Cashton Greens Wind Farm LLC
The First Community Wind Project in WI: an Innovative Public/Private Partnership

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Project Engineer

- 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

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

Turbine

Room tower
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

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Development</td>
<td></td>
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<tr>
<td>Engineering</td>
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<tr>
<td>Interconnect</td>
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<td>Balance of Plant</td>
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<td>Turbines</td>
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<td><strong>Total</strong></td>
<td><strong>Approx. $10 million dollars</strong></td>
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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
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