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Renewable Energy RFPs: Solicitation Response and Wind Contract Prices

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Memorandum

TO: Illinois Renewable Energy Policy Stakeholders
FROM: Ryan Wiser and Mark Bolinger, Lawrence Berkeley National Laboratory
SUBJECT: Renewable Energy RFPs: Solicitation Response and Wind Contract Prices

Introduction

As input into renewable energy policy discussions in Illinois, we have been asked to provide information on the results of recent, competitive solicitations for renewable energy, with a focus on wind power. In particular, this memorandum includes two pieces of information:

1. Publicly available data on the strength of response to recent renewable energy solicitations; and
2. Wind power purchase costs as revealed through actual power purchase agreements with electric utilities.

Solicitation Response

A growing number of electric utilities have issued solicitations for renewable energy. These solicitations have most often been motivated by state renewables portfolio standards, or by the fundamentally attractive economics of wind power in some regions.

These solicitations are virtually always structured as RFPs for long-term (10+ year) power purchase agreements. A variety of considerations are used in selecting winning bidders, including power sales price, contract term, credit quality and assurance, likelihood of project completion, etc.

It is not uncommon for utilities to obtain bid responses from a large number of renewable energy project developers, representing a large amount of renewable energy capacity (especially wind). Though detailed information on bid prices are not publicly available, Berkeley Lab has compiled information on the degree of response to a number of recent renewable energy solicitations in the

Western United States, and to three solicitations in the Midwest (Xcel, Great River Energy, and MG&E/WPPI). The table below shows the results of this data collection effort.

Utility	Renewable Energy or All-Source RFP?	Bid Response	Capacity Response
Xcel (MN)	All-Source	n/a	3,700 MW wind
Great River Energy	RE	62 offers; 25 bidders (56 wind; 6 other RE)	n/a
MG&E/WPPI	RE	16 offers; 11 bidders	n/a
PacifiCorp	RE	56 offers; 42 bidders	6,000 MW of RE, 85% wind, 15% geothermal/hydro
Portland General Electric	All-Source	n/a	2,600 MW of wind; 550 MW of biomass; 165 MW of geothermal
Puget Sound Energy	RE & All-Source	n/a	1,800 MW of wind
Xcel/PSCo	RE	17 offers; 12 bidders	2,000 MW of wind
NorthWestern	RE	23 offers; 15 bidders	1,650 MW of wind
NCPA (CA)	RE	66 offers	1,900 MW of RE
SCAPPA (CA)	RE	44 offers	2,110 MW of RE
SMUD	RE	58 offers	1,940 MW of RE
SCE	RE	53 offers; 37 bidders	5,300 MW of RE
Nevada Power/Sierra Pacific	RE	25 non-solar offers; 14 solar offers	Over 1,000 MW of RE
Avista	RE	10 offers; 8 bidders	n/a
LADWP	RE	40 offers	n/a

Though not shown in the table, the amount of bid response typically far exceeds the utility's needs, sometimes by an order of magnitude. SCE, for example, has contracted with less than 500 MW of projects, compared to bid response of 5300 MW. PacifiCorp was seeking 1100 MW of renewable energy contracts, and received a 6000 MW response. PSCo sought 500 MW, and received 2000 MW of response. Moreover, the three data points from the Midwest (Xcel, Great River Energy, MG&E/WPPI) show that response in the Midwest is as strong, or even stronger, than in the West, perhaps because robust wind resources are more widely available in the Midwest than in much of the West. To be sure, some of the projects that are bid are of low quality, but these results clearly demonstrate that the near-term supply curve for renewable energy is sufficiently deep to meet utility requirements.

Wind Power Contract Costs

Renewable energy contract costs are not widely available. However, based on industry knowledge and limited data release, a general sense for recent renewable energy contracts costs in markets with renewables portfolio standards that have generated a number of long-term renewable energy contracts is provided below (note that these contracts include electricity and renewable energy credits - RECs):

- **Texas:** 2-3.5 ¢/kWh (for wind)
- **California:** 4.5-6.0 ¢/kWh (for wind, geothermal, biomass)
- **Nevada:** 4-5.5 ¢/kWh (wind and geothermal)
- **Minnesota:** 2.5-3.5 ¢/kWh (for wind)
- **New Mexico:** 2.5-3 ¢/kWh (for wind)

In addition, Berkeley Lab has compiled actual power sales/purchase agreements for 39 wind power projects, totaling 2800 MW of capacity. Contract prices represent the cost paid by electric utilities for wind power (and in most cases, associated RECs), under long-term contract. Most contracts have been signed as a result of competitive solicitations, though some derive from bilateral negotiation between wind developers and electric utilities. The projects represented in our sample have commercial on-line dates of September 1998 through December 2005, and account for over 60% of all wind projects installed during the last 6 years.

Power purchase agreement terms range from 10 to 33 years, expected wind project capacity factors range from 23% to 44%, and project size ranges from 9 MW to 297 MW. Contract prices, in levelized nominal dollars, range from a low of 1.88 ¢/kWh to a high of 8.9 ¢/kWh. The average levelized nominal contract price is 3.7 ¢/kWh (in real 2003\$, the average levelized contract price is 3.25 ¢/kWh). The figure below shows nominal levelized contract prices in relationship to expected capacity factor.

This contract sample includes two wind projects in Minnesota, five in Iowa, and two in Wisconsin. In aggregate, these projects total 600 MW, with project sizes ranging from 9 MW to 113 MW. Contract costs range from a low of 2.5 ¢/kWh to a high of 8.9 ¢/kWh. The Minnesota projects, installed in 1998 and 1999, have contract costs in the low 3 ¢/kWh range. The Iowa projects, installed from 1999 to 2002, have contract costs as low as 2.5 ¢/kWh for the most recent project, and as high as 5.2 ¢/kWh for an older project. The two Wisconsin projects show the highest contract costs, of 5.9 – 8.9 ¢/kWh, well above the average for the other projects included in our dataset and not representative of current contract costs. Illinois' Mendota Hills wind project, meanwhile, is claimed to be selling its power to ComEd under ComEd's Rate Rider 4, which lists prices that range from 2.88 ¢/kWh during the non-summer, off-peak period, to 5.7 ¢/kWh during the summer peak.

Though prices have, in general, tended to decline somewhat over the last six years, steel prices and turbine supply shortages are increasing costs in 2005, and this situation is expected to continue into 2006. As a result, prices for 2005-2006 projects may be somewhat higher than those represented in our contract sample.