

Cashton Greens Wind Farm LLC,
Innovative partnership for financing and ownership
of a 5 MW community wind project

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Wind Energy Systems Engineering

AWEA
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Gundersen
Lutheran®



Wes Slaymaker P.E

Project Engineer



2000



2007



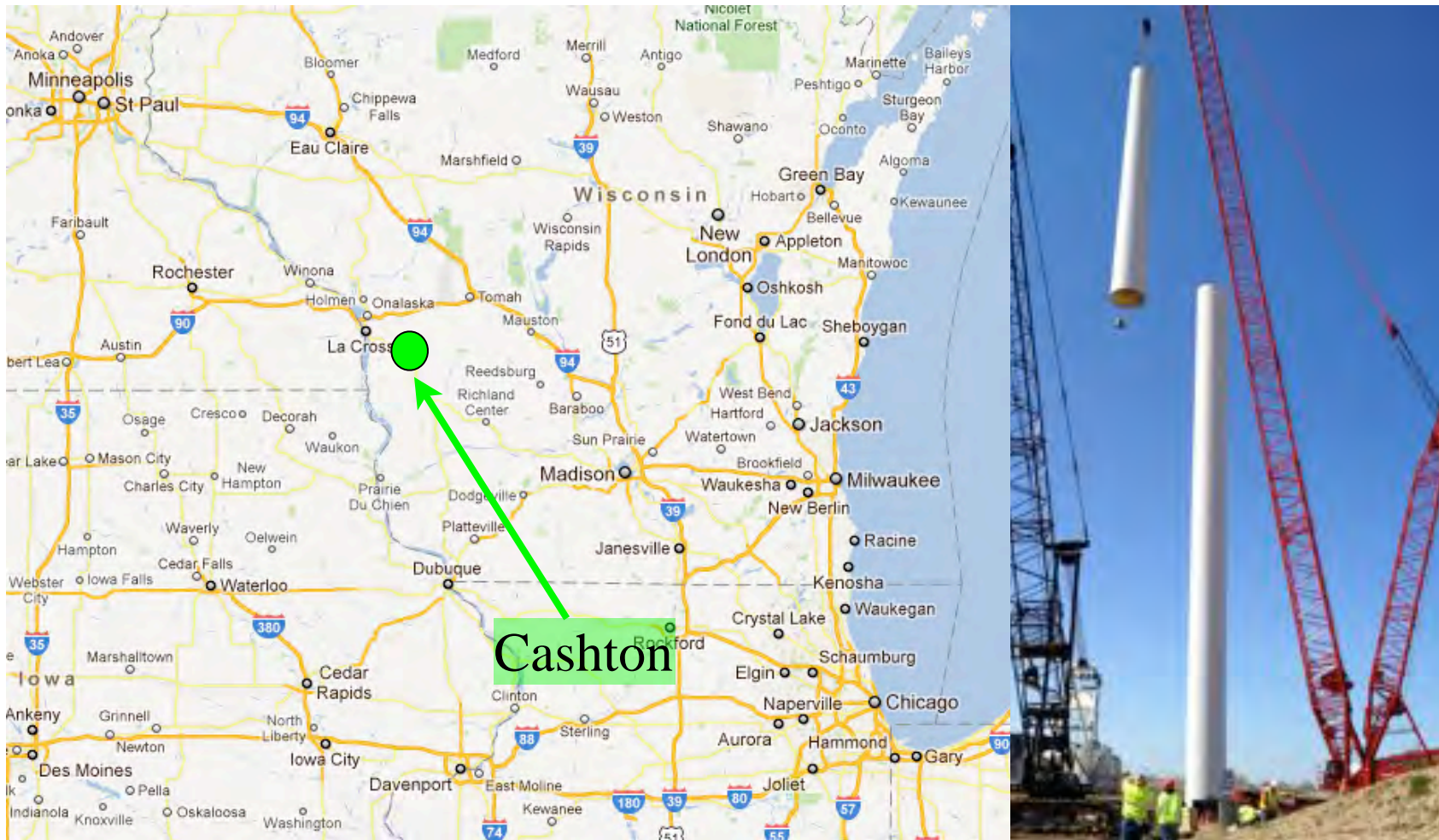
- Have worked for 12 years in wind business in the Midwest developing wind projects from 0.1 to 300MW
- Specializing in Community Wind projects and distributed generation

Outline of talk

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

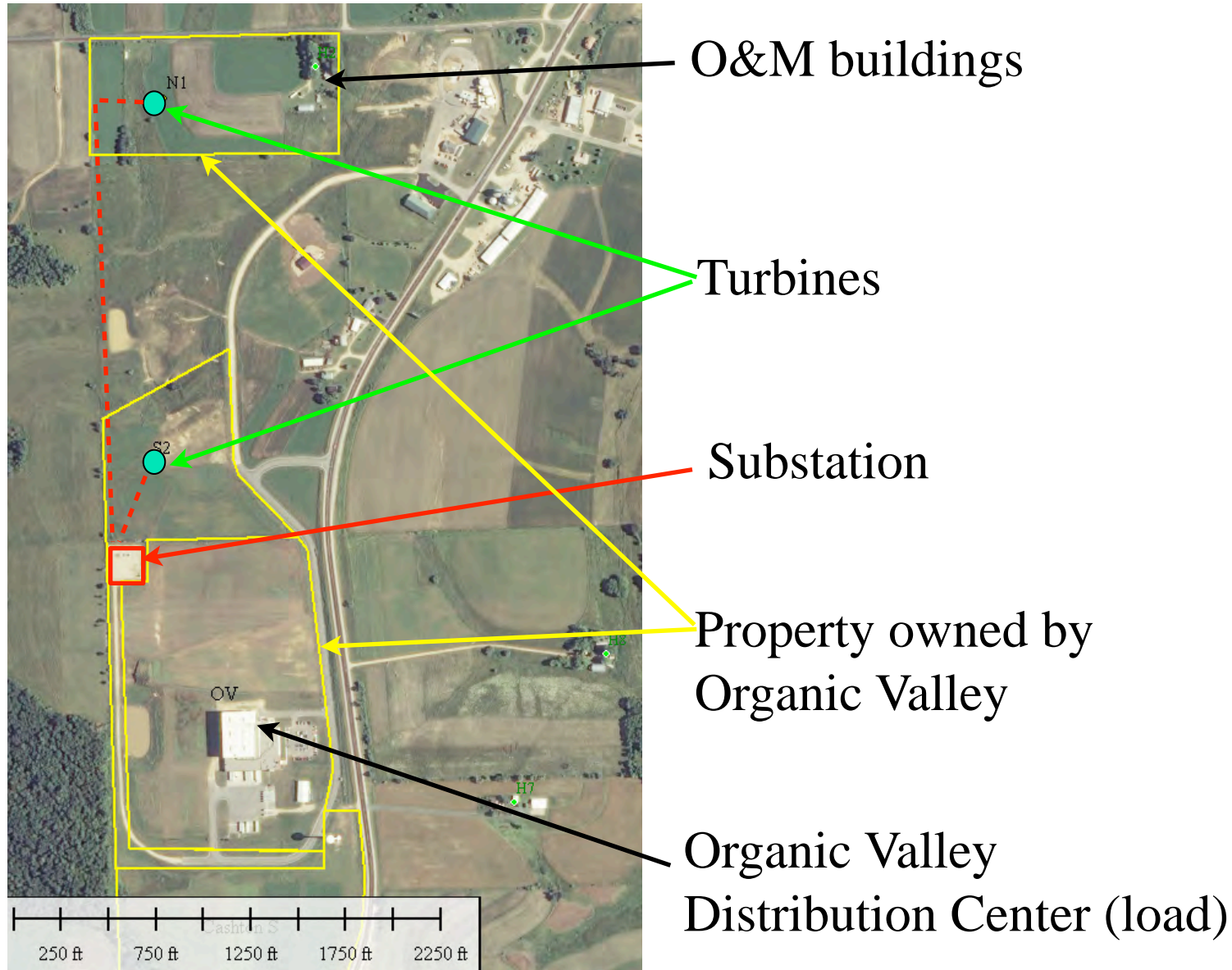
- Feasibility study
- Grants
- Permitting- lots of meetings and tours
- PPA- negotiate innovative structure
- Financing
- Construction

Project Overview-Where is it?



Two large turbines- distribution connected at business park

Project Overview- Site Plan



Project Ownership

- 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, nearby on radio tower, 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

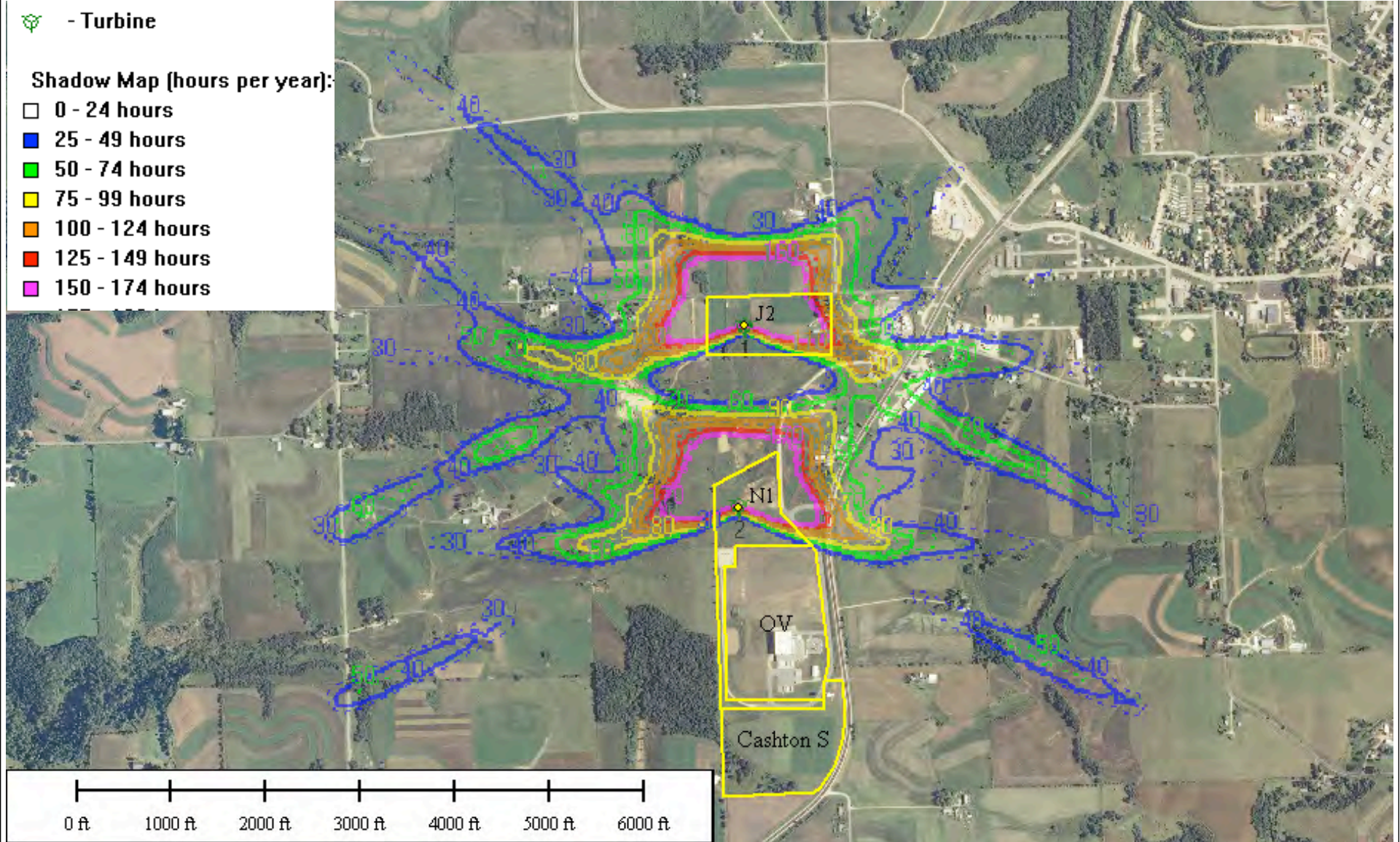
- Community meetings- Village Hall
- Organic Valley employee meetings
- Project Committee tour nearby wind projects
- Address concerns:
 - Sound
 - Stray Voltage
 - Shadow Flicker

Shadow Flicker

 - Turbine

Shadow Map (hours per year):

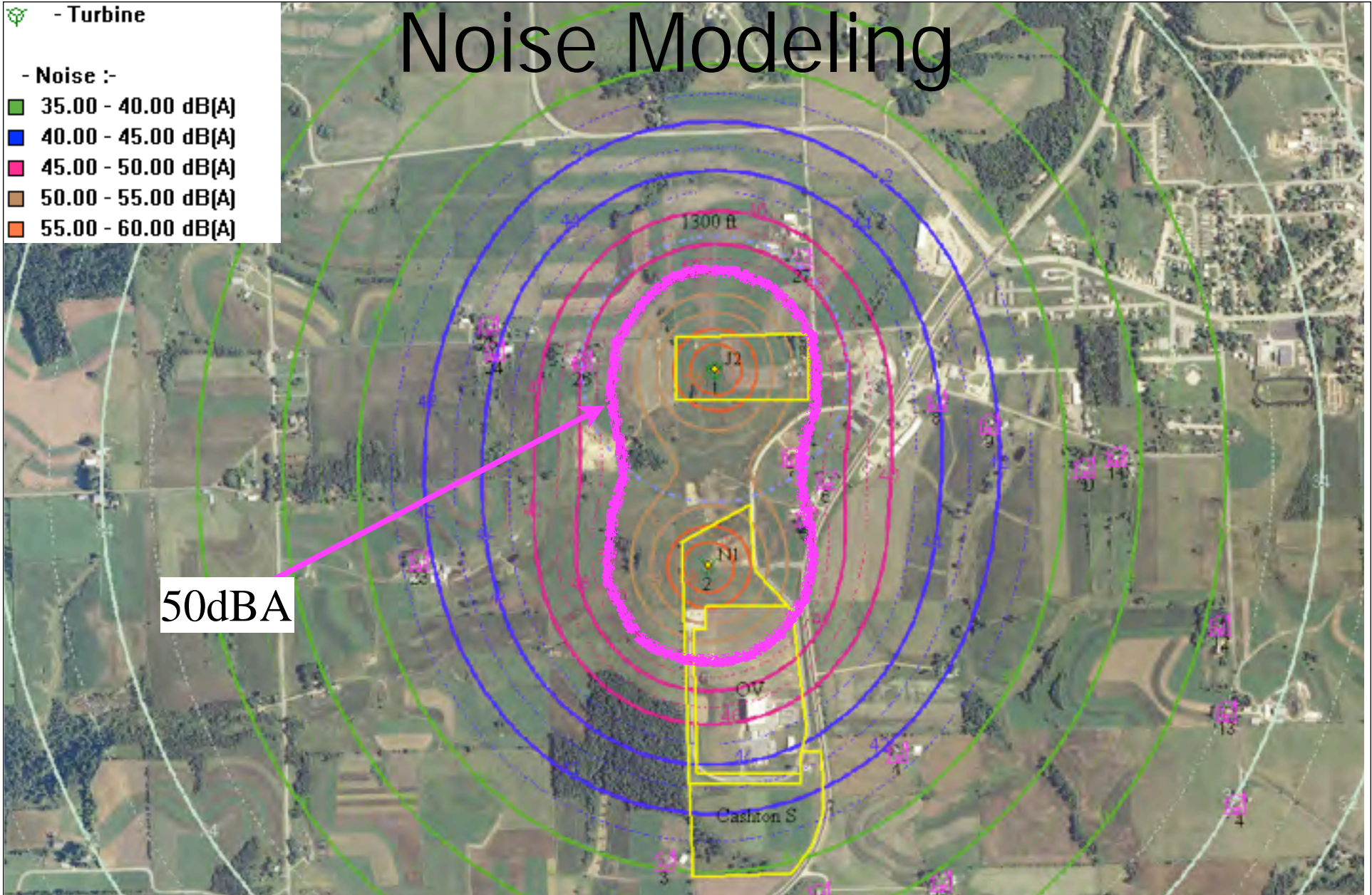
-  0 - 24 hours
-  25 - 49 hours
-  50 - 74 hours
-  75 - 99 hours
-  100 - 124 hours
-  125 - 149 hours
-  150 - 174 hours



2 Turbines- Shadow flicker 100m tower

Noise Modeling

- Turbine
- 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)



Calculate noise isolines, stay below 50dB(A) at residences

PhotoSimulations



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)



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

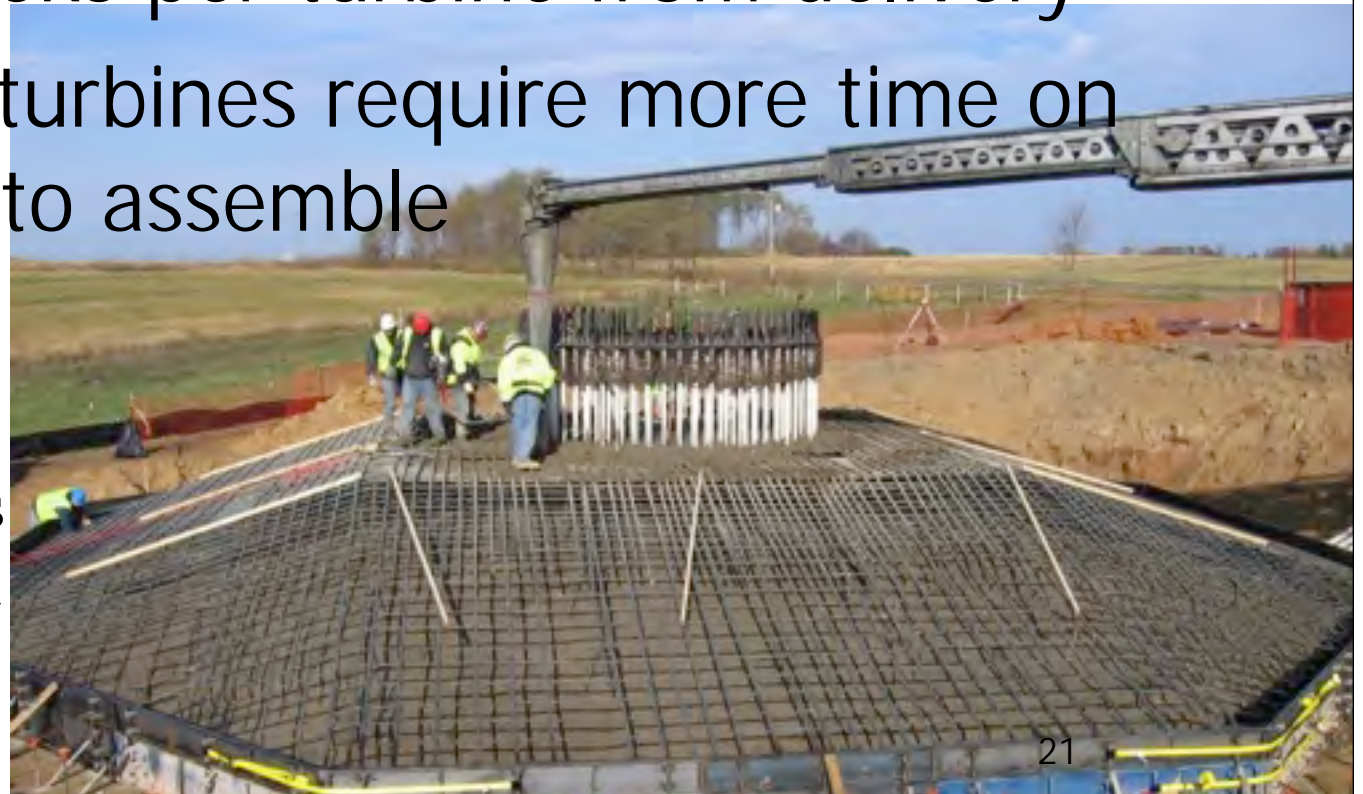
Project Costs- Overview

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
- Spring road restrictions not an issue
- Two weeks per turbine from delivery
- Clipper turbines require more time on ground to assemble

700 Cubic yards
concrete in each
foundation!



Contact Information

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