Community Wind:
Studies Show Multiple Benefits to Rural Communities and Public at Large

April 11, 2011
Welcome!

Introductions and Objectives

Ernie Shea
25x’25 Project Coordinator
Webinar objectives:

- Discuss ways to develop community wind despite potentially higher costs and limited policy support
- Get in-depth presentations on the findings of two recent studies concerning the financing of community wind projects
- Learn about new policy initiatives by 25x’25 and wind power allies
- Learn about the latest wind power politics
Session Leaders

- **Ernie Shea**, 25x’25 project coordinator
- **Mark Bolinger**, Lawrence Berkeley National Lab
- **Eric Lantz**, National Renewable Energy Lab
- **Peggy Beltrone**, 25x’25
- **Lloyd Ritter**, 25x’25
Webinar Procedures

- Lines will be muted during presentations to minimize background noise
- For presenters and Q&A, un-mute by pressing *6
- Will take questions at the end of the presentations
- To ask a question, either press *6 to un-mute or use the comment feature to submit a written question
Mark Bolinger

Lawrence Berkeley National Laboratory
Community Wind:
Capitalizing on the (Temporary!) Value Provided by the Recovery Act

Mark Bolinger
Lawrence Berkeley National Laboratory

25x’25 Webinar, April 11, 2011
1) What is community wind? Reasonable people can (and do) disagree on how to define it.

2) For the purposes of this presentation, I will define community wind by the process of elimination:

A community wind project is any project using utility-scale wind turbines (i.e., >100 kW) that is:

- Not owned by an investor-owned utility (IOU)
- Not owned by a publicly-owned utility (POU)
- Not owned exclusively by an independent power producer (IPP)*

*The IPP test sometimes requires a judgment call, particular for 3rd-party-owned projects interconnected on the customer side of the meter
New Community Wind Projects in 2010
20 projects totaling 91 MW in 12 states

<table>
<thead>
<tr>
<th>State</th>
<th>Project Name</th>
<th>Capacity (MW)</th>
<th>Notable Financing Aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>Teichert Aggregates</td>
<td>1.50</td>
<td>3rd-party owned with site host PPA</td>
</tr>
<tr>
<td>CO</td>
<td>Pueblo Towers (Vestas factory)</td>
<td>1.80</td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>University of Delaware</td>
<td>2.00</td>
<td>Public-Private Partnership with turbine supplier</td>
</tr>
<tr>
<td>MA</td>
<td>Berkshire East Ski Area</td>
<td>0.90</td>
<td></td>
</tr>
<tr>
<td>MA</td>
<td>Falmouth Notus</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td>MA</td>
<td>Falmouth Wastewater</td>
<td>1.65</td>
<td></td>
</tr>
<tr>
<td>OH</td>
<td>Conneaut Middle School</td>
<td>0.60</td>
<td>3rd-party owned with site host PPA</td>
</tr>
<tr>
<td>OH</td>
<td>Conneaut Waste Water Treatment</td>
<td>0.40</td>
<td>3rd-party owned with site host PPA</td>
</tr>
<tr>
<td>OH</td>
<td>Ohio Northern University</td>
<td>1.20</td>
<td>3rd-party owned with site host PPA</td>
</tr>
<tr>
<td>AK</td>
<td>Delta Junction</td>
<td>0.90</td>
<td>USDA grant &amp; loan, state production tax credit</td>
</tr>
<tr>
<td>IA</td>
<td>Bulldog</td>
<td>1.50</td>
<td>USDA grant &amp; loan, state production tax credit</td>
</tr>
<tr>
<td>IA</td>
<td>Wolverine</td>
<td>1.50</td>
<td>USDA grant &amp; loan, state production tax credit</td>
</tr>
<tr>
<td>IN</td>
<td>Randolph Eastern Schools</td>
<td>1.00</td>
<td>Public-Private Partnership with developer</td>
</tr>
<tr>
<td>IN</td>
<td>Union City</td>
<td>1.00</td>
<td>Public-Private Partnership with developer</td>
</tr>
<tr>
<td>KS</td>
<td>Greensburg</td>
<td>12.50</td>
<td>Up-front, lump-sum sale of RECs</td>
</tr>
<tr>
<td>MN</td>
<td>Grant County</td>
<td>20.00</td>
<td>Construction financing from turbine supplier</td>
</tr>
<tr>
<td>MN</td>
<td>Ridgewind</td>
<td>25.30</td>
<td>First sale/leaseback of a wind project</td>
</tr>
<tr>
<td>MN</td>
<td>Woodstock Municipal</td>
<td>0.75</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>PaTu Wind Farm</td>
<td>9.00</td>
<td>State investment tax credit and loan program</td>
</tr>
<tr>
<td>WA</td>
<td>Coastal Energy Project</td>
<td>6.00</td>
<td>New Markets Tax Credits, inverted lease</td>
</tr>
</tbody>
</table>

Total 2010 Community Wind Capacity: 91.15 MW
Community wind’s low market penetration in the US is partly policy-related: most individuals can’t use the tax benefits
Prior to the Recovery Act of 2009: Federal Wind Incentives Were Tax-Based

1) **Production Tax Credit (“PTC”):**
   - $/MWh income tax credit in place during first 10 years of project’s life
   - Inflation-adjusted value of $22/MWh in 2011
   - For a “typical” community wind project with an installed cost of $2500/kW and a 30% capacity factor, the present value of the PTC amounts to 15% of total project costs (at a 10% nominal discount rate)

2) **Accelerated Tax Depreciation:**
   - Up to ~95% of total installed costs can be depreciated using a 5-year schedule (creates net operating losses in early years of project)
   - Present value of depreciation deductions equals 25.7% of installed project costs (only 6.8% of which is due to acceleration)

\[ PV \ (PTC \ + \ \text{depreciation}) = \sim 41\% \ of \ installed \ project \ costs \]

(but this assumes efficient use of tax benefits!)
After the Recovery Act of 2009: Cash Is King

- **February 2009:** Among many other things, the *American Recovery and Reinvestment Act of 2009* allows wind projects to **temporarily** choose between the PTC, a 30% investment tax credit ("ITC"), or a 30% cash grant.

- The cash grant is good news for projects that don’t have tax credit appetite (e.g., many community wind projects)...but some tax appetite is still required for efficient use of depreciation deductions.

- The cash grant provides 2 types of measureable benefits:
  1) Direct Benefits (Face Value)
  2) Indirect Benefits (Ancillary Value)
At Face Value, the 30% ITC and Grant Are Obviously Good For Community Wind

Relative to the PTC (which is production-based), the ITC/grant (which are investment-based) provide more value to projects that cost more and/or generate less.

Analysis blindly assumes a 33% capacity factor for all 2010 community wind projects. In reality, capacity factor will vary by project, but in no case is it likely to venture outside of "the green zone."
# The 30% ITC and Cash Grant Also Provide Indirect or Ancillary Benefits

<table>
<thead>
<tr>
<th><strong>Alternative Minimum Tax (AMT)</strong></th>
<th><strong>PTC</strong></th>
<th><strong>30% ITC</strong></th>
<th><strong>30% Cash Grant</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>The PTC is exempt from the AMT for just the first 4 (of 10) years</td>
<td>The 30% ITC is fully exempt from the AMT; The AMT is not applicable to 30% cash grant</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Haircut for Government Grants</strong></td>
<td>The PTC is reduced by gov’t grants applied to capital costs</td>
<td>The 30% ITC/Grant is reduced only by gov’t grants that are not taxed as income (use of grant does not matter)</td>
<td></td>
</tr>
<tr>
<td><strong>Haircut for Subsidized Financing</strong></td>
<td>The PTC is reduced by gov’t-subsidized low-interest loans</td>
<td>The Recovery Act eliminated this haircut for the 30% ITC/Grant (but not for the PTC)</td>
<td></td>
</tr>
<tr>
<td><strong>Owner/Operator Requirement</strong></td>
<td>The owner must also operate the project to qualify</td>
<td>No such requirement – enables leasing</td>
<td></td>
</tr>
<tr>
<td><strong>Power Sale Requirement</strong></td>
<td>Power must be sold to an unrelated person to qualify</td>
<td>No power sales requirement for the ITC/Grant (this benefits behind-the-meter projects)</td>
<td></td>
</tr>
<tr>
<td><strong>Performance Risk</strong></td>
<td>Underperformance reduces both cash revenue and PTCs</td>
<td>Underperformance only reduces cash revenue (does not impact the 30% ITC/Grant)</td>
<td></td>
</tr>
<tr>
<td><strong>Passive Credit/Loss Limitations</strong></td>
<td>Individuals who are passive investors can only apply the PTC and ITC (and losses) against passive income</td>
<td>30% cash grant not subject to passive credit limitations</td>
<td></td>
</tr>
<tr>
<td><strong>Securities Regulation</strong></td>
<td>PTC and ITC do not provide cash with which to capitalize the project (i.e., do not reduce # of shares)</td>
<td>Grant may reduce number of investors/shares needed</td>
<td></td>
</tr>
</tbody>
</table>

The value of some of these ancillary benefits is explored in a January 2010 report titled “Revealing the Hidden Value that the Federal Investment Tax Credit and Treasury Cash Grant Provide to Community Wind Projects” (http://eetd.lbl.gov/EA/EMP/reports/lbnl-2909e.pdf)
Ridgewind Power Partners, LLC

First Sale/Leaseback of a Wind Project

Project Overview:

• 25.3 MW (11 x 2.3 MW Siemens turbines) in SW Minnesota
• Developed and constructed by Project Resources Corporation (PRC)
• Power and RECs to be sold to Xcel Energy for 20 years
• Achieved commercial operations in December 2010

Financing Overview:

• Union Bank provided $51 million in construction financing, to be repaid by the sale of the capital assets to a Union Bank affiliate (the lessor)
• Ridgewind Power Partners, LLC (the lessee) will lease the assets back, and operate and manage the overall project
• 20-year single-investor lease:
  – Lessor gets 30% cash grant, depreciation deductions, and lease payments
  – Lessee gets cash revenue net of operating costs and lease payments
Ridgewind Power Partners, LLC

First Sale/Leaseback of a Wind Project

• Using just one entity – Union Bank – for both construction and permanent financing simplified the financing process (and eliminated the potential for inter-creditor issues)

• Year-to-year variability of wind is often cited as a barrier to lease financing, but with the 30% cash grant, the risk is similar to that of project-level debt
  – Both involve fixed payments that are independent of how well project performs
  – 30% cash grant reduces capital needs and performance risk relative to PTC

• Turbine choice is important – sale/leaseback might not have been possible with unproven, or even second-tier, turbines

• PRC’s use of an experienced financial consultant helped to “get its foot in the door” at Union Bank

• Now that the project is operational, PRC is implementing its Minnesota Windshare program to expand community participation and benefits (this approach eliminates development and construction risk)
South Dakota Wind Partners, LLC

Intrastate Offering of Debt and Equity

Project Overview:

• 10.5 MW (7 x 1.5 MW GE turbines) project, piggybacking on Basin Electric Power Cooperative’s adjacent 151.5 MW “PrairieWinds SD1” project

• Basin developed, constructed and will operate both projects (all 162 MW) and will also buy the power from SDWP’s 10.5 MW

• SDWP pays Basin 6.48% (=10.5/162) of total construction and operating costs (but power sale is from 7 specific turbines)

• SDWP’s 6.48% portion of overall project cost ~$23.5 million

• SDWP initially formed by 4 organizations to enable their members (and other SD residents) to directly invest in wind power
  – East River Electric Power Cooperative initiated and championed the project
  – Joined by SD Corn Utilization Council, SD Farmers Union, SD Farm Bureau
South Dakota Wind Partners, LLC

Intrastate Offering of Debt and Equity

• 3 share classes offer varying combinations of equity and 6.5-year note:

<table>
<thead>
<tr>
<th>Investment Option</th>
<th>Minimum Investment</th>
<th>Equity Portion (and # of shares)</th>
<th>6.5-Year Note Portion (and interest rate)</th>
<th>Total Amount Raised (and time to raise)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A</td>
<td>$15,000</td>
<td>$750 (1 share)</td>
<td>$14,250 (7.00%)</td>
<td>$7 million (2 weeks)</td>
</tr>
<tr>
<td>Class B</td>
<td>$15,000</td>
<td>$1,500 (2 shares)</td>
<td>$13,500 (6.75%)</td>
<td>$4.5 million (4 weeks)</td>
</tr>
<tr>
<td>Class C</td>
<td>$15,000</td>
<td>$14,250 (19 shares)</td>
<td>$750 (5.50%)</td>
<td>$5.3 million (8 weeks)</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>$5.8 million</strong></td>
<td></td>
<td><strong>$11 million</strong></td>
<td><strong>$16.8 million in ~8 weeks</strong></td>
</tr>
</tbody>
</table>

• Intrastate offering raised $16.8 million from >600 investors in 8 weeks; the remainder (~$6.7 million) came from the Section 1603 30% cash grant

• At 6.5 years, mutual buyout option (either party can trigger) at formula-based price – likely to be exercised

• 30% cash grant is critical to success (reduces need for tax appetite)

• Novel way for distribution cooperatives to facilitate member investment in wind power without confronting “all requirements” issues
Conclusions

1) This is the most favorable (federal) policy environment for community wind ever – but will it last?

2) 2011 likely to be a good year for community wind: already ~75 MW built or under construction; more likely

3) Still, community wind likely to remain a small segment of the U.S. wind market in the near term...though its small size belies its importance to the overall market:
   - **As a test bed for financial innovation:** flips, sale/leasebacks, intrastate offerings, NMTCs
   - **As a local economic development engine:** greater local benefits increase public support for wind
For More Information

Community Wind: Once Again Pushing the Envelope of Project Finance
http://eetd.lbl.gov/EA/EMP/reports/lbnl-4193e.pdf

Revealing the Hidden Value that the Federal Investment Tax Credit and Treasury Cash Grant Provide to Community Wind Projects
http://eetd.lbl.gov/EA/EMP/reports/lbnl-2909e.pdf

PTC, ITC, or Cash Grant? An Analysis of the Choice Facing Renewable Power Projects in the United States
http://eetd.lbl.gov/EA/EMP/reports/lbnl-1642e.pdf

Contact info: MABolinger@lbl.gov, 603-795-4937

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Eric Lantz

National Renewable Energy Laboratory
The Economic Development Impacts of Community Wind

25X25 Community Wind Webinar

Eric Lantz
National Renewable Energy Laboratory

April 11, 2010

Hull, MA
Presentation Overview

Basic Questions:

1. How do we measure economic development from Community Wind Projects?

2. What are the economic development impacts from Community Wind projects?

3. How do community wind projects measure up to absentee-owned wind projects?

4. How might AWEA’s recent community wind policy definitions affect economic impacts?

Spirit Lake Community Schools (IA)
Quantifying community wind’s value

MEASURING ECONOMIC DEVELOPMENT IMPACTS
The JEDI Analysis Tools

Currently public
- Utility-Scale Wind
- Natural Gas
- Coal
- Geothermal
- Ethanol
- Solar (CSP, PV)

In process
- Transmission
- Water
- Biopower
- Offshore, small wind

JEDI is used by industry, government, academics, advocates, consultants, and others.

Jobs and Economic Development Impacts (JEDI) Model
Jobs and economic activity estimates are based on county, state, or regional multipliers; multipliers are grounded in empirical demand and the resulting economic activity for a specific year.
Project Development & Onsite Labor

Sample Jobs:
- Truck drivers
- Crane operators
- Earth moving
- Cement pouring
- Management Support
Local Revenues, Equipment, & Supply Chain

Steel mill jobs, parts, services - equipment manufacturing and sales - blade and tower manufacturers

Property taxes - Financing, banking, accounting
Induced Economic Activity

Money spent on local goods and services from increased revenue: *sandwich shops, child care, grocery stores, clothing, other retail, public transit, new cars, restaurants, medical services*
JEDI Caveats

• Results are an estimate, not a precise forecast

• Results are not a measure of project profitability or viability

• Results report *gross jobs* as opposed to *net jobs*
  
  *They do not consider whether a specific project displaces development elsewhere nor do they account for potential changes in electricity rates*

• Assumptions around local sourcing and procurement are fundamental in determining local economic activity

• Jobs are reported as Full-Time Equivalent (FTE) jobs (i.e., 2,080 hour units)

• *JEDI* relies on a simplified cash flow analysis (i.e., only considers initial investment and Rate of Return)
Quantifying community wind’s value

HIGHLIGHTING PAST WORK
Most projects rely on a higher number of workers for a shorter period.
• Operations period impacts are bolstered when a project is financed entirely with local resources.

• From statewide economic development perspective, the local investment share (i.e. % local equity) is more important than the individual investor ROI.
$1.5 million to $10 million in construction related economic activity was generated by these projects

$250k to $1 million in economic activity continues to be generated annually by these projects
Comparing Results with Other Retrospective Analysis

• Ratio of Construction Period Impacts  2.3 – 3.1 : 1
• Ratio of Operations Period Impacts  1.5 – 1.8 : 1
• Based on this sample the average is weighted towards Flip type projects
Quantifying community wind’s value

PRELIMINARY RECENT UPDATES
Construction Period Impacts: Under AWEA’s new policy position (20 MW)

- Absentee projects show relatively high variability in terms of use of local, goods and services during construction, the two absentee scenarios shown here reflect a reasonable range
  - $6 million to $15 million in state & local construction period economic activity
  - 57 to 130 Full time equivalent, short-term construction jobs ($2 million to $6 million in state and local wage earning)
Operations Period Impacts: Under AWEA’s new policy position (20 MW)

- $0.5 million to $1.4 million in state & local economic activity annually
- 4 to 11 Long-term jobs ($150k to $450k in annual state & local wage earning)
Comparing Operations Period Impacts Across Multiple Studies

Note: Values shown here represent the ratio of community wind to a hypothetical “average” absentee wind project. The ratio of impacts is interpreted as the value shown to one (e.g., 2.8 : 1).

Year listed is year of study publication.
Interpreting the Results

UNDERSTANDING WHY RESULTS VARY
Explaining variability in economic development impacts

Size and cost of the project
- Higher costs often results in increased impact for both construction and O&M

Size and diversity of the local economy
- Level of analysis
- Multiplier effect

Developer preferences
- Goods and services

Magnitude and allocation of project revenues
Explaining variability in impacts from community wind projects

- Analyses for community wind projects are often conducted at different levels (e.g., county vs. state).
  - Generally, it is best not to compare analyses conducted at different levels

- Even community wind developers have different preferences in regards to local labor resources

- Individual labor pools may vary widely

- Differing ownership structures result in significantly different distributions of project revenues

- Variable estimates of projected revenues and expected return on investment

- Changing project costs (construction and O&M)
Conclusions

• Community wind projects typically offer more local economic development per MW

• Without a significant local ownership component, additional economic development impacts from community wind may only be incremental

• Primary community wind economic development drivers:
  • Use of local labor, goods and services (construction period)
  • Local equity/ownership share (operations period)

• With a strong local ownership component, evidence consistently suggests community wind:
  • Construction period impacts are up to 3 times that of absentee projects
  • Operations period impacts are up to 3 times that of absentee projects
Thank You

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http://www.windpoweringamerica.gov/

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25x’25 Policy Efforts

Peggy Beltrone

25x’25
25x’25 Policy Efforts to Spur Locally Owned and Consumed Wind Power

Community Wind Initiative
1. Enhanced technical assistance to communities
2. Competitive, pre-development grants
3. Study of national electrical distribution network

Disappointing progress on CWI

New initiative with broader goals and partners
The Policy Front

Lloyd Ritter
25x’25
- Community Wind Initiative (CWI) for DOE

- Sec. 48 Investment Tax Credit
  - AWEA CWWG rallying behind proposal to expand existing investment tax credit for small wind, solar and geothermal energy to include community wind projects of 20mw or less
  - 25x25 discussed this with AWEA last year, and now it is gaining traction
Treasury grant program

- highly successful for community wind but its continuation in jeopardy.
- Initially enacted in ARRA 2009, extended for 1 year in late 2010

REAP program

- DWEA pressing to streamline the program, including
  - a radically simplified application process
  - other changes to improve effectiveness
- REAP rule due out this week
  - several positive changes to be made but more needed to meet partners’ goals
  - next up is public comment, Farm Bill re-write
Community and Distributed Wind Power Roundtable

- sponsored by 25x’25 at USDA next month
- will include federal agency personnel, ag group leaders, and wind industry reps.
- invite only, small group setting to further dialogue on these important issues

Energy bills in progress; unclear at this juncture what happens the remainder of the year
25x'25
AMERICA'S ENERGY FUTURE

www.25x25.org