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Berkeley Lab and the Clean Energy Group

CASE STUDIES OF STATE SUPPORT FOR RENEWABLE ENERGY

An Open-Ended Renewables RFP in Minnesota Funds Biomass and Innovative Wind Applications

Ryan Wisner, Berkeley Lab

CASE SUMMARY

Case Description

Xcel's Renewable Development Fund (RDF) in Minnesota announced the results of its first solicitation in early 2002. With over \$9 million to spend on "commercial" projects, the solicitation sought grant requests from a variety of renewable technologies.

Innovative Features

The outcome of this solicitation in terms of megawatt-hours of renewable energy *actually* delivered will remain unclear for some time. Nonetheless, several interesting features of the solicitation bear mention:

- the solicitation was open and relatively unstructured in an attempt to attract a wide variety of creative and effective project proposals;
- the program administrator specifically gave weight to biomass proposals and innovative, smaller-scale wind applications that might otherwise not compete with larger-scale projects;

- the Fund developed an explicit method to compare the cost-effectiveness of proposals that were received; and
- the Fund selected projects that were deemed to have a reasonable chance of obtaining a long-term power purchase agreement from the local utility to improve chances for project completion.

Results

- The RDF received 28 proposals for commercial projects. The Board ultimately selected 8 projects – three biomass, one hydro, two solar, and two wind. If these projects come to fruition, the total funding of \$9.8 million could result in 12 MW of new renewables capacity.
- This is a reasonably high level of funding per MW installed. But it must also be remembered that RDF focused on smaller-scale, innovative projects to ensure a large number of winning bidders and a mix of renewable technologies. The program, for example, has

funded several biomass digestion projects, a school-based wind project, and a

“cooperative” wind project.

CASE STUDY DETAILS

The Xcel Fund

The Xcel Renewable Development Fund (RDF) will grow by approximately \$9 million per year. The RDF was created from a nuclear waste disposal settlement, and is administered by the Renewable Development Board (which consists of two representatives of Xcel Energy and two representatives from the environmental community).

An Open-Ended Solicitation

On July 16, 2001, Xcel issued its first solicitation for renewable energy grant proposals – future solicitations may use non-grant funding mechanisms. “Grant” contracts may have terms of up to 10 years, allowing both production incentives and traditional up-front grants to qualify. The timeline for the solicitation called for proposals to be submitted by August 20, 2001 and for signed grant contracts to be filed with the Commission by December 21, 2001.

Proposals could fall into one of three categories: (A) commercial technology (minimum of 60% of funds), (B) experimental technology (maximum of 20% of funds), and (C) research and development (maximum of 20% of funds). Because most states plan to primarily target commercially available technologies, we focus on Minnesota’s Category A results in this case study.

Category A proposals (i.e., commercial technology) were to be new projects or refurbished existing projects, and eligible technologies included wind, solar, and certain types of hydro and biomass. The solicitation was open to all of these technologies because the RDF wanted to avoid pre-determined technology favoritism and sought a broad range of proposals from which to choose. Projects that would be used to meet Xcel’s renewable energy mandate were not eligible for funds under the solicitation.

Evaluation Criteria

Evaluation criteria of Category A proposals fell into four categories: (1) project approach and work plan, (2) project team, (3) economic development impact, and (4) cost-effectiveness. Each proposal was quantitatively scored based on these criteria, with cost-effectiveness being given the highest weight. The Renewable Development Board evaluated, scored, and selected winning proposals, for ultimate approval by the PUC. The Board sought to fund a minimum of 4 projects under Category A and also wanted to fund a diverse mix of renewable resources. Therefore, quantitative scores were not the sole metrics of final project selection. Instead, each proposal was evaluated relative to a “peer group” of other proposals with similar project size and technology type.

The Cost Effectiveness Criterion

The Board recognized that it was important to apply a cost-effectiveness test that was appropriate for the wide range of projects likely to be proposed in terms of size, technology type, and application (electricity used on site versus sold to the grid). The Board initially decided to calculate the amount of renewable energy generated over a 15-year period per dollar of RDF funding. The Board also explored the application of “utility cost ratio”, “total resource cost”, and “ratepayer impact measure” tests. The Board ultimately used the ratepayer impact test as the measure of cost effectiveness (it deserves note that the results from this test were found to not differ substantially from the initially-proposed test). The ratepayer impact test is calculated by dividing Xcel’s avoided energy cost (derived from the amount of energy proposed to be delivered by the applicant and appropriate on-peak and off-peak avoided cost estimates) by the sum of RDF funds requested, expected utility energy payments to the applicant (e.g., under a power purchase agreement), and utility lost revenue (if self generation is

involved). A 15-year present-value estimate was then calculated. Results of this test were given strong weight in the scoring process within each project size and type category.

Treatment of PPAs and Grid Sales

As described in other innovative practice cases, a proper linkage between fund solicitations and long-term power purchase agreements (PPA) is often crucial to success. The Board made clear that its decision to fund a project would not bind Xcel Energy to purchase the electricity from the project under a long term PPA. However, in evaluating proposals, the Board considered the likelihood of each proposal's success in obtaining a PPA.

Each contractor was required to provide an estimate for the annual price schedule it would need for up to a 15-year PPA. For those projects that would need a PPA, the Board used a screening criterion of whether the proposed price schedule would possibly be accepted by Xcel – the Board included two Xcel employees, facilitating the screening process and potentially improving the prospects of ultimately obtaining PPAs. While this allowed some consideration of the PPA in project selection, there remains a significant concern that some (perhaps many) of the funded projects will be unable to obtain a favorable PPA and therefore will be unable to move towards completion. To minimize the risk of wasted funds, projects that rely on a PPA will only receive their RDF funds once the PPA has been negotiated with Xcel and approved by the Minnesota PUC.

Solicitation Results

The RDF received 28 proposals in Category A. After considering the evaluation criteria, the Board selected 8 projects: three biomass, one hydro, two solar, and two wind projects. If these projects come to fruition, the total funding of \$9.8 million could result in 12 MW of new renewables capacity in the state. Though this is a reasonably high level of funding per MW installed, it must be remembered that RDF focused on smaller-scale projects to ensure a large number of winning bidders; RDF was also not willing to

fund projects that would be used to meet the Xcel renewables mandate.

Each selected project is briefly described below. “5-year incentive equivalent” data are calculated by spreading the RDF funding request over 5 years of expected electricity production (as provided by the fund administrator), ignoring discounting.

- **Greden Dairy & Crop Farm** is a 90-cow dairy farm. The project involves anaerobic digestion of manure waste. The project will have a capacity of 100 kW, with about 325,000 Btu of excess heat that will be used on site. Excess energy will be sold to Xcel at a net metering rate, or used on site to operate a soybean processing facility. The contract award is for \$80,000. (5-year incentive equivalent = 1.6 cents/kWh).
- **Minnesota Corn Processors** had planned to install a 580 kW reciprocating engine to utilize methane that is currently being flared from its processing facility, with electricity used on site. The contractor was to develop a report that could be used to show other industrial process facilities how to implement similar projects. The contract award was for \$400,000, but the contractor subsequently declined the award. (5-year incentive equivalent = 1.7 cents/kWh).
- **AnAerobics** owns and operates a treatment system for a canned vegetable processor. Using a “first-of-its-kind” technology, AnAerobics will simultaneously convert both solid and liquid waste from the processing plant into methane gas and carbon dioxide. 1.7 MW of electricity will be generated, and sold to either Alliant or Xcel. The contract award is for \$1,300,000. (5-year incentive equivalent = 1.8 cents/kWh).
- **Crown Hydro** is a 3.2 MW, run-of-river hydro facility located in Minneapolis that anticipates selling its electricity production to Xcel. The contract award is for \$5,100,000. (5-year incentive equivalent = 5.4 cents/kWh).

- **Minnesota Department of Commerce** will administer a 4-year rebate program for grid-connected PV installations of 4 kW and smaller. The rebate amount will be \$2,000/kW, with an aggregate program goal of 400 kW of capacity. The contract award is for \$1,150,000. (5-year incentive equivalent = 48 cents/kWh).
 - **Science Museum of Minnesota** is completing design work on an “environmental experiment center.” The RDF will help fund an 8 kW rooftop solar system. The contract award is for \$100,000. (5-year incentive equivalent = 170 cents/kWh).
 - **Project Resources Corporation**, together with enXco, will construct six 900 kW wind turbines, two each at three separate locations near distribution substations for a total of 5.4 MW. The development will employ the use of prototype turbines, and the development is to incorporate a new investment program where individuals from the community can purchase shares and earn a return from the project without having turbines located on their land. The contract award is for \$900,000. (5-year incentive equivalent = 1 cent/kWh).
 - **Pipestone, Jasper School System** will construct a 900 kW wind turbine on public school property. The school will use 75% of the electricity produced, and will sell the remaining to Sioux Valley Southwestern Electric. The contract award is for \$752,835. (5-year incentive equivalent = 5.8 cents/kWh).
- projects that involve a novel concept, approach, or application may also be given preference. Further clarification will be provided on other technology eligibility guidelines.
- Maximum \$/kW buy-down amounts may be specified, and a maximum funding level for individual projects may be established. These changes are intended to avoid proposal “clutter” and ensure that proposals are consistent with the RDF’s objectives.
 - To minimize PPA-related problems, a clear price signal may be sent by publishing PPA rates for small wind, distributed generation, and net-metered facilities. The RDF may also provide a maximum price range that Xcel Energy would pay under a negotiated PPA.
 - Increased marketing and publicity about the availability of funds under the program to encourage a deeper applicant pool.

Though grant periods for up to 10 years were allowable, the majority of projects requested up-front incentive structures.

Lessons Learned and Next Steps

The Board of the RDF is apparently pleased with the results of the first solicitation. That said, a number of relatively modest changes are being considered to further improve future solicitations. Some of the most relevant possible changes include:

- An even more explicit preference may be given to biomass technologies, while wind

**ORGANIZATION AND
CONTACT INFORMATION**

John Lupo
Xcel Energy
414 Nicollet Mall
Minneapolis, MN 55401-1993
<http://www.xcelenergy.com/EnergyMarkets/EnergyMarketsRFPmain.asp>
john.lupo@xemkt.com
(888) 547-9603

INFORMATION SOURCES

Xcel Renewable Development Fund:
<http://www.xcelenergy.com/EnergyMarkets/EnergyMarketsRFPmain.asp>

Xcel Energy. 2001. "Xcel Energy Renewable Development Fund Project Selection and Funding." Filing to the Minnesota PUC. Docket No. E02/M-00-1583.

Personal communication with: Bill Grant (board member of the Renewable Development Fund) and John Lupo (administrator of the Renewable Development Fund).

ABOUT THIS CASE STUDY SERIES

A number of U.S. states have recently established clean energy funds to support renewable and clean forms of electricity production. This represents a new trend towards aggressive state support for clean energy, but few efforts have been made to report and share the early experiences of these funds.

This paper is part of a series of clean energy fund case studies prepared by Lawrence Berkeley National Laboratory and the Clean Energy Group, under the auspices of the Clean Energy Funds Network. The primary purpose of this case study series is to report on the innovative programs and administrative practices of state (and some international) clean energy funds, to highlight additional sources of information, and to identify contacts. Our hope is that these brief case studies will be useful for clean energy funds and other stakeholders that are interested in learning about the pioneering renewable energy efforts of newly established clean energy funds.

Twenty-one total case studies have now been completed. Additional case studies will be distributed in the future. For copies of all of the case studies, see:

<http://eetd.lbl.gov/ea/ems/cases/> or <http://www.cleanenergyfunds.org/>

ABOUT THE CLEAN ENERGY FUNDS NETWORK

The Clean Energy Funds Network (CEFN) is a foundation-funded, non-profit initiative to support the state clean energy funds. CEFN collects and disseminates information and analysis, conducts original research, and helps to coordinate activities of the state funds. The main purpose of CEFN is to help states increase the quality and quantity of clean energy investments and to expand the clean energy market. The Clean Energy Group manages CEFN, while Berkeley Lab provides CEFN analytic support.

CONTACT THE MANAGERS OF THE CASE STUDY SERIES

Ryan Wisner

Berkeley Lab
1 Cyclotron Rd., MS90-4000
Berkeley, CA 94720
510-486-5474
rhwisner@lbl.gov

Mark Bolinger

Berkeley Lab
1 Cyclotron Rd., MS90-4000
Berkeley, CA 94720
510-495-2881
mabolinger@lbl.gov

Lewis Milford

Clean Energy Group
50 State Street
Montpelier, VT 05602
802-223-2554
lmilford@cleangroup.org

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