

# Common Energy Arguments: Exposing Myth vs. Reality

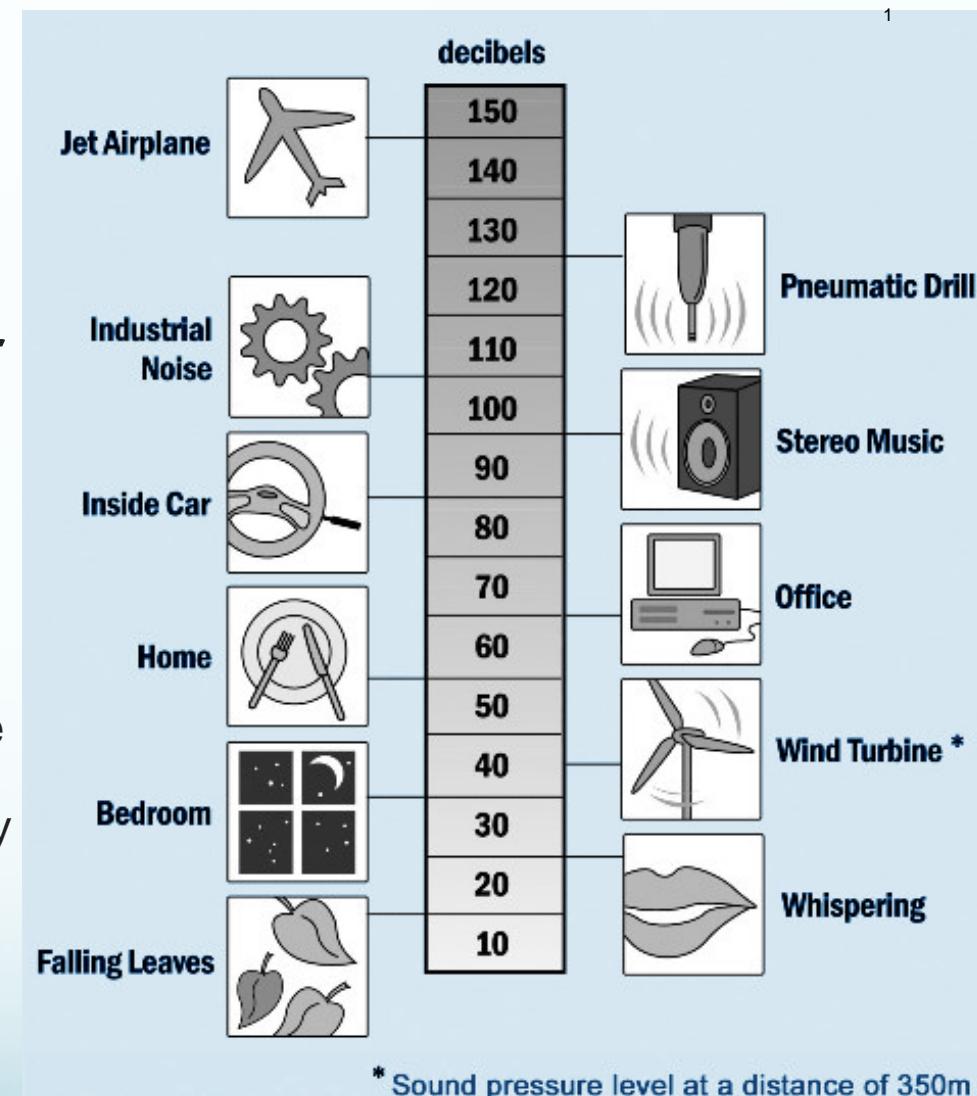
Associated Wind Developers  
2012

# Noise

*The noise created by a wind turbine in operation is very loud and can cause a number of serious health effects*

**REALITY** Wind turbines do make sound, however this sound is far quieter than is often claimed, and the health effects attributed to it are fictional

- The noise produced is quieter than that of many other everyday processes<sup>1</sup>
- Reaction and disposition to this sound is subjective
- “It has been argued that infrasound and low frequency noise from wind turbines may cause serious health effects in the form of ‘vibroacoustics disease,’ ‘wind turbine syndrome,’ or harmful infrasound effects on the inner ear. However, empirical supports for these claims are lacking.”<sup>2</sup>



# Low Frequency Noise (Infrasound)

*Infrasound is as an extremely annoying whooshing noise associated with wind turbines and presents a unique risk to human health*

**REALITY** Aside from exceptional circumstances, the infrasound created by wind turbines is inaudible to humans and causes no adverse health effects

- Infrasound is defined as a vibration with a frequency below 20 Hz, which the average person can only hear or feel at amplitudes above 110 dB
- Highest recorded amplitude at 100m from a turbine is **5 Hz at 90 dB<sup>1</sup>**
- “Available evidence shows that **the infrasound levels near wind turbines cannot impact the vestibular system**<sup>2</sup>
- Conclusion: Research and available information has led researchers to conclude that **“infrasound and low-frequency noise from wind turbines is not an issue.”<sup>2</sup>**



<sup>1</sup>Leventhal, 2009.

<sup>2</sup>Ellenbogen, Jeffrey. Massachusetts Department of Environmental Protection Wind Turbine Health Impact Study, January 2012

# Shadow Flicker



**The shadow flicker caused by a wind turbine's rotation can cause a number of serious health effects, such as epilepsy and stress**

**REALITY** *The shadow flicker effect cannot impact human health and can actually be all but eliminated with careful siting.*

- Shadow flicker is a predictable effect which can be all but eliminated, or reduced to **merely a few minutes per day at dawn and dusk** with adequate planning<sup>1</sup>
  - Proper siting
  - Active mitigation, including turning off wind turbines when the effect is most apparent
  - Planting trees to screen flicker when the sun is lowest and longest shadows are not screened by existing vegetation
- **“The allegation is sometimes made that shadow flicker from wind turbines can cause epileptic seizures. This is not true**—shadow flicker from wind turbines occurs much more slowly than the light “strobing” associated with seizures. The strobe rates generally necessary to cause seizures in people with photosensitive epilepsy are 5 to 30 flashes per second and large wind turbine blades cannot rotate this quickly.”

# “Wind Turbine Syndrome”

*Residents living near wind turbines often experience “Wind Turbine Syndrome,” which is allegedly characterized by insomnia, vertigo, nausea, panic attacks, and memory problems*

**REALITY** “*There is no evidence for a set of health effects, from exposure to wind turbines, that could be characterized as a ‘Wind Turbine Syndrome’*” <sup>1</sup>

Cause	Effect	Connection
Exposure to Wind Turbines	Annoyance	Limited epidemiological evidence
Noise	Annoyance	Insufficient epidemiological evidence
Noise	Sleep deprivation	Limited epidemiological evidence
Annoyance	Sleep deprivation	Not sufficiently quantified
Noise	Direct health problems and disease	Insufficient evidence
Infrasound	Direct effects on the vestibular system	Not demonstrated scientifically
Infrasound	Coupling into structures such that people feel vibrations	Yes for other applications, no connection observed with wind turbines
Exposure	Wind Turbine Syndrome	No evidence
Noise	Psychological distress, mental health problems	Strongest study: No association 1 <sup>st</sup> weaker study: An association 2 <sup>nd</sup> weaker study: No association

# Danger of Collapse or Blades Being Thrown



*Wind turbines are dangerously complicated machines which can collapse or throw their blades due to manufacturing or operational defect, endangering the lives of nearby civilians*

**MYTH**

**REALITY** *Turbines are structurally sound and highly advanced feats of engineering, most accidents are instances of occupational hazard, and civilian deaths are an extremely rare occurrence*

- Since 1970, there have been 35 human deaths associated with wind turbine operation or malfunction on a global level
  - Only **two were members of the public, one of whom was a parachutist**<sup>1</sup>
- **Several tens of thousands of wind turbines are installed globally**, with a total nameplate capacity of 238,351 MW expected at the end of 2012<sup>2</sup>
  - Thus, two civilian deaths in 42 years is an extremely low number
- **"No passerby has been injured by wind energy"**<sup>3</sup>
- The number of fatal accidents at fossil fuel plants, drilling platforms, and nuclear power plants far exceed those which occur at wind facilities every year
- Modern wind turbines are designed **to withstand Class 5 Hurricane force winds**

<sup>1</sup>Gipe, Paul. Contemporary Mortality Rates in Wind Energy, 2009.

<sup>2</sup>Global Wind Energy Council. Global Wind Report: Annual Market Update, 2011

<sup>3</sup>Paul Gipe, Executive Director, Ontario Sustainable Energy Association

# Fire



***“Turbines often catch fire, and when they do they often send flaming shards into fields and forests.”<sup>1</sup>***

**REALITY** *Wind turbines fires are very rare, and extensive safety protocols are implemented*

- There have only been **158 fire incidents in over 100,000 turbines globally in over 40 years<sup>1</sup>**
- Safety measures include lightning protection, temperature monitors and automatic shut-off controls to minimize overheating, and systems which adjust blade pitch to prevent over-speeding, in addition to periodic maintenance
- Analytic systems reveal the cause of a system failure or fire, in turn allowing the technology to continually become safer
- **38,000 operational wind turbines in the US today, with very few experiencing such failures or defects<sup>1</sup>**

# Lightning

*Wind turbines are prominent targets for lightning and endanger the lives of nearby civilians*

**MYTH**

**Reality** *Wind turbines are well designed to adapt to this risk, and extensive safety protocols and engineering are included in wind turbine development to minimize risk of lightning strikes to civilians*

- Most wind turbines are designed with a complicated system of copper webbing inside to **funnel electricity directly into the ground**<sup>1</sup>
- Turbines are so well-designed to deal with lightning that they are **legally allowed to continue operating after being struck** until next scheduled maintenance
- Turbines are typically far away from buildings and settlements
  - Any damage would be to turbine, not people or infrastructure



# Ice Throws



*Large chunks of ice accumulate on wind turbines which can then be thrown into populated areas as the blades rotate*

**MYTH**

**REALITY** *Substantial research has proven that this is not a risk to civilians or property*

- Turbines are designed to shut down when ice accumulates on blades
- Most facilities are not erected near buildings or settlements, due to noise regulations and since the wind resource is typically minimal in these areas
  - AWD always practices thorough and careful siting to minimize or eliminate risk to nearby residents
- “...wind turbines should not cause risks as far as ice throw is concerned.”<sup>1</sup>

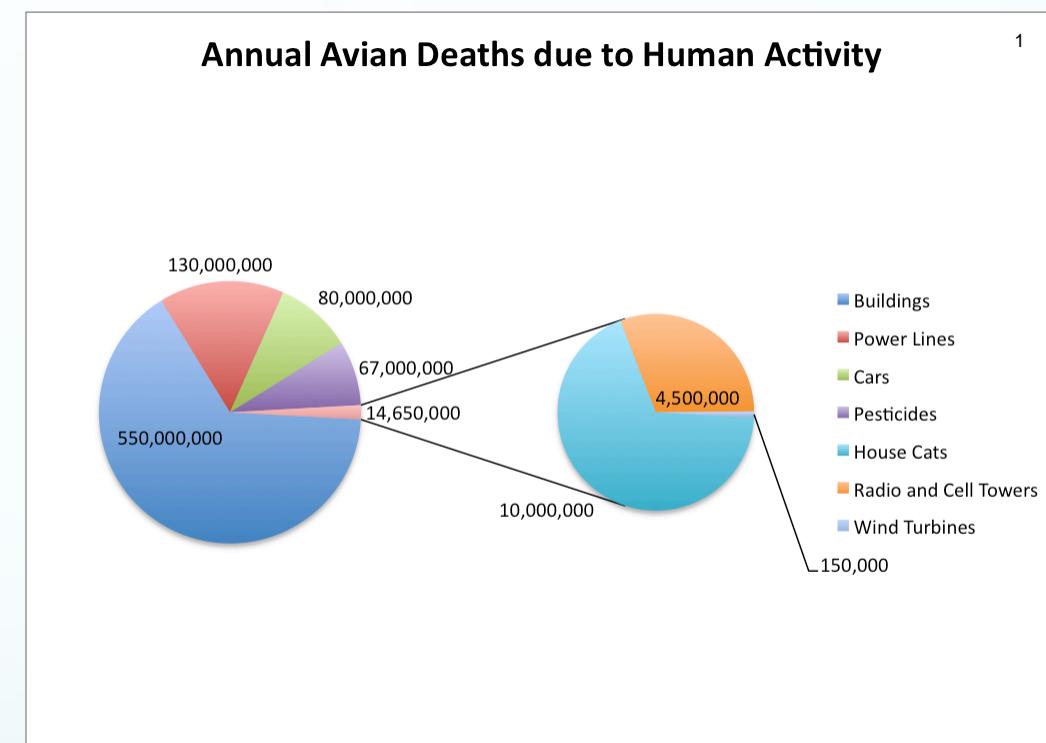
# Birds

**MYTH**

**Wind turbines present a significant threat to bird populations and could lead to the extinction of some species**

**REALITY** *Wind is one of the few sources of energy that cannot significantly impact bird populations negatively, unlike coal, oil, natural gas, and hydroelectric*

- In general, **non-renewable energy sources** “pose higher risks to wildlife” than **renewable sources**. Coal, which wind directly replaces, “is by far the biggest contributor” to wildlife endangerment<sup>1</sup>
- In total, **.003%** of avian deaths due to human activity result from wind turbine collisions<sup>1</sup>



# Bats

*Wind turbines kill a large number of bats every year, many of which are endangered*

**MYTH**

**REALITY** *The mechanism by which bats can be killed by wind turbines can be managed to dramatically reduce the danger they present, and Aeronautica Windpower and the wind industry as a whole engage in active mitigation, researching further solutions to this issue*

- Turbines kill bats through pulmonary barotrauma, not impact with blades
  - Slight reduction in turbine speed at night, when bats are active, reduces barometric gradients exponentially and minimizes bat fatality<sup>1</sup>
- “Relatively small changes to wind-turbine operation resulted in nightly reductions in bat mortality, ranging from **44% to 93% [fewer deaths than would have occurred without slowing the blades], with marginal annual power loss (<1% of annual output]**)”<sup>1</sup>
- Preventative technologies and measures exist and are implemented at new projects, in particular sonic deterrents





# Ground Water Contamination

**If there is a spill, the ground water will be contaminated by the oils contained within the generator.**

**REALITY** Aeronautica turbines use environmentally-friendly oils that are biodegradable. **These oils will not pollute the ground water.**

- The Aeronautica 750kW Turbine Uses<sup>1</sup>:
  - Hydraulic Oil
    - 60L (~16gal.)
      - Mobil DTE 25 Material Safety Data Sheet
        - Biodegradable
        - Ecotoxicity—Not expected to be harmful to aquatic organisms
        - Ingestion—First Aid is not normally required. Seek medical attention if discomfort occurs.
    - Gear Oil
      - 148L (~39gal.)
        - Mobilgear SHC XMP 320 Material Safety Data Sheet
          - Biodegradable
          - Ecotoxicity—Not expected to be harmful to aquatic organisms
          - Ingestion—First Aid is not normally required. Seek medical attention if discomfort occurs



# Flight Risk



*Wind turbines present a significant danger to aircraft in foggy or nighttime conditions*

**MYTH**

**REALITY** *Airplane collisions with wind turbines are no more common than collisions with other types of structures, and the FAA must ensure the siting of a wind turbine facility abides by safety and flight path protocols*

- “The presence of wind turbines in the vicinity of airports does not pose a risk to high-flying aircraft.”<sup>1</sup>
- Risk to small aircraft can be effectively eliminated by careful placement of facilities
  - FAA or local aviation authorities ensure a wind facility will not abut flight paths

# Aesthetics

*Wind turbines are ugly and ruin the appearance of their rural host settings*

**MYTH**

**REALITY** *Beauty is in the eye of the beholder, and many find wind turbines to be majestic sentinels of a sustainable future*

- Lack of universal aesthetic appeal is far outweighed by the numerous environmental and economic benefits they bring



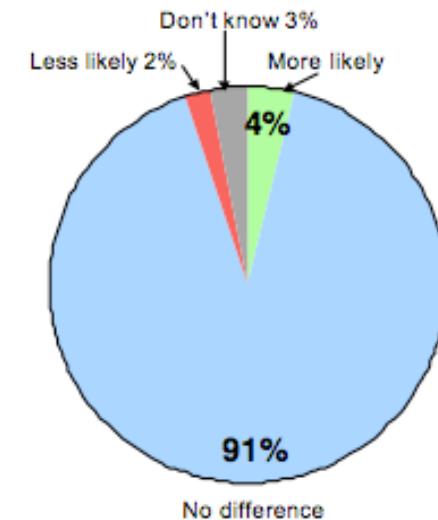
# Tourism

**The presence and visibility of wind turbines has and will significantly depress tourism in a given area**

**REALITY** Wind turbines have never been shown to have a detrimental effect in tourism, and some regions have actually experienced heightened interest as a result of the presence of wind turbines

- One study conducted in Scotland showed **80% of respondents being interested, and 54% of them were “very interested” in visiting a wind farm if it were open to the public**<sup>1</sup>
- “The majority (58.2%) of [visitor] respondents in North Devon thought that wind farms have no overall impact on the tourist experience. A total of 18.4% of those questioned thought that wind farms actually have a positive impact...while only 14.8% thought that wind farms have a negative impact.”<sup>2</sup>
- “Scottish tourism revenues in 2015 are forecast to be .18% lower than they would have been if there were no wind farms in Scotland.... This effect will [be offset] by other economic or environmental impacts of wind farms”<sup>3</sup>
- “From what I’ve seen, **tourism-wise, the impact has been a positive one.** We see a lot of tours to visit our wind farms. They range from school groups learning about it to town planning commissions who want to learn about it.”<sup>3</sup>

**Q Likelihood of Visiting Argyll in the Future**  
 Has the presence of wind farms in Argyll made you any more likely to visit the area in future, made it less likely, or has it made no difference?



<sup>1</sup>Professor Cara Aitchison, University of the West of England. “Evidence Gathering of the Impact of Wind Farms on Visitor Numbers and Tourist Experience.” 2004.

<sup>2</sup>Economic Research Findings: The Economic Impacts of Wind Farms on Scottish Tourism,” Glasgow Caledonian University on Behalf of the Scottish Government. 2007.

<sup>3</sup>Glenn, Puit. “Do Wind Turbines Turn off Tourists?” Michigan Land Research Institute

# Property Values



*The presence of wind turbines has a detrimental effect on property values and makes it difficult to sell a house at an otherwise reasonable price*

**REALITY** *There is no evidence that the presence of wind turbines in the vicinity of a home will have a negative impact on its property value*

- “Homes which sold in the year the project was announced and constructed and had a clear view of the turbines, are not affected uniquely; and **no measurable effect is found for homes located within a mile of the [wind farm].**<sup>”1</sup>
- **“Neither the view of wind energy facilities nor the distance of the home to those facilities was found to have any consistent, measurable and significant effect on the selling prices of nearby homes.”<sup>”2</sup>**
- “Based on the data and analysis presented in this report, **no evidence is found that home prices surrounding wind facilities are consistently, measurably, and significantly affected** by either the view of wind facilities or the distance of the home to those facilities.<sup>”2</sup>

<sup>”1</sup>Ben Hoen, “Impact of Windmill Visibility on Property Values in Madison County, New York.” 2006.

<sup>”2</sup>Ben Hoen, Ryan Wiser, et al. “The Impact of Wind Power Projects on Residential Property Values in the United States, a Multi-site Hedonic Analysis, 2009.

# Don't Contribute to Tax Base

*Because of the massive subsidies awarded to them and their dubious financing, wind turbines do not contribute to the tax base*

**MYTH**

**REALITY** Wind turbines do contribute heavily to the tax base, and fossil fuels actually avoid tax contribution to a greater extent than wind does

- Utilities are granted a Production Tax Credit of .022 \$/kWh for all electricity generated from wind turbines, for the first ten years of a project<sup>1</sup>
  - This reduces tax revenue, but **fossil fuels received five times the federal benefit** from 2002-2007<sup>2</sup>
  - Thus, wind energy contributes to the tax base to a greater extent than fossil fuels and nuclear
- Production Tax Credits spur investment in wind developments and infrastructure deriving energy from it, which was estimated to reach **\$15 billion per year** in 2010<sup>2</sup>
  - This investment in turn contributes heavily to the tax base

Exhibit 3 – Comparison of Federal Expenditures for Energy Development, 1950–2010  
 (Billions of 2010 Dollars)<sup>2</sup>

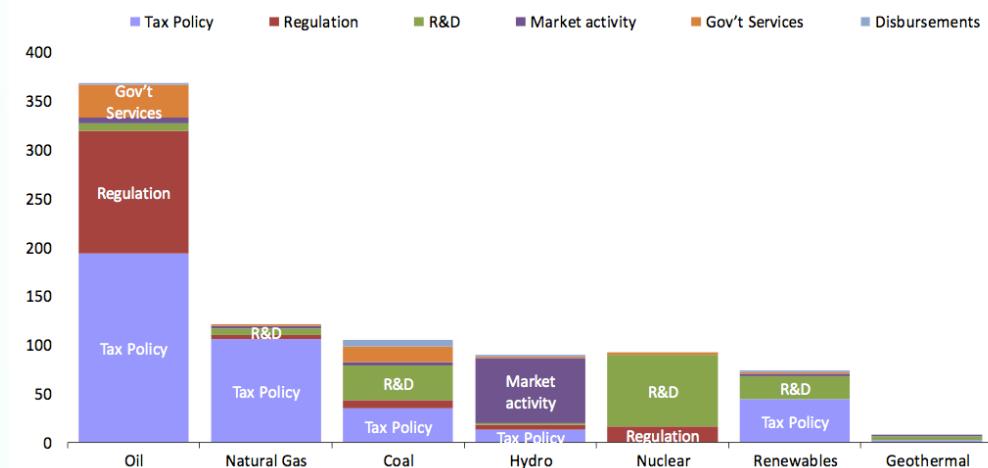


Exhibit 1 – Summary of Federal Energy Incentives, 1950–2010  
 (Billions of 2010 Dollars<sup>1</sup>)<sup>2</sup>

TYPE OF INCENTIVE	ENERGY SOURCE							SUMMARY	
	Oil	Natural Gas	Coal	Hydro	Nuclear	Renewables <sup>2</sup>	Geothermal	Total	Share
Tax Policy	194	106	35	13	-	44	2	394	47%
Regulation	125	4	8	5	16	-	-	158	19%
R&D	8	7	36	2	74	24	4	153	18%
Market Activity	6	2	3	66	-	2	2	80	10%
Gov't Services	34	2	16	2	2	2	-	57	7%
Disbursements	1	-	7	2	-18	2	-	-6	-1%
Total	369	121	104	90	73	74	7	837	
Share	44%	14%	12%	11%	9%	9%	1%		100%

<sup>1</sup>Database of State Incentives for Renewable Energy, "Production Tax Credit."

<sup>2</sup>"60 Years of Energy Incentives: Analysis of Federal Expenditures for Energy Development." Management Information Services, Inc. 2010

# Profits Move Elsewhere



*Wind farm developers are just interested in making money and moving on to the next project, taking the benefits of wind turbines with them*

**REALITY** *The town hosting a wind turbine development typically turns a profit or receives an incentive from the developer, and the environmental benefits cannot be exported*

- **\$30 Million:** Amount offered to the town of Powys, Wales over 20 years by RWE AG to allow development of a wind farm<sup>1</sup>
- **\$2-3 Million:** Net amount saved by the town of Hull, MA through 2008 on electricity prices since the Hull 1 turbine was installed in 2001<sup>2</sup>
- On a national level, a greater integration of wind energy into the American energy picture will **reduce the flow of American money to foreign oil companies**<sup>3</sup>
- The carbon emissions and pollution offset by the wind turbine will benefit the surrounding area and world immeasurably throughout the facility's lifetime
  - According to the American Wind Energy Association the **8,500 MW of wind power brought online in the US in 2008 alone was enough to take the equivalent of 7 million cars off the road**<sup>3</sup>

<sup>1</sup>Booker, Christopher. "How Much Profit will a Wind Turbine Turn?" The Telegraph, 2012.

<sup>2</sup>Community Case Study: Hull." Renewable Energy Laboratory, University of Massachusetts, Amherst. 2008  
 Ghelani, Brijesh. "What are the Carbon Offset Benefits of a Wind Farm?" 2007.

# Higher Electricity Prices

**Wind-generated energy is far more expensive than fossil fuel energy**

**REALITY** *The cost of wind-generated electricity paid by consumers is competitive with conventional fossil fuels, and actually lower in many markets*

Levelized Cost Comparison for New Generating Capacity in the United States  
 (2004 Dollars per Megawatthour) 5

Cost Element	Technology			
	Coal	Natural Gas	Wind	Nuclear
Capital ...	30.4	11.4	40.7	42.7
O&M....	4.7	1.4	8.3	7.8
Fuel ....	14.5	36.9	0.0	6.6
<b>Total<sup>a</sup>...</b>	<b>53.1</b>	<b>52.5</b>	<b>55.8</b>	<b>59.3</b>

<sup>a</sup>Includes transmission hookup costs.  
 O&M = operations and maintenance.

Source: Energy Information Administration, *Annual Energy Outlook 2006*, DOE/EIA-0383(2006) (Washington DC, February 2006).

- Wind resource is free throughout the installation's lifetime
  - Not subject to inflation or oil price spikes which can lead to expensive consumer electric bills
  - Utilities support wind because it "acts as a hedge against future volatility of natural gas prices"<sup>1</sup>
  - Utilities can sign 25 year contracts for constant electricity prices with wind power, unlike any fossil fuel, and consumers in turn receive stable electricity prices<sup>2</sup>
- \$30 Billion: Would be saved by consumers annually if 20% of east coast electricity came from wind, the Department of Energy's current target for 2030<sup>3</sup>
  - Roughly \$270 per consumer, per year
- \$250 Million: Saved by Colorado consumers through Public Service Company of Colorado's wind energy production<sup>4</sup>
- The dollar/kWh price of wind-generated electricity can match or beat coal, nuclear, and natural gas<sup>4</sup>

<sup>1</sup>"Supplemental Direct Testimony and Exhibits of Kurtis J. Haeger on Behalf of Public Service Company of Colorado," September 19, 2011

<sup>2</sup>Colorado Public Utilities Commission, Decision No C11-1291

<sup>3</sup>Joint Collaborated System Plan, a study conducted by many of the grid operators in the Eastern US, 2008.

<sup>4</sup>"Power Prices Below Zero," Bernstein research, webcast on May 21, 2009

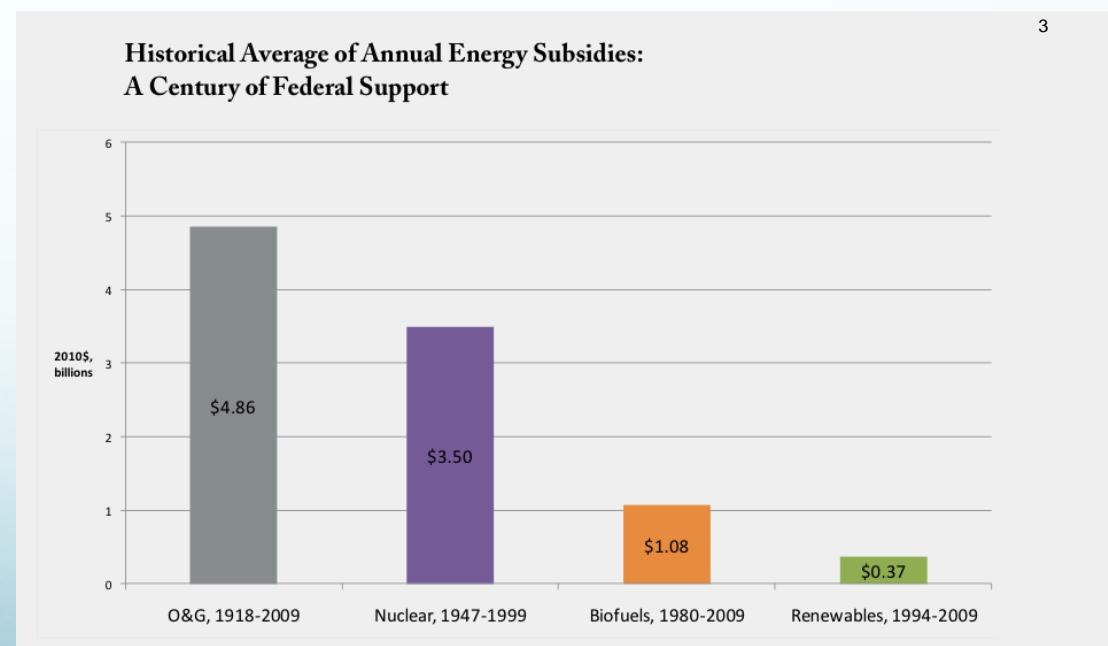
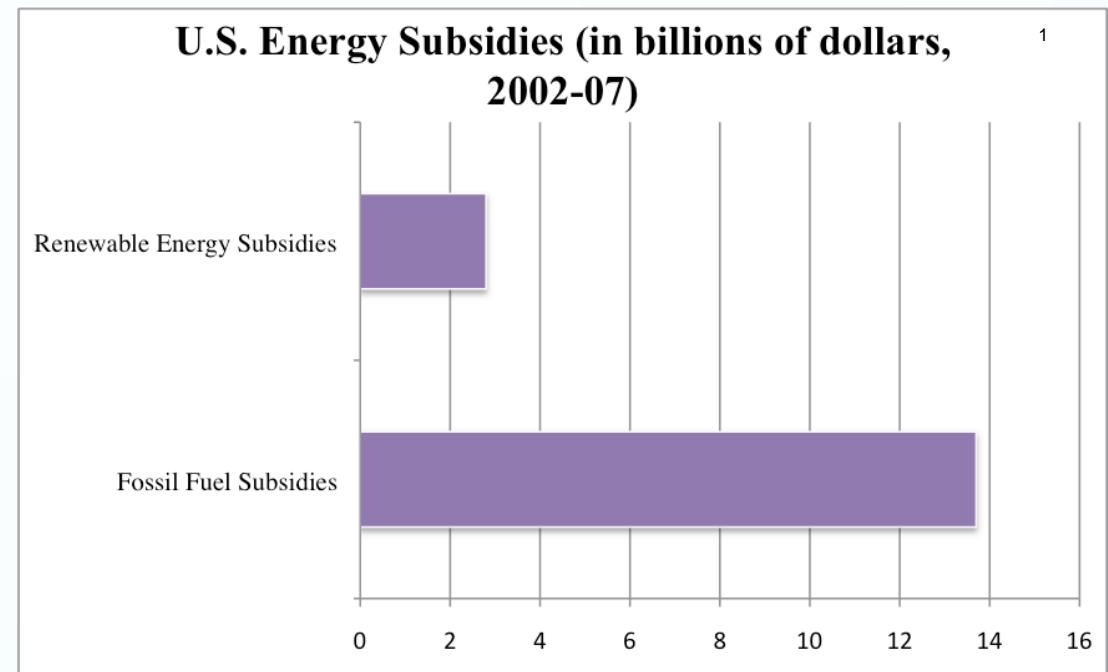
<sup>5</sup>U.S. Energy Information Administration. "International Energy Outlook 2006." 2006.

# Heavily Subsidized

*Renewables are subsidized at a dramatically higher rate than fossil fuels, and these subsidies are damaging the American economy*

**REALITY** All sources of energy are subsidized, with renewables receiving a small minority

- **\$500 billion:** Paid by taxpayers to fossil fuel industries in the past 90 years<sup>1</sup>
- **Wind receives a tax credit of .022 \$/kWh**<sup>1</sup> produced, so while tax revenue is reduced, this is not a flow of public money into the wind sector
- **70% of federal energy subsidies** since 1950 have gone to fossil fuel<sup>1</sup>
  - Despite this massive disparity, wind energy prices are competitive with fossil fuels in many power markets<sup>2</sup>
- **\$120 billion:** Estimated annual health-related externalities of fossil fuel combustion<sup>3</sup>
  - **\$0:** For renewable power production such as wind<sup>3</sup>



<sup>1</sup>"Federal Electricity Subsidies: Information on Research Funding, Tax Expenditures, and Other Activities that Support Electricity Production." GAO, October 2007.

<sup>2</sup>"Power Prices Below Zero," Bernstein research, webcast on May 21, 2009

<sup>3</sup>Pfund, Nancy and Ben Healey. "The Historical Role of Federal Subsidies in Shaping America's Future." 2011.

# Inefficient Use of Land

*Wind energy facilities take up too much area to produce a large amount of the nation's energy*

**MYTH**

**REALITY** *Wind turbine facilities use up a small amount of land, are often welcomed by private landowners, and will produce a significant amount of the nation's future energy demand*



- With **20% of American energy needs coming from wind**(the current target by 2030 for the US), the amount of land out of commission would be **smaller than Anchorage, Alaska<sup>1</sup>**
- **Only 2-5% of the land needed to host a wind turbine is unusable**, making dual use of wind farms a possibility<sup>1</sup>
  - Farmers and ranchers commonly rent out their land to wind developers and can still engage in their normal activities
  - **\$3,000**: Average rent paid to farmers and ranchers for hosting wind turbines, without disrupting usage of their land<sup>1</sup>

<sup>1</sup>"20 percent Wind Energy by 2030: Increasing Wind Energy's Contribution to the US Energy Supply," US Department of Energy, July 2008.



# Can Never Provide Substantial Power

*Wind power will never be able to meet a significant amount of global or national power demand*

**MYTH**

**REALITY** *Wind is already utilized heavily worldwide, and its estimated minimum reliable capacity is about 20% of global demand*

- **83 countries** currently use wind energy on a commercial basis<sup>1</sup>
- There are currently **238,351 MW of installed wind capacity** globally, enough to power about **60 million American homes**<sup>2</sup>
- Installed wind capacity met **2.5% of global electricity demand** in 2010<sup>2</sup>
- **Denmark met 22% of its electricity demand** with wind energy in 2010<sup>1</sup>
- **35% of new American electric generating capacity** since 2007 has come from Wind<sup>2</sup>
  - Despite receiving about only 12% of government energy subsidies in this same period<sup>2</sup>
- American wind industry is ahead of schedule to produce **20% of American electricity** by 2030<sup>2</sup>
- Installed wind capacity in America has expanded by an average of **29%** annually since 1998<sup>3</sup>
- California already produces over **20% of its energy through wind and solar**



<sup>1</sup>REN21. *Renewables 2011 Global Status Report*. Paris. 2011

<sup>2</sup>Energy Information Administration, American Wind Energy Association, 2007-2010 AWEA

<sup>3</sup>World Wind Energy Association. "World Wind Energy Report 2010." 2011.

# Back-up Generation



*The presence of wind turbines in a grid system necessarily forces grid operators have a large amount of conventional power on standby to ensure a consistent power supply*

**MYTH**

**REALITY** *Wind power requires only a small amount of back-up generation, which is also true of fossil-fuel power plants in case of blackouts or failure*

- "The results to date also lay to rest one of the major concerns often expressed about wind power: that a wind plant would need to be backed up with an equal amount of dispatchable generation. It is now clear that, even at moderate wind penetrations, **the need for additional generation to compensate for wind variations is substantially less than one-for-one and is often closer to zero.**"
- Adding **1,500 MW** of new wind capacity (meeting the power demand of about 200,000 homes) to the Xcel Energy power system in Texas would require only an additional **8 MW** of conventional generation to accommodate for the added variability

<sup>1</sup>Findings of the Utility Wind Interest Group (55 utilities with wind in their systems), November 2003.

<sup>2</sup>American Wind Energy Association. "Wind Energy: The Facts." 2008.

# Intermittence

*Wind is intermittent, and therefore energy produced from it endangers the stability and reliability of the electric grid*

**REALITY** *Wind energy is already integrated into American and foreign power grids with great success, and the issues surrounding its intermittence have been overblown*

- Wind energy fluctuations are relatively predictable and can be accounted for<sup>1</sup>
  - Far easier to predict than the constantly fluctuating supply and demand electricity system which utilities already deal with
- Collective generation of all turbines and facilities in a system is what matters<sup>1</sup>
  - Operating principle of grid function and design throughout its entire existence
  - Thus, **wind energy does not present an added burden based on its intermittence**
- While an individual turbine or farm generates electricity intermittently, **stronger winds elsewhere at a given time will compensate for this**<sup>1</sup>
  - Department of Energy estimates that the US can draw at least **20% of its power from wind farms without any issues resulting from the intermittence of this source**<sup>1</sup>
- Large fossil fuel power plants shut down abruptly with no notice, forcing utilities to keep sufficient power for a large city on standby<sup>1</sup>
  - In contrast, wind fluctuations are foreseeable and gradual, and wind never stops blowing entirely
  - Two times in 2011, **wind energy was able to maintain the power supply** in parts of Texas when fossil-fuel power plants failed during periods of peak demand due to extreme weather<sup>2</sup>



<sup>1</sup>European Wind Energy Association. *Wind Power Impacts on Power Systems. "Wind Energy: The Facts"* 2010.

<sup>2</sup>"An Interview with the CEO of the Texas Grid," The Texas Tribune, February 4, 2011

# TV/Radio Signal Interference

*Wind turbine operation ~~inevitably~~ disrupts TV and radio signal transmission*

**REALITY** Any such disruption is rare and can easily be corrected by proper turbine placement and design

- Analog signals can be disrupted by wind turbines, but **most signals today are digital, which are not affected by wind turbines**<sup>1</sup>
- Stronger antennae or relay stations to route signals around facilities easily solve this problem and are regularly implemented in wind farm development<sup>1</sup>
- “...adequate design and location can prevent or correct any possible interference problems at relatively low cost using simple technical measures, such as the installation of additional transmitter masts”<sup>2</sup>



<sup>1</sup>American Wind Energy Association, “Wind Power Facts.” 2008.

<sup>2</sup>European Wind Energy Association. “Wind Energy: The Facts” 2010.

# Carbon Emissions



*“Wind farms are fueling higher temperatures on the ground... these things are poster children we are told for addressing global warming, and now they are contributing?” –Neil Cavuto, FOX News<sup>1</sup>*

**REALITY** SUNY-Albany researchers, who conducted the study in question, clarified that wind turbines “re-distribute the air’s heat near the surface, which is fundamentally different from the large-scale warming effect caused by increasing atmospheric concentrations of greenhouse gasses.”<sup>2</sup>

<sup>1</sup>Your World with Neil Cavuto, April 30 2012.

<sup>2</sup>Scientist debunks ‘Misleading’ coverage of wind farm study,” Media Matters, April 30, 2012



# Consume Rare Earth Metals

*The construction of wind turbines necessarily burns through the Earth's supply of rare metals, such as neodymium*

**REALITY** *A large percentage of the neodymium used in wind turbine construction can be reused, and only a small fraction of the global supply is devoted to this process*

- Neodymium magnets are the strongest permanent magnets known, and are commonly used in some wind turbine generators, though not Aeronautica's
- By 2030, the European wind industry will have consumed a mere **.35% of the world's available supply of neodymium<sup>1</sup>**



# Habitat Fragmentation



*Wind turbine installations are leading contributors to the harmful phenomenon of habitat fragmentation which threatens our nation's ecosystems*

**MYTH**

**REALITY** *Wind turbines are typically constructed in regions where habitat fragmentation has already occurred, so there is little additional contribution to this effect by wind turbines*

- Wind turbines are typically built near roads, transmission lines, and farms, where habitat fragmentation has already occurred<sup>1</sup>
- The contribution of wind farms to habitat fragmentation is **negligible in comparison to that of roads and transmission lines**<sup>1</sup>

# What's in it for me?

*Wind turbines do not benefit the local community and residents hosting them at all*

**MYTH**

**REALITY** *The presence of a wind turbine has a number of social, environmental, and economic benefits for nearby residents*

- The pollution and carbon offset by the 8,500 MW of wind power brought online in the US in 2008 alone was the equivalent taking of 7 million cars off the road<sup>2</sup>
  - This reduction in toxic emissions will help preserve Campobello's beautiful natural scenery and wildlife
- Wind as a resource is free and unlimited, so the Campobello's residents will no longer be subject to fossil fuel prices spikes and will receive stable electricity prices for decades

