effects research portion of the legislation:** I think you should simply require that wind farms disclose, in a publicly-accessible online archive, the hourly power production and number of blade revolutions per hour of each of their turbines. The low-frequency (such as 8 Hz) wind turbine sound level is directly related to the turbine blade RPMs and number of turbines operating. Then researchers (and residents themselves) could assess discomfort in real time in relation to turbine operation. Then it would be easy for residents to tell you how they feel, sleep, etc, in relation to the turbines – my guess is

this would be the piece of legislation the wind farms would fight most to oppose because it would be the most useful for the public. Alternatively, I think the most efficient thing you (the State health department) could be funded to do is to simply set up a low-frequency sound monitoring system in each neighborhood and provide a live-stream so the public can view, in real-time, the low-frequency sound levels. It's pretty easy to spot the wind turbine fundamental frequency and harmonics in the raw/live feed – without any post-processing costs. So then when people are up in the middle of the night because they can't seem to fall back asleep for some reason, at least they can look at the feed to understand whether or not (more likely than not) it's because the turbines are on full-blast.

The UH researcher can contact Rep Quinlan for my contact information – a group of 10 of us on the North Shore have a research team reviewing/collecting wind turbine health effects publications – I haven't been updating my Google Drive or nonapua.com web site (because I'm spending so much time building our tomb/wind turbine safe room).



**HB-2188-HD-1**

Submitted on: 2/23/2020 9:52:32 AM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Chris Bruns	Individual	Comments	No

Comments:

First, a correction to the testimony just submitted by Dawn Bruns - Most of text of the testimony my wife dated/submitted 2/23, was written on 2/22 (this is only noteworthy because in her testimony she referred to the low wind turbine sound pulse level "last night" and that reference is to Friday night (not Saturday night)). I have submitted my personal, private information about the adverse effects the wind turbines are having to my health to the Hawaii Department of Health. We live at Sunset Beach, three miles from the Kahuku Wind Farm's turbines that have been operating pretty continuously since January 2013.

In addition, thank you Finance Committee for being among the leaders addressing the important need to keep wind turbines far away from residents. From a finance committee perspective, wind turbines near residences become a burden to the public (finances) when they are built near residents and schools - when they are so close to developed areas that they adversely affect childhood development, child and adult mental health, and when chronic exposure results in work disability and clusters of the population end up with dementia from the turbines. The public is also burdened when wind turbines are, for whatever reason, allowed close to residents and the next Governor/legislature ends up having to pay \$100 million to buy out the wind farm to take it down to protect the public.



# UNIVERSITY OF HAWAII SYSTEM

## Legislative Testimony

**LATE**

Testimony Presented Before the  
House Committee on Finance  
Monday, February 24, 2020 at 1:00 p.m.

By

Jerris Hedges, MD, Dean  
James W. Hall III, PhD, Professor  
Department of Communication Sciences and Disorders  
John A. Burns School of Medicine

And

Michael Bruno, PhD  
Provost  
University of Hawai'i at Mānoa

HB 2188 HD1 – RELATING TO WIND ENERGY FACILITIES.

Chair Luke, Vice Chair Cullen, and members of the committee:

Thank you for this opportunity to testify in **support** of HB 2118 HD1, which, among other features, requests that the John A. Burns School of Medicine (JABSOM) conduct a study on the effects of noise production by wind energy facilities on the health of residents and students.

The Department of Communication Sciences and Disorders in JABSOM at the University of Hawai'i and administrative leadership in the John A. Burns School of Medicine fully support the proposed study to evaluate the risk of hearing loss and reported relevant health issues (e.g., noise annoyance, sleep disturbance, tinnitus) in an adequate sample of residents in multiple appropriately selected Hawai'i communities exposed to wind turbine noise. Findings based on analysis of data collected through the study will contribute importantly to evidence-based education of residents in communities potentially affected by wind farm development. Findings of the study will also provide guidance for planning purposes to the state of Hawai'i and its policymakers involved in decisions regarding proximity of wind turbines to homes and other occupied areas.

The three co-investigators in the proposed study, Drs. James W. Hall III, Samantha Kleindienst Robler, and Henry L. Lew, are faculty members in the Department of Communication Sciences and Disorders. Each is available and prepared to participate in the study as described in the formal proposal pending approval of the requested funding of \$100,700.

Again, thank you for this opportunity to testify in support for HB 2188 HD1, provided that its passage does not impact the priorities in the University of Hawai'i Board of Regents' Approved Budget.



Hawaiian  
Electric

**LATE**

**TESTIMONY BEFORE THE  
HOUSE COMMITTEE ON FINANCE**

**H.B. 2188, HD1**

**Relating to Wind Energy Facilities**

Monday, February 24, 2020  
1:00 p.m., Agenda Item #6  
State Capitol, Conference Room 308

Rebecca Dayhuff Matsushima  
Director, Renewable Acquisition Division  
Hawaiian Electric Company, Inc.

Dear Chair Luke, Vice Chair Cullen, and Members of the Committee,

My name is Rebecca Dayhuff Matsushima and I am testifying on behalf of Hawaiian Electric Company, Inc. (Hawaiian Electric) with **comments on H.B. 2188, HD1**, Relating to Wind Energy Facilities.

H.B. 2188, HD1 proposes to amend Section 205-4.5 of the Hawaii Revised Statutes to establish an unspecified setback from the nearest existing farm dwelling or residential dwelling unit for wind energy facilities in agricultural districts. HD1 amended the setback distance from one mile to an unspecified distance and adds a requirement for the University of Hawaii at Manoa John A. Burns School of Medicine to conduct or contract for a study on the effects of noise produced by certain wind energy facilities in Hawaii on the health of residents and students.

While we understand the concerns raised by some regarding the location and proximity of renewable energy projects, Hawaiian Electric notes this bill will have a potential impact on achieving the State's renewable energy goals. We will need to rely on all viable technologies, including utility scale wind projects, to achieve the legislative

mandate to reach 100% renewable energy. To achieve this goal, legislative policies must all be aligned in the same direction and the entire state of Hawaii must work together. Meeting the Legislature's mandate of 100 percent renewable energy by 2045 will require a significant amount of land. For example, on Oahu we have an active Request for Proposal to procure 1,300,000 MWh of renewable, dispatchable energy. If translated to solar, this would, for example, equal 594 MW of solar capacity, with an estimated footprint of 3,000 acres. This translates roughly to 29 Aloha Stadiums of land. Similar footprints would be needed for a mix of resources including solar and wind. Realistically, this will require a significant amount of land, which is challenging on a 600-square mile island with more than 1 million people. This is why it is important to make sure that our State's land-use policies, its economic development plans, and our renewable energy mandates are aligned. We encourage lawmakers to seek alignment of key energy, land use, and other policies, especially as communities have voiced concerns about siting of certain renewable energy projects.

Thank you for this opportunity to comment on H.B. 2188, HD1.

**LATE**

**HB-2188-HD-1**

Submitted on: 2/24/2020 10:14:35 AM

Testimony for FIN on 2/24/2020 1:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
Joseph Kohn MD	We Are One, Inc. - www.WeAreOne.cc - WAO	Support	No

Comments:

**In support of HB 2188 HD1**

Dear Chair Luke, and members:

As one of 350Hawaii.org's 6,000 members, I support HB 2188 HD1.

Kahuku's wind farm was poorly planned and ignored the concerns of residents for years.

Living close to a wind farm can cause earaches, dizziness, fainting, migraines, and trouble sleeping, in addition to the nuisance noise levels and shadow flickers.

Like other NIMBY projects, wind farms tend to be sited near low-income communities and communities of color.

A "one-mile setback from the nearest existing farm dwelling or residential dwelling unit for certain wind energy facilities in agricultural districts" is a weak, half-done measure that only addresses a small piece of the problem.

But it's better than nothing.

Pass this bill and show at least a little respect for people having to deal with the effects of a wind farm.

[www.WeAreOne.cc](http://www.WeAreOne.cc)



**LATE**

183 Pinana St., Kailua, HI 96734 • 808-262-1285 • info@350Hawaii.org

To: The House Committee on Finance  
From: Brodie Lockard, Founder, 350Hawaii.org  
Date: Monday, February 24, 2020, 1:00 pm

**In support of HB 2188 HD1**

Dear Chair Luke, and members:

350Hawaii.org's 6,000 members support HB 2188 HD1.

Kahuku's wind farm was poorly planned and ignored the concerns of residents for years.

Living close to a wind farm can cause earaches, dizziness, fainting, migraines, and trouble sleeping, in addition to the nuisance noise levels and shadow flickers.

Like other NIMBY projects, wind farms tend to be sited near low-income communities and communities of color.

A "one-mile setback from the nearest existing farm dwelling or residential dwelling unit for certain wind energy facilities in agricultural districts" is a weak, half-done measure that only addresses a small piece of the problem.

But it's better than nothing.

Pass this bill and show at least a little respect for people having to deal with the effects of a wind farm.

Brodie Lockard  
Founder, 350Hawaii.org

**LATE**

**HB-2188-HD-1**

Submitted on: 2/23/2020 9:34:19 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

Submitted By	Organization	Testifier Position	Present at Hearing
tlaloc tokuda	Individual	Support	No

Comments:

To: The House Committee on Finance

From: **Tlaloc Tokuda**

Date: Monday, February 24, 2020, 1:00 pm

**In support of HB 2188 HD1**

Dear Chair Luke, and members:

As one of 350Hawaii.org's 6,000 members, I support HB 2188 HD1.

Kahuku's wind farm was poorly planned and ignored the concerns of residents for years.

Living close to a wind farm can cause earaches, dizziness, fainting, migraines, and trouble sleeping, in addition to the nuisance noise levels and shadow flickers.

Like other NIMBY projects, wind farms tend to be sited near low-income communities and communities of color.

A "one-mile setback from the nearest existing farm dwelling or residential dwelling unit for certain wind energy facilities in agricultural districts" is a weak, half-done measure that only addresses a small piece of the problem.

But it's better than nothing.

Pass this bill and show at least a little respect for people having to deal with the effects of a wind farm.

Tlaloc Tokuda

Kailua Kona HI 96740





**LATE**

**HB-2188-HD-1**

Submitted on: 2/23/2020 10:02:33 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Joshua kaina	Individual	Support	No

Comments:

Aloha,

I am a resident of Kahuku who will be negatively impacted by the close proximity of an industrial scaled wind energy FACTORY. I am writing in strong support for HB 2188 HD1 with recommendations. A minimum set back of 1-mile for a for all wind turbines is essential to protect our communities right to a healthy and safe living environment. In addition, we recommend that all turbines over 350' tall to comply with a setback of 15' for each foot of vertical height. I further recommend that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

The current set back regulation, which is height of the turbine, is completely inadequate and insufficient to protect human health and wellbeing. The closer people live to wind turbines, the greater the negative impacts on them because it increases exposure to noise pollution, and other risks and annoyances. Increasing the set back from residential homes, schools, and farm dwellings is imperative to protect community members from harm.

Wind turbines create both audible and inaudible noise. The audible noise emitted from wind turbines rotating blades are repetitive which is a source of greater annoyance and separates them from other environmental noises. (Schäffer et al., 2016) "The burden of environmental noise with wind turbines is not episodic or random: for the most part its effects are constant and unrelenting. nothing like an occasional aircraft over the house, nor the 70 plus dB experienced at a concert for a few hours. This is an undeniable health pressure of enormous magnitude."

This long term exposure to noise is a stressor that causes adverse health effects. This leads to auditory injuries such as hearing loss and tinnitus. Non auditory effects on health are psychological and physiological distress.

In addition, peer-reviewed scientific studies have proven the existence of inaudible noise infrasound from wind turbines. (McPherson). Although infrasound is inaudible, it is known to cause health problems. (Salt and Kaltenbach), (Salt and Lichtenhan). This is now being more established through sound studies in Brown County, Wisconsin and the Cape Bridgewater Wind Farm in Australia.

Many reports and studies, such as Ambrose, Rand and Krogh (2012), Bolin, Bluhm, Eriksson and Nilsson (2011), Nissenbaum, Aramini, and Hanning (2012), Jefferey (2013), Salt and Lichtenhan (2014), Salt and Hullar (2010), Alves-Pereira and Branco (2007), Phillips (2011), and Laurie (2015), conclude that there are adverse health effects stemming from noise, infrasound, or shadow flicker from wind turbines. Residents that live in close proximity to turbines from the U.S., Canada, European countries, Japan and Australia have been speaking out about the health effects they have been experiencing. Sleep disturbances, tinnitus, headaches, migraines, nausea, dizziness, irritability, stress, increase epileptic seizures are detrimental health effects experienced by residents who live near wind turbines. Their testimonies serve as a warning that more safety precautions need to be made to ensure the safety of residents first, in addition to the need for more research.

Even if AES or wind turbine companies deny these facts, the concept of international law and trade and environmental agreement is the Precautionary Principle which states that if scientific evidence is inconclusive it is always best to err on the side of human health.

Furthermore, there are safety risks, such as blade throw and tower collapse (as was experienced by the Auwai wind farm on Maui in 2016), stray voltage, and toxic fires that cannot be extinguished (as was experienced by the Kahuku community in 2012) that must be understood and properly mitigated to secure health and safety of our residents. The City of Lincoln Nebraska noted, "Because of widespread concerns about health and safety, many jurisdictions scattered around the United States and Canada have adopted larger setbacks in recent years" ([lincoln.ne.gov](http://lincoln.ne.gov), 2015).

Increasing the set back from residential homes, schools, and farm dwellings is imperative to protect community members from harm and adverse health effects from industrial scale wind turbines. The only proven safety measure is to have a safe and adequate set back distance. Given that there is no current regulation and protection against infrasound, a greater set back distance is needed and we strongly believe that this bill is the step in the right direction.

As North Shore resident, I understand need for clean energy, but strongly believe that renewable energy projects should be implemented responsibly and must not come at the cost and destruction of human health and wellbeing.

Unfortunately, the latest project, the Na Pua Makani wind project was so poorly developed that over 200+ members of the community were arrested protesting its construction. One of the main reasons the community was so upset was the poor siting done by the developer. Three of the 568 foot turbines being sited less than 1,700 feet away from homes and schools. Existing, farm dwellings are less than 700 ft away from these industrial scale wind turbines because the current set back regulations excludes homes of farmers on agricultural land. Which subjects the community and children from the unrelenting noise from wind turbines. In addition, it has recently come to light that

the City and County of Honolulu likely violated the law when approving a waiver for minimum setbacks, it is clear that more regulation relating to the siting of wind turbines is needed. HB 2188 is a step in the right direction.

I further suggest that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

Therefore, I ask that you pass HB 2188 Relating To Wind Energy Facilities with the aforementioned recommendations requiring a minimum one mile setback and discussed additions to the proposed study, is the least the state can do to move towards safe, equitable and just implementation of its energy initiatives.

Thank you for this opportunity to testify.

[http://www.euro.who.int/\\_data/assets/pdf\\_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1](http://www.euro.who.int/_data/assets/pdf_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1)

<https://lincoln.ne.gov/city/plan/dev/wind/working-group-info/chapman-6.pdf>

Mahalo, Joshua Kaina

**LATE**

**HB-2188-HD-1**

Submitted on: 2/24/2020 6:56:18 AM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Nanea Lo	Individual	Support	No

Comments:

Dear Chair Luke, and members:

As one of 350Hawaii.org's 6,000 members, I support HB 2188 HD1.

Kahuku's wind farm was poorly planned and ignored the concerns of residents for years.

Living close to a wind farm can cause earaches, dizziness, fainting, migraines, and trouble sleeping, in addition to the nuisance noise levels and shadow flickers.

Like other NIMBY projects, wind farms tend to be sited near low-income communities and communities of color.

A "one-mile setback from the nearest existing farm dwelling or residential dwelling unit for certain wind energy facilities in agricultural districts" is a weak, half-done measure that only addresses a small piece of the problem.

But it's better than nothing.

Pass this bill and show at least a little respect for people having to deal with the effects of a wind farm.

me ke aloha 'Ä• ina,

Nanea Lo

**LATE**

**HB-2188-HD-1**

Submitted on: 2/24/2020 8:14:32 AM

Testimony for FIN on 2/24/2020 1:00:00 PM

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Ina Taea	Individual	Support	No

Comments:

Aloha,

My name is Ina Taea. I am writing in strong support for HB 2188 HD1 with recommendations. A minimum set back of 1-mile for a for all wind turbines is essential to protect our communities right to a healthy and safe living environment. In addition, we recommend that all turbines over 350' tall to comply with a setback of 15' for each foot of vertical height. I further recommend that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

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Even if AES or wind turbine companies deny these facts, the concept of international law and trade and environmental agreement is the Precautionary Principal which states that if scientific evidence is inconclusive it is always best to err on the side of human health.

Furthermore, there are safety risks, such as blade throw and tower collapse (as was experienced by the Auwai wind farm on Maui in 2016), stray voltage, and toxic fires that cannot be extinguished (as was experienced by the Kahuku community in 2012) that must be understood and properly mitigated to secure health and safety of our residents. The City of Lincoln Nebraska noted, "Because of widespread concerns about health and safety, many jurisdictions scattered around the United States and Canada have adopted larger setbacks in recent years" (lincoln.ne.gov, 2015).

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Unfortunately, the latest project, the Na Pua Makani wind project was so poorly developed that over 200+ members of the community were arrested protesting its construction. One of the main reasons the community was so upset was the poor siting done by the developer. Three of the 568 feet turbines being sited less than 1,700 feet away from homes and schools. Existing, farm dwellings are less than 700 ft away from these industrial scale wind turbines because the current set back regulations excludes homes of farmers on agricultural land. Which subjects the community and children from the unrelenting noise from wind turbines. In addition, it has recently come to light that the City and County of Honolulu likely violated the law when approving a waiver for

minimum setbacks, it is clear that more regulation relating to the siting of wind turbines is needed. HB 2188 is a step in the right direction.

I further suggest that HB 2188 HD 1 be amended to clarify noise as audible and inaudible (infrasound) noise in the study proposed to be undertaken by the University of Hawaii at Manoa John A. Burns school of medicine.

Therefore, I ask that you pass HB 2188 Relating To Wind Energy Facilities with the aforementioned recommendations requiring a minimum one mile setback and discussed additions to the proposed study, is the least the state can do to move towards safe, equitable and just implementation of its energy initiatives.

Thank you for this opportunity to testify.

[http://www.euro.who.int/\\_\\_data/assets/pdf\\_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1](http://www.euro.who.int/__data/assets/pdf_file/0009/383922/noise-guidelines-exec-sum-eng.pdf?ua=1)

<https://lincoln.ne.gov/city/plan/dev/wind/working-group-info/chapman-6.pdf>

**HB-2188-HD-1**

Submitted on: 2/24/2020 12:40:16 PM

Testimony for FIN on 2/24/2020 1:00:00 PM

**LATE**

<b>Submitted By</b>	<b>Organization</b>	<b>Testifier Position</b>	<b>Present at Hearing</b>
Janet Pappas	Individual	Support	No

Comments:

Dear Chair Luke and FIN committee members,

Let's not have another fiasco like Ka Makani, which should have paved the way for other wind projects in Hawaii. We need to support the renewable energy siting bill (SB2805) and this bill (HB2188) to ensure the safety of the system for Hawaii's residents and restore their confidence in the building process (which must include citizen participation).

Wind can contribute substantially to our renewable energy mix in Hawaii, but project managers must be transparent and keep the health and safety of people at the forefront.

Thank you for listening,

Jan Pappas

Aiea, Hawaii