

Distributed Wind Case Studies

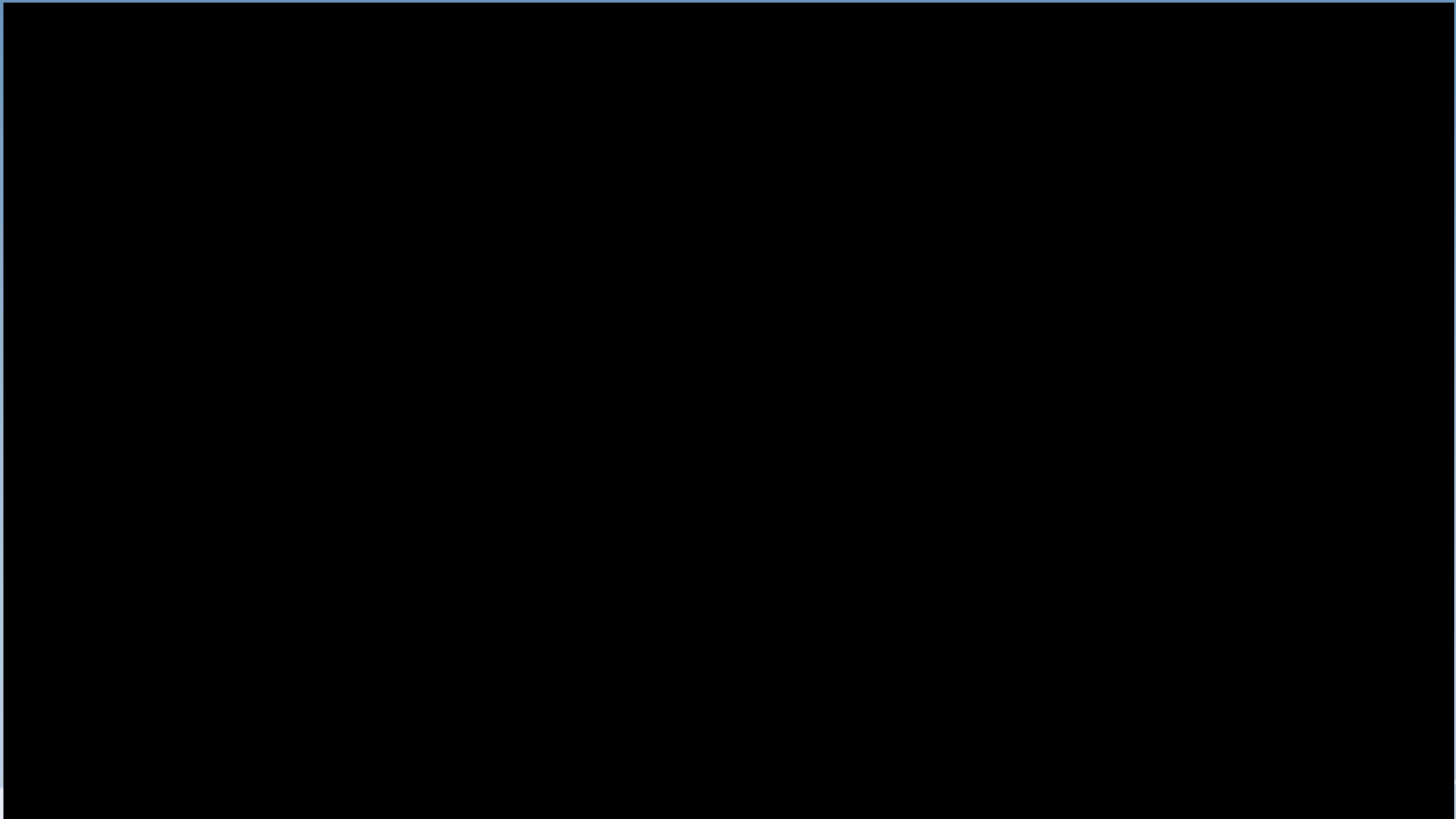
Blaine Loos

Energy Project Analyst

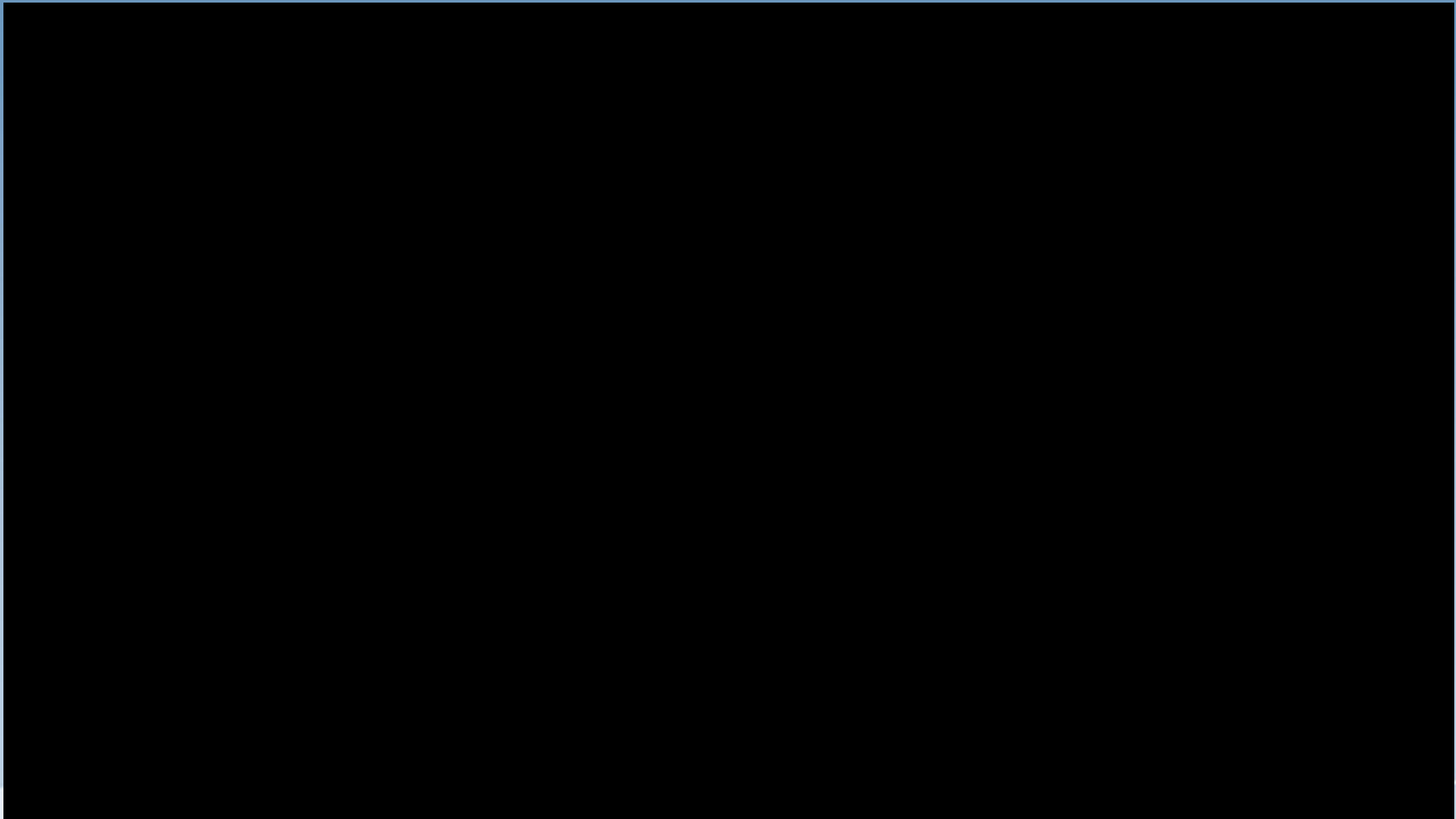
Center for Wind Energy at James Madison University

The bottom of the slide features a decorative graphic consisting of several overlapping, wavy lines in shades of white, light blue, and beige, creating a sense of movement and depth.

Virginia Distributed Wind



Virginia Distributed Wind



Virginia Distributed Wind

- Largest Turbine: 10 kW
- Turbines Installed: ~120
- Total Installed Capacity: ~500 kW

Virginia Case Study

- Doug and Mary McCallum
- Roanoke County
- Began in 2004
- VSWIP



Virginia Case Study

- Picked back up in 2009
- Denied permit by county
- Worked for 2 years
 - Meetings
 - Work Sessions
 - 100 page application

Mr. Radford opened the public hearing for public comment.

Ms. Jacqueline Shuck, Roanoke Regional Airport Commission, discussed the importance of an FAA report including findings whether or not systems would be in compliance with regulations. She discussed the importance of coordinating with the FAA regarding systems.

Mr. Robert Lynch, 2618 Colonial Avenue, stated his residence is one mile from transmitter site for 911 emergency communications on Bent Mountain. He expressed concern regarding interruption of aviation radar, television signals, and false radar patterns. He stated the small amount of power generated would be sent across the country. He stated the systems will affect entire area. He discussed tax incentive benefit. He stated WFXR is opposed to the ordinance due to potential issues with emergency alerts.

Ms. Sue Karr, 8011 Poor Mountain Road, discussed concerns regarding land use and liability of loss, noting concern regarding fire and water contamination. She expressed concern regarding issues of homes remaining unsold near these systems. She stated wind energy companies should offer buyouts. She expressed concern regarding house values diminishing near these systems.

Mr. Peter Airey, 846 Austin Avenue, stated more research is needed prior to adopting amendments. He requested commission investigate data prior to ruling on petition.

Ms. Hooker stated this public hearing is for the proposed amendments to the zoning ordinance as it would apply throughout the county since no petition has been received for their review.

Mr. Gordon Ewald, 243 Saddleback Trail, stated he is a pilot. He discussed protecting the approach slopes for the safety of air traffic. He stated the approach to the valley is already afflicted by terrain. He stated Delegate Morgan Griffith has sent a letter to Roanoke Regional Airport Commission stating the valley would be adversely impacted by a wind farm. He expressed concern regarding interference with radar. He stated 'clutter' occurs above the wind turbines.

Mr. Jim Woltz, 10564 Sugar Camp Road, discussed the importance of property rights. He stated he is also a pilot. He expressed concern regarding the need to increase the descent minimum altitude for aircraft. He discussed the importance of aviation to the entire region.

Virginia Case Study

- 52 Citizens comment at 1 meeting

Ms. Tammy Belinsky, 9544 Pine Forrest Road, stated the system would be harmful. She discussed duties of the commission. She stated information received is inadequate to support the amendment. She stated public concerns regarding the ordinance have not been addressed.

Mr. Steven Hanes, 10250 Mill Creek Road, expressed concern regarding viewshed protection not being properly addressed. He expressed concern regarding affects Blue Ridge Parkway and tourism and outdoor activities. He expressed concern regarding decreasing property values. He discussed the importance of appearance to the area for years to come.

Mr. Elliott Wheeler, 831 Hanover Drive, expressed concern regarding impacts to the entire area. He discussed use and design standards, asking if the project is financial feasible without government subsidies.

Mr. Bob Johnson, 9964 Patterson Road, stated he was drawn to the area because of the mountains. He discussed the importance of reducing the carbon footprints on environment. He stated solar panels could be used. He expressed concern regarding destroying things we value.

Mr. Mark Howard, 232 Reynolds Drive, discussed the importance of making a business friendly decision. He stated AEP has wind power in Texas, he stated it would be great in Virginia.

Mr. Mark Hanson, 184 Vista Lane, discussed importance of solar and wind energy. He stated blades are now fiberglass. He stated he is a teacher at Dabney Lancaster College. He stated harm to birds was with lattice towers in early '80's. He stated monopolies provide no risk. He stated statistically property values were not found to have decreased. He discussed the importance of clean green energy.

Mr. Bill Modica, 1546 Creek Lane, chairman of Sierra Club stated he supports the amendments. He stated it would be good for the environment and economy. He stated supporting documents will assist with good project. He stated systems do not create noise effect compared to refrigerator. He stated no significant impact on property values. He discussed access roads to desirable sites.

Mr. Bob Egbert, 3571 Bradshaw Road, spoke in support of the ordinance. He discussed renewable energy. He discussed fossil fuel running out in future and price will increase. He discussed battery technology which AEP is currently using in West Virginia. He discussed the importance of generating our own power.

Ms. Kathleen Baudreau, 11568 Bottom Creek Road, discussed substantial health concerns, including sleeplessness and hypertension. She expressed concern regarding anect on aviation. She stated more scientific research is needed. She discussed low frequency sounds causing wind turbine syndrome.

Mr. Jerusalem Walker, 1605 Timberline Road, expressed concern regarding neurological problems caused prenatally. She stated decibel levels affect children learning and sleeping. She stated no evidence is available because

research has not been done yet. She stated permanent brain damage has been reported in chicks and rats.

Mr. Bill Hume, 8828 Willet Lane, expressed concern regarding air traffic difficulty. H stated it will affect future growth of valley.

Mr. Dan Crawford, 2811 Kipling Street, stated he is on executive committee of the Sierra Club. He expressed concern regarding noise.

Mr. Rudy Vietmeier, 460 Bluebell Lane, discussed energy conservation efficiency. He discussed the importance of renewable energy. He stated he is a member of the Cool Cities Coalition. He stated ordinance will be an example for other localities.

Mr. Chip Tarbutton, 1819 Electric Road, stated he is a member of the Roanoke Tea Party. He stated he is opposed to changing the ordinance. He stated there are economic and budgetary reasons to reject the ordinance. He expressed concern regarding turbine fires. He stated this type of energy generation is inefficient. He stated the government bears the cost of systems.

Mr. Michael Scott, 8469 Poor Mountain Road, stated the ordinance is not specific enough. He expressed concern regarding decibel levels and how they are measured. He stated a definition of severe wind event is needed. He expressed concern regarding shadow flicker impact and mitigation.

Ms. Roberta Carpenter Johnson, 9964 Patterson Drive, stated she is a member of the Cool Cities Coalition. She discussed the importance of energy to sustain. She stated ordinance is not in compliance with Comprehensive Plan, future land use, 2010 Vision Statement, and Zoning Ordinance. She stated turbines should be banned. She expressed concern regarding disposal for all excavated fill. She expressed concern regarding streams and animals. She discussed importance of acquiring a third party opinion.

Mr. Bruno Duron, Mr. Hunter Smith, and Mr. George Ahl, presented a representative display of an existing home and tower height in relation to turbine height and size. They discussed air currents and noise travelling on currents.

Ms. Diana Christopulos, 907 Greenbrier Circle, stated the Cool Cities Coalition promotes conservation. She stated wind power is clean and free. She stated it is less polluting and supports renewable energy. She suggested 60 db in residential areas.

Ms. Karen Scott, 8443 Poor Mountain Road, stated turbines are antiquated. She stated company is using Roanoke as a dumping ground. She expressed concern regarding low frequency sound and disturbance of sleep and health. She suggested having setbacks far enough so quality of life is not disturbed.

Dr. Joseph Tamez, 5740 Equestrian Drive, stated wind systems would have less impact on air quality.

Mr. Darryl Branstetter, 6568 Sylvan Brook Road, expressed concern regarding proposed decibel levels. He stated Mr. Elswick requested examples at previous

meeting. He stated levels are 10 db in bedroom, 60 db on a busy street, and 120 db would be a loud horn.

Mr. James Scott, 8443 Poor Mountain Road, expressed concern regarding injury to adjacent property owners and health problems. He discussed need for general liberty for all. He stated that 60 db does not cover low frequency noise. He expressed concern regarding enforcement of regulations as proposed.

Ms. Monica Rokicki, 1211 4th Street, expressed concern about use of fossil fuels, noting renewable energy is needed. She discussed climate changes and particulate pollution.

Mr. James Gray, 6408 Orchard View Lane, discussed importance of protecting citizens. He discussed conducting community meetings and compensating citizens for decreasing property values.

Ms. Loretta Gray, 6408 Orchard View Lane, expressed concern regarding information received not being reviewed. She suggested evaluating all information before making decision.

Dr. Kathy Davieds, D.V.M, 1560 Bottom Creek Lane, expressed concern auditory stimuli will have negative effect on animals. She stated frightened animals are more likely to bite increasing rabies exposure.

Mr. Mark McClain, 907 Greenbrier Court, stated he is a member of Cool Cities Coalition. He stated he is an advocate for emission reduction, conservation, efficiency, and renewable energy. He stated wind is the most economical energy since it is never depleted.

Ms. Virginia Weisz, 11558 Bottom Creek Road, expressed concern regarding health effects. She stated the turbines would be 12 stories higher than Wachovia Tower. She stated oscillating low frequency noise causes nausea and dizziness. She stated systems should not be placed near residences, hospital, and schools and kept at least two miles away and maximum 30 decibels.

Ms. Kenley Smith, 10275 Bent Mountain Road, discussed the need to protect mountains from industrial development.

Mr. Bob Crawford, 6620 Shingleridge Road, stated he is a member of the Sierra Club. He suggested allowing waivers for increased decibels if a system is in uninhabitable area.

Mr. Michael Mills, 8755 Poor Mountain Road, expressed concern regarding noise, blade throw, and tower collapse. He recommended increasing proposed setbacks. He stated goal should be protecting the citizens.

Mr. Brian Lang, 6752 Quail Place, stated he enjoys views and ridgelines in the area, and likes turbines. He stated they produce clean renewable energy.

Ms. Roberta Bondurant, 11577 Bottom Creek Road, discussed protection of Poor Mountain Ridge Trail along ridgeline is a bird habitat. She discussed migration of

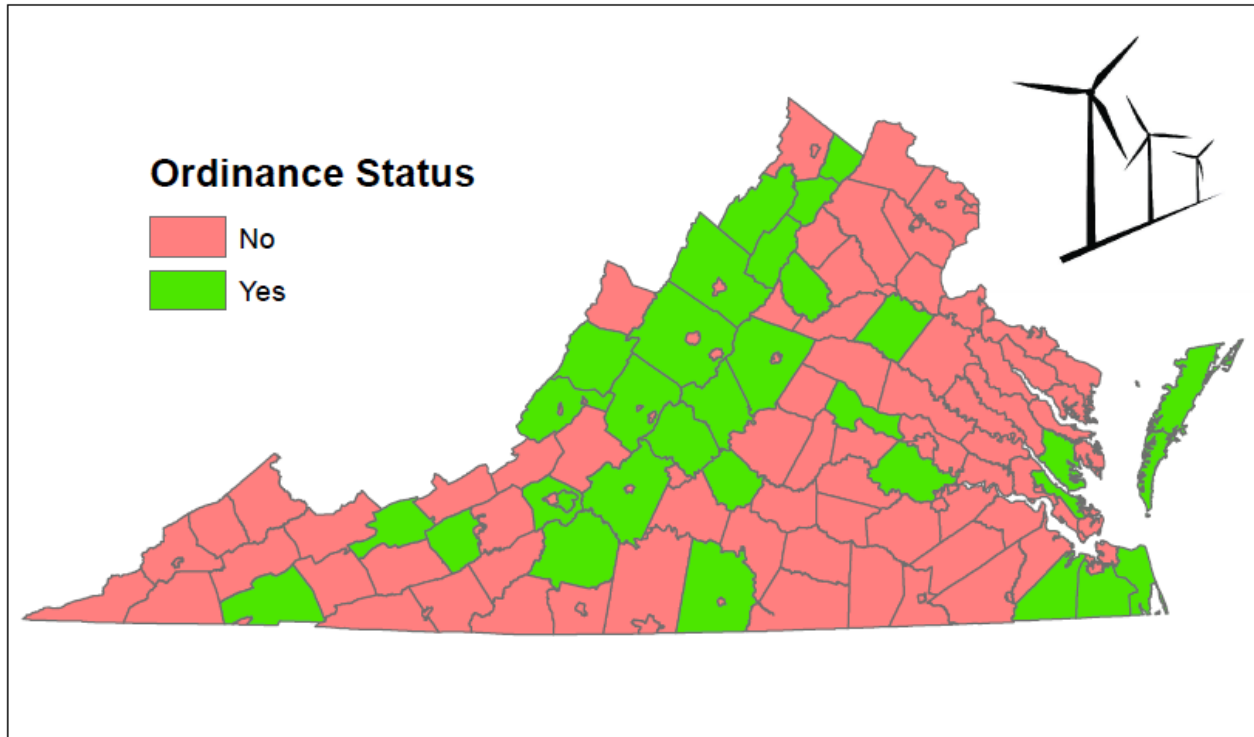
Virginia Case Study

- Finally in 2011, SUCCESS!
 - Total Cost: \$75,000
 - State Grant: \$15,000
 - Federal Tax Credit: \$18,000
 - **Cost to Homeowner: \$42,000**

Virginia Case Study

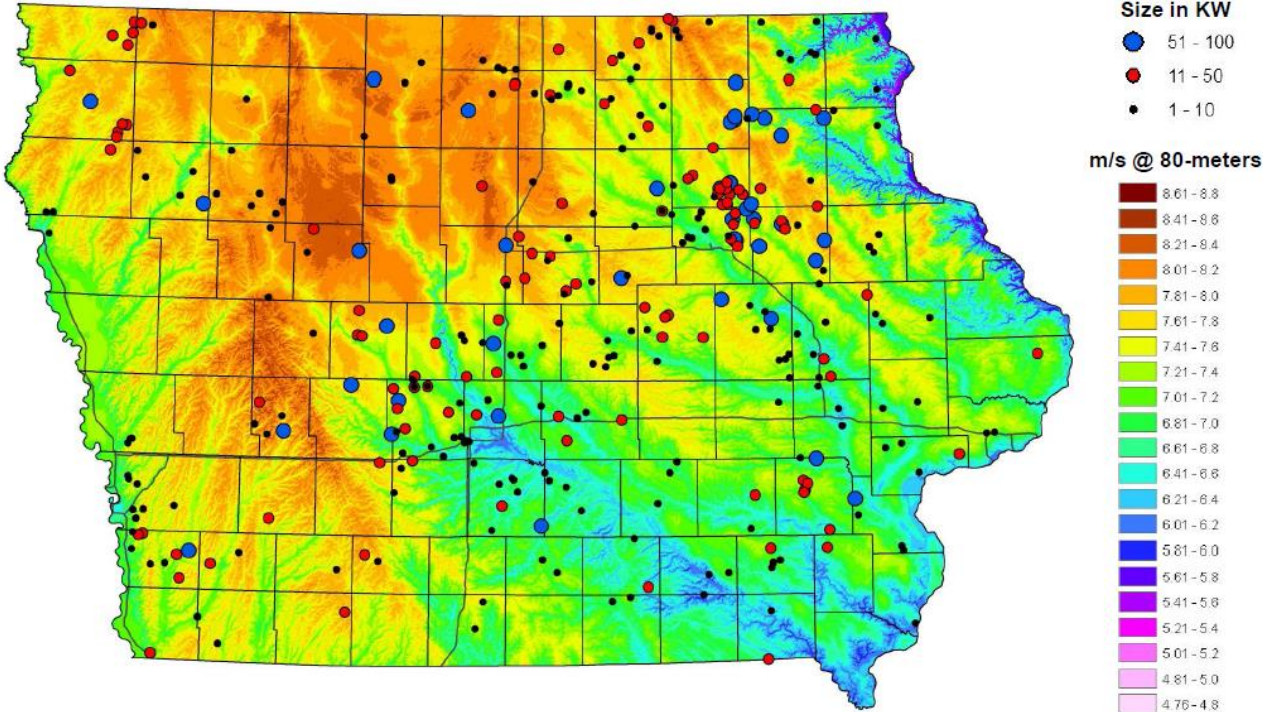
- “They’ve run the numbers long term, and it looks like the tower will pay for itself in 15 to 20 years. The turbine is supposed to last 30 years, so they expect a payoff down the road.”
- “Was building the tower worth it? Undoubtedly, they replied, not hesitating a bit.”

Virginia Case Study



Iowa Distributed Wind

Small Wind turbines in Iowa (1 – 100 kW)



Map produced by Wind Utility Consulting, PC



Iowa Case Studies

- Jeff Jobe
 - Business and Cooperative Program Director at USDA Rural Development in Iowa
 - Presentation from the Distributed Wind Energy Association's All-States Summit in October 2014