

Co-op Financing for Wind Projects

WPA/UWIG/NWPPA
Utility Workshop

Kevin Rackstraw

April 23, 2001



Cooperative Finance for Wind: Purpose

- NREL wanted to look at the competitiveness of wind projects developed using financing terms available to cooperatives, compare to IPPs
- Worked with PERI to construct a model to allow us to vary assumptions about size, project cost, tax, returns, wind regime and their impact on cost of energy

Cooperative Finance for Wind: Project Summary

- **Project Sizes:** 2 MW, 10 MW, 50 MW
- **Wind Regimes:** Class 4 and Class 6
(~27% and ~37% capacity factors)
- **Ownership:** Distrib. Coop. (tax exempt) vs. IPP
- **Tax Credits or Incentives:** With and without the REPI (for cooperative case) and the PTC
- **Figures of Merit:** Cost of Energy (COE), levelized
Current, Constant and First-Year
Also: Internal Rate of Return (IRR)
Payback

Cooperative Finance for Wind: Inputs and Assumptions

- Costs include:
 - Plant and equipment
 - Construction interest
 - Financial and legal fees
 - Land costs
 - 6 month debt service reserve
 - Debt Service Coverage: 1.25 (co-op); 1.4 (IPP)
- Assumptions
 - Inflation: 3% on O&M and insurance
 - Price escalation: 1% (co-op); 2.5% (IPP)
 - Project life: 30 years

Cooperative Finance for Wind: Summary of Analysis

1. Cooperatives have a substantial financing advantage over IPPs
 - 30-year debt, low rates
 - 6.8% in this analysis
 - Assumed 28 year debt, 30 year project life for this analysis
 - Debt up to 85% of project cost
 - 80% assumed in this analysis, higher than most IPPs can do
 - Co-op required equity ROR half or less of IPPs
 - Assumed 8% minimum (worst case)
 - IPP assumption 17% minimum
 - Assumes that cooperatives can achieve installed costs equal to or at worst within ~10% of IPPs
 - The largest developers and projects (100 MW+) may beat this due to experience, buying power, other economies of scale

Cooperative Finance for Wind: Summary of Analysis

2. Bigger is better
 - Larger projects (50 MW in this analysis) produce far lower COEs than smaller projects (2 MW and 10 MW here)
3. Economies of scale fairly flat at smaller size range
 - Very small projects (2 MW) can be competitive with moderate-size projects (10 MW) if development is well managed
4. Buying power from a larger (ie, 50 MW) IPP project may mean a lower COE than building a 2 or 10 MW project itself
 - Availability of energy purchase from a larger IPP may be limited

Cooperative Finance for Wind: Qualifications

- Does not consider relative risks of IPP vs co-op option
- Assumes minimal interconnection costs for all projects
 - Could have a higher relative effect on smaller projects
- Does not consider firming costs, requirements
- Assumes cooperative meets 85/15 requirement
 - ie, no more than 15% can be “export” energy beyond own needs
- COEs need to be presented in context (state assump.)
- Does not compare to largest IPP projects (100s of MW)
- Treats REPI and PTC as equally likely
 - Does not account for uncertainty of REPI
 - IPP cases assume extension of PTC

Cooperative Finance for Wind: Results

- Lowest COEs were achieved by cooperative in every case where equal treatment was accorded REPI/PTC
 - ie, either both had REPI or PTC or neither did
- Lowest COEs were for 50 MW project with REPI/PTC
- Only cases where IPP had lower COE:
 - IPP 50 MW project had PTC and Co-op 50 MW had no REPI
 - IPP project had Class 6 wind vs. Co-op Class 4 wind
- Lowest COE for 2 MW within \$.007/kWh of 10 MW
- NOTE: Large IPP projects (100+ MW) are coming in substantially under our calculated costs

Cooperative Finance for Wind: Results (current levelized only)

SUMMARY RESULTS: Cooperative Wind Financial Analysis

Project Owner, Size	Co-op 2 MW				Co-op 10 MW		Co-op 50 MW		IPP 50 MW	
\$/kW Assumption	\$1600		\$1250		\$1200		\$950		\$950	
Wind Class	4	6	4	6	4	6	4	6	4	6
COE w/out REPI/PTC Current Levelized \$/kWh	.0986	.0714	.0824	.0595	.0716	.0524	.055	.0405	.0728	.0542
Approximate COE w/ REPI/PTC Current Levelized \$/kWh	.0898	.0626	.0736	.0507	.0628	.0436	.0462	.0317	.0608	.0422
IRR, No REPI/PTC	8.85%	9%	9.62%	9.62%	8.67%	8.77%	8.77%	8.71%	20.06%	20.38%
IRR w/ REPI/PTC	16.57%	19.79%	19.77%	23.58%	19.61%	23.68%	22.98%	27.63%	25.11%	29.14%

Project Owner, Size	IPP 50 MW	
\$/kW Assumption	\$850	
Wind Class	4	6
COE w/out REPI/PTC Current Levelized \$/kWh	.0655	.0495
Calculated COE w/ REPI/PTC Current Levelized \$/kWh	.0535	.0375

Cooperative Finance for Wind: GRAPHS (Placeholder)

- Color graphs will be presented at the 4/24 meeting
 - Current and Constant Levelized COEs
 - First-Year COEs