Wind Turbine Project

University of Illinois at Urbana-Champaign

South Farms Wind Turbine Project

Public Meeting

January 31, 2011

Morgan Johnston, EIT

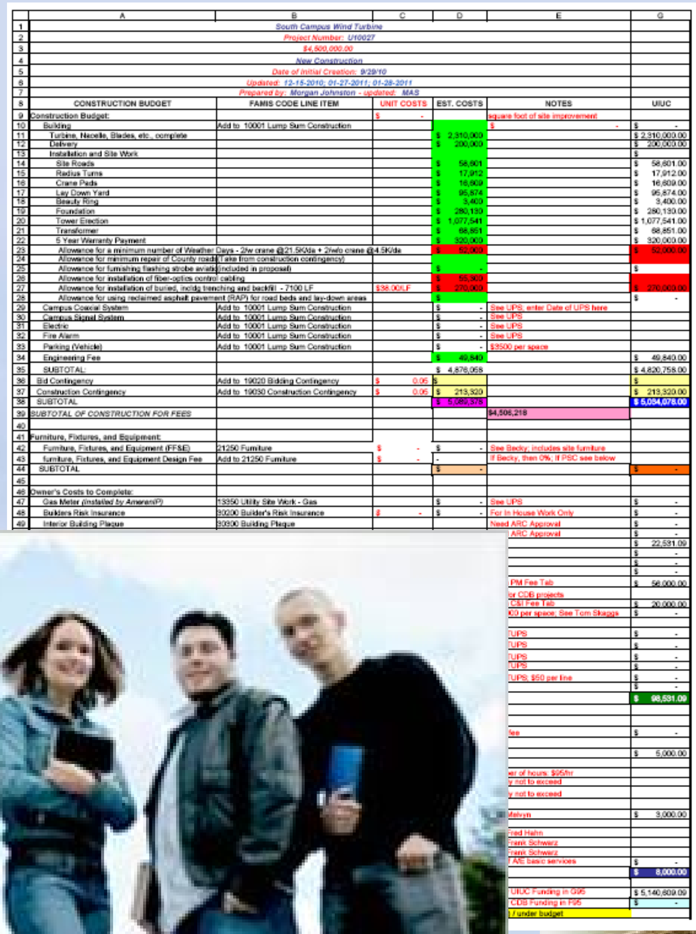
Sustainability Coordinator

mbjohnst@illinois.edu

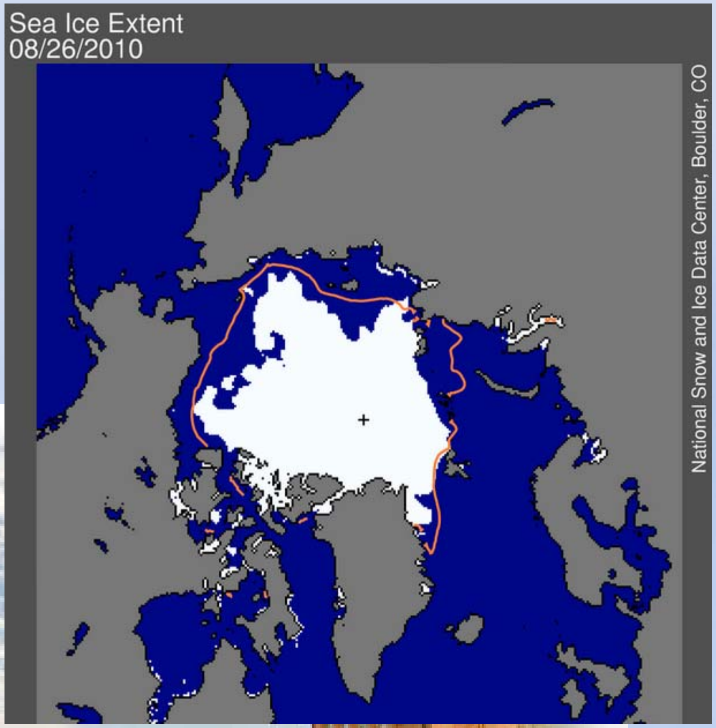
Topics

- Finances
- Location selection
- University process
- Noise impact
- Other questions
- Research opportunities

Economic Viability



	A	B	C	D	E	G
1	South Campus Wind Turbine					
2	Project Number: U10027					
3	$4,500,000.00					
4	New Construction					
5	Date of Initial Creation: 9/29/10					
6	Updated: 12-15-2010; 01-27-2011; 01-28-2011					
7	Prepared by: Morgan Johnston - updated: MAS					
8	CONSTRUCTION BUDGET	FAMIS CODE LINE ITEM	UNIT COSTS	EST. COSTS	NOTES	UIUC
9	Construction Budget:		$ -		square foot of site improvement	
10	Building	Add to 10001 Lump Sum Construction			$ -	$ -
11	Turbine, Nacelle, Blades, etc., complete			$ 2,310,000		$ 2,310,000.00
12	Delivery			$ 200,000		$ 200,000.00
13	Installation and Site Work					$
14	Site Roads			$ 58,601		$ 58,601.00
15	Radius Turns			$ 17,912		$ 17,912.00
16	Crane Pads			$ 16,609		$ 16,609.00
17	Lay Down Yard			$ 95,874		$ 95,874.00
18	Beauty Ring			$ 3,400		$ 3,400.00
19	Foundation			$ 280,130		$ 280,130.00
20	Tower Erection			$ 1,077,541		$ 1,077,541.00
21	Transformer			$ 68,851		$ 68,851.00
22	5 Year Warranty Payment			$ 320,000		$ 320,000.00
23	Allowance for a minimum number of Weather Days - 2/w crane @21.5K/da + 2/w/o crane @4.5K/da			$ 52,000		$ 52,000.00
24	Allowance for minimum repair of County roads	(Take from construction contingency)				
25	Allowance for furnishing flashing strobe aviatio	(included in proposal)		$ -		$
26	Allowance for installation of fiber-optics control cabling			$ 55,300		
27	Allowance for installation of buried, incldg trenching and backfill - 7100 LF		$38.00/LF	$ 270,000		$ 270,000.00
28	Allowance for using reclaimed asphalt pavement (RAP) for road beds and lay-down areas			$		$ -
29	Campus Coaxial System	Add to 10001 Lump Sum Construction		$ -	See UPS; enter Date of UPS here	
30	Campus Signal System	Add to 10001 Lump Sum Construction		$ -	See UPS	
31	Electric	Add to 10001 Lump Sum Construction		$ -	See UPS	
32	Fire Alarm	Add to 10001 Lump Sum Construction		$ -	See UPS	
33	Parking (Vehicle)	Add to 10001 Lump Sum Construction		$ -	$3500 per space	
34	Engineering Fee			$ 49,840		$ 49,840.00
35	SUBTOTAL:			$ 4,876,058		$ 4,820,758.00
36	Bid Contingency	Add to 19020 Bidding Contingency	$ 0.05	$		$
37	Construction Contingency	Add to 19030 Construction Contingency	$ 0.05	$ 213,320		$ 213,320.00
38	SUBTOTAL			$ 5,089,378		$ 5,034,078.00
39	SUBTOTAL OF CONSTRUCTION FOR FEES				$4,506,218	
40						
41	Furniture, Fixtures, and Equipment:					
42	Furniture, Fixtures, and Equipment (FF&E)	21250 Furniture	$ -	$ -	See Becky; includes site furniture	
43	furniture, Fixtures, and Equipment Design Fee	Add to 21250 Furniture	$ -	-	If Becky, then 0%; If PSC see below	
44	SUBTOTAL			$ -		$ -
45						
46	Owner's Costs to Complete:					
47	Gas Meter (installed by AmerenIP)	13350 Utility Site Work - Gas		$ -	See UPS	$ -
48	Builders Risk Insurance	30200 Builder's Risk Insurance	$ -	$ -	For In House Work Only	$ -
49	Interior Building Plaque	30300 Building Plaque			Need ARC Approval	$ -
					ARC Approval	$ -
						$ 22,531.09
						$ -
						$ -
						$ -
					PM Fee Tab	$ 56,000.00
					or CDB projects	
					C&I Fee Tab	$ 20,000.00
					00 per space; See Tom Skaggs	$ -
					TUPS	$ -
					TUPS	$ -
					TUPS	$ -
					TUPS	$ -
					TUPS; $50 per line	$ -
						$ -
						$ 98,531.09
					fee	$ -
						$ 5,000.00
					er of hours: $95/hr	
					y not to exceed	
					y not to exceed	
					Malvyn	$ 3,000.00
					Fred Hahn	
					Frank Schwarz	
					Frank Schwarz	
					f A/E basic services	$ -
						$ 8,000.00
					UIUC Funding in G95	$ 5,140,609.09
					CDB Funding in F95	$ -
					/ under budget	



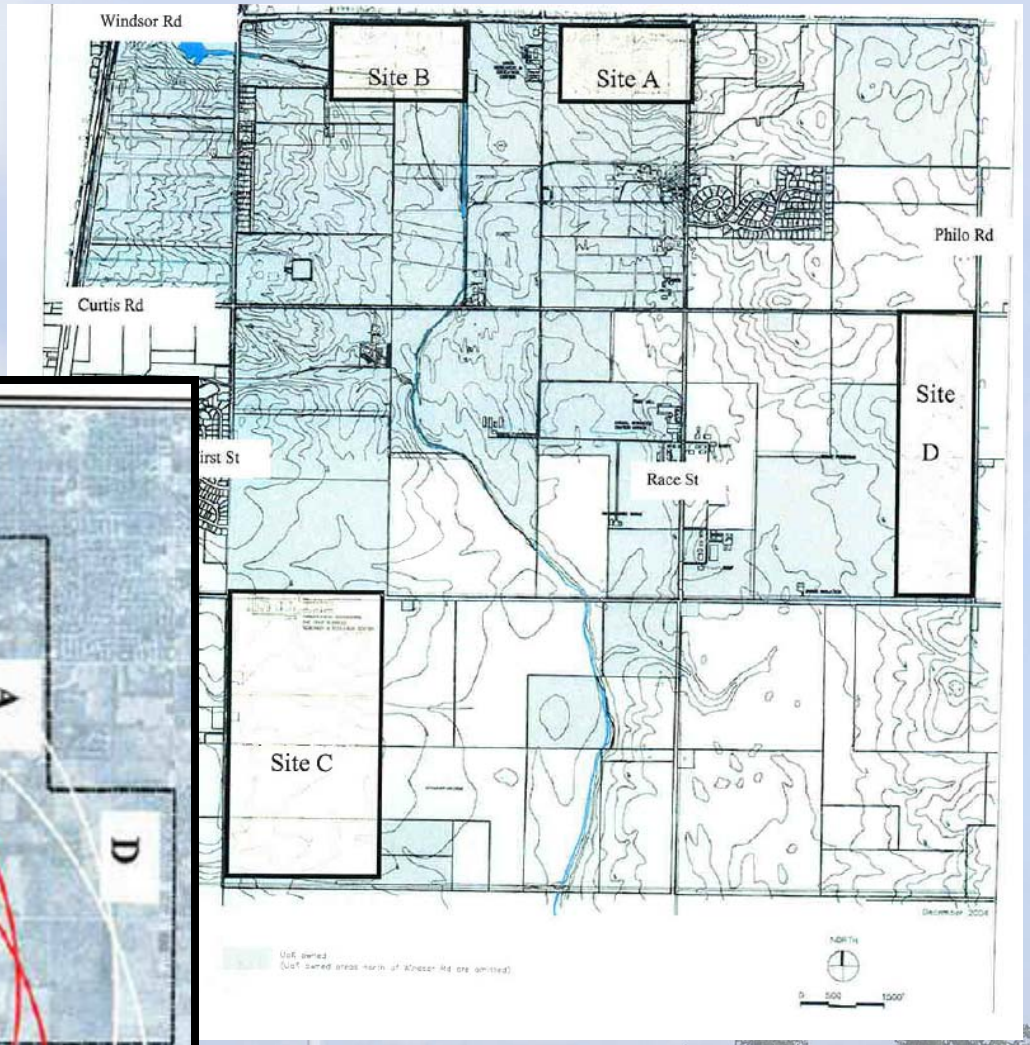
Return on Investment

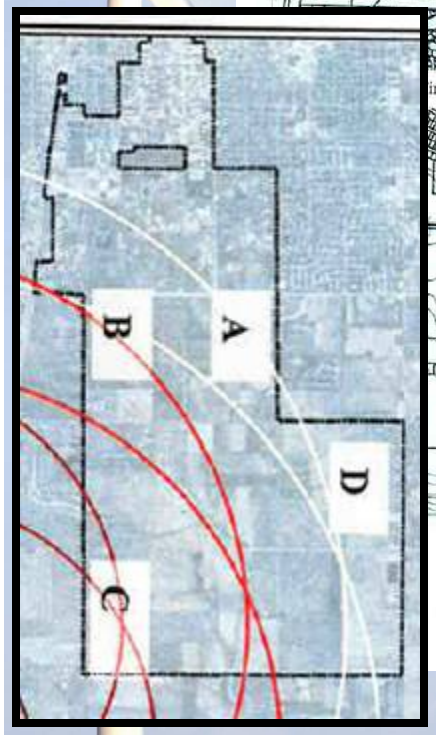
ROI measures	High End	Low End
Cost of capital		**3.50%**
Net present value		*$487,195*
Return on investment		**24.24%**
Payback (in years)		*18.40*
Internal Rate of Return		*5.5%*

Budget Status

$5,200,000	Total project cost
- $500,000	Chancellor’s office
- $500,000	President’s office
- $1,000,000	Utilities division
- $500,000	Student Sustainability Committee grant
- $2,000,000	Illinois Clean Energy Community Fund grant
$700,000	**additional funding needed**

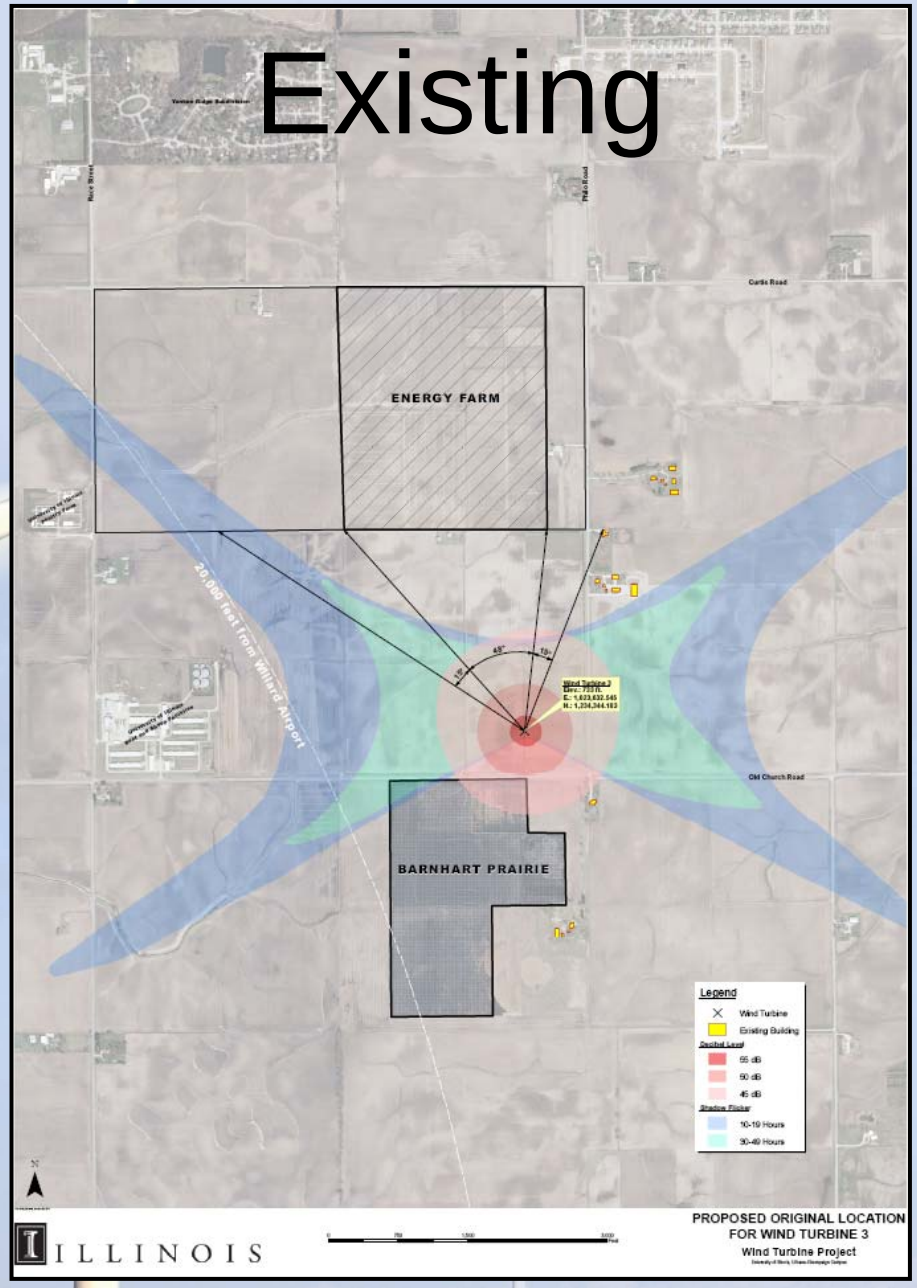
Navigant Consulting, Inc.





- Present/planned uses
- Proximity to residential areas
- Access to the electrical underground distribution system
- Elevation
- Proximity to airport runways

Existing



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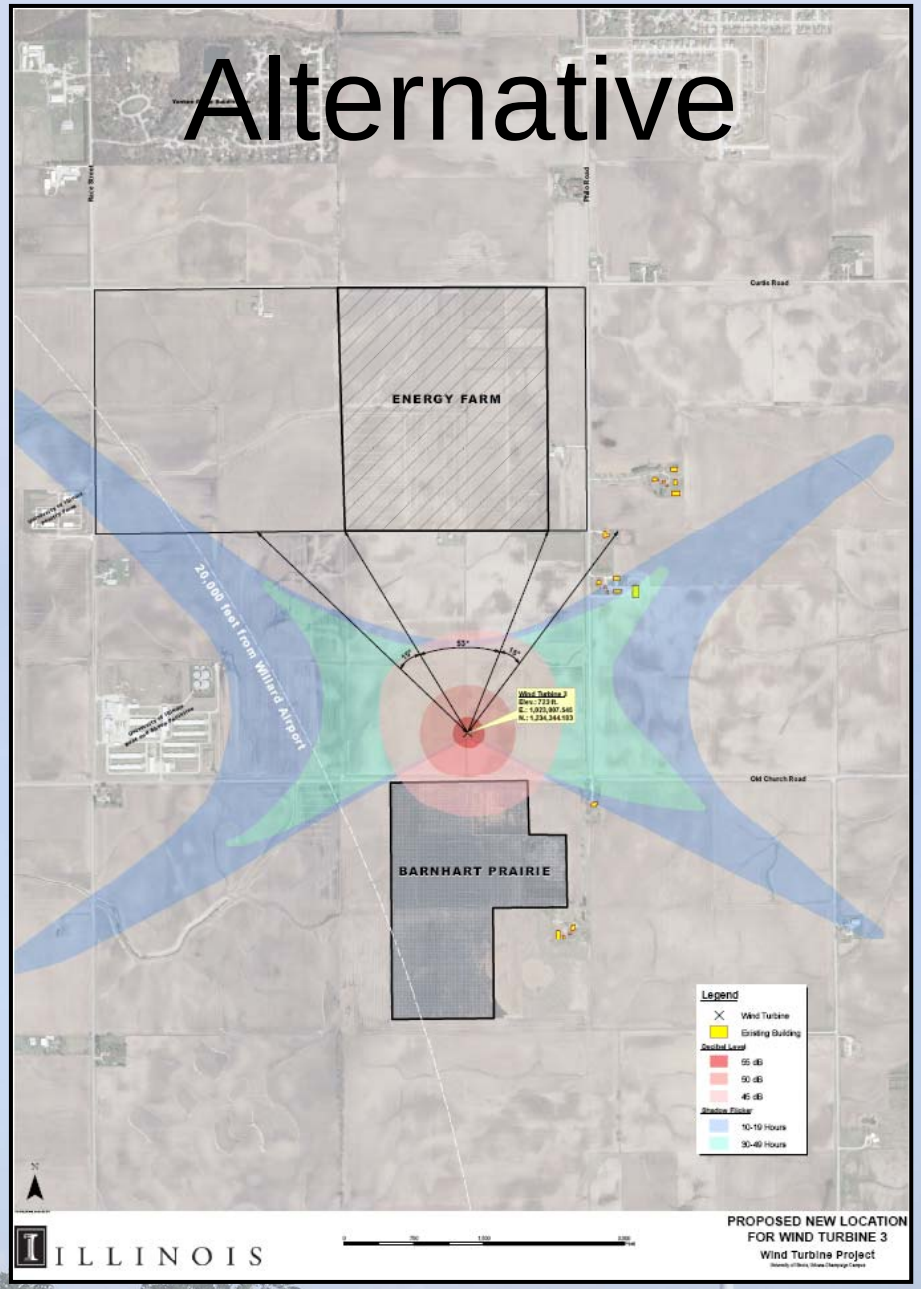
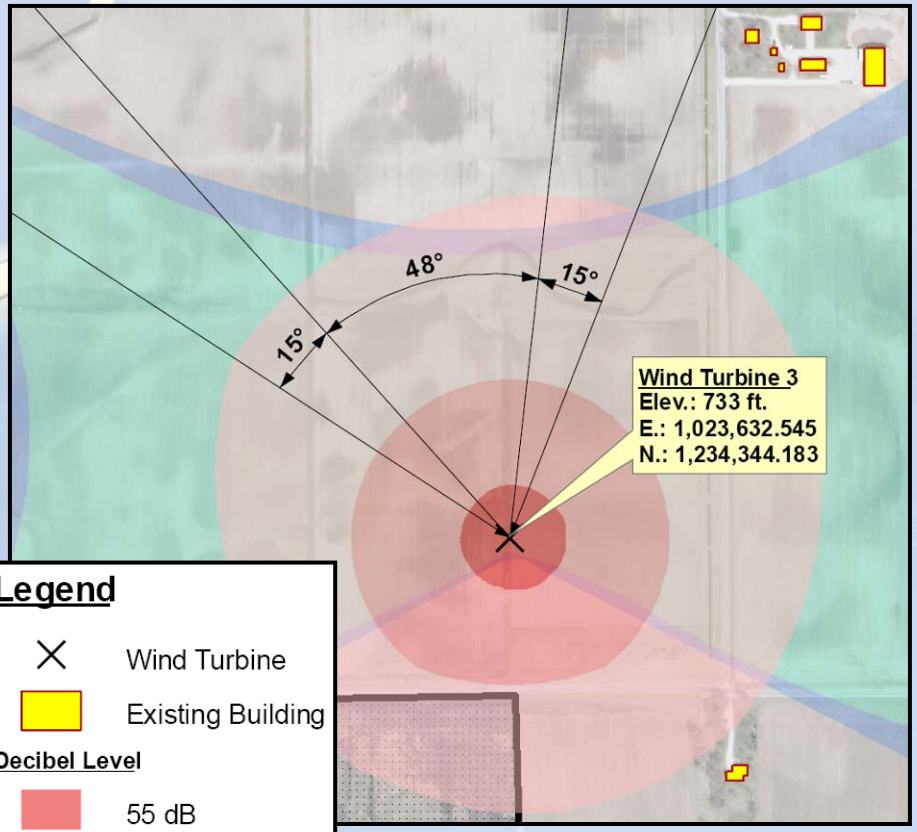


Existing



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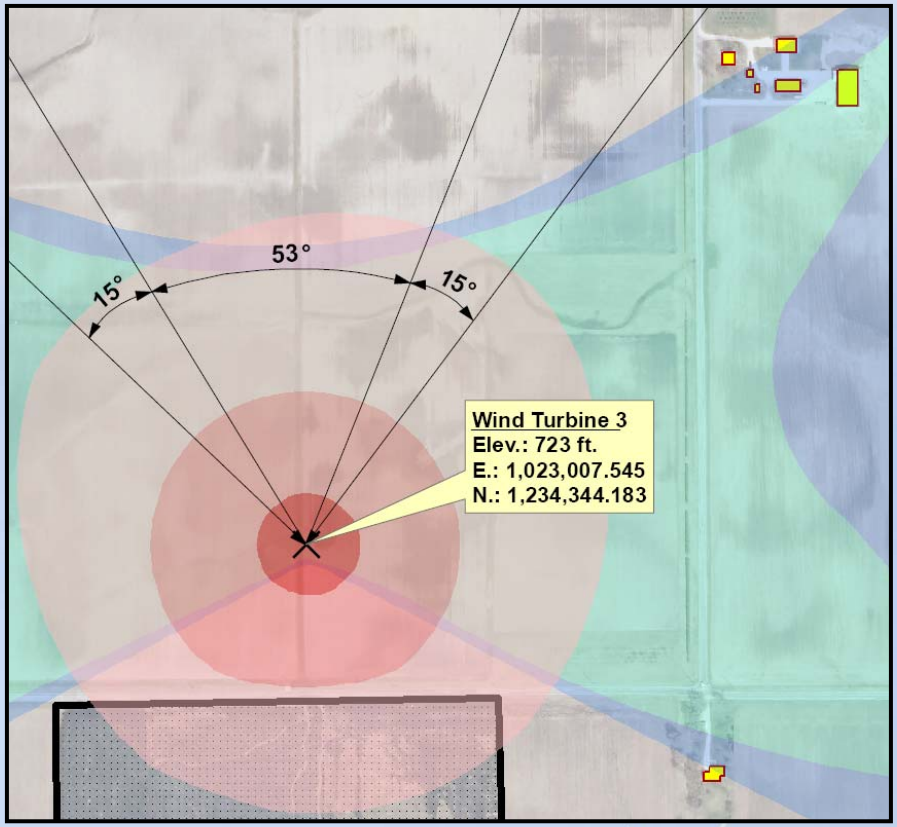


Legend

- Wind Turbine
- Existing Building

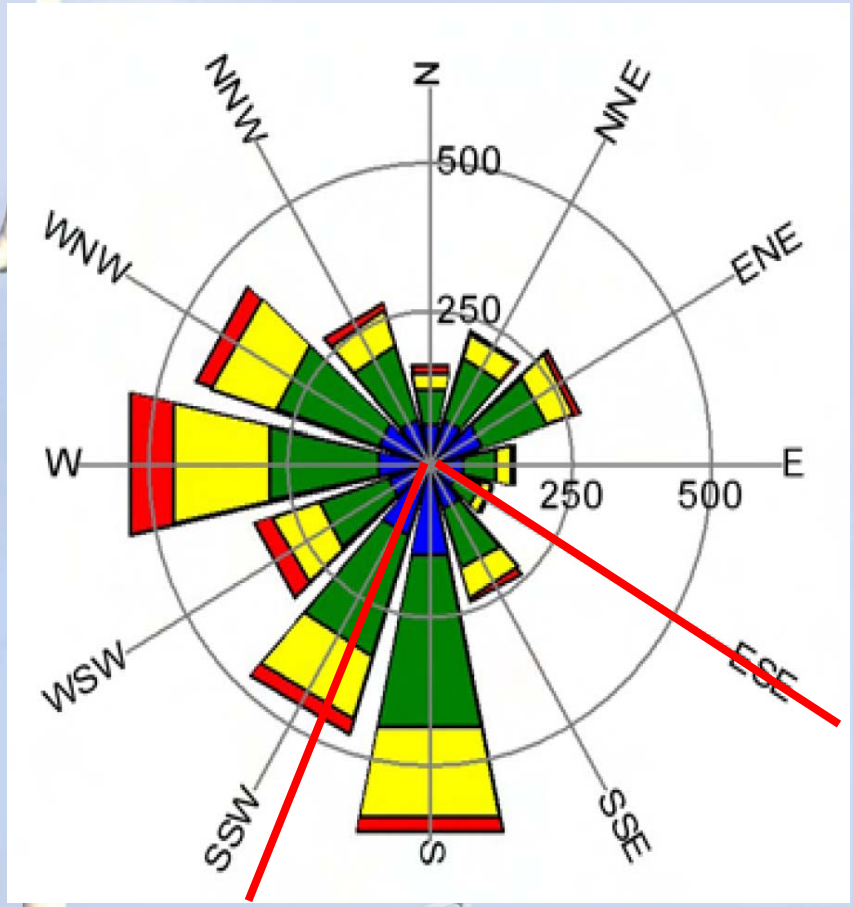
Decibel Level

- 55 dB
- 50 dB
- 45 dB

Shadow Flicker

- 10-19 Hours
- 30-49 Hours

Existing



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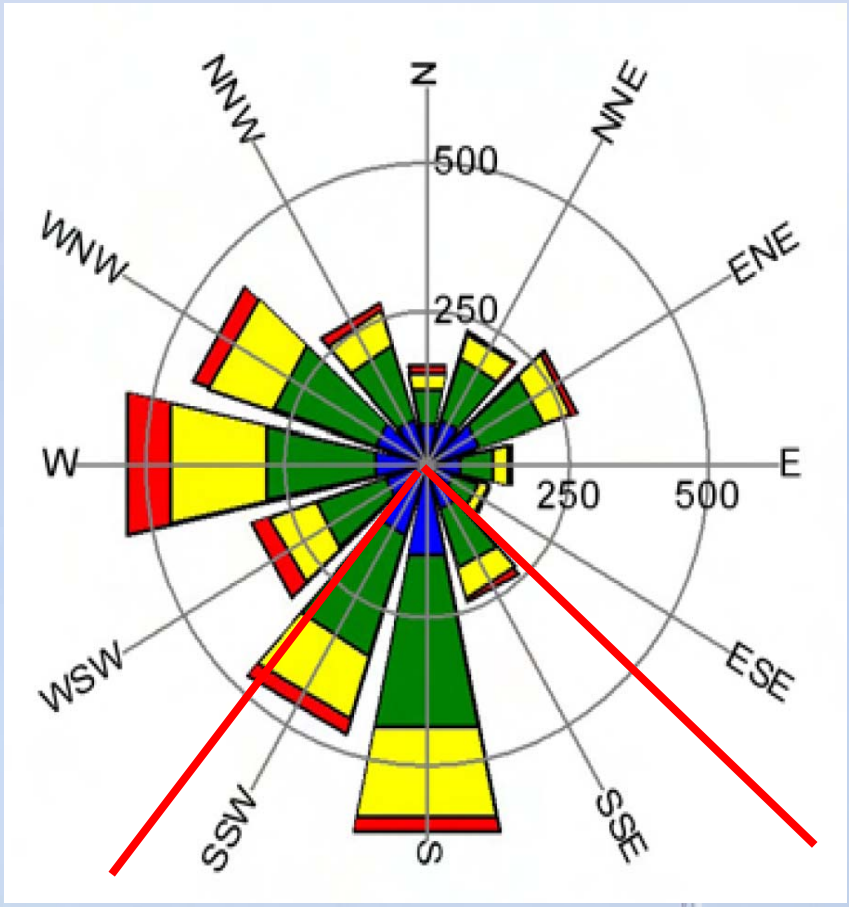


Generic UI Project Process

1. Idea stage: gets departmental and Chancellor's Capital Review Committee (CCRC) approval
2. Feasibility stage: studies are conducted to clarify the budget needed and the scope of the project
3. Project stage: funding commitments are signed, CCRC approval, then Board of Trustees approval
4. Implementation stage: construction, commissioning, and completion

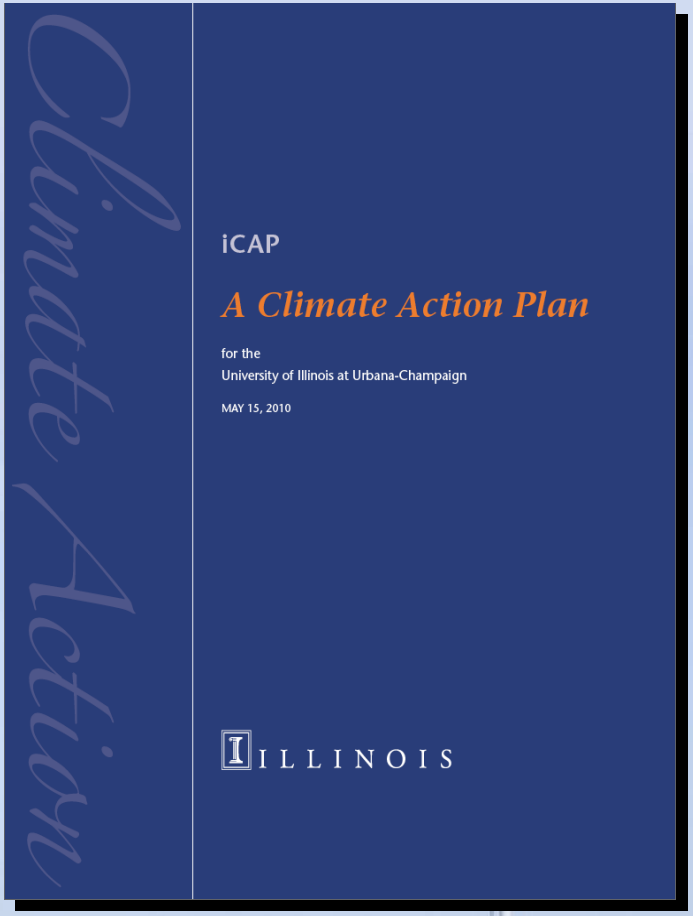
Project History

- 2003 – 2005: idea stage
- 2005 – 2007: feasibility stage
- 2007 – 2008: first attempt
- 2008 – 2010: project on hold
- 2010 – 2011: second attempt

(see http://sustainability.illinois.edu/ssc/windturbine.html for details)

Sustainability Projects

- Retrocommissioning
- Solar energy, biomass, and “the coal study”
- Local foods, active transportation, waste management
- Policies ranging from space management to spending priorities



Noise Impact

- University required to meet IL Pollution Control Standards, regarding noise pollution
- 55 decibels is the sound of a normal conversation
- Approximately 45 decibels at edge of University property

Noise Impacts

How common are these negative reactions?

Very limited solid survey data

Industry reports tend to suggest issues are rare: 5-10% max
(and that those who complain about noise
are more generally against the wind farm)

Community advocates imply that nearly everyone
who can hear turbines is disturbed
(and those who don't speak up are under gag orders
or afraid to cause waves in town)

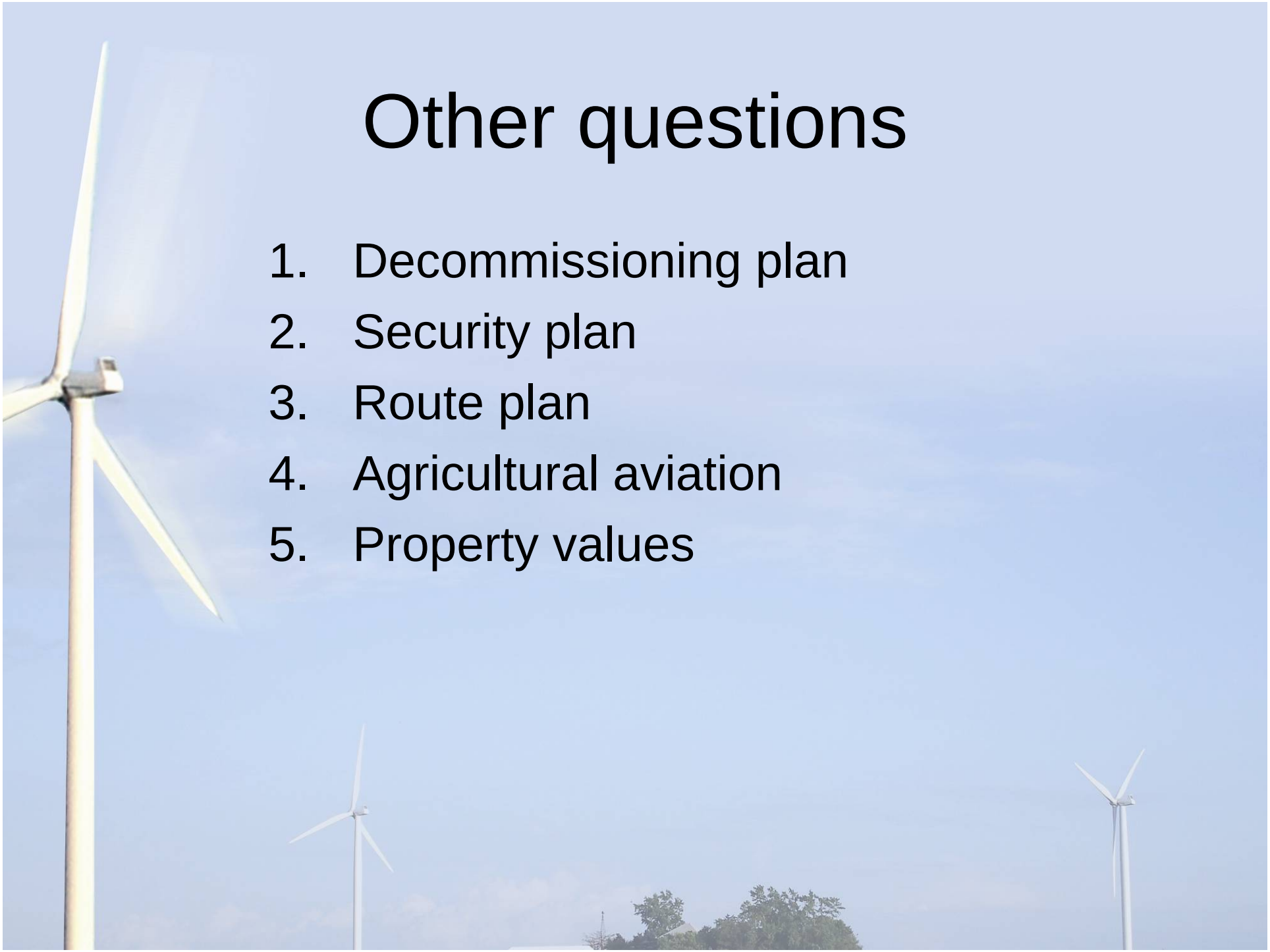
Informal reports and the few in-depth studies of annoyance
suggest the reality is between these extremes
(with plenty of ambiguity for each side to play with
as they present the results)

Slide 13: Scandinavian studies. Information on this slide taken from primary papers on each of the three studies:

SWE-00: Eja Pederon and Kerstin Persson Waye. Perception and annoyance due to wind turbine noise—a dose-response relationship. J. Acous.Soc.Am. 116(6), December 2004.

SWE-05: Pederson and Waye. Wind turbine noise, annoyance and self-reported health and well-being in different living environments. Occup. Environ. Med. 2007;64;480-486

NL-07: Pederson, van den Berg, Bakker, Bouma. Response to noise from modern wind farms in the Netherlands. J. Acous.Soc. Am. 126 (2), August 2009



Other questions

1. Decommissioning plan
2. Security plan
3. Route plan
4. Agricultural aviation
5. Property values

Research Opportunities

- ACES
  - Demonstration site for farmers and others
  - Research effect on crop, wildlife, and ecosystem health
- Engineering
  - Airfoil design and aero acoustics
  - Airflow/turbulence, energy conservation, and instrumentation and control
- Office of Continuing Education
  - Use the wind turbines as a teaching tool
  - Classes through the Smart Energy Design Assistance Center
- Interdisciplinary, collaborative approach
  - Accessible facility
  - Engineering and ACES Open Houses will incorporate it

Question/Comments

Thank You

Morgan Johnston
Sustainability and Transportation Coordinator
Facilities & Services
University of Illinois at Urbana-Champaign
217-333-2668
mbjohnst@illinois.edu