

# Cashton Greens Wind Farm LLC,

The First Community Wind Project in WI: an Innovative Public/Private Partnership

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Gundersen  
Lutheran®



# Wes Slaymaker P.E

Project Engineer



2000



2013



- Have worked for 14 years in wind business in the Midwest developing wind projects from 0.1 to 100MW
- Specializing in Community Wind projects and distributed generation

# Outline of talk

Learn how the CGWF wind project created successful 5MW community wind project with these major

tasks:

- Feasibility study
- Grants
- Permitting- lots of meetings and tours
- PPA- negotiate innovative structure
- Financing
- Construction

# Project Overview

- Organic Valley and Gundersen Health Systems, equal owners and developers
- Each entity finances the project internally
- Each entity gets half of grants, tax credits and cash.
- Motivations are to reduce carbon footprint, benefit local community, hedge electric costs for operations

# Cashton development process

- Form project group- get funds
- Met tower- 50m, use nearby radio tower, Wisconsin's Focus of Energy grant helped fund
- Grants- US Treasury, Focus on Energy
- Permitting- Local and FAA
- Interconnect- distributed generation- PSC standard documents
- Marketing project (utilities and financing)

# Cashton Greens Feasibility Work

## Phase I (simultaneous activities)

- Wind measurement- grant from Focus on Energy for equipment on 50m tall radio tower, later SODAR for shear verification
- Initial site plan
- Interconnect – discuss with utility
- Initial economic feasibility
- Contract Negotiations with Utility – price and term

# SODAR wind measurement



Reduce uncertainty on energy estimate, shear above 50m

# Permitting








- Community meetings- Village Hall
- Organic Valley employee meetings
- Project Committee tour nearby wind projects
- Address concerns:
  - Sound
  - Stray Voltage
  - Shadow Flicker

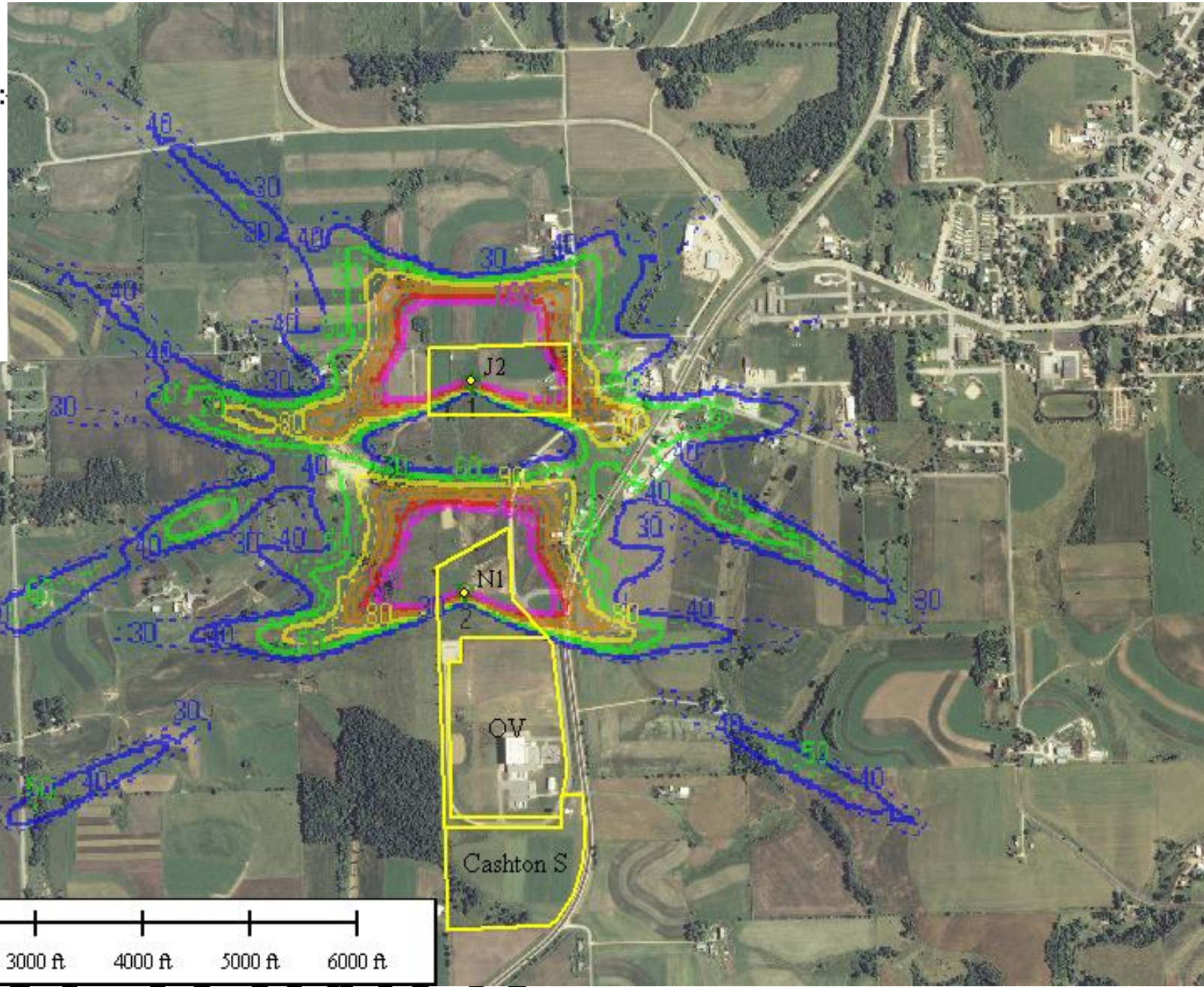


# Shadow Flicker

 - Turbine

Shadow Map (hours per year):

-  0 - 24 hours
-  25 - 49 hours
-  50 - 74 hours
-  75 - 99 hours
-  100 - 124 hours
-  125 - 149 hours
-  150 - 174 hours








# TOUR TOWER



 - Turbine

# Noise Modeling

- Noise :-
-  35.00 - 40.00 dB(A)
  -  40.00 - 45.00 dB(A)
  -  45.00 - 50.00 dB(A)
  -  50.00 - 55.00 dB(A)
  -  55.00 - 60.00 dB(A)



50dBA

Calculate noise isolines, stay below  
50dBA at residences

# Cashton Timeline

- 2006- start wind measurement
- early 2009- wind analysis, turbine select
- Fall 2009- shop for turbines, get construction pricing
- 2009- start negotiating PPA with utilities, apply for grants
- Summer 2010- permit and finalize PPA
- 2011- negotiate TSA and contractor agreement, start foundations
- April 2012- erect wind turbines!
- May 2012- online and making \$\$\$

# Innovative Power Purchase

- Power Purchase Agreement (PPA) with Upper Midwest Municipal Utility Assoc. (UMMPA)
- PPA structured to provide a hedge against electrical inflation
- Renewable Credits (RECs) are sold to UMMPA, then also a “back to back” agreement with Organic Valley for RECs to be used at their buildings



# Interconnection

- Distribution Connection 4160V at substation transformer
- Interconnect Agreement with UMMPA (follows WI Public Service Commission guidelines)



# Where is power used?

- Organic Valley DC center consumes approximately 3/4 output of one turbine (this is soon to be more when new building is finished)
- Remainder is “backfed” to the 69kV transmission system
- Owner’s pay the local utility to access transmission through transformer

# Turbine Choice

- Project wanted turbines on OV owned property, only two locations possible.
- Large turbines desired for maximum yield from two locations
- No height limits so 2.5MW turbines on 100m towers are possible.
- GL already had established Clipper relationship for their GL Wind project
- Had tried to buy from other suppliers but they did not support small projects

# Turbine Supply Agreement

- Clipper is willing to support small project with two turbines
- Some delays due to new owner
- Includes standard warranties\*, on-site O&M garage and offices w/spare parts
- Longer warranty terms to reduce risk for small project owner
- 100m steel towers, a first for Clipper

\*small projects often cannot obtain



# Balance of Plant- EPC Agreement

- Release request for bids to pre-qualified contractors
- Choose most competitive bid
- Limited Notice to Proceed
- Negotiate EPC agreement -no turbine
- “share the risk” in crane costs and wind delays

# Financing

- The easy part because each entity can balance sheet finance, and later get low interest loan
- no need for expensive construction financing
- US Treasury grant simplifies tax treatment
- GL Envision LLC is set up by Gundersen to be a for-profit entity to own generation and use depreciation benefits

# Project Costs- Overview

Cost Category	Amount
Development	
Engineering	
Interconnect	
Balance of Plant	
Turbines	
Total	Approx. \$10 million dollars

# Construction

- Foundations and cabling installed in Fall
- Turbine erection starts March 30, 2012
- Spring road restrictions not an issue
- Two weeks per turbine from delivery
- Clipper turbines require more time on ground to assemble
- COD May 31 2012

700 Cubic  
yards concrete  
in each  
foundation!



# Publicity



- 2012 Public Ribbon Cutting Ceremony

# Operations

- Turbines require scheduled maintenance every 6 months
- Unscheduled outages 1-3 times per month
- First couple years performance on target
- Monitor and control remotely 24/7

# Contact Information

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