

Barriers and Solutions to Wind Development in Utah



Wind Pioneers Training

Tremonton, Utah

09 . 19 . 09

**State
Energy
Program**

UTAH GEOLOGICAL SURVEY

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OUTLINE



- 1. Net Metering in Utah**
- 2. Public Acceptance**
- 3. Wind Ordinances**

Net Metering



- **Important Notes:**

- Investor owned utilities (Rocky Mountain Power) and cooperative utilities are required by law to allow net metering.
- Rocky Mountain Power is regulated by the Utah Public Service Commission
- Municipal utilities are not required to allow net metering, though many do.
- Utah received an “F” in the most recent *Freeing the Grid* report.

Net Metering



- *Recent Improvements*
 - Aggregate Generation Limit
 - ✦ Was: Capped at 0.1% of 2007 RMP Peak Demand
 - ✦ Is: Capped at 20% of 2007 RMP Peak Demand
 - Net Metering Credit and Value
 - ✦ Was: Avoided Cost
 - ✦ Is: Cost of Energy at Time Produced
 - RECs – Stay with the power producer (resident or business)

Ordinances – SJR1



- Sponsors: Senator Pat Jones and Representative Rebecca Chavez-Houck
- Designed to provide guidance to local governments seeking to develop ordinances - a “best practices” template that can be modified to accommodate local needs
- State Energy Program urged to develop model ordinances this year through stakeholder processes and report to legislature
- Develop, if appropriate model, ordinances for:
 - Solar, Geothermal, Hydro, Biomass, Wind
- Original Resolution Language
<http://le.utah.gov/~2009/htmdoc/sbillhtm/SJR001.htm>

Renewable Energy Ordinances, cont.



HYDRO

- Other processes in place
- Generally not on city or county land
- Very site specific and should be dealt with on case by case basis.

BIOMASS/BIOFUEL

- Too many fuel types and applications to develop an ordinance.

Renewable Energy Ordinances



GEOHERMAL

- Industry feedback deemed an ordinance unnecessary
- Other processes in place, such as water permitting
- Generally not on city or county lands
- Plants and technologies differ widely, case-by-case basis

SOLAR

- Solar Working Group efforts
- State Energy Program Guidelines for Planners
- Salt Lake City Sustainable Code Project – Findings available on-line: <http://www.slccgreen.com/CodeRevision.htm>

Need for Model Wind Ordinance



- Proactive rather than reactive
- Addresses all types of wind: residential and commercial
- Allows governments to not have to “reinvent the wheel”
- Helps save time and resources for all involved
- Addresses compatibility with existing land uses
- Addresses local and environmental concerns up front
- Public participation and consensus building
- Address issues of sound, safety, aesthetics

Public Acceptance



Education ~ Familiarity ~ Addressing Fears and Concerns with Real Life Experience

- Talk to policy makers, friends, organizing events addressing renewable energy or other environmental issues.
 - ✦ Speak at City, County, & Planning Meetings
 - ✦ Movie night
 - ✦ Start an environmental book club or other discussion forum
 - ✦ Start a campaign in your community. i.e. university, town, work, child's school etc.
 - Apply for a Blue Sky Grant
 - Work with teachers to incorporate energy curricula

Public Acceptance



- **NIMBY and CAVE people**
 - Converse with in a non-combative manner
 - Realize that beauty is in the eye of the beholder and the limitations in changing that.
 - Put yourself *truly* in their position.
 - Listen
 - Use credible sources when countering
 - Be respectful

Show the Old and the New

THEN

NOW



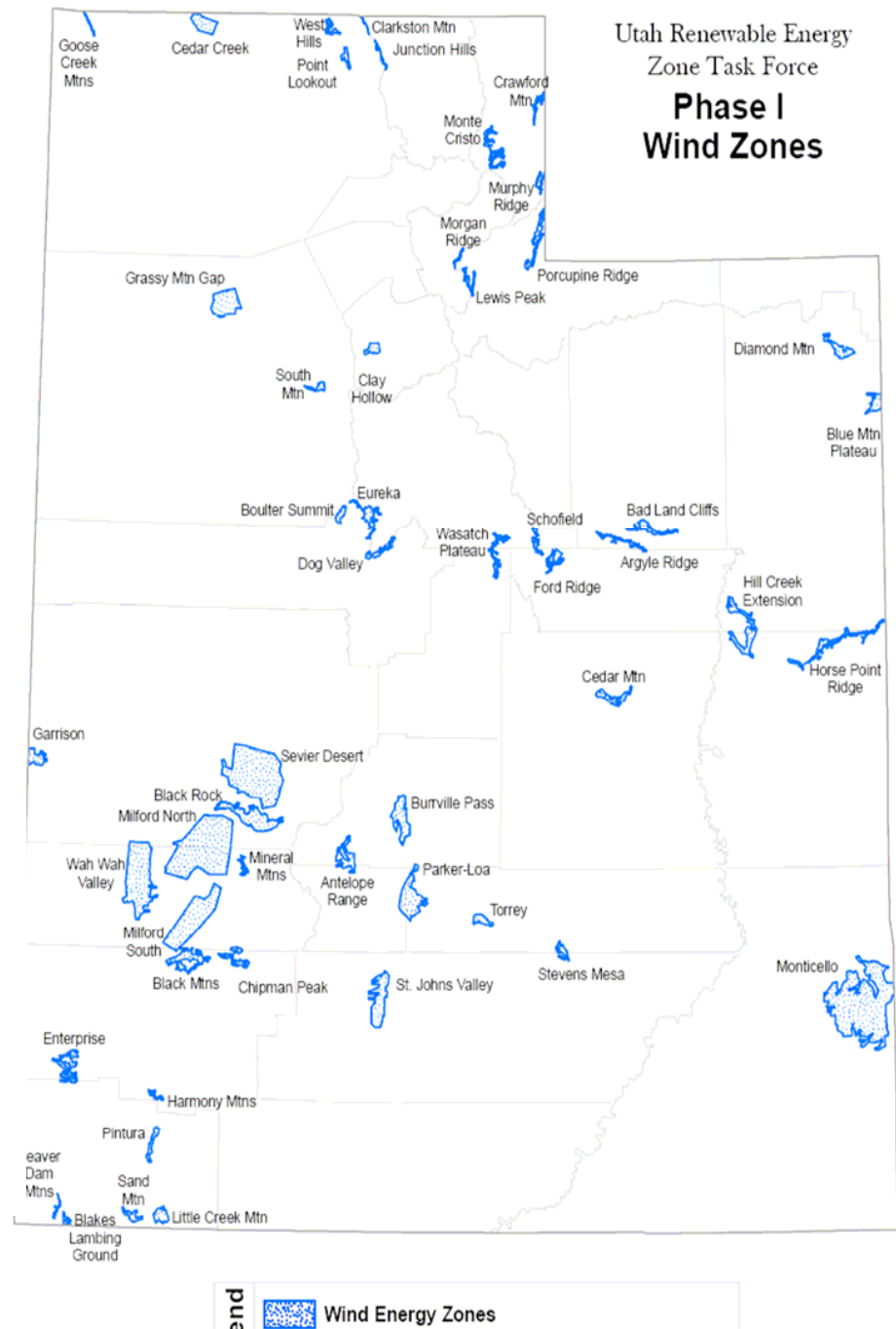
Use Scientific and Credible Data

1,830 MW – 9,145 MW of developable wind in Utah

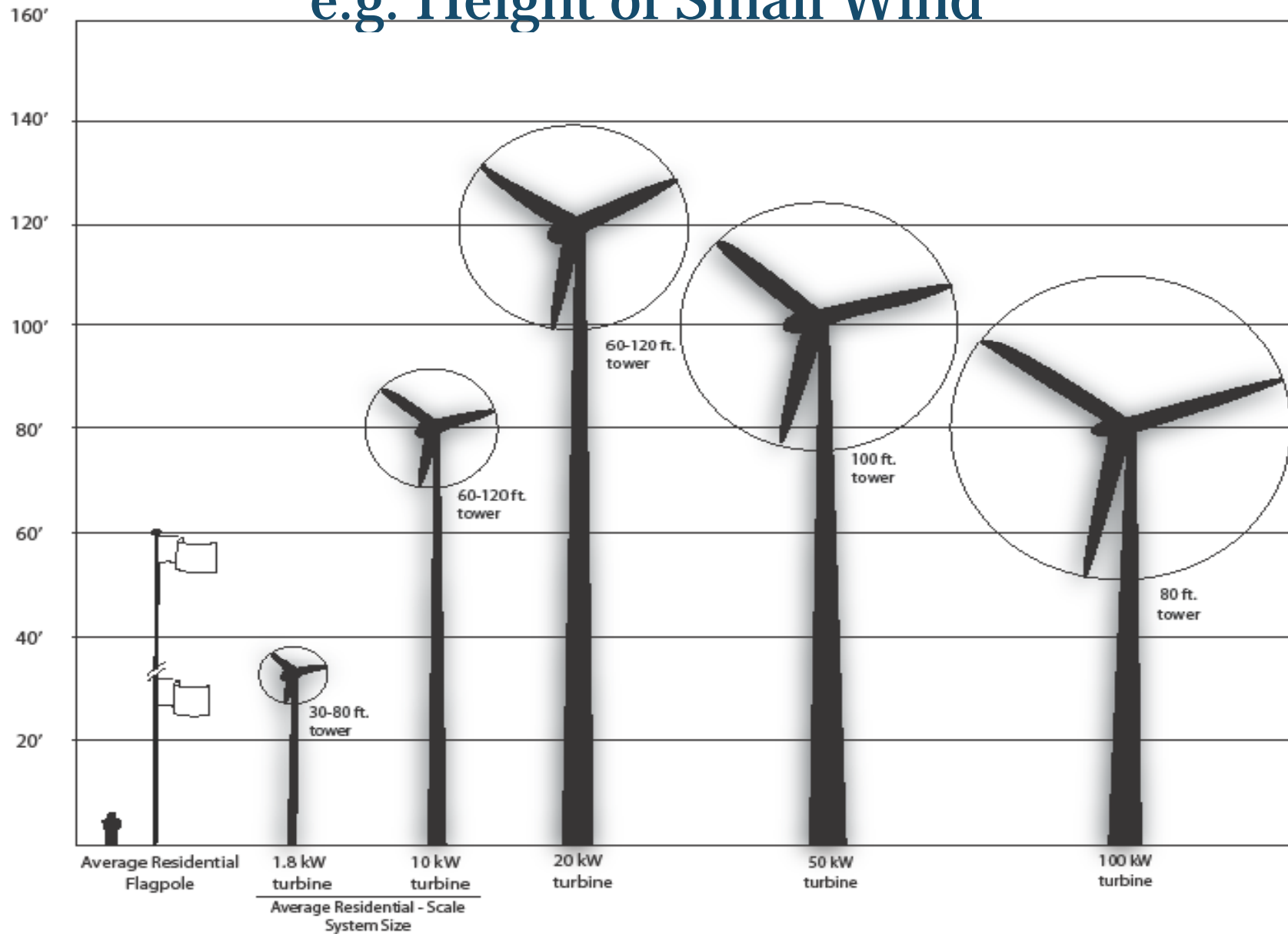
Utah Renewable Energy Zone Task Force Phase I Report

URL:

geology.utah.gov/sep/renewableenergy/urez/index.htm



Use Examples that People Can Relate to e.g. Height of Small Wind



Embracing Wind



Best Practice: Aesthetics



- Require conditional use permits for special character districts (i.e., historic areas or scenic by-ways)
- Require regular maintenance & up-keep
- Neutral colors that blend with environment
- Restrict advertising
- Stipulations for removal and land reclamation if abandoned/inoperable after 24 months



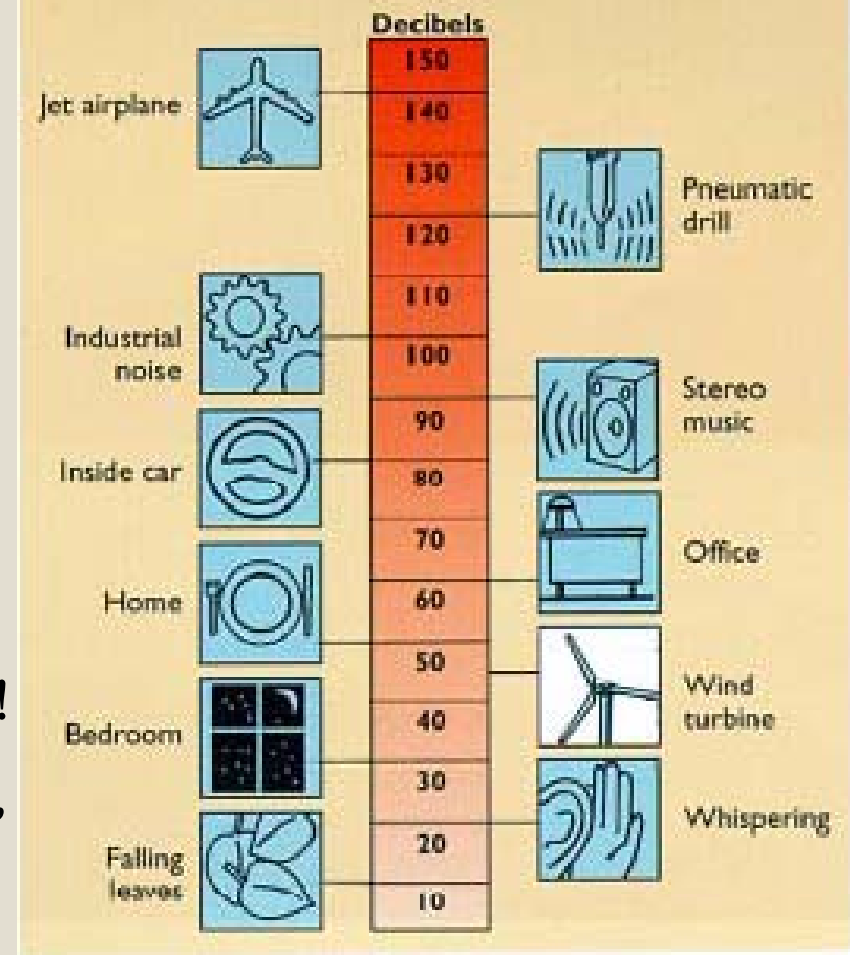
Best Practice: Height



- Height = Wind quantity & quality
 - Height impacts project feasibility
- Vertical distance minimizes sound at ground level
- Total Height (ground to blade tip)
 - Small Wind: 200' (~120' hub height)
 - Commercial Wind: 450' (150~200' hub height)
 - 80 meter for met towers
- Ground clearance of moving parts: 25-30'
- Consider exemptions from existing height limitations

Sound

- Usually masked by ambient sounds (i.e., wind, traffic)
- Modern turbines much quieter
- Exponentially quieter with distance (i.e. at 200 ft, only $\frac{1}{4}$ the intensity as at 100 ft)
- A commercial wind farm at 750 to 1,000 feet is ~ 45 dBa (Background noise in a house ~ 50 dB(A))
- Hear for yourself – visit Spanish Fork!
- Beware of web myths, pseudo-science, and misinformation



Source: American Wind Energy Association

Best Practice: Sound



- Not to exceed “nuisance noise” levels
- Limit to 60 dBa as measured from nearest inhabitable structure (not property line)
- Allow exceptions for unusual conditions, such as storms (i.e., 10 dB > ambient noise level)
- Acoustical studies unnecessary (and expensive) for small wind



Safety



- One documented human injury from large wind (paraglider)
- Zero reported from small wind
- Engineered Structures, just like lamp posts, which are allowed in parking lots near cars & people
- Structural failure is extremely unlikely
 - Trees more likely to fall
- Setback distances address this issue



Other “Issues”



- **“Ice throw”**
 - Risk < Getting struck by lightning
- **“Shadow Flicker”: rotor shadows from slower (large) blades**
 - Extremely uncommon in Utah (lower latitude), only certain times of day at certain times of the year
 - Setbacks or vegetative buffers mitigate, if not entirely eliminate, this potential nuisance, especially at U.S. latitudes.
 - Shadow flicker calculator
www.windpower.org/en/tour/env/shadow/hadowc.htm
 - Strobe rates are much faster than large wind turbine blades are able to rotate; no connection to epilepsy

Best Practice: Safety



- Compliance with all applicable local/state/federal codes (safety, electrical, construction, etc.)
- Limit access to authorized personnel only; no climbing apparatus external of the tower within 10 feet of ground.
- Require safety and utility signage
- Setback: 100%-110% of height from top of rotor (blade) from all inhabited structures (not owned by property owner), overhead utility lines, property lines, and public roads and right-of-ways
- Keep in mind: turbines don't jump

Best Practice: Setbacks



- Setbacks are recommended over a minimum lot size.
- 100-110% of height of rotor + tower from property lines, inhabitable structures not owned by property owner, public rights-of-way, and utility transmission lines
- Alternative compliance – allow for exceptions
 - Building inspector certify installation
 - Adjacent owners sign agreement
- What setbacks are applied for telephone/light poles?
Flag poles?

Property Value



- **Studies inconclusive**
- **Anecdotal evidence that values increase**
- **Compare with windmills: historical icon**
- **Local economic development from wind projects may help increase property values or balance impacts**
- **No clear evidence that being within view of turbines depresses value over the long-term**



Wildlife Considerations: Bats



- Recent studies show that increased number of bat mortalities have been found at large scale wind farms (largely in the southeast)
- Current Biology article found barotrauma
- More studies are underway, ecosystem effects are unclear
- Anabat meters now being used in commercial wind studies
- Wind Turbine Guideline Advisory Committee Bats and Wind Energy looking closely at this issue



Wildlife Considerations: Birds

- Altamont Pass, CA issue (1980s)
- Avoid migratory corridors
- Audubon Society endorses wind when sited properly
- FACT: No documented avian mortality cases with small wind
- Migratory bird and impact studies are performed for all commercial sites on Federal Land.
- Best practice: Large wind farms should be subject to local wildlife office inspection and approval.
- Invite public comment



Wildlife Considerations: Sage Grouse



- Studies suggest that Sage Grouse avoid vertical structures
- Sage Grouse is expected to be listed as threatened or endangered in 2009.
- Many studies underway, we will know more next year.
- Best practice: 4 miles from any identified lek, OR line of sight.
Utah Division of Wildlife.
- www.fws.gov/mountain-prairie/species/birds/sagegrouse



Other ways to encourage renewable energy



- Good ordinances send a message that a community is open for business = economic development!
- Reduce or waive permit fees, development impact fees
- Expedite review periods
- Address wind access rights
- Award points in performance-based review and green and building programs
- Support local Wind for Schools Projects
- Collaborate with locals interested in residential wind
- Exempt from existing standards that unintentionally restrict (e.g. design standards, height limitations)
- Allow for flexibility and ability to address unique projects



Resources for Local Government

American Planning Association. "Planning and Zoning for Renewable Energy." PAS Info Packet, 2008.

American Wind Energy Association "Wind Energy Siting Handbook" www.awea.org/sitinghandbook

American Wind Energy Association website, small wind section. www.awea.org/smallwind

Cooper, C. and Pitt, D. "Taking the Red Tape out of Green Power." Network for New Energy Choices, 2008 (forthcoming, 2008).

Heller, E. "Zoning and Permitting Standards for Urban Wind Turbines." Zoning Practice, July 2008 (forthcoming, 2008).

Interstate Renewable Energy Council www.irecusa.org

National Renewable Energy Laboratory (DOE) www.nrel.gov

RENEW Wisconsin small wind toolbox. www.renewwisconsin.org/wind/windtoolbox.html

Sagrillo, M. and Green, J. "Why Turbine Height Matters." National Renewable Energy Laboratory, 2007.

Stimmel, R. "In the Public Interest: How and Why to Permit Small Wind Turbines." American Wind Energy Association, 2008 (forthcoming, 2008).

Rhoads-Weaver, et al. "Small Wind Siting and Zoning Study: Development of Siting Guidelines and a Model Zoning By-Law for Small Wind Turbines." American Wind Energy Association, 2006.

Rogers, et al. "Wind Turbine Acoustic Noise." University of Massachusetts at Amherst. Amended 2006.

Utah Clean Energy www.utahcleanenergy.org

Utah State Energy Program geology.utah.gov/sep

Photo Credits



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- NREL/Department of Energy
- Robin Wilson, personal collection
- Ryan Robinson, Spanish Fork Aerial Shot
- Utah Clean Energy



Thank you! Questions?



Please contact us for further information or to get involved:

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Photo Credit: Blue Sky Program, Rocky Mountain Power