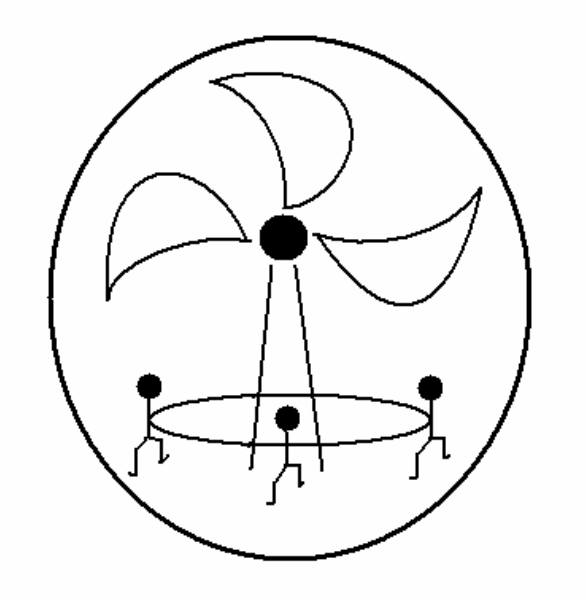
Community Wind Development



Supportive Policies
Public Financial Incentives
Best Management Practices

Environmental Science and Policy Spring Workshop
School of International & Public Affairs
Columbia University
April 2006

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CASE STUDIES, FIGURES, AND TABLES

ACRONYMS

CEG	*Clean Energy Group*
CESA	*Clean Energy States Alliance*
CREBs	*Clean Renewable Energy Bonds*
DOE	*Department of Energy*
DSIRE	*Database of State Incentives for Renewable Energy*
kWh	*kilowatt hour*
LLC	*Limited Liability Corporation*
MW	*Megawatt*
NREL	*National Renewable Energy Laboratory*
NYSERDA	*New York State Energy Research and Development Authority*
PPA	*Power Purchase Agreement*
PTC	*Production Tax Credit*
PURPA	*Public Utilities Regulatory Policies Act*
REC	*Renewable Energy Credit*
REPI	*Renewable Energy Production Incentive*
RPS	*Renewable Portfolio Standard*
USDA	*United States Department of Agriculture*

EXECUTIVE SUMMARY

Clean Energy Group (CEG), a Vermont-based non-profit organization dedicated to the use of renewable energy resources, is exploring the opportunities available for communities to build their own wind power projects.

Community wind projects are locally owned, utility-scale projects connected to the local transmission grid. They generally consist of one or a few turbines clustered in development to reduce land use. Community wind provides consumers concerned with mitigating the environmental impact of their energy use with an option for clean, renewable energy where it is not otherwise provided. It also provides the opportunity to offset energy costs and earn revenue from power sales.

CEG is primarily concerned with developing projects in states participating in the Clean Energy States Alliance (CESA), a CEG-managed consortium of 18 renewable energy development funds in 14 states. CEG is also interested in learning how community wind projects develop in non-member states.

We researched the development of proposed and existing community wind projects in several states. We analyzed the challenges to project development, particularly during project conception and planning. We examined the federal, state, and utility-level policies and financial incentives that can help overcome these challenges. Our most insightful findings came through interviews with community members and successful project managers. Some key findings from our study are:

- Renewable Portfolio Standards have mixed results in encouraging community wind
- Transmission grid interconnection remains a substantial cost to small projects
- Tax incentives and credits are not always effective for community wind
- Creative ownership and financing models are being developed for community wind

Throughout the report, we profile successful projects to illustrate the strategies that project developers have used to initiate and finance community wind projects. By comparing and analyzing effective strategies, we determined the strongest policies, most effective public incentives, and the best practices for community wind project development, including:

- Renewable Portfolio Standards that require small generation projects
- Standards for transmission grid interconnection and net metering
- Expedited permitting and interconnection processes
- Grants, rebates, and production incentives for renewable energy projects
- Outreach programs to educate community members about wind power

Community wind projects offer economic and environmental benefits to their owners, but there are several barriers to financing and constructing projects. We have learned that community wind requires diligence, planning, and effective communication. We hope that this report helps further the understanding of successful strategies.

ACKNOWLEDGEMENTS

This report is the culmination of research by a team of students in Columbia University's School of International and Public Affairs Masters in Public Administration in Environmental Science and Policy program.

We are indebted to the assistance from our Faculty Advisor Tanya Heikkila, as well as the guidance from Clean Energy Group Project Manager Cameron Brooks.

We would also like to thank the project managers, fund managers, and community members who responded to our interview requests and provided helpful information.

Project Manager Sallie Lacy and Deputy Project Manager Robin DeJong managed the research team.

The principal author of this report was Brian Ross, assisted by Editor Sarah Lopas.

The research for this report and some of the writing was completed by the policy analysis team: Debbie Brockett, Kristen Cady-Sawyer, Melissa Dimas, Nupur Hiremath, Sue Kim, Kari Kopko, and Bonnie Stamper.

SECTION I: INTRODUCTION TO THE REPORT

Clean Energy Group and Clean Energy States Alliance

In 2006, the **Clean Energy Group** (CEG) retained graduate students from Columbia University's School of International and Public Affairs to report on the regulatory drivers encouraging community wind project development, and the public financial incentives available for project financiers.

CEG is a non-profit organization with a primary mission of gathering information about renewable energy markets, advocating for the advancement of clean energy technologies, and working with energy partners to develop projects in the US and abroad. CEG manages the **Clean Energy States Alliance** (CESA), a consortium of 18 renewable energy development funds located in 14 states (Fig. 1). CESA member-funds are managed by public commissions, non-profit agencies, and – in one case – by a private utility. The funds distribute monies to renewable energy projects in their respective states, and in aggregate are worth about $3.5 billion.[1]

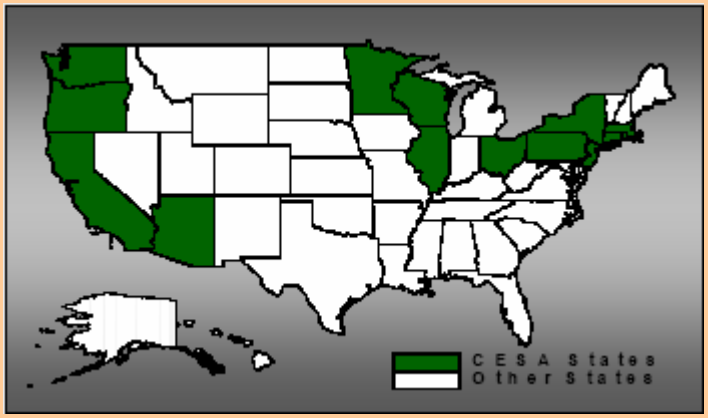

Fig. 1: Clean Energy States Alliance (CESA)

CEG is exploring the potential for locally owned and operated wind-powered electricity production – a concept known as **community wind**. These projects are generally rooted in concern for the environment. Concerns about our nation's reliance on foreign energy sources and global warming were also motivating factors for some communities to develop clean, domestic, and renewable energy resources.[2] Community wind projects can also generate revenue for owners, either through direct electricity sales or savings from offset electricity purchases. Recent market rates for natural gas have increased and fluctuated, making wind energy a cost-effective alternative to the fossil fuel.[3] These reasons make clean, domestic, and renewable energy resources a favorable option for many consumers.

[1] Clean Energy States Alliance. "About CESA." Accessed 4/11/06 at www.cleanenergystates.org/about
[2] Pardonner, Don. Phone Interview 2/23/2006.
[3] Berry, David. (2005) Renewable energy as a natural gas price hedge: the case of wind. *Energy Policy,* 33, 799 – 807.

Community Wind

Being a relatively new phenomenon in this country, community wind projects are defined in varied ways by researchers, but for our purposes we considered four defining characteristics:

● ***Local Ownership.*** Typical owners include local limited liability companies (LLC), municipal electric utilities, rural electric co-operatives, schools and universities, and Native American reservations. At least one consumer of the electricity produced must hold a financial stake in the project, and ideally the project ownership structure will place a principal financial stake in the hands of community members.

● ***Utility Scale Capacity*****.** Project capacity is typically from 1 megawatt (MW) to 20 MW in generating capacity. However, there are projects both smaller and larger than this scale that could be considered community wind. Generally, we assume that utility scale capacity refers to a project's ability to satisfy the majority proportion of its owners electricity demand.

● ***Connected to Electric Grid.*** Grid interconnection provides project owners access to back-up power, which is important considering the intermittent nature of wind resources. Interconnection is also necessary to generate revenue for the project, either through direct electricity sales or by selling excess generation to the utility – a process known as net metering.

● ***Clustered Development.*** Community wind projects usually include few turbines, and those turbines are constructed near each other within relative vicinity of the community. All of the existing projects and most of the planned projects that we observed included one or a few turbines. Some benefits of clustered development include reduced transmission costs, including the need to invest in a large transmission grid and reduced land use that facilitates permitting and zoning procedures.

SECTION I: INTRODUCTION TO THE REPORT

Report Overview

The purpose of this report is to deliver four specific areas of research to the Clean Energy Group (CEG) and the Clean Energy States Alliance (CESA). The research modules were identified as:

- An updated review of existing policy drivers and financial incentives offered by the federal and state governments in CESA member-states.

- An overview of community wind activity in other states and successful financial policy and regulatory drivers in those states.

- Project profiles of community wind projects, either completed or in process.

- A summary of policy recommendations and identified best practices for community wind project development.

We present this information by summarizing the initial stages of a community wind project: Project Conception and Project Planning. We also include brief information about Project Construction and Project Operation. Case studies of completed and planned community wind projects are found throughout the report to illustrate the information in the text. Finally, several appendices included at the end of the report contain some of our supporting data drawn from interviews, professional and academic literature, and internet sources, as well as contact information that will help interested individuals connect with community wind enthusiasts.

Our findings and case studies are products of numerous interviews with community wind project managers, financiers, and interested developers in several states. These interviews focused on project conception, finance, and the future of community wind in the opinion of the interviewee. Each member of our research group focused on one state of interest, and then we compared the activities of each state to identify which policies and practices led to success.

The intended audience for this report is CEG, but as it includes some of the best policies and practices for developing community wind, interested parties should be able to use the information to facilitate project development.

States of Interest

Research for this report focused on activities and projects in states with CESA member-funds. These states are : **Arizona, California, Connecticut, Illinois, Massachusetts, Minnesota, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Washington, and Wisconsin** (Fig.1 and Fig. 2). The member funds in each CESA state play an active role in distributing funding to projects, and several have expressed interest in community wind through the CESA Community Wind Working Group.

Our research omitted four of the fourteen states with CESA member funds: **Arizona, New Jersey, Connecticut, and Rhode Island.** Arizona lacks sufficient wind resources to support project development, and does not appear to have developing wind power projects. Likewise, we found that the remaining three states supported renewable energy development, but they did not have sufficient wind power development or explicit interest in community wind projects to warrant extensive research. It is our hope that community wind enthusiasts in these three states use our research and recommendations to create strategies for implementing community wind projects.

We also profiled states without a CESA participant fund but with a substantial wind industry and possible interest in community wind. Those states of interest are **Montana, Colorado, Iowa, and Texas** (Fig. 2). Several of these states had existing or planned community wind projects.

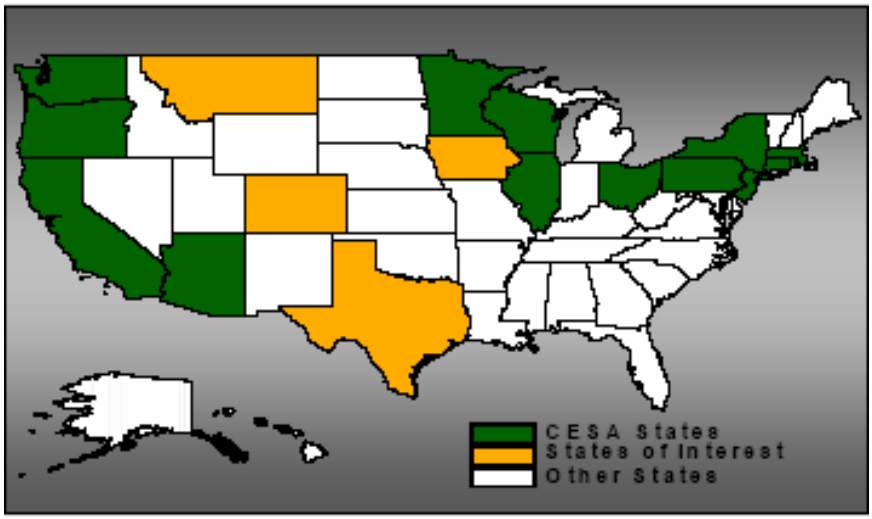

Fig. 2: CESA States and Other States of Interest

Stage I: Project Conception

In the projects we studied, project conception began with one or a few curious citizens pursuing information. Project conception begins with an interested developer noticing a windy day at a high school football game;[4] a community poll indicating support of renewable energy;[5] or construction of a large wind farm project in the area.[6] Before Project Planning begins, project developers must ascertain if community wind is feasible.

This section will identify some of the key information community wind developers must ascertain when determining project feasibility. In general, Project Conception begins with identifying resources, community support, energy needs, and supportive policies.

Access to Wind Resources

Project developers need to first determine if there are sufficient wind resources to support a project. Wind is an intermittent energy source depending on climate and weather factors, so wind-powered energy availability is variable in the US. There are several broad studies of wind patterns in the US, but the one most oft-cited is the Wind Resources Map developed by the Department of Energy National Renewable Energy Laboratory (NREL) (Fig. 3).[7]

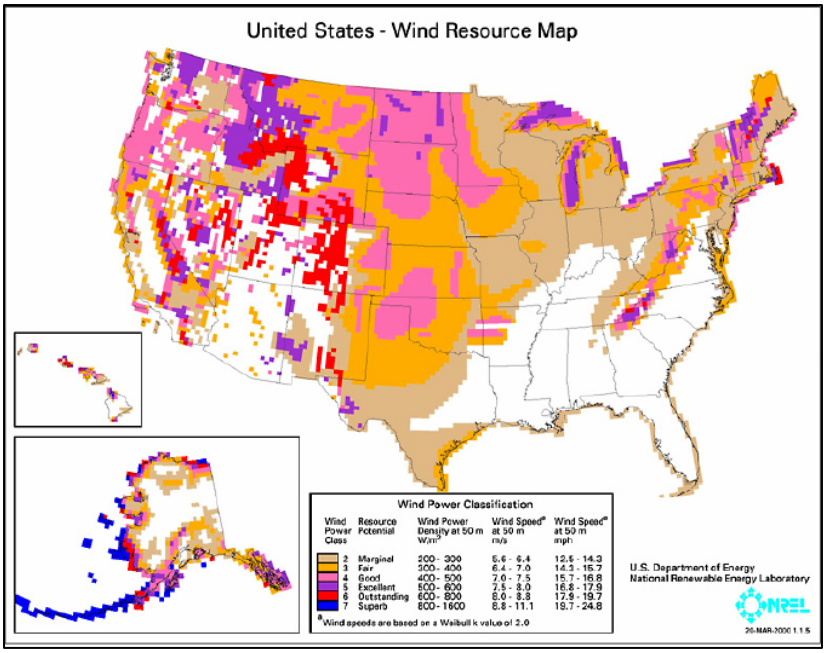

Figure 3: Potential and Installed Wind Capacity in the US.
(Source: Bird et al, 2005)

The NREL map shows that the strongest wind resources in the country are found in the mountain and Pacific Northwest regions. The southeast is devoid of adequate wind power resources, and its heavy forests also block access to wind. Good resources are available in the plains states, where open rural landscapes are ideal for wind power production. Also note on the map that several states have varied wind resources within their borders. Illinois is almost totally devoid of decent resources except for a small pocket in the central region of the state, where two community wind projects succeeded.

[4] Galluzzo, Teresa and David Osterburg; "Wind Power and Iowa Schools." The Iowa Policy Project; March 2006; Accessed online 3/30/2006 www.iowapolicyproject.org/2006docs/060307-WindySchools.pdf
[6] Middleton, Sean. Phone Interview. 3/1/2006.
[6] Rigel, Rick. Phone Interview. 4/14/2006.
[7] Bird, Lori, Mark Bolinger, et. al. (2005). Policies and Market Factors Driving Wind Power Development in the United States. *Energy Policy*, 33, 1397 – 1407.

SECTION II: RESEARCH FINDINGS

State	Potential Wind Capacity (bil kWh)	Installed Wind Capacity (MW)
Ohio	4	7
New Jersey	10	8
Massachusetts	25	1
Washington	33	390
Oregon	43	338
Pennsylvania	45	129
Wisconsin	58	53
California	59	2150
Illinois	61	107
New York	62	186
Minnesota	657	744
Arizona	N/A	0
Connecticut	N/A	0
Rhode Island	N/A	0

Table 1: Potential and Installed Wind Capacity in CESA States. (AWEA, 2006)

David Rusley, P.E., Manager of Engineering Projects, Cedar Falls Utilities:
"Back in 1998, a number of defects were in the design. However, the new larger turbines still are being manufactured with new defects as the envelope is pushed faster than problems can be solved. The important thing is to practically assume that significant major capital maintenance will be required to fix major problems when they occur. If the project financial plan cannot handle such contingencies, you will be in for rough times in the future."

Iowa Wind Distributed Generation Project

At their annual meeting in 1997, the Iowa Association of Municipal Utilities – a coalition of over 100 municipal utilities in the state – chose seven utilities to create the Iowa Wind Distributed Generation Project (IWDGP), a $2.8 million wind project consisting of three turbines with a total project capacity of 2.25 MW.

The benefits of the project would include: offset carbon emissions; green tag sales; electricity production to offset other sources; revenue from the Renewable Energy Production Incentive; and positive public relations. But another major reason to initiate the project was that it already had federal support.

IWDGP served as a research opportunity for the US Department of Energy National Renewable Energy Laboratory (NREL) and the Electric Power Research Institute. NREL wanted a project to test connecting turbines to a 12 kilovolt distribution feeder rather than the usual dedicated express feeders. The project included special settings on voltage regulators to minimize voltage flicker in the event of wind gusts. Researchers at NREL helped project developers secure a grant for 48% of the construction costs – all of which contributed to equipment purchase. The project also receives an annual federal contribution for project data collection, analysis, and report writing.

The Cedar Falls Utilities (CFU) – a group of six sister utilities serving the 350,000 citizens of Cedar Falls, IA – took the lead in project development and construction efforts, and owns a 66% share in the project. "Our motivation was that we anticipated the coming of future mandates for renewable generation," said CFU Manager of Engineering Projects David Rusley, "by being an early adaptor, we availed ourselves of [the cost covered by the 48% DOE/NREL construction assistance]." The three turbines are in the service territory of Algona Municipal Utilities, the project's operating owner.

Garnering Community Support

While the benefits of community wind projects accrue to the community,[8] we found that community resistance to projects can be a barrier to success. Project developers must test the level of support before moving forward with projects. This is not a barrier to eliminate, but rather one to manage: project managers indicated that communities that were educated about the benefits of community wind were most likely to reach consensus in their decision-making process.[9]

Helderberg Wind Forum Educating the Community

Project conception is typically a function of community demand for renewable energy and an individual or small group in the community with insight into community wind. But without community support, community wind enthusiasts will face disinterest or even backlash from colleagues.

The idea behind the Helderberg Wind Forum is that a community informed of the benefits of community wind will support project development. The Forum is the brainchild of Daniel Capuano, Loren Pruskowski, Alexander Gordon, and Kathleen Moore, four residents of Albany County, NY. In 2005, the Forum received grant funding from the New York State Energy Research and Development Authority to complete preliminary feasibility studies and a business prospectus to secure project financing. Now the Forum holds public events to test public reaction to their project proposal and build support.

The Forum held six public events in the past year. Events include public discussions, field trips to existing turbines, and launching a community focus group to address community concerns. For example, at their January 22, 2006, meeting, community residents were allowed to comment on several project sites. The Forum found that residents were wary of removing trees at several sites and of the possible noise pollution resulting from a turbine. Through this feedback, the Forum learns what confusion surrounding wind projects needs explanation and can anticipate resistance before moving forward with a project site.

Loren Pruskowski , Sustainable Energy Development, Inc., Helderberg Wind Forum:
"[Sometimes] you're in the supermarket and hear someone talking about wind energy, maybe there will be another person there shopping who can disseminate information. People talk and we want to arm them with the correct facts."

Right: Helderberg Wind Forum Tours the Fenner Wind Farm (Source: http://www.helderbergwind.org/photos/w08.JPG)

[8] Bolinger, Mark. (2001). Community Wind Ownership Structures in Europe and their Relevance to the United States. Lawrence Berkely National Laboratory. Accessed 4/11/06 at http://eetd.lbl.gov/EA/EMS/reports/48357.pdf
[9] LaMoreaux, Dennis. Phone Interview. 3/14/2006.

Generally, the strongest support we found for community wind came from communities concerned with mitigating the environmental, economic, and energy security impacts of their energy use. In addition, community members may favor community wind projects because a small cluster of turbines minimizes the typical complaints of large wind farm projects: it is comparatively easier to site few turbines out of the way of bird migration routes; fewer turbines produce less noise pollution; and fewer turbines have less prominence on the landscape. Our interviewees noted that community ownership invests a sense of pride, rather than disdain, in turbines.

Of course, there are also economic opportunities that draw community support. Self-production of electricity allows for consumers to avoid purchasing energy at utility rates; land developers can sell or lease project sites to project developers; and ancillary businesses such as maintenance and operations firms may build in areas with several community wind projects. Economic benefits are an incentive for rural projects, which can commoditize wind power to compliment farm income.[10]

Identifying a Customer for Power

Even when the community supports a project, there must be some use for the generated power. Some projects that we studied provide power for direct consumption by owners, either to power a building or group of facilities. For example, the Palmdale Water District project in California produces enough energy to offset $100,000 in annual energy costs, reducing annual energy bills to $37,000.[11] In such cases, the project developers must measure average and peak amounts of electricity demand in order to ensure that the energy savings will justify the project.

In other cases, community wind projects generate power for commercial sale. In this case, project developers must identify a customer for the electricity. Project owners must sign a **power purchase agreement** (PPA) with this consumer, locking up sales for a pre-determined period of time. Several of our interviewees indicated that the PPA is essential to project success. An assured stream of income for the project provides revenue to pay off the project costs and security to use as leverage in obtaining a loan.[12]

Some states have PPA regulations that are favorable to community wind. Minnesota's largest utility, Xcel Energy, is under agreement with the state to purchase 1,125 MW of wind power, with at least 100 MW coming from wind projects 2 MW or smaller in size.[13] In 2006, Oregon is expected to pass changes to its eligibility requirements under the federal **Public Utilities Regulatory Policies Act** (PURPA), increasing Oregon's **Qualifying Facilities** project capacity minimum to 10 MW.[14] Basically, this means that power providers will have to access more small generation projects to fulfill renewable electricity purchase mandates required by PURPA; two proposed community wind projects in the state plan to meet the 10 MW capacity.[15]

[10] Bolin, Keith. Phone Interview. 2/28/2006.
[11] LaMoreaux, Dennis. Phone Interview. 3/14/2006.
[12] Environmental Law and Policy Center. "Community Wind Financing." March 24, 2005. Accessed 4/11/06 at http://://www.elpc.org/documents/WindHandbook2004.pdf
[13] Minnesota House of Representatives. "H.F. No. 9, 2nd Engrossment – 2003 1st Special Session." Accessed 4/8/06 at http://www.revisor.leg.state.mn.us/bin/bldbill.php?bill=H0009.2.html&session_year=2003&session_number=1
[14] Thamert, Jermey. Phone Interview. 3/23/2006.
[15] Ibid.

Using Supportive Policies

Once project developers are convinced that there are sufficient resources, support, and demand for the community wind project, it is important to identify the relevant public policies that may support project implementation. Such policies may provide additional incentives to pursue project development.

Renewable Portfolio Standards

Renewable portfolio standards (RPS) are state policies mandating electricity providers to include renewable energy sources in their fuel mix, almost always including wind power as an eligible source. RPS requires that energy providers offer a certain percentage or MW capacity of their power from eligible renewable sources.[16]

Generally, RPS are written and enforced by state legislators or public utilities commissions. In 2004, Colorado passed the only RPS supported through public referendum.[17]

Each state determines its RPS percentage and sets a target year in which to achieve the total mandate, with percentage requirements increasing incrementally each year; current state RPS requirements in CESA states are summarized in Table 2.

State	RPS Target %	RPS Target Year
Pennsylvania	18%	2010
Arizona	1.1%	2007
New Jersey	4%	2008
Massachusetts	4%	2009
California	20%	2010
Connecticut	10%	2010
Minnesota	10%	2015
New York	25%	2013
Illinois	8%	2013
Wisconsin	2.2%	2011
Rhode Island	16%	2020
Ohio	N/A	N/A
Washington	N/A	N/A
Oregon	N/A	N/A

Table 2: CESA State RPS Targets
(Source: DSIRE, www.dsireusa.org)

Some RPS policies distinguish between existing and new capacity. Texas implemented an RPS that specifically requires 2,000 MW of renewable energy from new projects; adding to its existing 880 MW of renewable energy capacity.[18] RPS that target new generation are more effective in encouraging investment in new projects than those that allow power providers to draw from existing sources. However, most wind investment in Texas is in new large-scale wind power projects rather than community wind.[19] Massachusetts' RPS policy also requires new capacity as a condition of eligibility, and the community wind project in Hull, MA, was listed as a qualified facility in 2004.[20]

[16] Bird, Lori, Mark Bolinger, et al. (2005). Policies and market factors driving wind power development in the United States. *Energy Policy*, 33, 1397 – 1407.
[17] State of Colorado Public Utilities Commission. "COPUC Implementation of the Renewable Energy Standard of 37." Accessed 4/10/06 at http://www.dora.state.co.us/puc/rulemaking/Amendment37.htm.
[18] Langniss, Ole and Ryan Wiser (2003). The renewable portfolio standard in Texas: an early assessment. *Energy Policy*, 31, 527 – 535.
[19] Ibid.
[20] Commonwealth of Massachusetts. Office of Consumer Affairs and Business Regulation. Division of Energy Resources. "Renewable Portfolio Standard: Annual RPS Compliance Report for 2004." Jan. 9, 2006. Accessed 4/13/06 at http://www.mass.gov/doer/rps/rps-2004annual-rpt.pdf.

Some interviewees expressed that the RPS is the most significant policy driver encouraging renewable energy development,[21] and in turn development of community wind projects. However, RPS are not guarantees that there will be a customer available for community wind power. These policies vary by state and their specific language can control which technologies are successfully adopted:

- **Pennsylvania** has a seemingly aggressive "alternative energy portfolio", however eligible alternative sources include many technologies that are substantially cheaper than wind energy.[22]

- **Arizona's** Environmental Portfolio Standards requires 60% of the 1% mandated renewable energy generation come from solar energy;[23] however, it should be noted that the Arizona standard is under review and may be changed in the summer of 2006.[24]

- **Illinois'** Renewable Portfolio Goal mandates that 75% of the state's renewable energy come from wind power.[25]

In addition, most RPS do not include specific provisions for small generation projects, which would encourage investment in community wind.[26] Some notable exceptions include:

- **Minnesota** Governor Tim Pawlenty recently announced that the state would pursue 800 MW of community based energy development by 2010. Xcel Energy followed the announcement by pledging accelerated development of their planned 500 MW of wind capacity in the state.[27]

- **Washington** is currently debating an RPS that would include a specific requirement to obtain power from distributed generation projects up to 5 MW in capacity.[28]

[21] Miller, Ed. Phone Interview. 3/1/2006.
[22] General Assembly of Pennsylvania. "Senate Bill No. 1020." Accessed 4/08/06 at http://www.legis.state.pa.us/WU01/LI/BI/BT/2003/0/SB1030P1973.HTM
[23] Arizona Corporation Commission. "Environmental Portfolio Standards Developments." Accessed 4/10/06 at http://www.cc.state.az.us/utility/electric/environmental.htm.
[24] Arizona Corporation Commission Utilities Division Staff. Docket No. RE-00000C-05-0030, Decision No. 68566. Accessed 4/10/06 at http://www.cc.state.az.us/utility/electric/RES-03-14-06.pdf
[25] "Illinois Sustainable Energy Plan." Accessed 4/17/06 at http://icc.state.il.us/docs/en/050217ecGovEnergy2.pdf.
[26] Woodin, Paul. Phone Interview. 3/31/2006.
[27] Office of Governor Tim Pawlenty and Lt. Governor Carol Molnau. "Community Based Energy Development Grows in Minnesota: Excel Energy to Add 500 MW by 2010." March 28, 2006. Accessed 4/17/2006 at http://www.governor.state.mn.us/Tpaw_View_Article.asp?artid=1794
[28] Grove, Jennifer. Phone interview. 3/1/2006.

Interconnection and Net Metering

At Project Conception, developers decide to either sell the power generated by a community wind project or use that power to avoid electricity purchases. The revenue or savings help pay for the project and justify the decision to build. In either case, the project must connect to an existing transmission grid. Some projects own their own electric grid, while others must negotiate the terms of interconnection with a transmission utility.

Interconnection allows projects to both accept electricity from and emit generation to the local electric utility. This provides a reliable backup power supply and the potential for projects to sell any excess generation from the project. Grid interconnection is not an easy task, and utilities have several technical and safety concerns about connecting to energy generation projects:[29]

● Carrying capacity of the electric grid;

● Safety concerns such as reliable power switches;

● Logistical concerns like scheduling transmission time.

This study did not examine the validity of or solutions to these barriers, but we suggest that further research into these and other interconnection concerns may alleviate the stipulations on projects imposed by utilities.

Bureau Valley School Electricity Savings

Bureau Valley High School, located in Manlius, IL, owns and operates a single 660 kW Vestas turbine that directly provides the school's electricity. The school wanted to reduce electricity costs rather than cutting educational programs as a way to save money, and School Board Vice President Keith Bolin began looking into wind energy as a solution in 2000.

The school district received its first grant of $20,000 in July 2002 from CESA member fund Illinois Clean Energy Community Foundation (ILCECF) for a feasibility study. The study indicated that community wind was a viable option, so the school district applied for and received a $331,678 grant from ILCECF for construction in 2003; a $150,000 grant from the Illinois Department of Commerce and Economic Opportunity; and a $2,500 grant from the Illinois Environmental Protection Agency for installation in 2005. They supplemented grant funding with a low-interest loan of $450,000 from Union Bank using tax free bonds.

The total project cost came to $1.03 million, about $30,000-50,000 more than originally budgeted mainly due to $70,000 of legal fees and $20,000 of excess interconnection costs. According to Bolin, the difference was covered by the school's Operations and Maintenance Fund.

The turbine came online in early 2005, and the school receives its electricity behind the meter to offset the current load. Excess power is sold to the local utility Illinois Power at $0.03/kWh. The turbine fully powers the school when it generates at maximum capacity and Bolin estimates it can save the school district about $100,000 per year in energy costs. Several school districts in the area are looking into wind power as an energy option, using Bureau Valley High School as an example.

Right: Completed Bureau Valley School Project
(Source: http://www.bhsroe.k12.il.us/bureauvalley/bvhs/windturbine.htm)

[29] Federal Energy Regulatory Commission. "Assessing the State of Wind Energy in Wholesale Electricity Markets." November 2004.

A common concern among the community wind project developers we interviewed is the exhaustive and expensive reports that utilities demand before allowing interconnection. While these reports ensure that the connection is safe and regulated, they can be a significant cost for community wind projects. One project manager said that utilities often changed their requirements for interconnection reports, requiring additional research at extra cost before connecting to the community wind project.[30]

Some states and utilities do have interconnection standards that clearly outline the requirements of the project reports and streamline the process. In most cases, these standards are outlined either for large scale wind projects or for projects smaller than utility scale (Fig. 6). But there are examples of interconnection standards for community wind sized projects:

- **Wisconsin** has uniform interconnection standards for the entire state that only vary with regard to the size of the project.[31]
- **California** requires utilities to provide interconnection standards for projects up to 1 MW in capacity, and also holds them exempt from paying interconnection fees.[32]

Net metering is related to interconnection in that any project connected to the utility has the potential to sell excess generation to the utility, or earn revenue for measured self-generated electricity that offsets purchases.[33] Net metering is important for projects interested in saving energy – sometimes referred to as **"behind-the-meter"** projects – because they can earn revenue for energy they do not use, to compliment their savings.[34] This makes the project a **distributed generation** source, decreasing the energy demanded from large power plants.[35]

Net metered electricity is sometimes valued at a rate lower than the market price for power, often the **avoided cost rate**. This rate is the incremental cost of energy production that the utility must offer a qualifying facility when purchasing renewable energy.[36] The rate is set either by the utility or by the state legislature or public utilities commission. Undervalued savings can deter community wind projects from relying on net metering revenues for financial support. Utilities can further discourage net metering with penalty charges on electricity purchased during periods when demand exceeds generation, or a monthly "standby charge" for this back-up service.[37]

[30] Bolin, Keith. Phone Interview. 2/28/2006.
[31] Wisconsin Public Services Commission. "Rules for Interconnecting Distributed Generation Facilities." Accessed 4/08/06 at http://folio.legis.state.wi.us/cgi-bin/om_isapi.dll?clientID=26211892&advquery=psc%20119&headingswithhits=on&infobase=code.nfo&record={40182}&recordswithhits=on&zz=
[32] California Energy Commission. "Distributed Energy Resources Guide: Electrical Interconnection." Accessed 4/13/06 at http://www.energy.ca.gov/distgen/interconnection/california_requirements.html.
[33] Goett, Andrew and Richard Farmer (2003). "Prospects for Distributed Electricity Generation." Washington D.C., Congressional Budget Office.
[34] Bolinger, Mark, Ryan Wiser, et al. (2004). "A Comparative Analysis of Community Wind Power Development Options in Oregon." Accessed 4/14/06 at http://www.energytrust.org/RR/wind/OR_Community_Wind_Report.pdf.
[35] Special Task Force on the Consition and Future of the Illinois Energy Infrastructure. "Blackout Solutions." June 2004. Accessed 4/21/06 at http://www.state.il.us/ltgov/pdf/report.pdf.
[36] Federal Energy Regulatory Commission. "Assessing the State of Wind Energy in Wholesale Electricity Markets." November 2004.
[37] Special Task Force on the Condition and Future of the Illinois Energy Infrastructure. "Blackout Solutions." June 2004. Accessed 4/21/06 at http://www.state.il.us/ltgov/pdf/report.pdf.

For community wind developers, an ideal net metering policy would pay retail rates for excess power. Pennsylvania is currently considering new legislation that would allow for community wind projects to net meter at the retail rate of $.08/kWh, which is twice as high as the current wholesale rate.[38] Such policy is even more important to projects where market rates for electricity are high: Massachusetts' retail rates are three times the rate of Pennsylvania.[39]

Most of the states we researched had not adopted net metering standards for utility-scale projects (Fig. 5). Also, where there are net metering standards the maximum project capacity is often smaller than the capacity for interconnection (Table 3). This suggests that utilities will allow utility-scale projects to interconnect but not to generate revenue from excess generation. Some projects choose to install capacity just up to this net metering limit: the Palmdale Water District project in California intentionally installed 1 MW of capacity to benefit from the state's net metering standards.[40]

State	Maximum Project Capacity for Interconnection (kW)	Maximum Project Capacity for Net Metering (kW)
OR	25	25
WA	25	100
IL	40	40
OH	300	100
RI	1000	25
NJ	2000	2000
NY	2000	100
AZ	5000	10
CA	10000	1000
MN	10000	40
WI	15000	20
CT	25000	100
MA	N/A	60
PA	N/A	50

Table 3: State Interconnection and Net Metering Capacity
(Source: DSIRE, www.dsireusa.org)

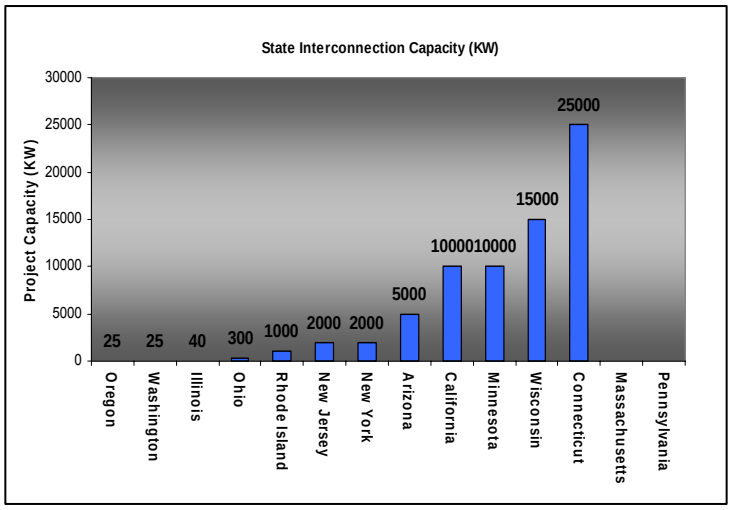

Figure 4: State Interconnection Capacity
(Source: DSIRE, www.dsireusa.org)

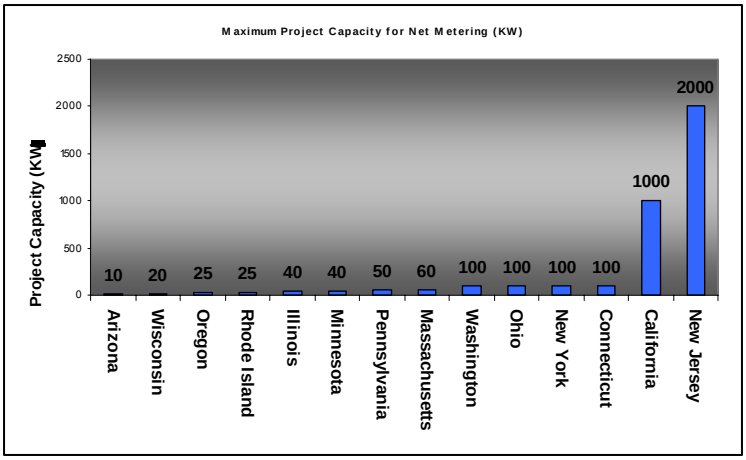

Figure 5: State Net Metering Capacity
(Source: DSIRE, www.dsireusa.org)

[38] Tuffey, Tom. Phone interview. 3/17/2006.
[39] Ibid.
[40] LeMoreaux, Dennis. Phone Interview. 3/14/2006.

Renewable Energy Credits

If project developers can access the power market, then they can earn revenue for the electricity they produce. But developers should also be aware that under some RPS, the environmental benefits of renewable power production can earn them additional revenue. These tradable benefits are defined by **Renewable Energy Credits** (REC), also known as renewable energy certificates, green tags, or other common names.[41]

RECs represent ownership rights over those beneficial environmental attributes associated with renewable energy, such as reduced emissions. Generally, one RECs is created for one megawatt-hour of electricity. RECs can be sold to utilities that must comply with an RPS, in lieu of actual power produced, or they can also be sold directly to consumers interested in purchasing the environmental attributes that REC rpresent, thus offseting the environmental impact of their energy use.[42]

Continuing Community Wind at Hull Wind

The community of Hull, MA, has a history with wind power stretching back to the 1800s. So when the Hull Municipal Light Plant installed a 660 kW turbine to replace a 40 kW turbine that was sited twenty years earlier in the same spot, there was much community support behind erecting the new turbine. Experience convinced the community that wind power was a worthy option for electricity generation. Aside from the historical value, the town recognized the economic value in having a wind turbine.

The Hull plant is owned and operated by the municipality, which paid for the entire project out of its own equity. Total cost of the project was $753,000 and yearly operations and maintenance costs are about $30,000 – all paid for by the project's revenue. It is estimated that the town has already saved approximately half a million dollars in energy purchasing costs since installation in 2003. Over the course of the project life, the net present value of the savings is estimated at $2 million.

These savings come from avoiding energy purchases at an average $.08/kWh. Hull buys electricity wholesale from the Massachusetts Municipal Wholesale Electric Company (MMWEC) and then sells power to town residents. The community wind project offsets some of the need to buy from MMWEC – ultimately saving the town money. Savings also come from the Renewable Energy Production Incentive and creation of Renewable Energy Credits – both variable savings but nevertheless a source of project revenue.

The Hull Project was developed by the Hull Municipal Light Plant, the UMass Renewable Energy Research Laboratory and the Massachusetts Division of Energy Resources.

The project has such strong community support and beneficial economics that a second wind turbine is scheduled to be erected at the landfill in Hull.

Right: Windmill Point, Hull, MA
(Source: http://www.hullwind.org/images.php)

[41] Holt, Ed and Lori Bird. "Emerging Markets for Renewable Energy Certificates: Opportunities and Challenges." National Renewable Energy Laboratory. January 2005.
[42] Ibid.

In states where RPS compliance is mandatory, utilities under RPS requirements prefer to purchase RECs in large quantities – they may ignore the small supply offered by community wind projects. [43] The voluntary REC market may be more applicable to community wind projects because they can offer smaller REC purchase contracts. These purchases are becoming more common as large institutions realize environmental benefits of renewable energy, and the favorable press that accompanies REC purchases. For example:

- Whole Foods Market purchased approximately 458,000 RECs to offset 100% of their nationwide electricity usage[44]
- Yale University uses savings from its energy conservation program to purchase wind power RECs[45]
- Duke University's Nicholas School of the Environment purchased $19,718 worth of RECs derived from wind power as a part of their campus-wide greening initiative.[46]

Several states are involved with regional REC tracking systems (Fig. 6). We encountered two notable voluntary REC purchases that supported community wind project development:

- The Illinois Clean Energy Community Foundation – a CESA memberfund – purchased $175,000 worth of RECs from the Illinois Rural Electric Co-Operative in advance of project construction.[47] The advance money subsidized initial costs of the project.[48]
- The Rosebud Sioux Tribe in south-central South Dakota signed a contract for REC sales to NativeEnergy, a Vermont-based REC trading firm.[49]

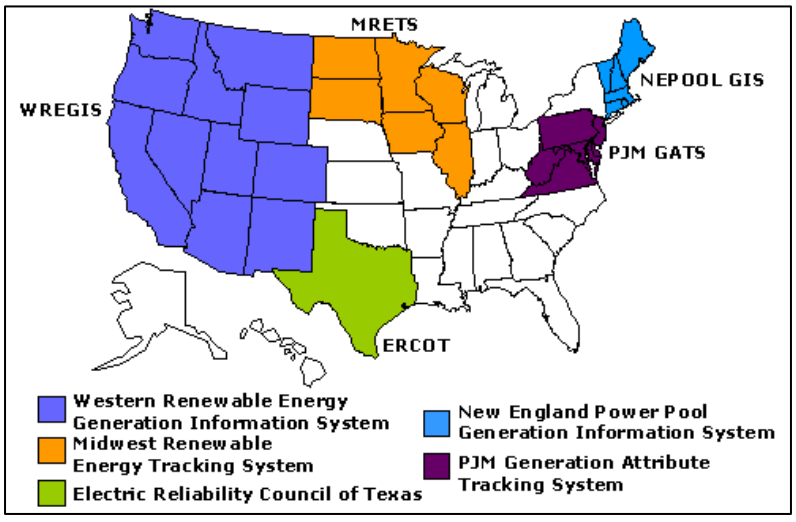

Figure 6: States with REC Tracking Systems (Source: Pew Center for Climate Change, http://www.pewclimate.org/what_s_being_done/in_the_states/rec_map.cfm)

[43] Birgisson, Gunnar and Erik Petersen, (2006). "Renewable Energy Development Incentives: Strengths, Weaknesses and the Interplay." *The Electricity Journal,* January.
[44] Whole Foods Market. "Whole Foods Market Makes Largest Ever Purchase of Wind Energy Credits in United States." Accessed 4/8/06 at http://www.wholefoods.com/company/pr_01-10-06.html
[45] Yale University. "Improvements in Yale's energy use patterns bode well for future." Accessed 4/8/06 at http://www.yaledailynews.com/article.asp?AID=32174
[46] Dukenvironment Magazine. "Nicholas School Purchases Renewable Energy Certificates to Offset Use of Fossil Fuels." Accessed 4/8/06 at http://www.nicholas.duke.edu/dukenvironment/f05/log-energy.html
[47] Miller, Ed. Phone Interview. 3/1/2006.
[48] Middleton, Sean. Phone Interview. 3/1/2006.
[49] NativeEnergy. "NativeEnergy to purchase renewable energy credits." May 7, 2002. Accessed 4/20/06 at http://www.nativeenergy.com/news050702.html

SECTION II: RESEARCH FINDINGS

Stage II: Project Planning

Once the project is conceived and proven as a feasible option for the community, it is time for project developers to begin planning for success. Most projects we observed continued to be managed by one or a few local advocates, but during planning these advocates reached out to additional stakeholders for information on financing and building their project.

Project planning may be the most important phase of the community wind project because it ensures that the project becomes operational. Planning requires extensive due diligence and completion of studies and project feasibility reports that provide invaluable information. While collecting information and data is time consuming and expensive, there are options available to community wind projects.

Project Financing Plan

The most substantial barrier to community wind development is securing adequate funding, as identified by our interviewees. There are few cases where developers used existing income or savings as equity for project finance: the Illinois Rural Electric Co-Operative devoted some of its steady cash flow to their project and several schools with large endowments used those reserves for project finance. However, most projects we observed required several financiers and a plan to maintain community ownership while attracting investors.

Early Minnesota Projects

One of the first conceived community wind projects in Minnesota, Carleton College became interested in a wind power project in the early 1990s. At that time the cost of producing wind energy was about $.40/kWh, and the college could not afford a project. The idea was dropped until a group of environmental studies students researching climate change reopened project research in 2002. By then, the cost of producing wind energy had dropped to about $.04/kWh and the students determined a project may be financially feasible.

Initially, Carleton included other local colleges and school districts in the project plans, but those parties backed out for lack of funding. Carleton carved $1.85 million out of its endowment for a 1.65 MW turbine, completed in 2004. The existing endowment allowed the project to move forward, and the Minnesota net metering law ensured a considerable revenue stream to support the project. Carleton has a 20 year power purchase agreement with Xcel Energy for the project's unused generation, at a minimum rate of $.033/kWh as required by state statute. Now Carleton is exploring the opportunity of adding a second or third turbine to its project.

The Moorhead Public Service (MPS) is also contemplating a third turbine in addition to the two .75 MW capacity turbines they installed in 1999 and 2002. MPS initially wanted to add renewable energy to their energy portfolio, and now supply 44% of their power from coal-fired generation, 54% from hydroelectric, and 1% from small wind projects.

MPS installed the two turbines using existing cash reserves, and are now recouping project expenses through electricity sales. Project cost decreased from $667,000 for the first turbine in 1999 to $650,840 for the second turbine in 2002 – a total project cost of about $1.3 million. MPS customers are charged a $.05/kWh premium for wind power, and can choose to purchase all power from the small wind projects or monthly 1000 kWh blocks. Consumer demand is driving the need for a third turbine, or MPS may purchase Renewable Energy Certificates to offer customers requesting additional renewable energy.

Securing Equity Financing

Project developers can seek out equity financiers – private investors willing to purchase a stake in the community wind project. These investors will be interested in projects that generate revenue through electricity sales; however, since community wind projects are small and have problems connecting to the electric grid, they are not as attractive an investment as larger projects.[50]

In addition to sales income, community wind projects can offer tax benefits to financiers. These incentives will be fully explained later in the report. For equity investors to reap these benefits, community wind projects must be at least partially owned by a taxable entity – usually a **Limited Liability Company** – and the project must generate a substantial tax shelter for investors.[51] Again, neither case is easy for community wind projects because they are small and do not generate as many tax benefits as larger projects.[52]

Project developers that include equity investors must consider the ownership model of the project. If equity investors are from the community then there is no concern over project ownership; community members already hold the principal financial stake in the project. But often project developers will seek investment from sources beyond the community. Then they must ensure that the project remains in local ownership for it to fit the definition of community wind.

Local Interest Turning to Local Investment in Minwind I & II

A group of farmers in Luverne, MN, were exploring strategies to generate rural income when they noticed a nearby wind farm in 2000. After much research and discussion, they reasoned that a community wind project would have multiple benefits. The group determined that to access the federal production tax credit and the Minnesota Renewable Energy Production Incentive, it would create two limited liability companies: Minwind I and Minwind II.

Within twelve days of their public offering, Minwind sold all $1.1 million available shares. The two companies designed their public offering so that each shareholder has only one vote in the company, regardless of share ownership. Also, no individual may own over 15% of the shares. They also required that 85% of the shares are farmer-owned. With the new equity, Minwind financed two identical 1.9 MW wind projects with all four turbines located on the same investor-owned farm that had the best wind resource and access to transmission lines. Minwind used local materials and contractors at every possible opportunity, including maintenance of the turbines.

After some difficulty negotiating a power purchase agreement, Minwind eventually entered into a 15-year contract with Alliant Energy, who needed to satisfy renewable energy requirements in Iowa and Wisconsin. Minwind delivered a 17% return on investment for its initial shareholders. The project was such a success that Minwind Energy erected seven new turbines owned by approximately 200 local investors, known as Minwind III-IX. More than $6 million in equity was raised over two meetings and more than 75 interested investors had to be turned away.

[50] Environmental Law and Policy Center. "Community Wind Financing." March 24, 2006. Accessed 3/24/06 at http://www.elpc.org/documents/WindHandbook2004.pdf.
[51] Ibid.
[52] Bolinger, Mark, Ryan Wiser, et al. (2004). "A Comparative Analysis of Community Wind Power Development Options in Oregon." Accessed 4/14/06 at http://www.energytrust.org/RR/wind/OR_Community_Wind_Report.pdf.

Attracting Equity Investors to Door County

The citizens of Door County, WI, formed the Door County Community Wind Committee to assess the feasibility of a wind project and to educate the community about the benefits of wind power. The Committee would like to install 75 MW of wind-energy capacity – with the long-term goal of doubling project capacity in coming years. CESA has already provided some technical assistance to the project and was reviewing a seed grant request at the time of this writing.

Though larger than an average community wind project, the estimated $112.5 million project financing plan includes equity investments from community members. By establishing themselves as a community wind project, the Door County Project may qualify for up to $45,000 from CESA-member fund Focus on Energy. However, that leaves a large amount of project costs to be covered by private equity investors – a significant detail that the Committee is currently assessing.

The plan for this and other state projects may include a version of the "flip" ownership model developed in Minnesota. Focus on Energy hired the Cooperative Development Services of Madison to develop Wisconsin's version of the model, which requires that a Limited Liability Company (LLC) of local investors front up to 20% of the project costs, and private investors to provide the remaining financing through equity and loans. Ten years of tax benefits pay off the investor's equity financing and loans, and the private investors retain the 20% contribution from the LLC. In exchange, the LLC gains ownership and operating rights to the project after the tax benefits run their course.

At such a large scale, the potential production incentives available to project investors will be great. However, Door County has not secured a power purchase agreement for the project, and is still developing the prospectus and *proformas* required by Federal Securities Law.

Interesting ownership models have developed in some states. The **"flip" structure** used in Minnesota and currently under development in Wisconsin requires that a private investor contribute the majority of equity and debt financing in exchange for tax benefits that pay off the investment, and then transfer project ownership to the community when the tax benefit eligibility ends.[53] Wisconsin community wind developers are tailoring a "flip" structure specific to their state's specific policies, and other states could follow suit.[54] Creative ownership structure is important in attracting equity investment to a project while retaining community involvement in the project.

Michael Vickerman, Director Renew Wisconsin:

On the Potential for Rural Income:
"Old line farmers need [wind power] to maintain their property. Most of them end up being hobby farmers. They have a primary job and relax by farming. That's just the way it has become in the US."

On Garnering Community Support:
"By and large, a developer will do himself a world of good by just getting a demographic lead on the community that is being considered for hosting a project. If there are a lot of commuter households or second homes, that developer is setting himself up for a lot of grief."

[53] Ibid.
[54] Ibid.

Securing Debt Financing

Another source of project capital is debt financing. Loans for wind power projects are usually borrowed against the predicted income stream generated by the project and secured through the PPA. Community wind projects that produce power for commercial sale can use expected revenues as collateral, and this is also where REC contracts are important as additional leverage for borrowing.[55]

In many cases, debt lenders and equity investors will be unfamiliar with wind power projects and may require additional due diligence before distributing financing. The lender or investor may require an exhaustive project financing report.[56] This can be a great strain on time, cash, and human resources for a small community wind project.

Public Financial Incentives

Community wind project developers often rely on public subsidies and financial incentives to finance projects. In the following sections, we will outline some of these incentives and some examples of projects that have successfully used these incentives to attract investors and to pay for projects.

State level incentives offered in CESA member states are summarized in Table 4 and presented in full in Appendix I.

State	Renewable Energy Production Incentive	Property Tax Exemption	Sales Tax Exemption	Other Tax Credits
AZ		X		
CA	X		X	
CT		X		
IL		X		
MA	X	X	X	X
MN	X	X	X	
NJ			X	
NY		X		X
OH			X	
OR		X		X
PA				X
RI			X	X
WA	X		X	

Table 4: CESA State Tax Incentives Where Wind Power is Eligible
(Source: DSIRE, www.dsireusa.org)

[55] Holt, Ed and Lori Bird. "Emerging Markets for Renewable Energy Certificates: Opportunities and Challenges." National Renewable Energy Laboratory. January 2005.
[56] Environmental Law and Policy Center . "Community Wind Financing." Accessed 4/11/06 at http://www.elpc.org/documents/WindHandbook2004.pdf

Federal Production Tax Credits

The most important public financial incentive encouraging investment in renewable energy projects is the **federal production tax credit** (PTC). This credit against taxable income for every kilo-watt hour of electricity produced by an eligible renewable source – including wind power – is available for the first ten years of project operations.[57] Investors in a high tax bracket, with a large tax appetite and demand for reducing their taxable income, are drawn to renewable energy projects by the federal PTC.

However, there are important limiting factors of the federal PTC concerning its effectiveness:

- The PTC has not been locked in as a long-term incentive by Congress. This limits confidence in the existence of the incentive and creates volatility in the renewable energy market.[58]

- The PTC contains a provision to limit "double-dipping" for public incentives. The PTC is reduced by a rate equal to the amount of other public money used for the project over the total project cost. The IRS is inconsistent in the way it treats these "double-dipping" situations, adding additional risk to investors interested in the PTC.[59]

- Only project owners are eligible for the federal PTC, and community wind owners can't trade the credits to third parties in exchange for cash payments.[60]

- The PTC must be claimed against passive investments – like property and other long-term assets – and not active investments.[61] This is encouraging for corporate investors with long-term assets, but it will likely deter individuals from investing in community wind projects.

Based on the projects we studied, the federal PTC has contributed to community wind projects with mixed results. Community wind projects are often owned by public or non-profit organizations that do not generate taxable income. Also, community wind projects are not usually large enough to generate a significant amount of tax credits. Also important is the "double-dipping" provision in the PTC. Community wind projects rely on substantial public funding and this decreases the amount of PTC that the project generates. This inability to generate a substantial tax shelter deters equity investors from investing in community wind projects.

[57] Edison Electric Institute. "Energy Policy Act of 2005: Summaryof Electric-Related Provisions in Title XIII – Tax Incentives." Aug. 10, 2005.
[58] Bird, Lori, Mark Bolinger, et al. (2005). Policies and market factors driving wind power development in the United States. *Energy Policy*, 33, 1397 – 1407.
[59] Wiser, Ryan, Mark Bolinger and Troy Gagliano (2002). "Analyzing the interaction between state tax incentives and the Federal production tax credit for wind power." Accessed 4/01/06 at http://eetd.lbl.gov/EA/EMP/reports/51465.pdf.
[60] Bolinger, Mark, Ryan Wiser, et al. (2004). "A Comparative Analysis of Community Wind Power Development Options in Oregon." Accessed 4/14/06 at http://www.energytrust.org/RR/wind/OR_Community_Wind_Report.pdf.
[61] Ibid.

But some projects successfully used the PTC, as with the China Hollow project in Oregon, which will utilize the PTC and other tax credits to pay for its single turbine.[62] Other projects have lured equity investors with the PTC, as with the Minwind projects in Minnesota. Minwind attracted investors despite their awareness of the project's limited ability to earn federal PTCs.[63]

So to summarize, the federal PTC may be a viable public financial incentive for some community wind projects, especially since it was recently renewed by Congress. But in general, this incentive does not apply to community wind project owners.

Attracting Equity Investors to China Hollow

As the first community wind project proposed in the Northwest, China Hollow, OR, will utilize state and federal tax benefits to attract equity investors. The project is a joint effort undertaken by Sherman County, Oregon Department of Energy, and two landowners providing the project site. The plan is to install a single 1.5 MW capacity GE turbine in 2006.

The project will cost an estimated $1.9 million and developers are planning a wide financing portfolio. Sherman County will provide funding in exchange for a portion of the revenue stream set aside for school projects, Oregon Department of Energy will allow issuance of ten-year bonds, and the Energy Trust of Oregon will also provide funding. The remaining investment is being solicited to equity investors with production tax credits serving as the attraction. The Oregon Business Tax Credit will provide an estimated $486,000; the Federal Production Tax Credit an estimated $664,000; and through five-year accelerated depreciation on the capital an estimated $266,000. The project is also estimated to generate $417,000 of revenue over its first ten years, making the total return on equity investment about $1.3 million.

One way an equity investor can enter into the project is by becoming a "Pass-through Partner." This is attractive to corporations with a large tax appetite. The pass-through partner invests in 25% of the initial project and receives the benefits of the project tax credits. They have two options of how to receive the credit: distribute a 35% tax break over five years, receiving 10% for the first two years and 5% for the following three years; or a 25% credit the first year of project operation.

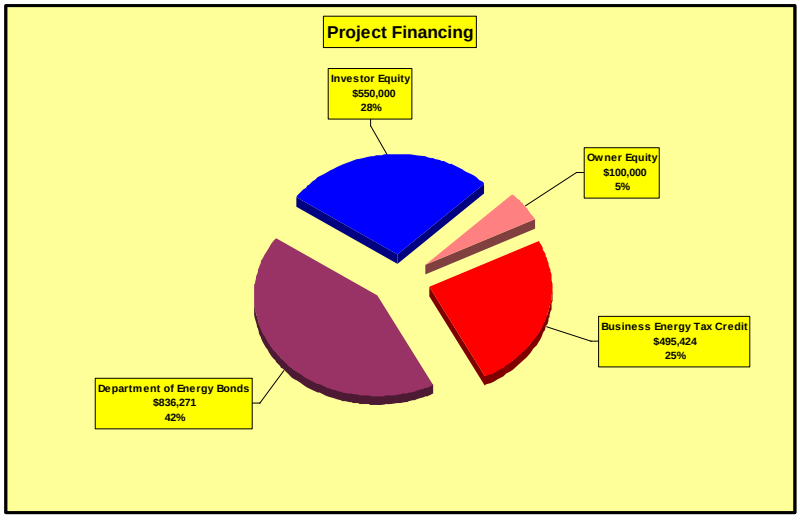

Figure 7: China Hollow Financing Plan (Source: Community Owned Renewable Projects, Paul Woodin)

[62] Woodin, Paul. Phone Interview. 3/31/2006.
[63] Bolinger, Mark, Ryan Wiser, et al. (2004). "A Comparative Analysis of Community Wind Power Development Options in Oregon." Accessed 4/14/06 at http://www.energytrust.org/RR/wind/OR_Community_Wind_Report.pdf.

State Tax Incentives and Exemptions

Several states offer tax benefits to renewable energy projects, including exemptions from property, sales, or income taxes. Wisconsin offers a property tax exemption for any property with a value added wind project.[64] In Montana, tax exemptions are offered only for small generation projects up to 1 MW in capacity – right on the cusp of community wind.[65] Massachusetts has a slew of exemptions specific to small-scale wind power projects.[66]

Oregon has a unique business tax credit that is helpful to community wind projects. The credit is available for investment in energy efficiency or renewable energy projects, including small wind power projects. The tax credit awards 35% of the investment against state income taxes: 10% in each of the first two years and 5% in each of the next three years. It also allows "pass-through" partners to receive a cash payment in return for tax credit, effectively allowing non-taxed owners into the system.[67]

Iowa has a state-level production tax credit of $.015/kWh credit available for renewable energy systems, including wind power, with a maximum enrollment of 90 MW. The state also has a $.01/kWh credit specific to wind power systems, was a maximum enrollment of 450 MW of installed capacity.[68]

Renewable Energy Production Incentives

As we described, community wind project owners are often public or non-profit agencies without taxable income, and as such would not benefit from the tax exemptions and credits described in the previous sections. For these owners, there are **renewable energy production incentives** (REPI) available at the federal and state levels. REPI function like the PTC except that instead of receiving credit against taxable income, projects earn cash payments in exchange for renewable power produced. Like the PTC, REPI payments are available for the first ten years of project operation.[69]

REPI are subject to annual congressional appropriations, and have contributed to the past volatility of investment in wind technology. But in 2005, the federal REPI was renewed at $.015/kWh from 2006 to 2026, and will be adjusted for inflation.[70] The 20 year appropriation at least appears to reduce risk that the incentive will disappear, but this is not guaranteed revenue for a project. Projects eligible for the federal incentive include not-for-profit electrical cooperatives, public utilities, state governments, and some other eligible producers.[71]

[64] "Wisconsin Statute 0070, Property Taxes." Accessed 4/23/06 at http://www.legis.state.wi.us/statutes/Stat0070.pdf.
[65] Montana Code Annotated 2005. "15-6-225. Small electrical generation equipment exemption." Accessed 4/23/06 at http://data.opi.state.mt.us/bills/mca/15/6/15-6-225.htm.
[66] Massachusetts Division of Energy Resources, Renewable Energy Programs. "Massachusetts Renewable Energy Tax Incentives." Accessed 4/17/06 at http://www.mass.gov/doer/programs/renew/renew.htm.
[67] Oregon Department of Energy. "Business Energy Tax Credits." Accessed 4/3/06 at http://oregon.gov/ENERGY/CONS/BUS/BETC.shtml.
[68] Iowa Utilieis Board. "Renewable Energy Tax Credits." Accessed 4/13/06 at http://www.state.ia.us/government/com/util/TaxCredits.html
[69] Bolinger, Mark, Ryan Wiser, et al. (2004). "A Comparative Analysis of Community Wind Power Development Options in Oregon." Accessed 4/14/06 at http://www.energytrust.org/RR/wind/OR_Community_Wind_Report.pdf.
[70] US Department of Energy Efficiency and Renewable Energy. Weatherization and Intergovernmental Program. "Program Areas: Renewable Energy Production Incentive (REPI)." Accessed 4/2/06 at http://www.eere.energy.gov/wip/program/repi.html.
[71] Database of State Incentives for Renewable Energy. "Incentives for Renewables and Efficiency – Renewable Energy Production Incentive." Accessed 4/11/06 at http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=US33F&State=Federal&currentpageid=1&ee=1&re=1

Some states offer REPI payments as well. Minnesota has a ten-year production incentive specifically for projects under 2 MW in capacity. This incentive includes a $.019/kWh payment for wind projects owned by typical community wind developers – local investor groups, non-profits, municipalities, and other public owners of small generation projects. The eligible project size is increased to 7 MW for projects owned by rural electric cooperatives.[72] California's Self-Generation Incentive Program offers $1.50 per watt for "behind-the-meter" project owners that produce their own wind power.[73]

Grants

Grants are funding mechanisms that have no repayment obligation or expectation for the recipient to provide a return. Grants can be unrestricted funding for any project expense, or they can target specific project components. Many development funds assist projects with initial expenses, like project feasibility reports and other considerable technical and legal costs.[74] Nearly every publicly or non-profit-owned project that we profiled included some grant funding in their project financing plan.

Sources of grants include federal and state governments, state renewable energy foundations, and utility renewable energy funds. Competitive federal grant programs are offered by the United State Department of Agriculture (USDA) and the Department of Energy (DOE), often in parallel with low-interest loan programs. It is important to remember that the size of federal grant programs is dependent on annual congressional appropriations. For example, this year the USDA Rural Business Cooperative Service offers $4.45 million through its Rural Cooperative Development Grant program,[75] down from $5.952 million in 2005.[76]

State and private public benefit funds and renewable energy development funds like the CESA members are good sources for project development grant monies for community wind projects. Many funds direct their monies to certain project components, such as feasibility and implementation reports. This can be an effective strategy since it helps projects initiate planning and can complete some of the work necessary for future grant and loan applications. Later funding can be used for the more expensive construction phase of the project.

[72] Minnesota Commerce. "Renewable Energy Production Incentives." Accessed 4/2/06 at http://www.state.mn.us/portal/mn/jsp/content.do?id=-536881350&subchannel=-536881511&sc2=null&sc3=null&contentid=536885915&contenttype=EDITORIAL&programid=536885394&agency=Commerce.
[73] California Bill No. AB 1685. Accessed 4/11/06 at http://www.dsireusa.org/documents/Incentives/CA23Fa.htm.
[74] Miller, Ed. Phone Interview. 3/1/2006.
[75] US Department of Agriculture, (2004). "Announcement of Rural Cooperative Development Grant Application Deadlines and Funding Levels." *Federal Register*, 71(53), 13948 - 13953. Accessed 4/17/06 at http://www.rurdev.usda.gov/rd/nofas/index.html.
[76] US Department of Agriculture, (2005). "Announcement of Rural Cooperative Development Grant Application Deadlines and Funding Levels." *Federal Register*, 70(92), 25528 – 25533. Accessed 4/17/06 at http://www.rurdev.usda.gov/rd/nofas/index.html.

Illinois Rural Electric Co-Operative Grant Funding

In May 2005, the Illinois Rural Electric Co-Operative installed a 1.65 MW wind turbine in Pike County. At capacity, the turbine supplies just under 5% of the power for the Co-Op's 10,250 members, about 4.3 million kWh annually, transmitted directly to local customers through the Co-Op's distribution grid.

The Co-Op utilized several grants to make this $1.878 million project a success: $438,544 from a USDA Section 9006 grant; $250,000 from the Illinois Department of Commerce and Economic Opportunity; and CESA member Illinois Clean Energy Community Foundation paid $175,000 for advance purchase of renewable energy credits generated by the project in the first ten years. In addition to the grants, the USDA Rural Utility Service provided $1.3 million in debt financing, $300,000 of which was used to upgrade the Co-Op's distribution system – a cost not originally factored into the total cost of the project. According to Sean Middleton, Managing Engineer at the Co-Op, "Getting the grants was an absolute necessity. We wouldn't have touched this project without getting the [USDA Section 9006] grant, but others were still necessary."

Another advantage of the project was connecting the turbine to the Co-Op's existing distribution grid; thus the Co-Op avoided negotiating a transmission contract by utilizing its own grid and delivering power directly to customers. Middleton says the turbine produces power at a cost just under the Co-Op's wholesale contract rate of 6.5 cents per kWh.

Sean Middleton, Managing Engineer, Illinois Rural Electric Co-Operative:
"Having your members use your power is a big benefit. Early on we had discussions with transmission suppliers, but they didn't really want to mess with a one turbine project, and it became apparent that wasn't going to be a good option. Great wind isn't really a great resource unless you have access to market."

Above: Cutting the Ribbon at Project Completion
(Source: http://www.e-co-op.com/windmill/Photos.asp)

Clean Renewable Energy Bonds

The Energy Policy Act of 2005 authorized $800 million in **Clean Renewable Energy Bonds** (CREBs) to be issued by eligible renewable energy projects owned by municipalities and public agencies. Bond holders may count the bond's credit against taxable income as determined by the IRS, while the issuer uses the investment to finance capital expenditures on eligible renewable energy projects.[77]

As this is a new program, the viability of CREBs as a valuable incentive has yet to be seen. Also, the deadline to apply to the IRS for CREBs is April 26, 2006 – shortly after the scheduled release of this report.[78] No information was available to study CREBs, and project managers would not have sufficient time to implement our findings this year. But we suggest that future research efforts study the effectiveness of these bonds as a public financial incentive for community wind.

Setbacks in the Luna Point Project Planning

The Luna Point Community Wind Project is currently the only community wind project being implemented in Washington. The Luna Point site had been developed as a wind power project demonstration site in the 1980s, and much of the wind and environmental impact data had already been collected and assessed. Also, a sub-station, now owned by the Klickitat County Public Utility District (PUD), already exists from the demonstration project. Project participants include Last Mile Electric Cooperative, Klickitat County PUD, A World Institute for Sustainable Humanity (AWISH), and Northwest Sustainable Energy for Economic Development (NWSEED).

The project started off well enough; in 2004, USDA awarded the project $307,000 – about 25% of the $1.2 million project cost – from Section 9006 grants. But developers at NWSEED soon encountered problems with financing the remaining 75% of the project costs. NWSEED submitted a proposal for a $740,000 zero-interest loan through the USDA's Rural Economic and Development Loan and Grant program, but were denied debt financing because renewable energy projects are not currently eligible for the zero-interest loan program. This was a time-consuming setback that could have been avoided had NWSEED and the state clearly understood the eligibility requirements.

Then in 2005, Vestas informed Luna Point project developers that the 660 kW turbine included in the plans had increased in price by 20%, increasing project costs. As NWSEED planned for the increase, Vestas instead discontinued the model at the end of the year. The project was now without a turbine to install and short of the cash to review project plans.

This year, project developers redirected their efforts toward securing Clean Renewable Energy Bonds (CREB) through the US Department of Energy. Ms. Jennifer Grove at NWSEED is preparing the application for the CREBs, which must be submitted by April 2006. She is cautiously optimistic, since the amount requested is relatively small – approximately $750,000-$1,000,000 – and much of the groundwork is already complete. However, because the CREB program is relatively young, it is difficult to estimate the timeframe within which the bonds might be awarded and the project might become operational.

[77] US Department of the Treasury Internal Revenue Service, (2006). "Internal Revenue Bulletin 2006-10, Notice 2006-7, Clean Renewable Energy Bonds." Accessed 4/2/06 at http://www.irs.gov/irb/2006-10_IRB/ar07.html.
[78] Ibid.

Other Planning Considerations

While project finance is an important component for community wind development, our interviewees also stressed some complications that can be mitigated in Project Planning. These concerns are not necessarily financial, but can limit the success of a project just as surely as an unsure financial plan.

Zoning and Permitting Requirements

Even with sufficient financing, community wind developers must adhere to environmental regulations and other zoning and permitting regulations. These regulations vary by county, township, and municipality, so there is no standard recommendation for negotiating a community wind project site. Also, since wind power projects are relatively new, communities may lack the institutional capacity to site and permit projects.

Above: Palmdale Water District Turbine (Source: Black and Veatch)

Palmdale Water District and Environmental Regulation

Palmdale is a desert city of about 150,000 residents in Los Angeles County, CA. The Palmdale Water District (PWD) is a municipally owned facility that provides potable water to half of Palmdale and some adjacent cities.

After the 2001 energy crisis in California, the PWD Board of Directors investigated ways to reduce energy costs, ensure price stability, and promote clean power. The PWD wastewater plant was identified by the Board as the largest single source of energy use in the district, and so the best candidate for self-generation technology. Consultants at Black & Veatch investigated over 30 self-generation options, and PWD eventually agreed to install a 30 kW solar array and a 1 MW wind turbine. PWD determined that one 1 MW turbine was optimal, given both the facility's energy demand and California's net metering law which only pertains to projects up to 1 MW in capacity.

PWD initially encountered opposition from the city government and residents who complained that the turbine was aesthetically displeasing and potentially harmful to wildlife. The City of Palmdale sued to stop the project, alleging that the project did not comply with the California Environmental Quality Act. The case ruled in favor of PWD with two major points from the judge: first, the judge ruled that aesthetics were not covered under the law; second, PWD would have to perform a full Environmental Impact Report before proceeding.

PWD took several measures to reduce the environmental impact of their turbine, which is located near a lake and susceptible to collisions with migrating birds. Black and Veatch recommended that a 185 foot area below the turbine remain covered with gravel. A base fence was buried far enough underground to deter rodent populations from entering the area, which might have attracted hawks hunting for food near the turbine and result in bird deaths. PWD shuts down the turbine when fog banks enter the area – since birds can't see through fog, and may collide with the unseen turbine.

Dennis LaMoreaux, General Manager, Palmdale Water District:
"Since it's been up, we have received many more compliments about the turbine than complaints."

Community support is valuable when siting a new project. Local officials unfamiliar with the visual, acoustic, environmental, and safety impacts of wind turbines will resist their construction. They may have pre-conceived ideas about wind projects, and create burdensome regulations that make obtaining permits for wind turbines a gruesome task. We have discussed the importance of clear communication with and education of citizens, but just as important is clear communication with public land use officials.[79]

For example, Wisconsin has experienced problems with moratoriums on wind project development, such as in Manitowoc County, or restrictive zoning ordinances on wind – both appear in reaction to community skepticism about wind power projects.[80] Renew Wisconsin, a non-profit in the state, works with counties that are interested in developing wind projects to implement what it calls a Model Zoning Ordinance that can help community leaders develop projects in concert with community needs.[81]

An example of zoning regulations friendly to community wind can be found in Pike County, IL, home of the Illinois Rural Electric Co-Operative community wind project. Pike County now has a clear ordinance on wind turbine siting specifications. The ordinance, approved by the Pike County Zoning Board, outlines the planning, construction, noise, height, and "setbacks" – required distance from homes and property lines.[82] Clear permitting requirements streamline the process of securing a project site.

Project Equipment Purchases

Purchasing wind turbines and other equipment can also require some planning, as difficulties and delays are common to the wind technology industry. Currently the demand for turbines in the US exceeds production, and several manufacturers are taking orders for equipment deliveries years in advance as they face a current back-log.[83] Usually larger wind projects have a better chance at getting turbines because they are able to make bulk purchases from manufacturers. In addition, project managers reported that manufacturers sometimes discontinue models between planning and construction phases, causing setbacks as developers must adapt plans to new turbines.[84]

The leading wind turbine manufacturer in North America is GE Wind.[85] At least one project manager we contacted said that GE Wind ignored smaller scale projects;[86] but they supplied equipment for the Lamar Light and Power project in Colorado when managers aggregated their purchases with a nearby wind farm.[87]

[79] Green, J. and Sagrillo, M. "Zoning for Distributed Wind Power – Breaking Down Barriers." August 2005. National Renewable Energy Laboratory.
[80] Vickerman, Michael. Phone Interview. 3/6/2006.
[81] Ibid.
[82] "Harvest the Wind: A Wind Energy Handbook for Illinois." Accessed 4/23/06 at http://www.iira.org/pubsnew/publications/IVARDC_Reports_614.pdf.
[83] Peterson, Susan E. "Turbine demand blows past supply; Worldwide interest in wind power is at a peak, but a shortage of the giant turbines is slowing wind development projects." *Minneapolis Star-Tribune.* March 1, 2006. Sec. D, pg. 1.
[84] Grove, Jennifer. Phone Interview. 3/21/2006.
[85] Chua, Godfrey. "Wind Power 2005 in Review, Outlook for 2006 and Beyond." *Renewable Energy Access.* Jan 6, 2006. Accessed 4/8/06 at http://www.renewableenergyaccess.com/rea/news/story?id=41304.
[86] Dougherty, Mark. Phone Interview. 3/16/2006.
[87] Rigel, Rick. Phone Interview. 4/14/2006.

Danish-based Vestas, which offers equipment, sales, and maintenance services, is second behind GE Energy in the turbine market.[88] Vestas recently acquired NEG Micon, another Danish-based manufacturer that leads sales in Canada. Encouraged by the extension of the federal PTC, some smaller turbine companies are starting production, including Clipper Wind, Gamesa, and Suzlon.[89] There are other wind equipment providers identified by the American Wind Energy Association, which posts a list of contractors on their website.[90]

Lamar Wind Energy Project's "Piggy-back" Strategy

Near Lamar, CO, the Colorado Green wind farm project planned to install 108 turbines in 2003. The community supported Colorado Green because of the potential environmental benefits of wind-generated power. According to Rick Rigel at the public utility Lamar Light & Power (LL&P), community support for the wind farm was so strong that they wondered if they could pursue a wind power project as well.

LL&P managers realized that they could take advantage of "piggy-backing" on the Colorado Green project. LL&P purchased five 1.5 MW turbines from GE Wind through Colorado Green, getting the same price offered the larger project. Rigel said that a major component of their success was that the utility could take advantage of this economy of scale.

Another "piggy-back" opportunity: Colorado Green's technician training program. Several individuals from the Lamar community completed the training program and now perform basic preventive maintenance and attend to minor repairs. LL&P also signed a five-year agreement for turbine maintenance with Colorado Green's technicians, so they attend to the more sophisticated maintenance issues. This timeframe corresponds to the five-year GE Wind warranty for replacement of turbine parts, though the maintenance contract can be renewed.

LL&P splits ownership of the project with the Arkansas River Power Authority (ARPA), a regional electric supplier comprised of seven electric utilities including LL&P. All five turbines are operated by the Lamar Utilities Board (LUB) from its power plant facility in Lamar. Electricity generated by the Lamar turbines feeds directly into their distribution system instead of a utility grid. The project was financed through the sale of bonds to a single private purchaser, which generated $6 million in debt-financing for the LL&P's three turbines. The LUB also sells renewable energy certificates and reduces the price of the electricity to consumers in Lamar.

LL&P continues to receive community support for their project. Rigel remembers that while the turbine blades were being attached, some 50-100 local residents showed up to observe the event. Development of the local wind resource represents a great economic opportunity for communities near Lamar, and several hospitals and schools have inquired about the possibility of installing similar projects. Whether this will come to pass or not remains to be seen, but there is certainly an interest in wind development in the area.

Stages III & IV: Project Construction and Operation

When the Project Planning is complete, community wind project developers begin to implement their strategies in the final two stages: Project Construction and Project Operation. Other than the financing mechanisms available to subsidize capital costs, we did not focus research on these final stages of community wind project development. We did learn general concerns and advice on project construction and operation that we include with the Best Management Practices.

[88] Chua, Godfrey. "Wind Power 2005 in Review, Outlook for 2006 and Beyond." *Renewable Energy Access.* Jan 6, 2006. Accessed 4/8/06 at http://www.renewableenergyaccess.com/rea/news/story?id=41304.
[89] Ibid.
[90] American Wind Energy Association. "Small Wind Turbine Equipment Providers." Accessed 4/2/06 at http://www.awea.org/faq/smsyslst.html.

SECTION III: CONCLUSIONS

Over the course of this report, we have described the information that a community wind project developer must ascertain when conceiving and planning a successful project. In this section, we review some of the best policies available to support community wind and hope that they can be replicated in other communities. We then summarize the best practices recommended by successful wind project developers and renewable energy development fund managers.

Best Policies

Oregon Business Tax Credit

Oregon offers a tax credit for investment in renewable energy projects. The investors receive a 10% tax credit in the first two years and 5% credit for the next three in return for a 25% investment in renewable energy projects. Since community wind projects are smaller than wind farms, this policy may attract investors to the small wind projects that require a smaller investment.

Washington Proposed Renewable Portfolio Standard

Though not yet in effect, this RPS is worth mentioning because it includes proposed incentives for distributed generation systems up to 5 MW in capacity. These projects would be allowed to double-count their production, earning two RECs for every one MWh of energy produced.[91]

New York State Energy Research and Development Authority (NYSERDA) 50/50 Project Grant

In the past, NYSERDA offered a grant amounting to half the costs for new renewable projects. This is a substantial incentive for new projects, and smaller projects may be more attractive to NYSERDA because they will require less appropriation. However, this incentive is offered on a sporadic basis as NYSERDA deems necessary. A more reliable project grant of this size would provide a stronger incentive for new projects.

Iowa Renewable Production Tax Credit

Iowa's wind-specific state PTC offers a $.01 tax credit per kWh with a maximum enrollment of 450 MW of capacity. The credit lasts for ten years, and counts against project owners' state income tax, business tax, or financial institutions tax.

Iowa Alternative Energy Revolving Loan Program

This program loans funding for renewable energy projects in Iowa. Projects receive half of their loan – or $250,000 – from the Iowa Energy Center with 0% interest; the remaining loan from a private lender at the market rate. Maximum term for the loan is 20 years.

[91] Grove, Jennifer. Phone interview. 3/1/2006.

California Self-Generation Incentive Program

California offers a $1.50 rebate per watt of wind energy capacity installed as an interconnected renewable source or clean distributed generation system. The maximum eligible system size is 5 MW, but the incentive is limited to $15,000. While this sum is insubstantial to cover project costs, the idea of a rebate for installed capacity would help subsidize project construction.

California Net Metering Policy

California mandates net metering standards for projects from 50 kW to 1 MW in capacity, and mandates that projects are offered a sale near retail rates. Perhaps most important, net metered systems are exempt from paying costs associated with interconnection studies, distribution system modifications, or application fees and exit charges – which can be considerable. This is the most proactive net metering policy available.

Illinois Pike County Expedited Wind Turbine Siting

Spurred by the Illinois Rural Electric Co-Operative's community wind project, the Pike County Zoning Board laid out clear standards and rules for siting wind turbines. These clear and explicit decisions streamline the permitting process and facilitate project planning.

Minnesota Renewable Production Incentive

This incentive is a $.015/kWh subsidy for projects under 2 MW in capacity. Unfortunately, program enrollment was limited to 200 MW of capacity, and closed to new applicants in 2005.

Oregon New PURPA Eligibility Limits

Under PURPA, facilities must purchase renewable energy from Qualifying Facilities at the avoided cost of their energy production or capacity. States determine the eligibility requirements for Qualifying Facilities. Oregon's limit capacity was 25 kW; but it is planned to increase to 10 MW, allowing larger renewable energy projects to qualify for PURPA.

SECTION III: CONCLUSIONS

Best Practices

Test Community Support for the Project

Many of the projects we studied followed a strong leader or small group of motivated citizens convinced of the environmental and economic benefits of community wind. Yet, community support is also essential to getting projects up and running. A community wind project developer must assess the attitude of the community when conceiving the project.

However, the developer should understand that citizens may be unfamiliar with the benefits of community wind: savings on electricity expenses and environmental benefits of renewable energy generation. The projects we studied used various educational strategies to build community support, including preparing and distributing educational materials, scheduling forum discussions and town hall meetings, and reaching out to community leaders. These. Such outreach and education efforts will be particularly important when advancing through the zoning and permitting phase of the project – where most public objections surface. Community support may facilitate movement through the permitting process, and backlash may be minimal from an informed community.

CEG and CESA member funds can help by continuing to research and promote the benefits of wind energy. A report highlighting the community benefits of locally-owned projects would also provide compelling evidence to an unsure community. The case studies in this report would be good examples to draw out and show how community wind succeeds in saving its owners energy costs while improving energy independence through a renewable source.

Prepare Comprehensive Due Diligence in Advance

During Project Planning, developers will need to furnish information to financiers, utilities, and grant providers. While each party has different interests, they will usually require the same information: feasibility reports, interconnection reports, or other geo-technical studies. Project developers can save time and effort by using these reports for multiple means. This way, resources spent on research materials for one application get further use. This up-front effort will benefit project developers in later stages: it will be easier for projects to complete complicated grant applications, as well as supply materials to potential equity and debt financiers.

CESA member funds already distribute money to assist communities with these types of project reports. This is a good strategy that helps initiate community wind projects where developers could not afford to get started, and helps supply them with information for further financial assistance. CEG could help by furnishing technical assistance for grant applications and project feasibility reports. CEG would be most helpful by identifying and focusing on that key information required by several sources, so that project developers are familiar with the common information asked of them throughout the project.

SECTION III: CONCLUSIONS

Identify All Possible Funding Sources

There are several funding sources available for community wind projects, but many times project developers are unaware of their options. Developers need to know where they can look for project subsidies; this report is a good start. However, there are several areas for further research: the "flip" ownership models surfacing in Minnesota and Wisconsin; the Clean Renewable Energy Bonds announced just this year; potential for bundling financial incentives; and private-public financing partnerships.

Project developers may find it beneficial to work with an existing financier that is familiar with the community or with the project owner. It is also helpful to work with financiers with previous experience with renewable energy, wind energy, or small wind projects. This avoids knowledge gaps or explanations because both parties are relatively familiar with the community or with the project demands. Clear communication between project developer and financiers is vital to success.

CEG can help attract investment to community wind projects by educating utilities, municipalities, institutions, and consumers about the availability of community wind projects. CEG may also want to educate banks or corporate investors in the financial merits of community wind. For example, potential equity investors may not understand or even be aware of the benefits offered by the federal PTC or other tax incentives. CEG and CESA can be a communication link between communities and interested investors.

Identify Important Policy Drivers

As explained, project developers should identify the important drivers of wind energy at project conception. The most important public policies encouraging growth of renewable energy production are found at the state level: including state RPS. While they have mixed success in encouraging community wind, the RPS are important mandates for renewable energy. They can be particularly helpful for small projects when they include tradable REC, which are an additional income stream for projects.

Two other important policies are interconnection and net metering standards, but these lack sufficient attention in the states. Net metering practices have the potential to provide small generation projects with a dynamic source of revenue, but are discouraged by enrollment limits and low sale rates. Revised standards would help ensure revenue for community wind projects. Uniform statewide interconnection standards would make it easier for project developers to complete necessary studies; these standards should be developed and adopted.

Project developers may not know where to look for policy information. CEG and CESA should provide information to communities, and again this report is a good start. The most comprehensive source of information currently available is the Database of State Incentives for Renewable Energy (DSIRE), available at **www.dsireusa.org.**

CEG could also expand its mission into policy advocacy. For example, CEG and CESA may be able to organize support for the Washington RPS initiative now under debate. This policy would directly assist community wind with its carve-out for distributed generation projects.

Communicate with Successful Project Developers

While some of the barriers to success are state- or even site-specific, there are general barriers relevant to all community wind projects. Successful project developers have probably worked through similar hardships, and are an excellent source of information. This report owes much to their experience and recommendations.

New project developers should also utilize the experience of their colleagues when confronted with barriers to success and faced with questions on how to proceed. There are some resources to help: online chat forums with project managers, information conferences, and trade association groups that provide excellent networking opportunities. In the spirit of building a community wind network, we provide contact information for our interviewees – with their permission – in Appendix III.

Again, CEG and CESA member funds are potential communication links between interested communities and financiers. CEG can work with other groups interested in community wind project development to build a resource network: rural electric co-operative associations have facilitated projects in Illinois and Iowa, and these are good examples of groups available for partnership. Other groups of interest would be non-profit capacity building groups that can assist with grant and loan applications. The Community Based Energy Development group in Minnesota is one example of a state-level group with considerable resources that may provide a successful partnership with CEG in providing resources to community wind projects.

Communicate with Utilities

In our opinion, it appears that most utilities resist distributed generation projects such as community wind. They use extra charges, fees, and interconnection and net metering requirements to deter behind-the-meter projects. In the absence of interconnection standards, utilities determine what information and safety assurances need to be proved before connecting a small project to its transmission grid. However, many community wind projects rely on a proactive relationship with the local utility.

Interconnection is a prime area for further research. CEG and CESA can focus studies on the general concerns expressed by utilities in resistance to grid interconnection. We believe that these concerns are reasonable, but that there must be solutions available to communities. Grid interconnection is part of the community wind definition for a reason: the revenues and savings through transmission utilities help justify the project.

Plan for an Unstable Turbine Market

Until either wind market subsidies are proven reliable or the market comes to scale, wind technology is bound to repeat its boom-bust cycle. Since the federal PTC was renewed, this cycle is ready for an upswing. However, small community wind projects may find difficulty in purchasing equipment without some planning.

A good strategy to mitigate this may be bulk equipment purchases, either with multiple community wind projects or in tandem with larger wind farms. A “piggy-back” purchase on a larger project was successful in Colorado: communities can purchase equipment through an existing or planned wind farm already placing a bulk order. This strategy may be repeated. Also, project developers should look to secure money for equipment purchases since making payments up-front would bind manufacturers to deliver products.

Developers with large cash reserves or those that secure equipment grants early in the project could handle this up-front cash outlay. Another possible solution utilized by project developers is to keep project plans flexible to different types of equipment, so that they can substitute the first available turbines.

This is an important area for further research. The CESA Community Wind Working Group is currently researching the opportunity for CESA to participate in bulk equipment purchases, and we believe this is an excellent strategy. They could also look into fronting money for equipment contracts, since these appear to be the largest drain on project budgets.

Prepare to Manage an Operational Project

Few project developers have significant experience with managing the construction of a wind power project on any scale. Fortunately, contractors are available for project construction management. For example, Vestas offers complete turn-key construction services – they design and build the project according to the communities specifications, so that owners need only "turn the key" to operate the project. These complete service options are more expensive than only purchasing turbines, but the premium may be well worth it.[92]

Once a project is operational, owners must prepare to maintain wind turbines and other equipment. Equipment warranties run out after a couple years so project owners should prepare to train staff in equipment maintenance. In the US there is a general lack of skilled labor available to maintain wind power equipment. Service technicians may relocate to areas with wind power projects or project staff may be trained in operations and maintenance to handle problems.

CEG could develop maintenance manuals for project developers. Even better, special degree programs at technical schools could train and certify qualified turbine maintenance workers and mechanics.

[92] Sean Middleton. Personal Interview. 3/1/2006.

SECTION III: CONCLUSIONS

Community Wind: The Big Picture

In this report we demonstrated that community wind is not the product of a set formula but rather a project-specific effort. While still young, community wind faces many obstacles that prevent it from entering the mainstream, but we observed projects that established new strategies to facilitate future implementation.

The managers and community members we interviewed expressed a growing discontent with the current domestic energy plan. Community wind projects channel that discontent into efforts that make a difference to communities. We met local champions that made a difference in their communities: fathers at the Spirit Lake School in Iowa turned an idea conceived at a windy football game into an economic opportunity with environmental benefits; a community in Massachusetts offset high electricity prices by harnessing local wind resources; and in Minnesota, we found projects benefiting from generous production incentives, a robust wind resource and supportive state policies and renewable purchase mandates.

While the economies of scale available to large-scale wind farms deter community wind from being a major player in the renewable energy market, we discovered something that is perhaps even more important than volume production of energy: the changing sentiment about the importance of clean, domestic energy production. The interviews we conducted revealed that economic returns were not always the sole motivating factor for starting a wind project. We found that in certain pockets of the country, many people are genuinely dismayed by the slow pace of change that the government is taking towards renewable energy and away from fossil fuels.

These initiatives help further policies that combat climate change, a problem gaining attention in the United States. Even if community wind is not the quickest way to reduce emissions, we commend the people for contributing to the erosion of what has traditionally been an impenetrable fossil fuel monopoly. With every additional successful project, future projects become even more economically viable and community wind moves closer to a reality for more communities.

NEW JERSEY

RPS Goal: 4% by 2008; potentially 20% by 2020

State Grant Program	
Applicable Sectors	Commercial, Industrial, local government
Techonologies Eligible	Solar, Wind, sustainable-grown biomass
Description of Incentive	Renewable Energy Project Grants and Financing are available to encourage the development of large-scale renewable energy facilities larger than 1 MW. Grants are available for up to 20% of eligible development costs. Long-term, low-interest rate bonds or loans may be available to finance the balance of project costs, however, borrowers are required to make a minimum 10% equity contribution to the project.
State Grant Program	
Applicable Sectors	Local governments and schools
Technologies Eligible	PV, Wind, Biomass, Fuel Cells (Renewable Fuels)
Description of Incentive	Clean Energy Financing encourages local governments and schools to undertake energy efficiency and/or renewable energy projects through grants and low-interest bond financing. Interest rates for loans vary from 3-5%, and grant and loan amounts can be up to the full amount of the project.
State Rebate Program	
Applicable Sectors	Commercial, Residential, Nonprofit, Schools, Institutional
Technologies Eligible	Photovoltaics, Landfill Gas, Wind, Biomass, Anaerobic Digestion, Fuel Cells (Renewable Fuels)
Description of Incentive	State rebate program applicable to commercial, residential, nonprofit, schools, and institutional sectors. Incentive amounts vary from $0.15 to $5.10 per watt direct current; incentives vary by technology and size. The maximum incentive is 60% of eligible costs for wind up to 10 kW, and 30% for wind greater than 10 kW. No maximum size is specified, however, output should not exceed 125% of the historical or expected (if new construction) consumption. Renewable systems must be new with all applicable performance and safety standards, and must carry a minimum 5-year warranty on all equipment. Installation must comply with all federal, state, and local codes; and must meet detailed siting criteria. Funding is provided by the "Societal Benefits Charge" collected from all customers of pubic utilities in New Jersey. Wind energy rebates start at $5 per watt (60% maximum) for systems up to 10 kW. Larger systems receive incrementally lower rebate amounts with a 30% maximum: $3.00/W for the first 10 kW for systems greater than 10 kW; $2.00/W for the next 90 kW of system size; $1.50 per watt for the next $400 kW of system size for system capacity in excess of 500 kW, up to 1 MW.
State Tax Exemption	
Applicable Sectors	Commercial, residential, and general pubic/consumer sectors
Technologies Eligible	Solar and Wind
Description of Incentive	New Jersey offers a full exemption from the state's 6% sales tax for all solar and wind-energy equipment; the exemption is available to all taxpayers.
Net Metering	
Applicable Sectors	Commercial and Residential
Technologies Eligible	Distributed Generation Systems up to 2MW
Description of Incentive	Net-metering is applicable to commercial and residential sectors, with a limit on system size of 2 MW. The electric distribution company credits a customer-generator at the full retail rate for each kWh produced by Class I renewable energy systems installed on the customer-generator's side of the electric revenue meter, up to the total amount of electricity used by that customer during an annualized period. Net excess is purchased by the utility at avoided-cost rate at the end of a 12-month billing cycle, and is credited to the customer's next bill. (Class I renewable energy is electricity generated by solar technologies, wind, fuel cells, geothermal technologies, wave or tidal action, and methane gas from landfills or a biomass facility.)

Continued on the next page.

NEW JERSEY (Continued)

RPS Goal: 4% by 2008; potentially 20% by 2020

Interconnection Standards

Applicable Sectors	Commercial and Residential
Eligible Technologies	Distributed Generation Systems
Description of Incentive	Interconnection is available for commercial and residential sectors, with a limit in size of 2 MW for net-metered systems. There is a total limit of the system of 0.1% of state peak demand or total impact of $2 million. Three different levels exist for review procedures, depending on the size of the system and certification. These levels dictate standards and fees associated with interconnection. Interconnection standards are not uniform across utilities, some utilities may require additional controls or external disconnect switches not included in the equipment package, to perform or pay for additional tests, or to purchase additional liability insurance.

OHIO

No RPS

State Loan Program

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government
Technologies Eligible	Solar Water Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells
Description of Incentive	The Renewable Energy Financial Assistance Program is one of four loan programs funded by the Energy Loan Fund (ELF), established by the Ohio General Assembly under the state's 1999 electric restructuring act (SB 3). The ELF was created to provide incentives for implementing energy-efficiency projects and renewable-energy projects. The renewable-energy loan program reduces the interest rate -- by approximately half -- on standard bank loans for qualifying Ohio residents and businesses that borrow money to implement energy-efficiency projects or renewable-energy projects. Approximately 11 banks currently participate in the program. Although the interest rate buy-down is available for five years, individual banks establish loan repayment terms on a case-by-case basis. Qualifying projects must be located in the service territory of one of the five participating electric-distribution companies to be eligible for ELF financing: Cinergy, American Electric Power, Dayton Power & Light, or FirstEnergy.Eligible projects include but are not limited to the purchase and installation of solar-electric (PV) systems, wind, biomass or bio-energy (from agricultural products or landfill methane), hydropower (from flowing water or existing dams) and fuel cells. Loans for residential projects range from $500 to $25,000, whereas loans for commercial and institutional projects range from $5,000 to $500,000. Industrial facilities are eligible if they qualify as "small businesses," as defined by the Small Business Administration.

State Grant Program **Distributed Energy Resources Grant**

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Agricultural, Institutional
Technologies Eligible	Solar Water Heat, Solar Space Heat, Photovoltaics, Landfill Gas, Wind, Biomass, CHP/Cogeneration, Anaerobic Digestion, Microturbines, Other Distributed Generation Technologies
Description of Incentive	DER grants are available for (but not limited to) new projects utilizing, combined heat and power (CHP), landfill or biomass methane for electric generation, microturbines, innovative industrial heat recovery, or clean-burning reciprocating engines. Commercial, institutional and industrial projects with a maximum capacity of 25 megawatts (MW) are eligible. The maximum grant award is $100,000; a minimum of 75% cost share is required. All projects must use the maximum Energy Loan Fund (ELF) linked deposit or ELF direct loan for which the project is eligible as part of the financing package. The maximum linked deposit is $1 million; the maximum direct loan is $500,000. (See the Notice of Funding Available for more information about ELF financing.) Previous recipients of OEE's DER grant program are not eligible.

State Grant Program **Renewable Energy Grants**

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Agricultural, Institutional
Technologies Eligible	Solar Water Heat, Solar Space Heat, Photovoltaics, Landfill Gas, Wind, Biomass, CHP/Cogeneration, Anaerobic Digestion, Microturbines, Other Distributed Generation Technologies
Description of Incentive	Grant funding is provided by the Energy Loan Fund (ELF), Ohio's public benefits fund. To qualify, projects must be located in Ohio and installed in the service territory of one of the four participating electric utilities: Cinergy, American Electric Power, Dayton Power & Light, or FirstEnergy. Renewable-Energy Grants totaling $450,000 are available for new solar-electric (PV), wind-electric and solar-thermal systems for all customer classes in Ohio. Incentive funds are limited, but qualifying applications will receive financial support until all the funds for this program have been awarded. Owners of new wind-energy systems may apply for a grant equal to $2.50 per watt of system capacity, up to 50% of system cost. Grants for residential systems are capped at $25,000; awards for non-residential systems are capped at $150,000. All project components must be new and must include a manufacturers' warranty. In cases where the installing contractor custom builds components, the installing contractor must provide a five-year warranty on those components.

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OHIO (Continued)

No RPS

Net Metering	
Applicable Sectors	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Microturbines
Technologies Eligible	Commercial, Industrial, Residential
Description of Incentive	100 kW limit on microturbines; no limit on other eligible systems
Interconnection Standards	
Applicable Sectors	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration, Microturbines, Other Distributed Generation Technologies
Technologies Eligible	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Fed. Government
Description of Incentive	300 kW for three-phase; 25 kW for single-phase
Public Benefits Fund	
Applicable Sectors	Commercial, Industrial, Residential, General Public/Consumer, Nonprofit, Schools, Local Government, Multi-Family Residential, Low-Income Residential, Agricultural
Technologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Renewable Transportation Fuels, Geothermal Electric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration, Microturbines
Description of Incentive	Ohio's 1999 electric-restructuring law created the Energy Loan Fund (ELF) and Universal Service Board, which consolidated low-income assistance programs and created a weatherization program targeted at low-income housing. The ELF will collect $100 million over 10 years from Ohio's four investor-owned utilities -- Cinergy, American Electric Power, Dayton Power & Light, and FirstEnergy -- to provide low-interest loans and loan guarantees for energy-efficiency improvements at residential, government, educational, small commercial, small industrial and agricultural facilities. The ELF also provides funding for renewable-energy projects and public-education efforts. The Ohio Department of Development's Office of Energy Efficiency (OEE) operates this fund.In addition to establishing funding levels, Ohio's restructuring legislation created the Public Benefits Advisory Board, a multi-stakeholder panel that assists the Department of Development in administering the Universal Service Board and the ELF. The Department of Development collaborates with the Ohio Public Utilities Commission to design and develop energy programs. The OEE has developed loan programs for the ELF:1)Business & Institutional Loans. 2) Renewable Energy Financial Assistance Program.3) Double-Saving Loans for Energy Home Improvements. 4) Whole-House Energy Performance Training (for contractors, inspectors and service providers
Environmental Disclosure	
Applicable sectors	Utitlity
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Solar, Other Distributed Generation Technologies
Description of Incentive	In 2000, the Ohio Public Utilities Commission adopted rules requiring electricity suppliers to disclose environmental information to retail customers in accordance with the state's 1999 restructuring law (SB 3). Retail providers must disclose fuel mix and emissions data for each electricity product offered. Disclosure must be provided in a standard format on an annual basis, with quarterly comparisons of actual and projected data. Fuel mix and emissions of carbon dioxide, sulfur dioxide and nitrogen oxides must be presented relative to the regional average. The amount of high-level and low-level radioactive waste generated also must be disclosed. The energy supplier should keep the records for all this data on file and be able to supply information to the Public Utilities Commission or a member of the public upon request.

CALIFORNIA

RPS Goal: Increase 2% by year beginning in 2003 to reach at least 20% by the end of 2010; goal of 33% by end of 2020

State Rebate Program

Applicable Sectors	Commercial, Industrial, Residential, Schools, Low-Income Residential, Agricultural, Institutional
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Wind, Fuel Cells (Renewable Fuels)
Description of Incentive	This program is offered to all grid-connected utility customers within the electric utility service areas of: Pacific Gas & Electric Company (PG&E), Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E) and Southern California Water Company (doing business as Bear Valley Electric Service (BVE)). Rebates for owner-installed systems are further discounted by 15 percent. The rebate levels for all technology types will continue to be reduced by $0.20/W every six months (every January 1st and July 1st).Rebates for eligible renewable energy systems installed on affordable housing projects are available at 25% above the standard rebate level up to 75% of the system's installed cost. Wind systems up to 50 kW in size may participate, but the rebates for such systems are limited to less than 30 kW.The following system requirements apply: must be grid connected; electricity production is not to exceed 200% of the site's historical or current electricity needs; the equipment retailer must provide a 5-year warranty;systems/components must meet national standards;only new equipment is eligible;systems must be or owner-installed;all systems must be installed with a performance meter; and system audits will be conducted by the Energy Commission. Amount allotted for renewable: Rebates vary by project, maximum funding available for all systems installed by any corporate or government parent is capped at $1,000,000,Approximately $118,125,000 in funding was allocated to the ERP for 2002 through 2006. $10M is allocated to the PV performance-based incentive program.

Public Benefits Fund

Applicable Sectors	Commercial, Industrial, Residential, General Public/Consumer
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, **Wind**, Biomass, Geothermal Electric, Municipal Solid Waste, (Note: small hydro is 30 MW or less), Anaerobic Digestion, Small Hydroelectric, Tidal Energy, Wave Energy, Ocean Thermal, Fuel Cells (Renewable Fuels)
Description of Incentive	California set the bar for all other renewable energy funds with the creation of a $540 million fund for renewables with its electric industry restructuring legislation (AB 1890) back in 1996. The success of that program led to legislation in 2000 (AB 995 and SB 1194) that extended funding -- at the same annual levels -- for 10 years (through 2012), creating an additional $1.35 billion in funding for renewables. SB 1038 (2002) authorized the California Energy Commission (Energy Commission) to administer the fund. Funding is collected from customers of the state's three major investor-owned utilities -- SDG&E, SCE and PG&E. The Existing Renewable Facilities Program is divided into two tiers: (1) biomass and solar-thermal projects, which receive $20.25 million in annual funding, and (2) wind projects, which receive $6.75 million in annual funding. This program supports the development and maintenance of existing renewable energy projects. This account uses a production credit mechanism based on the kilowatt-hours generated by a project. Once on line, the new facilities receive incentive payments for a maximum of five years, and like the Existing Program, incentives are awarded based on the number of kilowatt-hours generated.

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CALIFORNIA (Continued)

RPS Goal: Increase 2% by year beginning in 2003 to reach at least 20% by the end of 2010; goal of 33% by end of 2020

Interconnection Standards

Applicable Sectors	Commercial, Industrial, Residential
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, **Wind**, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration, Microturbines, Other Distributed Generation Technologies
Description of Incentive	Rule 21 specifies the technical interconnection rules for all DG under 10 megawatts (MW), including renewables. Net metering in California now applies to renewable-energy systems up to 1 MW, and includes provisions for time-of-use net metering. Significantly, net-metered systems up to 1 MW are exempt from paying costs associated with the interconnection studies, distribution system modifications or application review fees discussed below. Large DG Systems up to 10 MW: California's interconnection rules are based on a screening process that determines the level of review process for interconnected systems. After DG operators apply for interconnection, the utility performs the Initial Review Process (IRP) of the project plans. If all screens are passed, then the system qualifies for Simplified Interconnection, whereby no additional studies are needed. If a system does not pass the IRP, it must undergo supplemental review process (SRP).As an outcome of the SRP, systems may be permitted to undergo "Simplified Interconnection" with some additional requirements, or where one or more screens are not passed, the system must undergo a forr Interconnection Study, for which the costs are determined by the utility and borne by the system owner. In regard to exit fees in particular, the CPUC ruled in 2003 that systems under 1 MW that are net metered and/or eligible for CPUC or CEC clean-energy incentives are fully exempt from exit fee surcharges. This includes many solar and wind systems, as well as fuel cells.

Net Metering

Applicable Sectors	Commercial, Industrial, Residential
Technologies Eligible	Photovoltaics, Landfill Gas, Wind, Fuel Cells, Anaerobic Digestion
Description of Incentive	California's net-metering law, requires all three of California's investor-owned electric utilities (PG&E, SCE, and SDG&E) and the state's rural cooperatives to allow net metering to all customers for systems up to 1 megawatt (MW).Limit the total amount of net metering to 0.5% of a utility's peak demand;Exempt net metering from "exit fees" or "departing load fees; Prohibit inter-class cost shifting that results from net metering;Allow municipal utilities to permit either net-metering or co-metering, which credits customers for generation on a "time-of-use" basis for the generation value of their production;Advise the state treasurer to consider net metering and co-metering projects as sustainable building methods or distributed-energy technologies for purposes of evaluating low-income housing projects;Permit wind-energy projects up to 50 kW to net meter; and ***require wind-energy projects from 50 kW to 1 MW to utilize "wind energy co-metering," which provides for time-of-use pricing and credits***.Net excess generation (NEG) is carried forward to a customer's next bill for up to 12 months. Any NEG remaining at the end of each 12-month period utility. The combined capacity of net-metered systems may not exceed 0.5% of a utility's peak demand. California does not allow any new or additional demand charges, standby charges, customer charges, minimum monthly charges, interconnection charges, or other charges that would increase an eligible customer-generator's costs beyond those of other customers in the rate class to which the eligible customer-generator would otherwise be assigned.

ILLINOIS

RPS Goal: Nonbinding 8% in 2013; 75% should come from wind

Public Benefits Program	Clean Energy Community Foundation
Applicable Sectors	Nonprofit, Schools, Local Government, State Government
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind, Biomass, Fuel Cells, Other Distributed Generation Technologies
Description of Incentive	The Illinois Clean Energy Community Foundation (ICECF) was established in December 1999 as an independent foundation with a $225 million endowment provided by Commonwealth Edison. The ICECF invests in clean-energy development and land-preservation efforts, working with communities and citizens to improve environmental quality in Illinois. The ICECF provides grants, on a competitive basis, to programs and projects that improve energy efficiency, develop renewable-energy resources, and preserve and enhance natural areas and wildlife habitats in Illinois.
Property Tax Exemption	
Applicable Sectors	Commercial, Industrial, Residential
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Geothermal Electric
Description of Incentive	Illinois offers a special assessment of solar-energy systems for property-tax purposes. For property owners who register with a chief county assessment officer, solar equipment is valued at no more than a conventional energy system. Eligible equipment includes active solar-energy systems, passive solar-energy systems, wind-energy systems and geothermal-energy systems.

OREGON

No RPS

Public Benefits Fund

Applicable Sectors	General Public/Consumer
Techonologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Direct-Use Geothermal Energy, Fuel Cells (Renewable Fuels)
Description of Incentive	Oregon's 1999 electric-utility restructuring legislation (SB 1149) required Pacific Power and Portland General Electric (PGE) to collect a 3% public-purpose charge from their customers to support renewable energy and energy-efficiency projects.The Energy Trust now serves Oregon customers of Pacific Power, Portland General Electric and NW Natural Gas (which opted in to the Energy Trust's efficiency programs only, with a 1.25% public charge beginning in 2003). Of the funds collected by the utilities, 75% (amounting to approximately $45 million per year) support the Energy Trust's renewable energy and efficiency programs, with at least $10 million of that allocated to renewables. The Energy Trust's renewable-energy programs include financial incentives for small-scale and utility-scale projects that generate energy. fAt least 80% of the energy-conservation expenditures are concentrated in the service territory of the utility where the funds were collected.

State Grant Program

Applicable Sectors	Commercial, Industrial, Residential, General Public/Consumer, Nonprofit, Schools, Local Government, State Government, Agricultural
Technologies Eligible	Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Anaerobic Digestion, Fuel Cells (Renewable Fuels)
Description of Incentive	In order to provide opportunities for Oregonians to take advantage of incentives for renewables, The Energy Trust of Oregon, a nonprofit organization created to invest public purpose funding for energy efficiency and renewable energy in Oregon, created May 2002.This program is designed to support renewable energy projects that do not already have an established incentive program developed and launched by the Energy Trust of Oregon. but the projected program budget is expected to fund 4-6 projects each year. The program does not fund R&D or pre-commercial activities. It is likely to fund projects that follow certain guidelines, including:New, commercial technologies in established applications;Old technologies in new applications;Projects that can be implemented quickly;Market defining demonstrations. They expect to reserve 10% of the Renewable Energy program budget, or about $1 million annually, for open solicitation incentives. There is no funding cap for projects, Energy Trust may fund all or a portion of the above-market costs of a project, (defined generally as the difference between current wholesale or retail electricity prices and the cost of electricity generated by the project). There is no fixed percentage for the amount of the above-market costs the Energy Trust will pay. Eligible projects must either be located in the Oregon service territory of Pacific Power or Portland General Electric, or have a power purchase agreement with one of those utilities. Off-grid projects are not eligible for Energy Trust support.

Property Tax Exemption

Applicable Sectors	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, **Wind**, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Geothermal Heat Pumps, Methane Gas, Solar Pool Heating
Technologies Eligible	Commercial, Industrial, Residential
Description of Incentive	Oregon’s property tax exemption states that the added value to any property from the installation of a qualifying renewable energy system not be included in the assessment of the property’s value for property tax purposes. This exemption is intended for end users and does not apply to property owned by anyone directly or indirectly involved in the energy industry.

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OREGON (Continued)

No RPS

Personal Tax Credit

Applicable Sectors	Residential
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Renewable Fuel Vehicles, Fuel Cells, Geothermal Heat Pumps, Refueling Stations
Description of Incentive	Homeowners and renters who pay Oregon income taxes are eligible for the Residential Energy Tax Credit if they purchase premium-efficiency appliances, heating and cooling systems, duct systems, closed-loop geothermal space or water heating systems, solar water and space heating systems, photovoltaics, wind, fuel cells, and alternative fuel vehicles and charging or fueling systems. Amount Alotted for Renewables:PV: $3.00/W; Spa/pool heating: $0.15/kWh saved; Residential Appliances, HVAC, Water Heating: 25% of net purchase price; All other renewable technologies: $0.60/kWh saved during the first year.All other renewable technologies: $0.60/kWh saved during the first year, up to $1,500.

State Loan Program

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Tribal Government, Fed. Government, Rural Electric Cooperative
Eligible Tevhnologies	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Geothermal Electric, Municipal Solid Waste, CHP/Cogeneration, Small Hydroelectric, Renewable Fuels
Description of Incentive	The Oregon Small Scale Energy Loan Program (SELP) is administered by the Oregon Department of Energy and was created in 1981 after voters approved a constitutional ammendment authorizing the sale of bonds to finance small scale, local energy projects. The sale of bonds is made on a periodic basis and, occasionally, to accommodate a particularly large loan request. The program offers low-interest loans for projects that: Save energy; Produce energy from renewable resources such as water, wind, geothermal, solar, biomass, waste materials or waste heat; Use recycled materials to create products;Use alternative fuels; and Reduce energy consumption during construction or operation of another facility. Loans are available to individuals, businesses, schools, cities, counties, special districts, state and federal agencies, public corporations, cooperatives, tribes, and non-profits. In June of 2005, the passage of Senate Bill 735 expanded the program to allow projects proposed by intergovernmental entities as well as projects located outside of Oregon, where providing substantial benefits within Oregon. Though there is no legal maximum loan, the size of loans generally ranges from $20,000 to $20 million. Terms vary, but are generally set to match the term of the bonds that funded the loans. Loan terms may not exceed project life. Businesses which qualify for SELP often qualify for the Business Energy Tax Credit (BETC).As of December 2004, 643 loans had been closed totaling $363 million. Renewable energy projects accounted for 215 loans and 428 loans were for conservation projects.

Private Grant Program

Applicable Sectors	Nonprofit, Local Government, Tribal Government
Technologies Eligible	Solar Water Heat, Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Animal Waste-to-Energy
Description of Incentive	Using revenues generated from the sales of Green Tags, Bonneville Environmental Foundation (BEF), a not-for-profit organization, accepts proposals for funding for renewable energy projects located in the Pacific Northwest (OR, WA, ID, MT). Any private entity, organization, local or tribal government located in the Pacific Northwest may participate. BEF may deliver funding through various means, including grants, loans, convertible loans, guarantees, and direct investments in renewable energy projects. BEF renewable energy grants and investments may range from a few thousand dollars for small installations, to significant investments in central station grid-connected renewable energy projects. If a BEF grant is requested for a generating project, the BEF share will not exceed 33% of total capital costs, and 0% of operating costs. BEF generally does not fund resdidential and small business renewable energy projects with grants or investments. Rather, BEF supports installations for residential and small businesses customers through two cooperatives: the Northwest Solar Cooperative and Our Wind Co-op

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OREGON (Continued)

No RPS

Net Metering

Applicable Sectors	Commercial, Residential
Technologies Eligible	Photovoltaics, Wind
Description of Incentive	Oregon's original 1999 net metering law (HB 3219) allowed net metering for customers with solar, wind, or hydropower systems up to 25 kW. The law was expanded in June 2005 (SB 84) to include landfill gas, digester gas, waste, dedicated energy crops, and low-emission, nontoxic biomass derived from wood, forest, or field residues. Furthermore, the Oregon Public Utilities Commission may increase the 25-kW system limit for customers of public (investor-owned) utilities. Residential and commerical customers are eligible for net metering up to a total installed capacity of 0.5% of a utility's historic single-hour peak load. Above this installed capacity, net metering eligibility can be limited by regulatory authority. Net excess generation is either purchased at avoided cost or credited to the customers next monthly bill. At the end of an annual period, any unused credit is granted to the electric utility. This credit is then either granted to customers enrolled in the utility's low-income assistance programs, credited to the generating customer, or "dedicated to other use." Net metering is to be accomplished using a standard bi-directional meter. Utilities

Interconnection Standards

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Fed. Government
Eligible Technologies	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Municipal Solid Waste, Anaerobic Digestion
Description of Incentive	Oregon's net metering law, ORS 757.300 (HB 3219 of 1999), includes interconnection requirements for systems generating up to 25 kW. This law was expanded by SB 84 of 2005 to include landfill gas, digester gas, waste, dedicated energy crops, and low-emission, nontoxic biomass derived from wood, forest, or field residues. The Oregon Public Utilities Commission may increase the 25-kW system limit for customers of public (investor-owned) utilities. Standardized technical interconnection standards were developed by the Oregon Building Codes Division and apply to all utilities in the state. Systems must be installed according to the Oregon Electric Specialty Code (essentially NEC Article 690), must comply with Institute of Electrical and Electronic Engineers (IEEE) codes, and must employ Underwriters Laboratories (UL)-listed equipment. Manual external disconnects are not required. Additional liability insurance is not required, but the utility is exempt from any liability for loss, injury or death related to the interconnection of a net-metered system. Oregon currently does not have uniform interconnection procedures. Each utility has different requirements

Business Energy Tax Credit

Applicable Sectors	Commercial, Industrial, Multi-Family Residential
Eligible Technologies	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Renewable Transportation Fuels, Geothermal Electric, Geothermal Heat Pumps, Municipal Solid Waste, CHP/Cogeneration, Hydrogen, Refueling Stations, Ethanol, Methanol, Biodiesel, Fuel Cells (Renewable Fuels)
Description of Incentive	Oregon's Business Energy Tax Credit (BETC) is for investments in energy conservation, recycling, renewable energy resources, or less-polluting transportation fuels. Any Oregon business may qualify. As examples, projects may be in manufacturing plants, stores, offices, apartment buildings, farms, and transportation. The 35% tax credit is taken over five years: 10% the first and second years and 5% for each year thereafter. Any unused credit can be carried forward up to eight years. Those with eligible project costs of $20,000 or less may take the tax credit in one year. Under the pass-through option, a project owner may transfer a tax credit to a pass-through partner in return for a lump-sum cash payment (the net present value of the tax credit) upon completion of the project. The Pass-through Option allows non-profit organizations, schools, governmental agencies, tribes, other public entities and businesses with and without tax liability to use the Business Energy Tax Credit by transferring their tax credit for an eligible project to a partner with a tax liability. Projects that use solar, wind, hydro, geothermal, biomass, or fuel cells (renewable fuels only) to produce energy, displace energy, or reclaim energy from waste may qualify for a tax credit. Renewable resource projects must replace at least 10% of the electricity, gas or oil used. The energy can be used on site or sold.

MINNESOTA

RPS Goal: 1% in 2005, increasing by 1% per year to reach at least 10% in 2015

Low-Interest Loan

Applicable Sectors	Agricultural
Techonologies Eligible	Wind, biomass, anaerobic digesters
Description of Incentive	This is a low-interest loan program, administered by the Minnesota Department of Agriculture through the Minnesota Rural Finance Authority (RFA). Loans are provided to farmers for improvements or additions to permanent agriculture facilities, including wind-energy systems with a maximum capacity of 1 MW became eligible for the program. Maximum loan amounts are up to 45% or $200,000 of loan principal for a maximum term of 10 years. Borrow must be a Minnesota resident, a Minnesota domestic family-farm corporation or a family-farm partnership. The borrower (or one of the borrowers) must be a principle operator of the farm.

Low-Interest Loan

Applicable Sectors	Schools, local government, hospitals
Technologies Eligible	All renewable technologies, including energy efficiency and conservation projects
Description of Incentive	This loan is available to buy down up to 50% of loan principal to 0% interest with a simple payback of 10 years or less; up to 50% of the total project cost, not to exceed $500,000. This loan program is applicable for any specific renewable energy, energy efficiency, or energy conservation "capital improvement" measure. There are no specific improvements designated for energy efficiency, as long as a measurable amount of energy is conserved as a result of the project. A technical analysis of the proposed energy-saving capital improvement is required with each loan application.

Property Tax Exemption

Applicable Sectors	Commercial and residential
Technologies Eligible	Wind and PV
Description of Incentive	Minnesota excludes from real estate property taxation all real and personal property of wind-energy systems; in lieu of a property tax on large wind-energy systems, a production tax was implemented in 2002. Wind systems greater than 12MW are taxed at a rate of 0.036 cents/kWh; and systems between 250 kW and 2 MW are taxed at a rate of 0.012 cents/kWh. Wind systems under 250 kW are exempt from the production tax. However, a provision in a separate statute (Minn. Stat 272.028) allows a mutually agreeable alternative to be negotiated between the local government authority and the wind facility owner for the purpose of maintaining "public infrastructure and services."

Wind Sales Tax Exemption

Applicable Sectors	Commercial, residential, general public/consumer
Technologies Eligible	Wind
Description of Incentive	Wind-energy conversion systems used as electric power sources are exempt from Minnesota's sales tax. Materials used to manufacture, install, construct, repair or replace wind-energy systems are also exempt from state sales tax. A "wind energy conversion system" (WECS) is defined as any device, such as a wind charger, wind mill or turbine, that converts wind energy to a form a usable energy

Private Funds(Xcel)

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, Utility, State Government, Tribal Government, Fed. Government, Agricultural, Institutional
Technologies Eligible	Photovoltaics, Wind, Biomass, Hydroelectric, CHP/Cogeneration, Anaerobic Digestion, Renewable Fuels, Fuel Cells (Renewable Fuels)
Description of Incentive	The Xcel Renewable Development Fund (RDF) provides grants periodically through an RFP process. In 2005 the Minnesota Public Utilities Commission approved a second round of 29 projects totaling almost $37 million dollars. The third round of funding is expected to begin in 2006 or 2007.

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MINNESOTA (Continued)

RPS Goal: 1% in 2005, increasing by 1% per year to reach at least 10% in 2015

Net Metering

Applicable Sectors	Commercial, Industrial, Residential
Eligible Technologies	Photovoltaics, Wind, Biomass, Hydroelectric, Municipal Solid Waste,
Description of Incentive	Minnesota's net-metering law was established in 1983 and applies to all investor-owned utilities, municipalities and rural cooperatives. Qualifying facilities of 40 kW or less are eligible. There is no limit on statewide capacity. Utilities must purchase net excess generation (NEG) at the average retail rate. The average retail rate is the total annual class revenue from sales of electricity minus the annual revenue resulting from fixed charges, divided by the annual class kWh sales. The purchase of NEG at retail rates distinguishes Minnesota's net-metering law from similar programs in most other states. Only Wisconsin also provides for the purchase of NEG at retail rates.

Interconnection Standards

Applicable Sectors	All systems smaller than 10 MW
Eligible Technologies	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State and Federal Government
Description of Incentive	Only systems smaller than 10 MW can be interconnected, only systems under 40 kW qualify for net-metering. Additional insurance of $300,000 is required for systems under 40 kW. The Minnesota Public Utilities Commission has developed interconnection standards that apply to all utilities in the state, including municipal and co-op utilities. The regulations are streamlined and uniform, and address safety, economics, and reliability issues. Minnesota recognized the benefits of distributed generation would be lost, however, if the process of connecting small generators to the electric grid proved too dangerous, or the process of negotiating such connections proved too burdensome. To avoid this outcome, the Legislature adopted § 216B.1611 to facilitate the process. In particular, the Legislature directed the Commission to establish parameters for interconnection that would balance the needs of the utility and its ratepayers with the needs of the small generators. Utilities would then propose tariffs establishing standardized terms for interconnection consistent with the Commission-approved parameters.

ARIZONA

RPS Goal: 0.2% in 2001, increasing to 1.1% in 2007-2012; 60% must come from solar

Personal Tax Credit

Applicable Sectors	Commercial, Industrial, Residential, Schools, Low-Income Residential, Agricultural, Institutional
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Wind, Fuel Cells (Renewable Fuels) Qualifying technologies wind generators, and wind powered pumps.
Description of Incentive	Arizona's Solar Energy Credit provides an individual taxpayer with a credit for installing a solar or wind energy device at the taxpayer's Arizona residence. The credit is allowed against the taxpayer's personal income tax in the amount of 25% of the cost of a solar or wind energy device, with a $1,000 maximum allowable limit, regardless of the number of energy devices installed. The credit should be claimed in the year of installation and if the amount of the credit exceeds a taxpayer's liability in a certain year, the unused portion of the credit may be carried forward for up to five years.

State Tax Exemption

Applicable Sectors	Commercial, Residential, General Public/Consumer
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Wind, Solar Pool Heating, Daylighting
Description of Incentive	Arizona provides a sales tax exemption for the sale or installation of "solar energy devices". A solar energy retailer may exclude from tax up to $5,000 from the sale of each solar energy device, and a solar energy contractor may exclude up to $5,000 of income derived from a contract to provide and install a solar energy device. For contractors, the deduction cap of $5,000 applies to the contract, rather than each energy device. To take advantage of these exemptions, a retailer or contractor must register with the Arizona Department of Revenue (ADOR) filing Arizona Department of Revenue Form 6015 - Solar Energy Devices. The statutory definition of "solar energy device" includes wind electric generators and wind-powered water pumps in addition to daylighting, passive solar heating, active solar space heating, solar water heating, and photovoltaics. The sales tax exemption does not apply to batteries, controls, etc., that are not part of the system.

Interconnection Standards

Applicable Sectors	Commercial, Industrial, Residential
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, CHP/Cogeneration, Microturbines, Other Distributed Generation Technologies
Description of Incentive	In 2005, the Arizona Corporation Commission (ACC) initiated a proceeding to establish statewide interconnection standards for distributed generation (DG). The state's utilities individually developed DG interconnection agreements prior to the ACC's most recent move to establish statewide standards. The Salt River Project (SRP), SRP's rules include technical protection requirements, an interconnection process flow chart and a two-page interconnection application. The rules establish separate requirements for units based on system capacity: Class I -- 50 kW or less, single or three-phase Class II -- 51 kW to 300 kW, three-phase, Class III --301 kW to 5 MW, three-phase, Class IV -- more than 5 MW, three-phase Tucson Electric Power (TEP) and Arizona Public Service (APS), have similarly established their own interconnection rules for DG. It is likely that Arizona's regulated utilities will adopt the ACC's interconnection standards for DG when the final rules are issued

MASSACHUSETTS

RPS Goal: 1% new renewables in 2003, rising to 4% in 2009; plus 1% each year after

Conservation Patent Exemption (Personal)	
Applicable Sectors	Commercial
Techonologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind, Biomass, Hydroelectric, Renewable Transportation Fuels, Geothermal Electric, Fuel Cells, Geothermal Heat Pumps, Municipal Solid Waste
Description of Incentive	Corporate excise tax deduction on royalties from patents that are beneficial to renewable energy/conservation.Amount Allotted:100% deduction, allowable for 5 years.
Grants	
Applicable Sectors	Commercial, Industrial, Schools, Local Government, State Government, Fed. Government, Multi-Family Residential, Institutional
Technologies Eligible	Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Anaerobic Digestion, Renewable Fuels, Biodiese
Description of Incentive	State Grants For systems with capacity greater than 10 kW; >50% of generation must be used on site. Base incentive ranges $1.50 - $4.00/W-AC depending on technology, plus bonus rebate of $0.25 - $2.00/W-AC for each additional project element (e.g., on public building, part of certified green building, etc.) Design grants: lesser of $75,000 or 75% of actual cost; Construction grants: lesser of $500,000 or 75% of actual costs; Feasibility Grants: $40,000. Total budget = $8.9 million over 3 years.
Local Property tax exemption	
Applicable Sectors	
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells
Description of Incentive	Solar and wind powered devices utilized as a primary or auxiliary power system for the purpose of heating or otherwise supplying the energy needs of taxable property qualify for property tax exemptions for a period of 20 years from the date of installation.
Renewable Energy Credit (REC) Payment Options	
Applicable Sectors	Commercial, Nonprofit, Local Government, State Government
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal, Fuel Cells (Renewable Fuels)
Description of Incentive	Production incentive;Varies by project (a total of $15 million in present value will be awarded)
Renewable Energy Equipment Sales Tax Exemption	
Applicable Sectors	Residential
Technologies Eligible	Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Geothermal Heat Pumps
Description of Incentive	State sales tax exemption: up to 100% of the renewable
Tax Credit	
Applicable Sectors	Residential
Eligible Tevhnologies	Solar Water Heat, Solar Space Heat, Photovoltaics, Wind
Description of Incentive	personal tax credit on renewable energy systems; 15% up to $1,000.
Small Renewables Initiative Rebate	
Applicable Sectors	Commercial, Industrial, Residential, Schools, Local Government, Multi-Family Residential, Institutional
Eligible Tevhnologies	Photovoltaics, Wind, Small Hydroelectric
Description of Incentive	State rebate program for design & construction of customer-sited renewable energy projects. Amount Allotted to renewable:Ranges from $2.75/W to $6.75/W depending on technology and application. Maximum Incentive:$50,000 per project or site. Expected that fund will be at $5 million, allocated in blocks. Note: As of September 29, 2005, Block 1 of the Small Renewable Initiative (SRI) was fully allocated. Block 2 (second $1,000,000) was approved on October 28, 2005. Wind: $2.75 per watt (DC).

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MASSACHUSETTS (Continued)

RPS Goal: 1% new renewables in 2003, rising to 4% in 2009; plus 1% each year after

Solar and Wind Energy System Excise Tax Deduction	
Applicable Sectors	Commercial, Industrial
Eligible Tevhnologies	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind
Description of Incentive	Corporate deduction from net income of costs incurred from installing system.
Solar and Wind Power Systems Excise Tax Exemption	
Applicable Sectors	Commercial, Industrial
Technologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind
Description of Incentive	Corporate exemption for solar and wind energy systems that qualify for the Solar and Wind Power Excise Tax Deduction from the tangible property measure of the corporate excise tax. The exemption is in effect for the length of the system's depreciation period. Amount allotted for renewables: 100% of the tangible property portion of the excise tax (0.26% of the taxable value of the system).
Sustainable Energy Economic Development (SEED) Initiative	
Applicable Sectors	Commercial, Industrial
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Renewable Transportation Fuels, Fuel Cells, Municipal Solid Waste, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal
Description of Incentive	State loan program: Amount allotted for renewables: Program budget = $2 million. $50,000 - $500,000 (11/05 solicitation) Maximum Amount:$500,000 (11/05 solicitation).
Net Metering	
Applicable Sectors	Commercial, Industrial, Residential
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration
Description of Incentive	Net metering rules (no special fees imposed). DG systems limited to 60kW,net excess created from DG credited to customer's next bill at average monthly market rate.
Interconnection Standards	
Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Fed. Government
Eligible Technologies	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration, Microturbines, Other Distributed Generation Technologies
Description of Incentive	Interconnection rules for DG (but no limits on size of system)
Renewable Energy Trust Fund	
Applicable Sectors	General Public/Consumer
Technologies eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Municipal Solid Waste, Storage/conversion techs connected to renewables, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal, Renewable Fuels, Biodiesel
Description of Incentive:	Public Benefits fund: Total funding of roughly $150 million over a five-year period, with approximately $25 million per year for an undefined period beyond 2002. The charge levels were established as follows: three-quarters of one mill ($0.00075) per kWh in 1998; one mill ($0.001) per kWh in 1999; one and one-quarter mill ($0.00125) per kWh in 2000; one mill ($0.001) per kWh in 2001; three-quarters of one mill ($0.00075) per kilowatt-hour in 2002; and one-half of one mill ($0.0005) per kWh in each calendar year thereafter.

PENNSYLVANIA

RPS Goal: 18% by 2020 (8% Tier I and 10% Tier II)

State Grant Program	Metropolitan Edison Company SEF Grants (FirstEnergy Territory)
Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, Metropolitan Edison Territory of FirstE
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Municipal Solid Waste, CHP/Cogen
Description of Incentive	Local grant program, funds can be applied to development and use of clean energy technology.
Amount allocated	Varies: Max limit 1,000,000
State Grant Program	Pennsylvania Energy Development Authority (PEDA) - Grants
Applicable Sectors	Commercial, Industrial, Nonprofit, Local Government, Agricultural
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Geothermal Electric, Fuel Cells, Coal-Mine Methane; Waste Coal, Anaerobic Digestion, Small Hydroelectric
Description of Incentive	State Grant Program that issues funding solicitations to support advanced energy research and deployment projects, and to assist businesses interested in locating or expanding advanced energy operations in Pennsylvania
Amount allocated	Maximum Amount:$1,000,000 (2005 solicitation) Program Budget:$10 million grants, loans, loan guarantees (April 2005 solicitation)
State Grant Program	Pennsylvania Energy Harvest Grant Program
Applicable Sectors	Commercial, Nonprofit, Schools, Local Government, Agricultural
Technologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Renewable Transportation Fuels, Fuel Cells, CHP/Cogeneration, Anaerobic Digestion, Small Hydroelectric, Other Distributed Generation Technologies
Description of Incentive	State grant program that finances the implementation of clean and renewable-energy technologies that have measurable benefits in terms of pollution reduction, environmental quality and reduced energy use
Amount allocated	Varies by grant cycle. Program budget approx. $5 million/year. (The initiative is part of a plan for state-government agencies to obtain 10% of their electricity from renewable and alternative energy resources, including biomass, wind, solar, small-scale hydroelectric, landfill methane, coal-bed methane and waste
State Loan Program	Pennsylvania Energy Development Authority (PEDA) - Loans and Loan Guarantees
Applicable Sectors	Commercial, Industrial, Local Government, Agricultural
Eligible Tevhnologies	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Geothermal Electric, Fuel Cells, Coal-Mine Methane; Waste Coal, Anaerobic Digestion, Small Hydroelectric
Description of Incentive	State loan program that issues funding solicitations to support advanced energy research and deployment projects, and to assist businesses interested in locating or expanding advanced energy operations in Pennsylvania
Amout Allocated	Varies, Maximum Amount:Loans: $1,000,000; loan guarantees: $500,000 (2005 solicitation) Program Budget:$10 million grants, loans, loan guarantees (April 2005 solicitation)
State Loan Program	Metropolitan Edison Company SEF Loans (FirstEnergy Territory)
Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, Metropolitan Edison Territory of FirstEnergy
Eligible Tevhnologies	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration
Description of Incentive	Local loan program that can be used for development and use of renewable energy and clean energy technologies
Amout Allocated	varies, though max limit is $1,000,000.

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PENNSYLVANIA (Continued)

RPS Goal: 18% by 2020 (8% Tier I and 10% Tier II)

Private Grant Program	Penelec SEF of the Community Foundation for the Alleghenies Grant Program (FirstEnergy Territory)
Applicable Sectors	
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, CHP/Cogeneration
Description of Incentive	Local grant program that can be used for development and use of renewable energy and clean energy technologies
Amount allocated	Varies according to project, Max. Limit: Grants typically do not exceed $25,000
Private Loan Program	SEF of the Community Foundation for the Alleghenies Loan Program (FirstEnergy Territory)
Applicable Sector	Commercial, Industrial, Residential, Nonprofit, Schools, Penelec Service Territory of FirstEnergy
Technologies Eligible	All Solar, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, CHP/Cogeneration
Description of Incentive	Local loan program that can be used for development and use of renewable energy and clean energy technologies
Amount allocated	Varies according to project Max. Limit:Loans typically do not exceed $500,000;
Local Grant Program	SEF of Central Eastern Pennsylvania Grant Program (PP&L Territory)
Applicable Sectors	Commercial, Industrial, Nonprofit, Schools, Local Government, State Government, PP&L Service Territory
Technologies Eligible	Solar Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells
Description of Incentive	Local grant program to promote, research and invest in clean and renewable energy technologies, energy conservation, energy efficiency and sustainable energy enterprises that provide opportunities and benefits for PP&L ratepayers.
Amount allocated	Generally $10,000 - $25,000 per project with Max. Limit:$25,000. 60% of the funds are disbursed towards loans, 7% towards educational grants and 33% towards royalty and equity financing.
Private Loan Program	SEF of Central Eastern Pennsylvania Loan Program (PP&L Territory)
Applicable Sector	Commercial, Industrial, Nonprofit, Local Government, State Government, PP&L Service Territory
Technologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, CHP/Cogeneration, Other Distributed Generation Technologies
Description of Incentive	Local loan program to promote, research and invest in clean and renewable energy technologies, energy conservation, energy efficiency and sustainable energy enterprises that provide opportunities and benefits for PP&L ratepayers.
Amount allocated	varies by project with Max. Limit:none
Private Local Loan Progran	Sustainable Development Fund Commercial Financing Program (PECO Territory)
Applicable Sector	Commercial, Industrial, Nonprofit, Schools, PECO Service Territory
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Geothermal Heat Pumps
Description of Incentive	Local loan program for renewable energy projects.
Amount allocated	Varies by project, typically $50,000 to $1 million
Private Local Grant Prograr	Sustainable Development Fund Grant Program (PECO Territory)
Applicable Sectors	Commercial, Industrial, Nonprofit, Schools, Construction, PECO Service Territory
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Geothermal Heat Pumps, CHP/Cogeneration
Description of Incentive	Local grant program for renewable energy projects.
Amount allocated	Varies by project, typically $25,000.

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PENNSYLVANIA (Continued)

RPS Goal: 18% by 2020 (8% Tier I and 10% Tier II)

Private Local Loan Program	West Penn Power SEF Commercial Loan Program
Applicable Sectors	Commercial
Technologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, CHP/Cogeneration, Other Distributed Generation Technologies
Description of Incentive	Local loan program that promotes the use of renewable energy and clean energy among commercial, industrial, institutional and residential customers in the West Penn market region.
Amount allocated	Varies with max limit at $1,000,000.
Private Local Grant Program	West Penn Power SEF Grant Program
Applicable Sectors	Nonprofit, Schools, West Penn Power Service Territory
Technologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, CHP/Cogeneration, Other Distributed Generation Technologies
Description of Incentive	Local grant program that promotes the use of renewable energy and clean energy among commercial, industrial, institutional and residential customers in the West Penn market region.
Amount allocated	Varies by proposal
Green Power purchasing/aggregaton	
Applicable Sectors	State Government
Technologies Eligible	Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric
Description of Incentive	Green power purchasing/aggregation- Pennsylvania's state government will purchase each year 100,000 megawatt-hours (MWh) of electricity -- 10% of the state government's total electricity use -- generated by renewable resources and waste coal, at a premium rate of $0.0034 (0.34 cents) per kilowatt-hour (kWh).
Interconnection Standards	
Applicable Sectors	Distributed Generation Operators
Technologies Eligible	Distributed Generation
Description of Incentive	Interconnection standards currently being explored: to be determined
Amount Allocated	To be determined
Net Metering	
Technologies eligible	Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Applicable Sectors: Commercial, Industrial, Residential
Description of Incentive	Net metering rules, for owners of qualifying facilities less than 50 kilowatts (kW) may opt for net energy billing. Varies by utility. Net metering rules instructs each individual utility to file their own net metering policy and many have established limits of 10 kW. The state's first utility to adopt a net metering tariff, Philadelphia Electric Co. (PECO), recently increased its system limit to 40 kW and streamlined its interconnection requirements.
Public Benefits Fund	
Applicable Sectors	
Technologies Eligible	Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Geothermal Heat Pumps, Municipal Solid Waste Applicable Sectors: General Public/consumer
Description of Incentive	Each utility has own Public benefits fund to promote development and use of renewable energy and energy efficiency programs.
Amount Allocated	Approx. $55 million available overall for projects.

NEW YORK

RPS Goal: 25% total by 2015; 24% mandatory and 1% voluntary purchases

State Grant Program

Applicable Sectors	Commercial, industrial, residential, nonprofit, schools, local, state, and governments, agricultural
Technologies Eligible	Wind
Description of Incentive	I he Wind Incentive Program will provide 15% - 70% of the cost of the project based on system size and application, with the maximum incentive being $100,000. Equipment requirements are the following: systems must be new and comply with all applicable laws, regulations, codes, licensing, certification and permit requirements; systems must have at least a 5-year full warranty; inverters must be meet IEEE Standard 929-2000 and UL 1741.The installation must comply with all federal, state, and local codes; and must use a NYSERDA-approved installer. The system must be grid-connected for end-use application. Incentives will be provided only for customers that are New York electricity distribution customers of: Central Hudson Gas & Electric Corporation, Consolidated Edison Company of New York, Inc., New York State Electric & Gas Corporation, Niagara Mohawk Power Corporation, Orange and Rockland Utilities, Inc. and Rochester Gas and Electric Corporation who pay the System Benefits Charge. Incentives will be based on a percentage of the installed cost, ranging from 50% of costs for systems of 500 W to 10 kW, to 15% for systems larger than 80 kW. Larger incentives of up to 70% of costs are available for commercial fa

State Tax Exemption

Applicable Sectors	Commercial, industrial, residential, and agricultural
Technologies Eligible	Solar, Wind, Biomass
Description of Incentive	The Solar, Wind, and Biomass Energy Systems Exemption is a 15-year exemption to real property taxes for systems installed *PRIOR TO DECEMBER 31, 2005.* Systems installed after January 1, 1991 and before January 1, 2006 – each county, city, town, village and school district (except city school districts in New York, Buffalo, Rochester, Syracuse, and Yonkers) may choose to disallow the exemption – only through adoption of a local law and by school districts through adoption of a resolution. The amount of the exemption is equal to the increase in assessed value attributable to the solar, wind, or farm-waste energy system.

State Loan Program

	Reduced-Rate Loan Program
Applicable Sectors	Commercial, industrial, residential, nonprofit, local, state, and federal governments, multi-family residential, agricultural, institutional, and health care facilities
Eligible Tevhnologies	Solar Water Heat, Solar Space Heat, PV, Landfill Gas, Wind, Biomass, Geothermal Heat Pumps
Description of Incentive	The New York State Energy $mart Loan Fund is a loan program that provides reduced-rate loans through participating lenders to finance renovation or construction projects that improve a facility's energy efficiency or incorporate renewable energy systems. If applications are approved, loan amounts are up to $20,000 for residential projects; $1 million for multi-family new construction and all other non-residential); for existing multi-family projects $2.5 million ($5,000 per unit); plus an additional maximum of $2,500,000 for projects that include advanced meters. Terms are 4.0% below the lender rate for 10 years. For grid-connected wind turbine systems, a customer first must be approved to be receive incentives through New York State Energy Research and Development Authority's (NYSERA) Powernaturally Program (http://www.powernaturally.org/).
Amount allotted to Renewables	100%

Continued on the next page.

NEW YORK (Continued)

RPS Goal: 25% total by 2015; 24% mandatory and 1% voluntary purchases

Interconnection Standards

Applicable Sectors	Commercial, Industrial, Residential, Agricultural
Eligible Technologies	Distributed generation systems up to 2MW including Solar Thermal Electric, PV, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration, Microturbines, Other Distributed Generation Technologies
Description of Incentive	Changes made to the Standard Interconnection Requirements (SIR) by the Public Service Commission (PSC) in November 2002 streamlined the application process and provided a more ordered progression for the study and review phases of the procedure. Subsequently, in November 2004 the PSC issued an order further modifying the SIR by increasing the maximum capacity of interconnected systems from 300 kW to 2 megawatts (MW) and expanding interconnections to the state's network systems, which exist in large, urban areas (including New York City). The SIR addresses technical guidelines for interconnection and application procedures, although it leaves many details to the discretion of utilities. It includes the simplified requirements for small systems that qualify for net metering. (Prior to the PSC's November 2002 order, interconnection standards for net-metered systems were separate from the DG standards in the SIR.) Procedurally, the standard includes an 11-step process that covers initial inquiry to final utility acceptance for interconnection. Included in the appendices of the SIR are a standard contract and standard application forms. The SIR applies to state's six investor-owned local electric utilities: Central Hudson Gas and Electric, Consolidated Edison Company of New York, New York State Electric & Gas, Niagara Mohawk, Orange and Rockland Utilities, and Rochester Gas and Electric.

Net Metering

Applicable Sectors	Residential, Agricultural
Techonologies Eligible	PV 10kW or less, anaerobic digesters smaller than 400kw, residential wind turbines up to 25kW, and farm-based turbines up to 125kW
Description of Incentive	Utilities are obliged to accept customers into the net metering program on a first come, first serve basis until the total solar electric capacity signed up for net metering equals 0.1% of the utility's 1996 electric demand; farm waste system capacity equals 0.4% of the utility's 1996 demand; *and wind system capacity equals 0.2% of 2003 demand.* Individual utilities, however, can choose to allow a greater capacity to enroll in net metering. For solar-electric systems, farm biogas systems and small wind systems (10 kW and less), net excess generation (NEG) in a given month is credited toward the following month's bill at the retail rate. At the end of the annual billing cycle, if there is any net excess generation by the customer, consumers are paid the utility's avoided cost for that generation. However, net excess generation for wind systems larger than 10 kW is credited to the next month's bill at the state's avoided cost rate. Excess generation at the end of the year is still paid at the avoided cost rate. The PSC has developed uniform interconnection rules for net-metered systems.

WASHINGTON

RPS Goal: Statewide goal of 10% by 12/31/15; Requirements vary by utility

Private Grant Program	BEF - Renewable Energy Grant
Applicable Sectors	Nonprofit, Local Government, Tribal Government
Technologies Eligible	Solar Water Heat, Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Anaerobic Digestion
Description of Incentive	Using revenues generated from the sales of Green Tags, Bonneville Environmental Foundation (BEF), a not-for-profit organization, accepts proposals for funding for renewable energy projects located in the Pacific Northwest (OR, WA, ID, MT). BEF may deliver funding through various means, including grants, loans, convertible loans, guarantees, and direct investments in renewable energy projects. BEF renewable energy grants and investments may range from a few thousand dollars for small installations, to significant investments in central station grid-connected renewable energy projects. If a BEF grant is requested for a generating project, the BEF share will not exceed 33% of total capital costs, and 0% of operating costs.
Property and Sales Tax Exemption	
Applicable Sectors	Commercial, Residential, General Public/Consumer
Technologies Eligible	Photovoltaics, Landfill Gas, Wind, Biomass, Fuel Cells
Description of Incentive	In Washington State, tax does not apply to the sales of equipment used to generate electricity from wind, sun, or landfill gas, and with the passage of HB 1859 in 2001, fuel cells. The tax exemption applies to labor and services related to installation of the equipment, as well as to sales of equipment and machinery. Eligible systems are those with a generating capacity of at least 200 watts.
Production Incentive	
Applicable Sectors	Commercial, Residential, Local Government
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Wind, Anaerobic Digestion
Description of Incentive	In May 2005, Washington enacted Senate Bill 5101, establishing production incentives of 15 cents per kilowatt-hour (capped at $2,000 per year) for individuals, businesses, or local governments that generate electricity from solar power, wind power or anaerobic digesters. The incentive amount paid to the producer is adjusted according to how the electricity was generated by multiplying the incentive by the following factors: For electricity produced using a solar or wind generator equipped with an inverter manufactured in Washington state: 1.2 For electricity produced using an anaerobic digester, by other solar equipment, or using a wind generator equipped with blades manufactured in Washington state: 1.0 For all other electricity produced by wind: 0.8Ownership of the renewable-energy credits (RECs) associated with generation remains with the customer-generator and does not transfer to the state or utility. nitially, the incentive applies only to eligible systems that are not grid-connected, but will extend to grid-connected power sources once utilities serving 80% of the state's total customer load adopt uniform interconnection standards. In either case, the property must be served by a light and power business (i.e. off-grid properties are not eligible).
Net Metering	
Applicable Sectors	Commercial, Industrial, Residential
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Wind, Hydroelectric, Fuel Cells
Description of Incentive	25 kW, Washington's net metering law, enacted March 1998 (HB 2773), allows net metering for customers with solar, wind, and hydropower systems of 25 kW or less that are intended primarily to offset part or all of the customer's requirements for electricity. In 2000, EH 2334 added fuel cells to the list of eligible systems. All customer classes are eligible for enrollment. Enrollment is limited to a statewide installed generating capacity of 0.1% of the utility's 1996 peak demand.
Interconnection Standards	
Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, All Governments
Eligible Technologies	Solar Thermal Electric, Photovoltaics, Wind, Hydroelectric, Fuel Cells
Description of Incentive	Note: The Washington Utilities and Transportation Commission (WUTC) is currently developing stronger interconnection standards for customer-owned systems up to 25 kilowatts in capacity (Docket No. 051106). After standards for smaller systems have been adopted, the WUTC will develop interconnection standards for larger distributed generation (DG).

WISCONSIN

RPS Goal: 2.2% by 12/31/2011

State Incentives

Public Benefits Fund	Utility-generated Public Benefit Fund
Applicable Sectors	General Public/Consumer
Techonologies Eligible	Solar Water Heat, PV, Wind, Biomass, Anaerobic Digestion
Description of Incentive	Funding of renewable energy efforts by Focus On Energy comes from Wisconsin's Public Benefit Fund, of which 4.5%, by statute, must go towards renewable energy. These programs are supported by (1) funds that investor-owned utilities collect through rates established by the Wisconsin Public Service Commission, (2) a fee added to electric bills beginning in October 2000 that participating utilities collect and remit to the state, (3) funds contributed by participating municipal utilities and electric cooperatives, (4) federal funds for low-income energy assistance and weatherization programs, and (5) voluntary contributions. In 2005 Wisconsin's Public Benefit Fund was approximately $121 million in ratepayer funds, voluntary contributions, and interest earned.

State Grant Program

Applicable Sectors	Commercial, Industrial
Technologies Eligible	Solar Water Heat, Solar Space Heat, PV, Wind
Description of Incentive	Support for developing business plans and marketing materials for organizations and businesses that provide renewable energy services. Project costs can be shared up to 50% by Focus on Energy, with a maximum of $10,000.

State Grant Program

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, Tribal Government
Technologies Eligible	Solar Water Heat, Solar Space Heat, PV, Wind
Description of Incentive	Wisconsin's Focus on Energy program offers state grants applicable to residential and business sectors installing or expanding commercially-available wind and solar energy systems on their homes or businesses. Systems must be smaller than 20 kW, and rewards vary by renewable energy system type. For wind, rewards can be up to 25% or $35,000. Systems must comply with all federal, state and local codes and may be grid-connected or off-grid. Incentive levels vary accordingly. Customers must be located in the service territory of a participating electric provider or natural gas provider.

State Grant Program

Applicable Sectors	Commercial and Residential
Technologies Eligible	Solar Water Heat, Solar Space Heat, PV, Wind
Description of Incentive	When funds are available, costs for study can be shared up to 50% by Focus on Energy, with a maximum of $10,000. Intended to help businesses make informed decisions regarding renewable energy systems.

Property Tax Exemption

Applicable Sectors	Commercial, Industrial, and Residential
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, PV, Wind, Solar Pool Heating
Description of Incentive	Any value added by a wind-energy system is exempt from general property taxes. A wind-energy system is defined as "equipment which converts and then transfers or stores energy from wind into usable forms of energy, but does not include equipment or components that would be present as part of a conventional energy system".

Site Assessments

Applicable Sectors	Commercial and Residential
Eligible Tevhnologies	Solar Water Heat, Solar Electric, and Wind
Description of Incentive	Applicable to residential sector for $300-400 fee (however, homes in the Focus on Energy territory only pay 25% of the cost); to businesses for $500-600 fee (businesses in the Focus on Energy territory pay a maximum of $300). A renewable energy expert visits your home or business and provides site-specific information on how renewables can meet you energy needs. (This assessment is required for the Cash-Back Rewards program.)

Continued on the next page.

WISCONSIN (Continued)

RPS Goal: 2.2% by 12/31/2011

State Loan Program	
Applicable Sectors	Residential
Eligible Tevhnologies	Solar Water Heat, PV, Wind, Feasibility Studies
Description of Incentive	Utilities loan program applicable to the residential sector. Participants may borrow $2,500 - $20,000; 1.99% APR for a 10-year maximum term. Small-scale wind energy systems less than 20 kW are eligible, retail electric customers receiving residential electric service from Wisconsin Public Power Inc (WPPI) member utilities are eligible.
State Rebate Program	
Applicable Sectors	Residential
Technologies Eligible	Solar Water Heat, Photovoltaics, Wind, Feasibility Studies
Description of Incentive	Utilties Rebate Program: New installations of small-scale wind energy systems less than 20kW are eligible for a rebate of 25% or up to $5,000 for new installations; 50% or $2,500 for existing system repairs; and 75% or $375 for site assessments. Retail customers receiving residential electric service from Wisconsin Public Power Inc. (WPPI) member utilities are eligible.
Special Equitment	
Applicable Sectors	Nonprofit, Schools, Local Government, Tribal Government
Technologies Eligible	Wind
Description of Incentive	Provides support for *highly visible* wind turbine installations at nonprofit organizations or publicly-owned sites with an educational mission that includes renewable energy. The grant can cover up to a maximum of 50% of the system's installed costs up to $65,000.
State Loan Program	
Applicable sectors	Residential
Technologies Eligible	Solar Water Heat, Solar Electric, and Wind
Description of Incentive	Focus On Energy: Zero-interest loans are available for qualified homeowners to help finance renewable energy measures on existing one- or two-family owner-occupied homes. Loans are $2,500 to $20,000 at zero percent interest for terms from three to ten years.
Net Metering	
Applicable Sectors	All distributed generation systems no bigger than 20 kW
Technologies Eligible	Commercial, industrial, and residential
Description of Incentive	Category 1 systems (20 kW or smaller) systems qualify for net metering, and are not considered commercial ventures and subsequently do not require commercial liability insurance. Net excess electricity is purchased at retail rate for renewables (versus avoided cost for non-renewables).
Interconnection Standards	
Applicable Sectors	Commercial, industrial, residential, nonprofit, schools, and local, state, and federal government
Eligible Technologies	All distributed generation systems no bigger than 15 MW
Description of Incentive	Wisconsin recognizes four categories of distributed generation systems by size: Category 1 – 20 kW or less; Category 2 – Greater than 20 kW to 200 kW; Category 3: Greater than 200 kW to 1 MW; Category 4: Greater than 1 MW to 15 MW. In general, the interconnection regulations get more stringent as the system gets larger. All systems require additional liability insurance, however, systems that qualify for net metering are not considered commercial ventures and subsequently do not require commercial liability insurance.

CONNECTICUT

RPS Goal: 4% by 2004, rising to 10% by 2010

Public Benefits Fund	**Connecticut Clean Energy Fund**
Applicable Sectors	Commercial, Industrial, Residential, General Public/Consumer, Utility, Institutional
Techonologies Eligible	PV, Landfill Gas, Wind, Biomass, Hydroelectric, Renewable Transportation Fuels, Fuel Cells, Municipal Solid Waste, Hydrogen, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal
Description of Incentive	The Connecticut Clean Energy Fund (CCEF) was created in April 1998 as part of legislation deregulating the state's electric utility industry. A surcharge on Connecticut ratepayers' utility bills provides the funding for the CCEF. In 2000-2001 the charge was set at $0.0005 per kWh (0.5 mills per kWh), rising to $0.00075 per kWh (0.75 mills per kWh) in 2002-2003 and $0.001 per kWh (1 mill per kWh) from 2004 forward. The CCEF is managed by Connecticut Innovations, a quasi-governmental investment organization. Connecticut Innovations receives guidance from the Renewable Energy Investments Advisory Committee, whose members are appointed by the Connecticut General Assembly, the governor and the chairman of Connecticut Innovations. According to the statute, the CCEF is authorized to invest in the following clean-energy technologies: "solar energy, wind, ocean thermal energy, wave or tidal energy, fuel cells,landfill gas, and low-emission advanced biomass conversion technologies and other energy resources and emerging technologies which have significant potential for commercialization and which do not involve the combustion of coal, petroleum or petroleum products, municipal solid waste or nuclear fission." Amendments to the statute in 2003 through PA 03-135 added "hydrogen production and hydrogen conversion technologies" to the clean energy technologies in which the CCEF can invest. $15 million rising to ~$30 million annually
State Grant Program	
Applicable Sectors	Commercial, Residential
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Geothermal Electric, Fuel Cells, Geothermal Heat Pumps, Municipal Solid Waste, CHP/Cogeneration, Solar Pool Heating, Daylighting, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal
Description of Incentive	The New Energy Technology program's mission is to develop innovative energy efficient and renewable energy technologies to save energy, to improve air quality, and to help invigorate Connecticut's economy by creating employment opportunities. Grants are awarded to applicants who submit promising pre-commercial technologies that conserve energy or facilitate the use of renewable energy. These grants provide $10,000 each for up to five small firms each year. A small firm is one that employs 30 or fewer people. Previous award recipients have used the grant funds for product development, prototype testing, patent application, business plan development, payroll, and product marketing and promotion at trade shows.
State Loan Program	
Applicable Sectors	Commercial
Techonologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Fuel Cells, CHP/Cogeneration, Small Hydroelectric, Tidal Energy, Wave Energy, Ocean Thermal, Other Distributed Generation Technologies
Description of Incentive	The program will support proposals for demonstration projects that have a high likelihood of developing into a commercial product within a reasonable period of time -- generally, five years for fuel cells and three years for most other clean-energy technologies. Eligible resources include solar, wind, ocean thermal, wave or tidal, run-of-the-river hydro, fuel cells, hydrogen generation and storage technologies, landfill gas, low-emission advanced biomass-conversion technologies, and usable electricity from combined heat and power (CHP) systems with waste-heat recovery systems. Additionally, the CCEF's authorizing statute includes a provision allowing the fund to support "other energy resources and emerging technologies which do not involve the combustion of coal, petroleum or petroleum products, municipal solid waste or nuclear fission." Projects must have a capacity of at least 1 kilowatt (or the functional equivalent for hydrogen generation).

Continued on the next page.

CONNECTICUT (Continued)

RPS Goal: 4% by 2004, rising to 10% by 2010

Property Tax Exemption

Applicable Sectors	Commercial, Industrial, Residential
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Hydroelectric, Fuel Cells, CHP/Cogeneration
Description of Incentive	Connecticut allows municipalities to offer property-tax exemptions for certain renewable-energy systems. Eligible systems include solar space-heating systems, solar water-heating systems, photovoltaics, wind-energy systems, fuel cells, micro-hydropower systems and co-generation systems. Adoption of this exemption varies from one municipality to another. In some cases, the exemption applies to the total value of the qualifying renewable-energy system and can be applied to residential, commercial and industrial property.

State Loan Program

Applicable Sectors	Residential, Multi-Family Residential
Eligible Tevhnologies	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Photovoltaics, Wind, Biomass, Geothermal Heat Pumps
Description of Incentive	Single-Family Energy Conservation Loans are available through the Connecticut Housing Investment Fund (CHIF) to owners of 1 - 4 family homes who meet established income limits for family size and location. These loans may be used for a variety of conservation improvements. Interest rates vary in accordance with the borrower's family size and income and the loan may be repaid over ten years.Loans for large residential properties are available through the Multi-Family Energy Conservation Loan Program. The terms of this loan are similar to the single-family ECL Program, with a higher principal available on the loan.

State Grant Program

Applicable Sectors	Commercial, Industrial, Schools, Local Government, State Government, Institutional
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells
Description of Incentive	Connecticut's On-Site Renewable Distributed Generation (DG) Program provides grants to support the installation of systems that generate electricity at commercial, industrial and institutional buildings. Systems utilizing solar, wind, fuel cells, landfill gas, low-emission advanced biomass-conversion technologies and/or Class I hydropower are eligible.* Most program support will target photovoltaic (solar-electric) and fuel-cell projects. Projects that have potential to reduce the federally mandated congestion charges in Connecticut will be favored. This program is supported by the Connecticut Clean Energy Fund (CCEF), which has created an objective to assist in contracting for the installation of five megawatts (MW) of customer-side DG projects by mid-2007. The total funding allocated for all selected projects under the On-Site Renewable DG Program is $20.55 million. Significantly, the program will include targeted funding levels of $9 million for fuel cells and $9 million for photovoltaics. All projects must have a minimum system capacity of 10 kilowatts (kW), and projects must use an energy-generation device that is commercially available and offers warrantees, spare parts and service commensurate with commercial status. Facilities must be located in Connecticut within the Connecticut Light and Power (CL&P) or United Illuminating (UI) service territories. Award recipients are required to operate the system for at least eight years. The maximum individual project award is $2 million. However, in addition to grant awards, a premium of $0.01 per kilowatt-hour will be disbursed for projects in the congested area of southwestern Connecticut. The actual grant amount will be ascertained by an assessment of the difference between the host site's cost of energy that would be displaced by the proposed on-site generating equipment, and the total cost and value of the energy provided by the DG system. The following funding limits and evaluation timeframes apply to individual projects:Small wind: $3.60 per watt; 15-year evaluation timeframe.The grant (excluding the southwestern Connecticut premium) will be disbursed in installments to the owner of the equipment, based according to the following schedule, regardless of technology:Delivery of generating equipment to site: 50% , Startup, commissioning and inspection: 40% After six months of successful operation: 10%The final grant payment will be awarded provided that the system has produced at least 70% of the projected AC energy production during the first six months of operation, as verified by the CCEF's independent consulting engineer.

Continued on the next page.

CONNECTICUT (Continued)

RPS Goal: 4% by 2004, rising to 10% by 2010

State Grant Program

Applicable Sectors	Commercial, Renewable energy project developers
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Fuel Cells, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal
Description of Incentive	The Connecticut Clean Energy Fund's (CCEF) Project 100 Initiative supports legislation enacted in June 2003 (P.A. 03-135) requiring the state's electric distribution companies to enter into minimum 10-year contracts totaling at least 100 megawatts (MW) of Class I renewable energy. Pricing under these contracts will include a premium of up to 5.5¢ per kilowatt-hour (kWh). These long-term power purchase contracts must be filed with the Connecticut Department of Public Utilities by July 1, 2007, and must arise from projects that receive funding from the CCEF, among other criteria.

State Loan Program

Applicable Sectors	Commercial, Renewable energy project developers
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Fuel Cells, Anaerobic Digestion, Tidal Energy, Wave Energy, Ocean Thermal
Description of Incentive	Up to $250,000 (up to 5 MW); up to $500,000 (> 5 MW), The Connecticut Clean Energy Fund's (CCEF) Renewable Energy Projects in Pre-Development Program offers financing to encourage the development of renewable-energy projects in Connecticut or for renewable power production for the larger ISO New England wholesale electricity market. Activities supported may include site control, environmental assessments, facility design, grid interconnection analysis, development of commercial documents, and public outreach and education.

Net Metering

Applicable Sectors	Commercial, Residential, Multi-Family Residential, (multi-family of 2-4 units)
Technologies Eligible	Solar Thermal Electric, Photovoltaics, Landfill Gas, Wind, Biomass, Fuel Cells, Municipal Solid Waste, Small Hydroelectric, Tidal Energy, Wave Energy, Ocean Thermal
Description of Incentive	Renewable technologies: 100 kW; fossil technologies: 50 kW

Net Metering

Applicable Sectors	Commercial, Industrial, Residential, Nonprofit, Schools, Local Government, State Government, Fed. Government
Technologies Eligible	Photovoltaics, Landfill Gas, Wind, Biomass, Hydroelectric, Fuel Cells, Municipal Solid Waste, CHP/Cogeneration, Microturbines, Other Distributed Generation Technologies
Description of Incentive	100 kW for net-metered systems; 25 MW for non-net-metered DG

RHODE ISLAND

RPS Goal: 16% by 2020

State Sales Tax Incentive	
Applicable Sectors	Commercial, residential, general public/consumer
Techonologies Eligible	Solar water heat, solar space heat, PV, wind, geothermal
Description of Incentive	Certain renewable-energy systems and equipment sold in Rhode Island are exempt from the state's sales-and-use tax. Eligible products include solar-electric systems, inverters for solar-electric systems, solar-thermal systems, manufactured mounting racks and ballast pans for solar collectors, geothermal heat pumps, and wind turbines and towers.
Public Benefits Fund	
Applicable Sectors	Commercial, industrial, residential, general public/consumers, utility, institutional
Technologies Eligible	Passive Solar Space Heat, Solar Water Heat, Solar Space Heat, Solar Thermal Electric, Solar Thermal Process Heat, Photovoltaics, Wind, Biomass, Hydroelectric, Renewable Transportation Fuels, Geothermal Electric, Cofiring, Tidal Energy, Wave Energy, Ocean Thermal, Fuel Cells (Renewable Fuels)
Description of Incentive	The annual budget for the Rhode Island Renewable Energy Fund is approximately $3 million, however, the new RPS legislation has caused the Public Utilties Commission to review the fund. Funds applicable to community wind include: wind resource assesments, program development studies, incentives for renewable energy suppliers and green power marketers, and outreach and education efforts.
Net Metering	
Applicable Sectors	Commercial, industrial, residential
Technologies Eligible	Solar thermal, PV, wind, biomass, hydro, geothermal, fuel cells, municipal solid waste, combined heat and power/cogeneration
Description of Incentive	Rhode Island limits net metering to systems 25 kW and smaller, with a total limit on enrollment of 1 MW in the Narragansett territory.
Interconnection Standards	
Applicable Sectors	Commercial, industrial, residential, schools, local and state government
Technologies Eligible	Solar thermal, PV, landfill gas, wind, biomass, hydro, geothermal, fuel cells, municipal solid waste, combined heat and power/cogeneration, microturbines, other distributed generation technologies
Description of Incentive	For interconnection, Rhode Island has a total limit on enrollment of 1 MW.

APPENDIX II: INTERVIEW QUESTIONS

Wind Workshop
Survey for CESA and non-CESA states
Potential Interviewees: Fund Managers, Government agencies or NGOs that are supporting wind projects

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SURVEY QUESTIONS:

I. Questions for states that have implemented or are planning to implement community wind projects:

1. How many community wind projects are being planned/implemented in your state? (**Or:** We have found information on XX number of community wind projects. Are there others?) ***Note:*** *If the answer to this is that no projects are underway, then jump to the questions in Section II.*
2. If projects have been designed/implemented, have they been modeled after other projects? If so, which ones?
3. What is/was the primary funding source for community wind projects in the state? Or, what is the combination of funding that goes into a community wind project? Was it difficult to obtain funding?
4. Did the state receive any federal funding for the development of renewable energy projects? If so, what proportion of this was allocated to community wind?
5. How long is the approval process from project conception to implementation? (i.e., to get permits, financing, procure and implement?)
6. **FOR CESA STATE:** What has CESA's financial involvement been in terms of supporting the development of clean wind projects? Other types of non-financial involvement? Would you like to see CESA involved in ways that they are currently not?
7. **FOR NON-CESA STATE:** What role do non-profit organizations play in the state's development of community wind?
8. Do you have any information on the revenues of *ongoing* projects? Are projects profitable?
9. Who has the "capacity to act" with regard to community wind? Do the initiatives usually arise from local governments? Private Citizens? Farmers? Who mobilizes the effort or has the power to decide which projects move forward? What is their motivation?
10. Does the state have any policies/proposed initiatives dealing directly with community wind? Are these incentives easily identifiable/accessible to developers?
11. What are the greatest incentives? (Any specific regulations?)
12. Would it be feasible and/or desirable to bundle state and federal incentives so that developers can have "one-stop shopping?"
13. What do you consider to be the greatest obstacles to getting the projects going? (This could range from procurement to regulatory environments that exclude developers from incentives.) Do you have recommendations for improvement?
14. Do you have any great success stories that you would like to tell with regard to commuity wind activity in the state?
15. Do you know of any pending bills in the state legislature that would impact community wind, such as changes to RPS, interconnection standards, etc?
16. Is the RPS in your state being reached? How much is fulfilled by community wind?
17. Is the electricity market structure conducive to supporting community wind in terms of establishing power buying agreements?
18. What do you think is the future of community wind in your state?
19. Do you mind if we quote you in our report or final presentation?
20. Do you have any other contacts that we should interview?

Questions for states that have not developed any wind projects:

1. Why has the state not developed any community wind projects?
2. Are the reasons primarily political or logistical (e.g., problems procuring equipment, lack of space, intermittent wind, poor incentives, too much competition with other renewables, etc.)?
3. Is there support (among residents, non-profits, or local governments) for community wind in that state?
4. What would it take for a market for community wind to develop in that state?
5. How do you think CESA as an organization can best contribute to community wind development?

APPENDIX II: INTERVIEW QUESTIONS

Wind Workshop
Survey for Community Wind Projects
Potential Interviewees: Project Managers

SURVEY QUESTIONS:

I. Questions for community wind project managers:

1. What is the financial history of the project you are managing?
    a. Did you obtain a grant? If so, was it difficult?
    b. If you obtained a grant, how did you spend the money? Were there any restrictions?
    c. How much money came from the community members?
    d. Were there other financiers? (CESA, NGOs, State, Federal), and how much from each?
    e. How difficult was it to find investors, and what were their main concerns/what did they perceive as risky?
    f. Is the project currently profitable? If not, what is the projected timeframe to be profitable? Is profit measured in terms of electricity savings?
    g. Are there plans to expand/improve the project? i.e., buy more turbines?
2. What is the ownership structure of the project?
3. Was your project modeled after another project? If so, which one?
4. How long did the approval process from project conception to implementation take? (i.e., to get permits, financing, procure and implement?)
5. Who initiated the project (who was the champion, and what was their motivation for the project)? Who had the final say in implementing it?
6. What were the greatest incentives? (Any specific regulations?)
7. What were the greatest obstacles to getting the project going? What specific things would you like to see changed in order to better facilitate the process?
8. In general, how difficult is it to find buyers of the power?
9. Do you have any great success stories that you would like to share?
10. Do you know of any pending bills in the state legislature that would impact your community wind project, such as changes to RPS, interconnection standards, etc?
11. What do you think is the future of community wind in your state?
12. **FOR CESA STATES:** How do you think CESA as an organization can best contribute to community wind development?
13. Do you mind if we quote you in our report or final presentation?
14. Do you have any other contacts that we should interview?

APPENDIX III: INTERVIEW CONTACT INFORMATION

Master List of Contacts

Community Wind

No.	Last Name	First Name	State	Organization	Interviewee Type	Position	Phone	Phone (cell)	Fax	Email	Website	Address	City	Zip Code
1	Tutt	Tim	CA	California Energy Commission (CEC) - Renewable Energy Program	Fund Manager	Technical Director	1-800-555-7794; or 916-654-4058 (outside California)			renewable@energy.state.ca.us	www.energy.ca.gov/renewables	1516 9th Street, MS-45	Sacramento	95814
2	LaMoreaux	Dennis	CA	Palmdale Water District	Project Manager	General Manager	661-947-4111 x117		661-947-8604	dlamoreaux@palmdalewater.org	http://www.palmdalewater.org	2029 E Avenue Q	Palmdale	93550
3	Paxton	Curtis	CA	Palmdale Water District	Project Manager	Assistant General Manager	661-947-4111			cpaxton@palmdalewater.org	http://www.palmdalewater.org	2029 E Avenue Q	Palmdale	93550
4	Bolin	Kieth	IL	Bureau Valley School District	Project Manager	Vice President	815 445 5291							
5	Middleton	Sean	IL	Illinois Rural Electric Co-Operative	Project Manager	Engineer	217-742-3128			sean@e-co-op.com	www.e-co-op.com	2 S. Main St.	Wincester	62694
6	Miller	Ed	IL	Illinois Clean Energy Community Foundation	Fund Manager	Program Director	312 372 5191			emiller@illinoicleanenergy.org	www.illinoiscleanenergy.org	2 N. Lasalle St. Suite 950	Chicago	60602
7	Gifford	Jason	MA	Mass Technology Collaborative	Project Manager	Strategy and Business Manager for Renewable Energy Tech	508-870-0312	617-448-9001		gifford@masstech.org	http://www.mtpc.org/index.asp	75 North Drive	Westborough	
8	Shupp-Matthews	Diedre	MA	Mass Technology Collaborative	Project Manager		508-870-0312			matthews@masstech.org	http://www.mtpc.org/index.asp			
9	Juhl	Dan	MN	DanMar & Associates	Project Consultant	President/Owner of DanMar & Associates	507-777-4108			djuhl@woodstocktel.net	http://www.danmar.us/	996 190th Ave.	Woodstock	56186
10	Swanson	Michelle	MN	Xcel Energy	Utility Manager	Renewable Energy Manager for XCEL	800-895-4999		612-330-7601	michelle.m.swanson@xcelenergy.com	http://www.xcelenergy.com	414 Nicollet Mall	Minneapolis	55401
11	Strong	Richard	MN	Carleton College	Project Manager	Director of Facilities	507-646-4271			rstrong@acs.carleton.edu	http://apps.carleton.edu/campus/facilities/sustainability/wind_turbine/		Carleton	
12	Bengston	Kevin	MN	Moorhead Public Service	Project Manager	Energy Services Coordinator	218-299-5400			kbengston@mpsutility.com				
13	Brignolo	Joseph	MT	Native American Wind Energy	Fort Peck Reservation Wind Project Designer and Grant Securee (USDA 9006 Farm Bill grant)	Independent Contractor	513-899-9152			brignolo@soncov.com				

Master List of Contacts

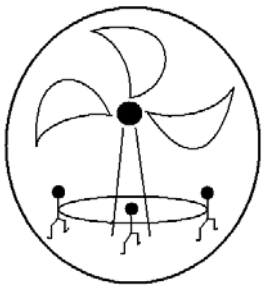
Community Wind

No.	Last Name	First Name	State	Organization	Interviewee Type	Position	Phone	Phone (cell)	Fax	Email	Website	Address	City	Zip Code
14	Pierce	Lizana	MT	Dept. of Energy - Golden, CO field office	Neither; grant issuer (DOE employee for Tribal Energy Program)	Project Manager, Tribal Energy Program	303-275-4727			lizana.pierce@go.doe.gov		1617 Cole Boulevard M/S 1501	Golden, CO	80401
15	Sansaver	Noel	MT	Fort Peck Community College	Project Coordinator	Director, Building Trades, Ft. Peck Community College	406-444-6769	406-650-8068		sansaver@hotmail.com		605 Indian Avenue	Poplar, MT	59255
16	Ryan	Dave	MT	National Center for Appropriate Technology	Private Wind Developer	Energy Engineer	406-494-8644	406-490-6233		daver@ncat.org	http://www.ncat.org/	3040 Continental Drive	Butte, MT	59702
17	Pruskowski	Loren	NY	Sustainable Energy Developments, Inc	Forum Member	He does the financial part of Helderberg	315-524-9010		315-524-9046	loren.pruskowski@sed-net.com	http://www.sed-net.com	6304 Furnace Road	Ontario	14519
18	Moore	Kathleen	NY	Integrated Environmental Data	Forum Member	PhD	518-872-2495 Albany: 518-956-7030			moore@iedat.com	http://www.iedat.com/	255 Fuller Rd, Suite 298	Albany	12203
19	Colello	Vicki	NY	NYSERDA	Fund Manager	Project Manager	518-862-1090 ext. 3273			http://www.nyserda.org/Contactlnformation/erstaff.asp				
20	Frenay	Erica	NY	Resident of Caroline City	Wants to develop a project		607-255-9911							
21	Woodin	Paul	OR	Western Wind Power	Project Developer	Owner	509-261-0219			pwoodin@gorge.net				
22	Thamert	Jeremy	OR	Oregon Power Solutions LLC	Project Developer	President	1.541.523.1095			jeremy@oregonpowersolutions.org		2101 Main St. Suite #205	Baker City	
23	Cowan	Alan	OR	Oregon Energy Trust	Fund Manager	Cesa Fund Manager	503-493-8888 Ext. 274		503-546-6862	alan.cowan@energytrust.org	http://www.energytrust.org	851 SW Sixth Ave., Suite 1200	Portland, OR	97204
24	DeWinkel	Carel	OR	Oregon Department of Energy	Senior Policy Analyst for the Oregon Department of Energy	Senior analyst	503-378-6099		503-373-7806	carel.dewinkel@state.or.us		625 Marion St NE Suite 1	Salem, OR	97301
25	Clark	Roger	PA	Sustainable Development Fund	Manager	Manager	215-574-5814	215.880-4561	215-574-5914	roger.clark@trfund.com	http://www.trfund.com/sdf/	718 Arch St. Suite 300 North	Philadelphia	19106
26	Sanders	Rob	PA	Sustainable Development Fund	Fund manager	Manager	215-574-5850		215-574-5950	rob.sanders@trfund.com	http://www.trfund.com/sdf/	718 Arch St. Suite 300 North	Philadelphia	19106

Master List of Contacts

Community Wind

No.	Last Name	First Name	State	Organization	Interviewee Type	Position	Phone	Phone (cell)	Fax	Email	Website	Address	City	Zip Code
27	Tuffey	Tom	PA	PennFuture	Fund manager		610.696.8051			tomtuffey@aol.com	www.pennfuture.org			
28	Foley	Eric	PA	St. Francis University	Project leader	Director	814.472.2872			edfad1@mail.francis.edu	http://www.francis.edu/c3/whatisc3page.shtm			
29	Kane	Mike	PA	Sustainable Energy Fund for the Penelec region	Fund manager		814.536.7741			mkane2@atlanticbb.net				
30	Ross	Deb	WA	Last Mile Electric Cooperative	Grant Securee (USDA 9006 Farm Bill grant)	Executive Director	360-705-8800		360-705-8801	lastmileelectric@msn.com	http://www.last-mile-electric-coop.org/	1063 South Capitol Way, Suite 211	Olympia	98501
31	Grove	Jennifer	WA	Northwest Sustainable Energy for Economic Development (NWSEED)	Non-Profit Project Manager	Program Director, Renewable Energy Projects	206-267-2212		206-770-6570	jennifer@nwseed.org	http://www.nwseed.org/default.asp	119 First Avenue South, Suite 400	Seattle	98104
32	Karp	Michael	WA	A World Institute for Sustainable Humanity (A W.I.S.H.)	"Steering Committee" role to Luna Point Project	CEO/President of organization	360-724-3215		360-724-5272	michael@awish.net	www.awish.net	147 Appaloosa Rd.	Bellingham	98229
33	Barkley	Allen	WA	Klickitat County Power Utility District (PUD)	Utility Project Participant	Power Manager	509-773-7608		509-773-4969	abarkley@klickpud.com	www.klickpud.com	1313 South Columbus Avenue	Goldendale	98620
34	Daughert y	Mark	WI	Focus on Energy Fund	CESA Fund	Fund Consultant	608-831-1127 x 302	608-213-0594		markd@msbnrg.com or daughert@tds.net	http://www.focusonenergy.com	211 South Paterson, 3rd Floor	Madison	53703
35	Krum	Larry	WI	Focus on Energy Fund	CESA Fund Manager	Manager Business Sector Renewable Energy					http://www.focusonenergy.com	211 South Paterson, 3rd Floor	Madison	53703
36	Vickerma n	Michael	WI	Renew Wisconsin	Project Supporter	Director	608-255-4044			mvickerman@renewwisconsin.org	http://www.renewwisconsin.org	222 South Hamilton Street	Madison	53703
37	Wichert	Don	WI	Focus on Energy	CESA Fund Manager	Director	608/249-9322 ext. 120		608-249-0339	donw@weccusa.org	http://www.focusonenergy.com	211 South Paterson, 3rd Floor	Madison	54234
38	Pardonne r	Don	WI	Door County Community Wind Committee	Community Member	Community Organizer	920-839-1182			n/a	n/a			



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