New Brunswick Community Wind Comments
April 4, 2008

Comments on New Brunswick's Community Wind Initiative

By Paul Gipe[1]

The province of New Brunswick is to be applauded for seeking the public's input on how best to develop community wind energy. It's heartening that the government of New Brunswick recognizes the value of and the role that community wind can play in the province's economic and energy development.

The authors of the province's briefing documents, Dr. Yves Gagnon and Toby Couture from the Université de Moncton, have done an admirable job of summarizing an extensive literature on this complex topic.

There is always a risk, however, in launching a program of this type and setting our sights too low by not envisioning the breadth of possibilities available and the benefits that might be won by being more ambitious. Programs like community wind in New Brunswick must engage the public's imagination and this can't be done by offering limited and timid objectives.

For example, why is this initiative limited only to wind energy? There are other abundant renewable resources, especially biomass, that are suitable for community development initiatives.

The following comments focus particularly on the discussion of wind project size limits, feed-in tariffs and project size limits, program size limits, voltage limits and the ownership criteria used to define community wind.

Background[2]

North American renewable energy advocates and especially community renewable energy advocates often use the terms *community wind* development and *cooperative wind* development interchangeably. This derives from the effort of Anglophone and Francophone North Americans to describe a uniquely continental European phenomenon of share ownership structures that allow local investment in renewable energy projects.[3]

---

[1] Paul Gipe, 208 S. Green St., #5, Tehachapi CA 93561-1741 USA, +661 325 9590, +661 472 1657 mobile, pgipe@igc.org, www.wind-works.org.

[2] For more background on cooperative and community renewable energy development in Europe, see Coop & Community Wind.

[3] Mark Bolinger has explored at length the distinctions between the various ownership structures in Europe and their relevance to North America, see Community Wind Power Ownership Schemes in Europe and Their Relevance to the United States by Mark Bolinger; LBNL –48357, http://eetd.lbl.gov/ea/EMS/reports/48357.pdf.

Further, community renewable advocates include renewable energy systems owned individually, for example by a single farmer, as well those owned by First Nations, municipal governments, or other community entities. Community renewable advocates do make a distinction between large central station projects owned by state enterprises (Crown corporations), and projects smaller in scale that may or may not be connected at distribution voltages. For example, it is not unheard of for community wind projects in Germany and Denmark to be connected at transmission voltages. Some of these projects can be quite large.[4]

Community renewables may include small solar power systems operated by individual farmers and homeowners, but typically does not include small household-size wind turbines. Wind turbines are significantly more cost effective at commercial scale and the community wind movement in continental Europe has focused exclusively on commercial-scale turbines.[5]

Denmark has long been known for the high concentration of shared ownership wind turbines (fællesmølle), as well as wind turbines owned individually by farmers. Individuals and families collectively own one-quarter of the 3,200 MW of wind turbines collectively in the country. This represents about 800 MW. Individual farmers and co-owned installations represent nearly two-thirds of the installed capacity, representing about 2,000 MW. Only one-tenth of Denmark's wind generating capacity is owned by traditional electric utilities.[6]

Co-Op & Farmer-Owned Wind Turbines in Europe

	Farmer	Co-op	Corporate
The Netherlands	60%	5%	35%
Germany	10%	40%	50%
Denmark*	64%	24%	12%
Spain	0%	0%	100%
Great Britain	1%	1%	98%

Source: NL, D, DK, ES, GB; Dave Toke, University of Birmingham, 2005, updated to Toke 2008.

*Onshore.

Similarly in Germany, the Bürger or citizen movement forms limited liability companies that seek share investments from local landowners and neighboring

[4] The Paderborn Bürgerbeteiligung is comprised of several clusters of 1.6 MW turbines totaling 111 MW, see Paderborn and the Sintfeld Community Wind Project.

[5] Wind turbines have increased significantly in size during the past two decades; thus, commercial-scale wind turbines of the 1980s seem small by today's standards.

[6] Dave Toke, Community wind power in Europe and in the UK, University of Birmingham, 2005, http://www.wind-works.org/articles/Wind%2029-3-Toke.pdf.

communities. These Bürgerbeteiligung, or citizen-owned companies, build community wind, solar, and biogas plants. Typically, the project developers raise as much equity as possible from the local community, then expand their net to the region, and finally, if there's not enough capital to build the project, they open investment up to the entire country.[7]

Nearly 40% of Germany's 22,000 MW of wind capacity, or 8,000 MW, is Bürger owned, while another 10%, or 2,000 MW, is owned directly by farmers. Half of German wind capacity—an investment worth nearly $20 billion--has been developed by landowners and small investors.

The German share-ownership model is now being used in France to a limited extent.[8]

Community Wind in Canada

Community renewable energy advocates in Canada are trying to replicate the Danish and German experience for several reasons. Though not without critics, there is widespread acceptance of wind energy in Denmark and Germany. This acceptance has been in part attributed to the greater degree of local ownership in Denmark and Germany than, for example, in Great Britain where there is a well organized, vocal, and effective opposition to wind energy. Moreover, some argue that renewable energy is too important to be left to traditional corporate development, especially development by private electric utilities and Crown corporations.

Renewable energy, because each generating plant is a relatively small unit, is also ideally suited for distributed ownership. Through local ownership more of the benefits of renewable energy development flow to the local community than otherwise. For this reason, many community renewable energy advocates see it as a means for local economic development.

Community Wind Definition

While the briefing documents acknowledge that there is no universal definition of what constitutes community wind, they set out some general guidelines.

Unfortunately, in simplifying the discussion, the briefing documents unreasonably limit the horizon of those who will participate in the public discussion. And by doing so, the briefing documents prejudice the outcome of the public discussions before they begin.

---

[7] See http://www.wind-works.org/articles/BuergerbeteiligungHenningHolst2006.html.
[8] See http://www.wind-works.org/FeedLaws/France/Les_Haut_des_Ailes.html.

Project Size Limits

This over simplification is particularly evident in the discussion of project size as one of the elements that constitutes community wind. Rather than celebrate the ingenuity and the breadth of creativity that is found in communities across North America and continental Europe, the briefing documents erroneously note that the "upper limit on the size of the wind farm" is 15 MW (between 5 and 10 turbines) for community wind projects. This is not true.

Thus oversimplification in the briefing documents can seriously mislead not only the public but also policymakers by relegating community wind to small project ghettoes, that is, disparate small clusters of a few turbines each separated by the substantial distances common in North America.

While many existing community wind projects are small by today's standards, they were not necessarily small when they were installed. Moreover, size has been a criteria used for determining community wind in only a few jurisdictions, Minnesota for example.

Community wind projects in Europe and in North America can be of any size. Some can be quite large. These are a few examples.

- The Elkhorn Ridge Wind project will be 80 MW when completed. It is expected to comply with Nebraska's Rural Community-Based Energy Development Act and thus qualify as community wind by Nebraska's definition.[9] It is important to note that this project is being developer led.

- The Paderborn Bürgerbeteiligung, or citizen-owned wind project, is comprised of several separate projects totaling 111 MW.[10]

- Bear Mountain Wind, initiated by Peace Energy Cooperative in British Columbia, will be 120 MW when completed in 2009.[11] While this project was initiated by the cooperative, a private developer is leading financing and construction.

- The Samsøe Offshore wind plant comprises ten turbines of 2.3 MW each for a total capacity of 23 MW. Two of the turbines are owned locally by residents of Denmark's "Renewable Energy Island". The rest are owned by outside investors.[12]

- Middelgrunden, the famous 40 MW project offshore from Denmark's capital city of Copenhagen, was developed by and is 50% owned by Middelgrundens

[9] http://www.nppd.com/Newsroom/NewsRelease.asp?NewsReleaseID=300.
[10] See Paderborn and the Sintfeld Community Wind Project.
[11] See http://www.peaceenergy.ca/index.html.
[12] See http://www.wind-works.org/articles/SamsoeRenewableEnergyIsland.html.

Vindmøllelaug. The other 50% is owned by the city's municipal utility. Middelrunden is the largest of Denmark's cooperatively developed wind projects.[13]

- Though never built, the development cooperative, Offshore-Bürger-Windpark Butendiek, planned to build a 200 MW project off the west coast of the Jutland peninsula just south of the Danish border.[14] Clearly the proponents of this project, farmers from northwest Germany, many who already had successfully developed their own local community wind projects, didn't feel that size, in and of itself, was a limiting factor.

- When installed in the mid 1980s, Velling Mærsk-Tændpibe was the largest wind plant in Europe. It consisted of 100 turbines of various sizes co-located on a polder south of Ringkøbing on the west coast of Denmark's Jutland peninsula. One-third of the turbines are cooperatively owned. Though the turbines were state of the art then, they are very small by today's standards. The total project amounted to only 13 MW and the cooperative portion was only 2.6 MW. However, for the coop investors and for the nearby communities this was a big project and it remains visually impressive even today.[15]

Size and Annual Costs

One lesson that has been repeatedly learned during the past two decades in North America is that any fleet of wind turbines must be large enough and profitable enough to justify ongoing service, repair, and management. Time and again, projects or experimental programs of one or two turbines widely scattered across the landscape have been abandoned, as the revenue hasn't been sufficient to pay for needed service and repairs.

One of the reasons for the success of California's wind farms is the literally thousands of wind turbines of each particular make that were installed within a few short years. Even though many of the manufacturers are no longer in business, the fleets are large enough that independent vendors have created profitable businesses providing spare parts and service.

There is a tendency in North America, where we have little experience with the distributed development of wind energy like that seen in Denmark and Germany, to assume that service on one or a few wind turbines is as easy and as inexpensive as servicing a large fleet. This is a particularly dangerous assumption when using a new model turbine or a turbine by a new vendor. All wind turbines are not created equal.

---

[13] See http://www.middelgrunden.dk/.
[14] See http://www.butendiek.de/seiten/projekt/projekt.php.
[15] All the turbines look alike even though they are of different sizes because they were all manufactured by one company, Vestas, whose plant was nearby.

The best Canadian example is the Windshare turbine at Toronto's Exhibition Place. The Lagerwey 750 kW turbine is a truly innovative direct-drive design. It is well designed, and well made. Nevertheless, Windshare planned two turbines for the site, but only one was installed. Shortly after installation of the first turbine the manufacturer went bankrupt.

Despite the best of intentions, Windshare has been beset by maintenance and repair issues. Flying in parts and technicians from Europe has been expensive. Worse, the delay in repairing the turbine has meant long periods of inoperation that not only is bad publicity for Windshare, but also severely cuts into annual revenues.

Two turbines would ameliorate the problem somewhat but what is needed for Windshare is a turbine or turbines that are a mate of hundreds more like it that are installed region-wide. Better yet for Windshare is to manage a project of tens or dozens of turbines that allows it to spread management, service, and repair costs over many more turbines and many more kilowatt-hours.

There is a related issue concerning the total annual reoccurring costs of wind energy in North America. The current market here, unlike that in Germany and Denmark, is not transparent. Very few people know exactly what the total annual costs are for operating a wind plant. And those that do are not making their findings public. Thus, most community wind advocates must operate with incomplete information and often grossly underestimate what it costs to service, repair, insure, and manage an operating wind plant.

There is data on annual reoccurring costs available from Germany and France and this data says that costs are far higher than that publicly discussed here.

Projects must be of a sufficient size and feed-in tariffs must be high enough to pay for the real costs of operating modern wind turbines while providing sufficient revenue for not only a reasonable profit but also an ample reserve. Twenty years is a long time and much can happen that can't be anticipated today. Costs must be spread over as many kilowatt-hours as possible and revenues must be as high as politically sustainable for projects to be as beneficial to their community participants as they can be.

Minnesota Policies

Initially, Minnesota limited community wind projects to 2 MW. By the late 1990s this was equivalent to one wind turbine. Several projects worked around the limit by siting several 2 MW projects in relatively close proximity. The 2 MW project cap was eventually seen as unnecessary and was lifted. Though there are no project size limits today, changes to Minnesota's C-BED act in 2007 allows county governments to permit C-BED projects up to 25 MW in size.

Minnesota Distributed Wind			
	MW	%*	Units
Small Developer	104	12%	93
Farmer Owned	74	8%	56
Locally Owned	72	8%	61
Municipal Utility	19	2%	18
Rural Electric Cooperative	6	1%	9
College/University	5	1%	3
School	1	0%	1
	281	31%	241
*% of 902 MW			
Source: Windustry.org, March 2007			

According to Windustry.org "30% (275 MW out of 895 MW) of Minnesota's wind energy capacity is community-based."[16] From the number and diversity of projects that have qualified for Minnesota's community wind program, it is apparent that Minnesota has a broad definition of what constitutes community wind, including the category of "small developer".

Fixed or Feed-in Tariffs & Size Limits

Again, in an attempt to simplify a complex subject, the briefing documents have erred in describing fixed-tariffs. The authors state that "Standard Offer Contracts also generally specify a maximum project size". Assuming that the authors intend Standard Offer Contracts as a synonym for feed-in tariffs, this is not the case.

Projects were not limited by size in Denmark nor are they limited by size in Germany. Projects in Spain that choose to use feed-in tariffs are limited in size to 50 MW, not 10 MW.

The briefing documents note the early 2 MW project size cap in Minnesota but they fail to mention that Minnesota specifically encourages "aggregation" to assemble bigger, more economic projects: "Aggregation of projects should be encouraged. Aggregation leverages interconnection and other costs of C-BED projects in geographic proximity, thus more efficiently bringing wind energy to market."[17]

Currently there are no size limits for C-BED projects in Minnesota. There may be limits in practice, but there are no statutory limits.[18]

Minnesota legislators who sponsored the original Community-Based Energy Development (C-BED) legislation have recently introduced HF 3537 that would introduce a full system of Advanced Renewable Tariffs patterned after those in

[16] See http://www.windustry.org/news/minnesota-passes-new-c-bed-legislation.
[17] See http://www.c-bed.org/key_elements.html.
[18] Private correspondence with Paul Blackburn, formerly the executive director of Community-Based Energy Development, March 27, 2008.

Germany. The proposed legislation does not limit C-BED or feed-in tariffs to projects below a maximum capacity. The proposed legislation instead qualifies C-BED projects by a 51% ownership requirement.

Amendments to C-BED in 2007 allowed counties jurisdiction for permitting C-BED projects up to 25 MW in size. It is clear from the intent that Minnesota wants expedited treatment for projects less than 25 MW but does not limit projects to 25 MW or less.[19]

Moreover, the 10 MW limit recommended for Ontario's Standard Offer Contract program, was chosen for regulatory reasons. Projects less than 10 MW in size had less onerous grid integration requirements. Nearly every stakeholder involved in the Ontario program now agrees that the 10 MW project size limit was too low.[20]

It is important to note that the system of Advanced Renewable Tariffs proposed in Ontario was intended to avoid "Standard Offers". The intent of the proposal for Advanced Renewable Tariffs was to provide a system of "non-standard" offers using a system of "standard contracts".[21] The clearly stated objective was to provide tariffs or "offers" that varied by technology, size, and resource intensity to foster development where people live, in their communities, using the resources they have in their communities whether solar energy, biomass, hydro, or wind energy.

The briefing documents commendably explain how varying tariffs for wind energy can be used to encourage broad geographic participation while protecting New Brunswick ratepayers against excessive costs. This is a subtle and confusing feature of the systems of Advanced Renewable Tariffs used in France and Germany and New Brunswick's briefing documents are among the first published in North America to explain to explain this feature clearly.

Program Size Limits

Most community wind programs do not limit participation at the outset by setting a program size cap. Some do, but most do not. In the jurisdictions that have seen the most successful development of community wind, there are no program caps. Denmark had no program limits, nor does Germany currently have a program size limit. Ontario's program was specifically launched with no program cap.

---

[19] See http://www.house.leg.state.mn.us/hrd/bs/85/hf2253.html.

[20] The author initiated and led the campaign for Advanced Renewable Tariffs that became Ontario's Standard Offer Contract program. See North America's First Electricity Feed Law: Standard Offer Contracts in Ontario, Canada.

[21] There is an extensive discussion of this and related issues surrounding the development of Ontario's Standard Offer Contract Program at http://www.wind-works.org/FeedLaws/Canada/OntarioandtheCampaignforAdvancedRenewableTariffs.html. Note especially The Power of Language: ARTs are not SOCs.

Some jurisdictions, such as Minnesota, have imposed program caps, but in the case of Minnesota the limit has been continually raised. The private utility serving much of Minnesota, Xcel, has said they are seeking 500 MW of community wind by 2010. The governor himself has declared a target of 800 MW.[22] These program caps are sufficiently large to allow participation by all of those with a desire to do so. In effect, Minnesota's program limit today is so large as to be no limit at all.

Voltage Limits

In addition, the most successful programs have not limited projects to distribution voltages. Germany does not limit the use of its feed-in tariffs to projects only connected at distribution voltages, nor did Denmark.[23] Ontario does limit its Standard Offer Contract program to projects connected at less than 50 kV. However, the Ontario Sustainable Energy Association has specifically recommended that this limit be lifted.[24]

Ownership (Equity) Requirements

It is noteworthy that in Germany there are no ownership requirements to qualify for the feed-in tariffs that make German-style community wind possible. Commercial projects also qualify. Similarly, in developing Ontario's Standard Offer Contract program, the question of ownership requirements was raised. However, the Ontario Sustainable Energy Association (OSEA), whose mission is community renewable development, deliberately chose not to place an ownership requirement on the program. That is, OSEA chose to make the program open to all participants in part because OSEA could not envision all the combinations of private sector, individually-owned, and mixed-ownership models possible.

Below are several examples of the differing equity participation of community wind projects in North America, ranked by greatest equity participation to lowest.

WindShare 100% Equity (Ontario)

To date, only one "community" wind turbine has been installed in Canada. WindShare's single cooperatively-owned wind turbine at Toronto's Exhibition

---

[22] See http://www.governor.state.mn.us/mediacenter/pressreleases/2006/march/PROD007481.html.

[23] The pig farmers of Sydthy Kabelaug in Northwest Jutland connected at the transmission level. Though the turbines are owned individually, the Kabelaug is a cooperatively owned collection system.

[24] Renewables without Limits: Moving Toward Advanced Renewable Tariffs by Updating Ontario's Groundbreaking Standard Offer Program, 2007.

Place. WindShare's turbine meets the strictest definition of community wind: it is 100% owned and controlled by investors living in Toronto.[25]

Val-Éo <50% Equity (Quebec)

Farmers on the south shore of Quebec's Lac St. Jean formed a cooperative and limited partnership to develop their wind resource. The cooperative is the general partner of the limited partnership. The farmers provided all the up-front expense for the first phase of developing a 50 MW project.

Like Peace Energy Cooperative, Val-Éo chose to work with a private partner, Algonquin Power, to prepare a bid for a contract from Hydro Quebec and to eventually build and operate the wind plant.

Val-Éo can provide up to 50% of its own equity in the project. However, unlike Peace Energy Cooperative, Val-Éo will maintain 50% of the voting shares regardless of the percentage of equity actually owned by community members once the project is built.

Minnesota C-BED

To qualify for Minnesota's C-BED tariffs, 51% or more of the equity in a project must be owned by Minnesota residents, municipalities, or NGOs. Moreover, "No single owner may be allowed to own more than 15 percent of a project. This encourages the distribution of benefits broadly rather than to a small number of individuals. For small projects, an exception is made for practical reasons. For instance, the Minnesota law allows a single individual to own up to 2 wind turbines."[26]

Nebraska C-BED

The $140 million Elkhorn Ridge wind plant near Bloomfield, Nebraska is being built in partnership with Midwestern Wind Energy, a Chicago developer. The 80 MW project will be the largest in Nebraska when completed by the end of 2008. The project will comply with Nebraska's Rural Community-Based Energy Development Act. The act requires that 33% of the power payments over the 20-year contract period go to Nebraska owners.[27] The project is the first of its kind in Nebraska and is being led by Midwestern Wind Energy.

---

[25] While Windshare is 100% owned by its investors, the turbine is co-owned with Toronto Hydro and management decisions are made jointly.
[26] See http://www.c-bed.org/key_elements.html.
[27] The 33% of total project revenues does not include lease payments or community development payments.

Nebraska's C-BED requires that those with land on which turbines are installed have first right of refusal to invest in the project.

Bear Mountain Wind 9%-25% Equity (British Columbia)

Bear Mountain Wind was one of only three projects selected in BC Hydro's call for tender. When commissioned in 2009, the 120 MW project will represent a total investment of nearly one-quarter billion dollars and be among the largest wind projects in Canada.

The Bear Mountain Wind project was initiated locally by Peace Energy Cooperative. The 250-member cooperative obtained leases on Crown land for the site that will entail sixty 2 MW Enercon E82 turbines.[28]

Believing that the cooperative was not technically competent to analyze the wind resource, Peace Energy selected a private partner in the wind industry. Thus, the private developer is leading the financing and construction of the project.

The Bear Mountain Wind Limited Partnership allows Peace Energy Cooperative to invest in the project. The cooperative hopes to raise $5 to 12 million for its portion of the project.

Depending upon the proportions of debt to equity in the project, Peace Energy's equity share could represent from 9% to 25% of the total equity in the project. Peace Energy will not have a controlling interest in the equity and will not have managerial control of the project.

Peace Energy Cooperative believes that even though this is a large project and it is managed by an outside partner, Bear Mountain Wind is a community wind project in part because the project was locally initiated and because the local community will own significant equity in the project.

Requests for Proposals

The briefing documents overlook one of the reasons communities cannot participate in calls for tenders: they are landlocked. Communities are where they are. The wind resource they can bid a project with is the wind resource they have within or nearby their community. Like farmers, communities cannot move to an area with a better wind resource to bid a lower price for a project. Commercial developers can, and do. Commercial developers seek out the windiest sites with the lowest land costs so they can bid projects with the lowest monetary costs.

---

[28] Valerie Gilson, Peace Energy Cooperative, info@peaceenergy.ca, 250 782 3882, March 26, 2007, www.peaceenergy.ca.

Requests for proposals inherently discriminate against local landowners and communities. Calls for tenders benefit outside corporate interests at the expense of local landowners and communities.

"Bands" for community power within call for tenders, as envisioned in Quebec, pit one community against another, one landowner against another, neighbor against neighbor in a zero-sum competition. Rather than an open process that encourages cooperation and sharing of information that is the hallmark of community economic and social development, community power bands proffers secrecy and subterfuge that leaves a stain on community relations for years.

Requests for proposals are the antithesis of democratic, cooperative actions that should be the aspiration of regional and community economic development.

Experience worldwide has shown that community wind development is best achieved when feed-in tariffs are used to determine the level of payment for community wind projects. Further experience has shown that participation should be open to all communities who want to participate. There should be a transparent process for awarding contracts, and payments for generation should also be transparent by using feed-in tariffs.

Renewable Energy Certificates

The briefing documents state that "in most jurisdictions where RECs are sold, the price of the RECs can play a significant role in the financial calculations of community wind projects." While in theory RECs "can" play a role, in practice they have not. No jurisdiction using RECs has seen any significant development of community power. The REC market is too volatile to provide revenue security for any community power project and thus any debt financing obtained is discounted for the volatility in the RECs market, raising financing costs and hence overall project costs.

Community power has been successful developed only in jurisdictions with feed-in tariffs as in Denmark and Germany and to a much lesser extent France.

Recommendations for New Brunswick Community Wind

Project Size

There should be no limit on project size. If there needs to be a limit on project size, the limit should be in the range of the community wind projects underway in Nebraska and British Columbia, that is, from 80 MW to 120 MW.

Voltage Limits

There should be no limit on maximum voltage. There may be cases where it makes the most economic sense to connect at transmission voltages.

Contract Awards and Payments

The program should be open to all communities that wish to participate and they should all be treated on an equal footing in a transparent manner. The best mechanism for doing so is through a feed-in tariff that is weighted or determined on the resource intensity of the site as has been used successfully in France and Germany.

Because of the unique situation in New Brunswick, where the community wind potential may exceed the capacity of the grid, it may be necessary to create criteria for selecting one community or one project over another. One criterion that could be used is to rank proposals that have the greatest community acceptance first.

Other Renewables

The program should be open to other renewables, especially biomass and biogas, and should not be limited solely to wind energy.

-End-