Status of Social Economy Provision of Wind Electric Energy in Alberta

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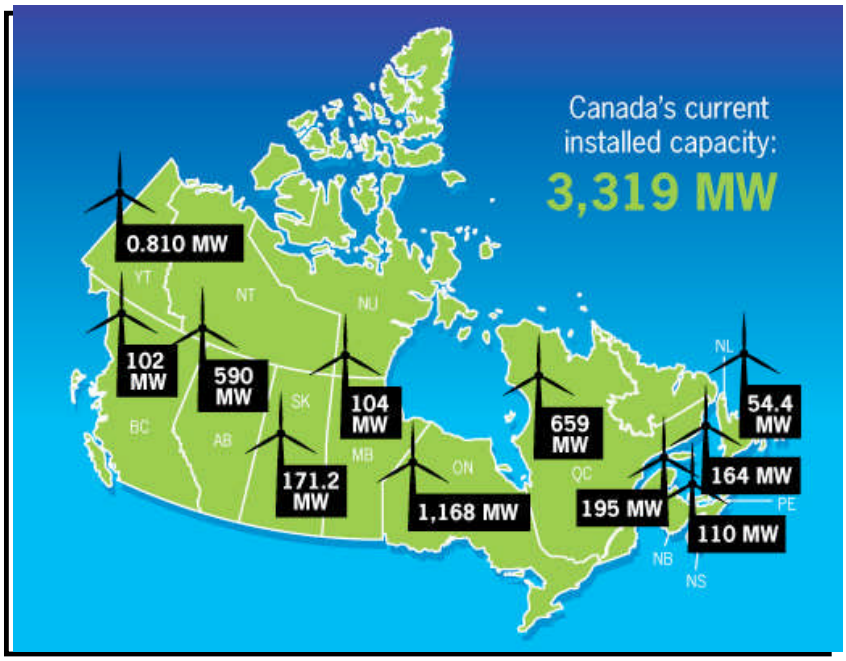
Wind electricity in Canada and Alberta

Wind power is one of the fastest growing energy sources in the world and Canada is no exception to this. 2009 was a record year for the development of wind power in Canada and it now occupies the 11th country spot in total installed capacity according to the World Wind Energy Association 2009 report. Total installed capacity in Canada is now at 3,319MW (CanWEA, 2009a[1]), which is up from 2,370MW at the end of 2008 (40% increase) and 1,770MW in 2007 (StatsCan, 2009). Every province now has some installed capacity (with the opening of Bear Mountain Wind Park in Dawson Creek, BC). In fact, using the CanWEA numbers, installed capacity from 2000 to 2009 grew at an average of 40% every year. According to a CanWEA press release "current provincial targets and policy objectives would result in a further quadrupling of installed wind energy capacity in the next six years" (CanWEA, 2009a).



Source: CanWEA 2009(http://www.canwea.ca/farms/index_e.php)

While this growth is impressive, it is important to keep in mind that Canada still has one of the most underdeveloped wind resources in the world. Germany, for example, which is 28 times smaller than Canada has 10 times more installed wind capacity (Valentine 2009, p.3). Only 0.6 per cent of Canada's total electricity production in 2008 was from wind and tidal sources (NEB, 2009, p.43- see table 1). This number is particularly significant given that Canada's total wind potential far exceeds total demand for electricity in the country. CanWea estimates that just 0.25% (2008, p.11) of the landmass would be needed to supply our total electricity needs.

A number of important caveats are necessary with wind resource estimates. The first is that electricity grids need to be designed around demand centers. Most of the best areas in Canada are in remote coastal and northern locations. This means that, in practice, it is very difficult to say what the actual *exploitable* resource (in terms of grid access and affordability) is. It is also important to note that wind is a variable source of power it

[1] I use the Canadian Wind Energy Association numbers here as they collect the most up to date information on installed capacity. Statistics Canada data is far more detailed, but the latest available report is for 2007.

often produces electricity at between 25 to 35 per cent of installed capacity (NEB 2009; see also Boccard, 2009). One way to address the variability of the wind resource is to use it in conjunction with firm sources of power (such as hydro-electricity), to offset times when the wind isn't blowing. While these practical limitations need inform siting and development planning, they do not challenge the fundamental point: wind resources in Canada are vastly underexploited.

Table 1 - Electricity Production (TWh)

	2004	**2005**	**2006**	**2007**	**2008**
Hydroelectric	336.7	358.4	349.5	365.8	369.3
Nuclear	85.2	86.8	92.4	88.2	88.6
Thermal	154.6	157.3	147.7	149.6	139.1
Wind & Tidal	1.0	1.6	2.5	2.9	3.6
Total	**577.5**	**604.2**	**592.0**	**606.5**	**600.6**

Figure 1- Source NEB 2009, p.43

Alberta plays a key role in this small but growing sector of Canada's total electricity production. Alberta's installed capacity at the end of 2009 was approximately 18 per cent of the national total. It used to be much higher until other provinces started developing more quickly. In fact, the Cowley Ridge windfarm near Pincher Creek, Alberta was the first commercial windfarm in Canada. The Pembina Institute's 2009 *Greening the Grid* report points out that

> Although Alberta was Canada's leading wind energy producer for many years, in 2008 both Ontario and Quebec have surpassed it. In spite of 15 years of wind development, Alberta still takes advantage of less than 1% of the estimated total wind energy potential in the province. (Pembina, 2009, p.1)

A quick look at CanWEA's projects under construction across the country (CanWEA, 2009b) slated to go online in 2010/2011 reinforces Ontario and Quebec's lead in total wind development. Alberta is slated to develop 121MW in 2010 and 334MW in 2011 (see table 2) which translates in to it holding its place with approximately 18% of installed capacity. All of these projects are being developed by major players in the windpower industry (for example, TransAlta or Ireland's Mainstream Renewable Power). Tim Weis and Jeff Bell at the Pembina Institute estimate that Alberta's total potential wind is 64,000MW (Pembina, 2009, 34), so even with these new developments the province is still underutilizing wind potential.

Table 2 – Projected Installed Capacity Growth

	Total Installed As of Dec 2009	2010	2011
B.C.	102MW	1.5MW	169.2MW
Alberta	590MW	121MW	334MW
Sask	171.2MW	0	24.75MW
Manitoba	104MW	0	138MW
Ontario	1168MW	443.7MW	99MW
Québec	659MW	100.5MW	699.6MW

New Brunswick	195MW	49.5MW	0
Nova Scotia	110MW	127MW	0
PEI	164MW	0	0
NFLD	54.4	0	0
Yukon	0.81MW	0	0
New		843.2MW	1464.55MW
Total Installed Capacity	3319MW	4162.2MW	5626.75MW
Alberta's share of new		14%	23%
Alberta's share of total	**17.7%**	**17%**	**18.6%**

Figure 2- Based on CanWEA 2009b

A major explanation for Alberta's relative decline as a leader in the Canadian total wind installation is the relative lack of public policy encouraging renewable energy production in the province. For example, in 2009 Ontario passed the Green Energy Act, which puts in place the oft-heralded feed-in-tariff system for renewable electricity generation. The Alberta government did introduce regulations to facilitate micro-generation in renewables (less than 1MW in size) in 2008, but the market prices are not high enough to justify the initial capital outlay. There has been little, if any, analysis of the uptake to date.

Another explanation is the availability of plentiful fossil fuel resources. Alberta, along with Nova Scotia, and Saskatchewan derive the majority of their electricity from 'dirty' sources like coal, thus exerting a high carbon footprint. Alberta's coal dominated (74 per cent) electricity generation produces a full one quarter of Alberta's greenhouse gas emissions (Pembina, 2009, p.1). It derives 3% from hydro and 1% from wind. Saskatchewan obtains 21% of its electricity from hydro and 3% from wind and tidal, whereas in Nova Scotia the figures are 7% and 1% respectively (Statistics Canada, 2009, Table 2). In Nova Scotia however, the provincial government made a major commitment to green the grid by passing the Environmental Goals and Sustainability Act in 2007, mandating that NSPower double its renewables generation by 2015.

Finally, Alberta's electricity market structure makes infrastructural investments in costly ventures like wind power development a risky venture. Alberta is the only province in Canada where the costs of generation are based solely on competitive wholesale markets. What this means is that power producers need to depend on retailers and consumer demand to ensure a return, rather than contracts with a centralized authority (like a public utility). The full retail and wholesale competitive markets put a higher premium on power for profit and lowest-cost production. This makes investment in new generation a riskier prospect, particularly for smaller, newer entrants (who don't benefit from economies of scale).

One consideration that often fails to make it in to the broader statistics of wind provision is the issue of ownership. Most provincial programs make no distinction whether wind is

developed by communities or investors, for profit or for security[2]. The rest of this diagnostic paper profiles the contribution that social economy groups with respect to wind energy provision in Alberta. There are many ways that this provision can take place: by creating a consumer market (purchasing), by generation (direct provision), or through intervention in policy processes (outreach/education). Since generation is the most direct way to provide wind I start with that form of provision.

The social economy generation of wind

The concept of social economy is contested. For Leslie Brown it is as follows:

> Rooted in local communities and independent from government, Social Economy organizations are democratic and/or participatory, pull together many types of resources in a socially owned entity, and prioritize social objectives and social values. While they may intend to make a profit, they do so in a context that sees profit as a means to meet social goals, not primarily as a means to create individual wealth. They may rely on volunteer labour as well as, or instead of, paid employees. The Social Economy is characterized by mutual self-help initiatives, and by initiatives to meet the needs of disadvantaged members of society." (L. Brown, MSVU, 2008)

For the purposes here I'll be focusing mostly on co-operatives, but will include native band and municipal utilities, where appropriate. It is beyond the scope of this diagnostic to unpack the complex lines between different conceptions of the social economy. The Canadian conception clearly includes co-operatives and non-profits. Taking Browns' definition above, one could tentatively include organizations owned democratically by public entities (municipal corporations). Power projects undertaken by native bands, to the extent that the community owns them for the purposes of local development, are also relevant.

Social economy groups interested in generating electricity through wind fall under the rubric of 'community power'. There is a large and growing literature on the contribution that direct ownership of resources has on communities (c.f, Gipe 2009; Warren & McFayden, 2010; Bolinger, 2005, EnvINT 2008). In short, there are five core arguments for social ownership and control of resources. Social economy energy provision:

1) Combats NIMBYism, through giving locals a stake in the project;
2) Helps educate communities about their resources;
3) Can spur local development and job creation;
4) Keeps profits in communities and builds local capital (financial and human).
5) Can institutionalize a *triple bottom line* ethos where the measurement of enterprise success is not narrowly construed solely in financial profit.

[2] One example of this is the federal government's ecoENERGY for Renewable Power program. It provides one cent per KWh for up to ten years. The program was slated to run from 2007 to 2011. It has allocated its total funding by 2009. Many private large wind farm developers were recipients. The full list is available at: http://www.ecoaction.gc.ca/ECOENERGY-ECOENERGIE/power-electricite/projects-projets-eng.cfm

Security, empowerment and local development are all contributing benefits associated with social economy initiatives. For these reasons development of renewable resources by social economy actors makes a contribution not only to a greener Alberta, but to a more socially just and resilient one as well. The link between the environment and equity issues is particularly important as environmental 'goods' and 'bads' are increasingly commodified. For example, carbon taxes attempt to internalize costs to dirty industries, but these costs (like the pollution itself) is often passed on to marginalized populations. Higher energy prices aimed at stimulating green energy developments also have significant distributive implications for Canada's less well-off citizens. For the five reasons described above, social economy institutions may have a key role to play in ensuring that *green* costs come with both security and control.

Co-operatives

With respect to the provision of wind, Canada only has one fully community owned wind turbine, the WindShare Co-operative project in Toronto. This single turbine project is a joint partnership between a municipal corporation, Toronto Hydro, and Windshare, which is part of the Toronto Renewable Energy Co-op. There have been a number of other wind-projects proposed by co-operatives through Ontario and across the country, but none have yet succeeded with the degree of co-operative ownership that the Windshare has.

One of these other projects is the Bear Mountain Wind Farm that arose from Peace Energy Co-op of Dawson Creek, BC. The co-op entered a partnership with Aeolis Power to develop the wind resource in Dawson Creek. It is now the largest (and only) wind project online in BC. AltaGas owns the physical assets on the site. The co-op retained a finders fee and an option for partial share of the revenue stream. At present, it does not have any stake in the ownership or operation of the project.

In Alberta there are no co-operatives generating wind energy at this time. The research has not revealed any plans by co-operatives in the province to do so either.

The majority of the co-operatives in Alberta that are involved directly with energy sources are distribution co-operatives. In fact, Alberta has the largest network of electricity distribution co-operatives in Canada. There are approximately 50 Rural Electrification Associations (REAs). These fall under two types: seven self-operating REAs and those that own the lines but contract their maintenance and operation to either ATCO or FORTIS. The self-operating distribution co-operatives could conceivably move in to generation at some point. One major barrier to this is the huge initial capital outlay for the membership/co-operatives. As a result, this line of action does not seem likely without policies specifically targeted to supporting community based power generation. However, there are other ways that the REAs could contribute which will be addressed below.

Municipalities

Large municipal utilities have significant resources and can play a role in supporting the social economy sector as Toronto Hydro did with Windshare. In Alberta's case, both

Calgary and Edmonton own utilities that are already involved in the provision of wind energy in the province.

The City of Calgary owns both Enmax Power and Enmax Energy. Enmax is part of a joint venture with TransAlta Wind on the McBride Lake 75MW wind farm. They also wholly own the Kettles Hill 63 MW and Taber 80MW wind farms. The Taber operation is the largest in Alberta. These 3 large-scale projects are not 'community wind' projects, but they do demonstrate ENMAX's expertise and financial capacity (as well as interest) in wind generation. As a publically controlled entity there may be room to pressure the city to include support for community power projects in their mandate.

The City of Edmonton used to own generating assets through EPCOR Energy Services, but divested these assets to a private company, Capital Power, in 2009. EPCOR is the major shareholder in Capital Power, but the creation of a separate company, with a distinct CEO and Board creates barriers to direct control by the city (and for public control). Prior to this divestment, EPCOR was involved in developing wind farms in BC, Ontario and was a partner with the Piikani Utilities Corporation in the Weatherdancer 900kw turbine on Piikani land near Pincher Creek.

A number of municipalities in the province have formed the Southern Alberta Alternative Energy Partnership. The municipality of Lethbridge is playing a key role with Economic Development Alberta. They started work in 2006 and are aiming to consult, plan and develop southern Alberta as a leader in renewable energy for the province. Their reports demonstrate clear interest in southern Albertan municipalities in capitalizing on renewable resources. Their consultations with communities have also resulted in feedback demonstrating the general acceptability of wind development, particularly when it is partnered with local job growth and technical expertise (Brown, McNeil, Reesor, 2006). The focus of the SAAEP has been attracting wind developers to their region, and not necessarily local ownership of the resource. The case could, however, be made for increasing partnerships rather than just granting land-leases to developers.

Native Bands

There is one turbine on reserve land in Alberta, on land of the Piikani nation near Pincher Creek. Spearheading this project was William Big Bull, a (now) board member of the Ontario Sustainable Energy Association. He won a 2004 Canadian Environment Award for his work on the project. The band first started looking in to wind development in the 1980s. They spent many years trying to get the project up a running. In fact, what is now the Cowley Ridge 10MW farm was originally slated to be on Piikani land but was relocated due to siting disagreements and is now owned by Canadian Utilities. Eventually they partnered up with EPCOR and the turbine was completed in 2001, becoming the first turbine in Canada on first nations land. The project is run as a partnership with EPCOR, but as far as I can gather, EPCOR financed (and owns) the actual turbine and the Piikani have the option to purchase a share at a later date.

The Piikani nation also has their own Rural Electrification Association and a new transmission line is slated nearby that will increase the potential for producing power on

the land and getting it to purchasers in other parts of the province. The Peigan Utilities Corporation site suggests that the Piikani are interested in developing more renewable power sources.

Other avenues for social economy provision of wind

While there are few cases of actual generation projects owned by social economy actors in Alberta there may be some scope for social economy bulk purchase to encourage renewable electricity. At present, green sources cannot compete with conventional power that was often developed (and paid off) many decades earlier. One way this incentive structure could be changed is with significant public investment in developing green power sources. In lieu of provincial support, organizations and consumers can try to encourage new wind development themselves. A drawback of this approach is that it relies on individual consumers, while the rest of the population gets a free ride off the greener grid.

Renewable energy certificate systems like this are plentiful in Alberta. For example, the Central Alberta Rural Electrification Association (CAREA) offers their members the ability to purchase Renewable Energy Credits. For twenty dollars a month, members of the REA can purchase 1MWh of renewable energy that is "physically metered and verified in Alberta" (CAREA, n.d.). They facilitate wind development in the province by paying higher than the market price for green power sources. This creates a market for green power that makes projects more financially viable. There is no reason why other social economy groups or co-operatives with a retail arm (like Battle River REA) could not join in this market.

One of the major private, for profit, players in the green energy market is Bullfrog Power. They launched in Alberta in 2007 and their business is based on signing up utility customers to pay an extra charge on their utility bills to help support wind development. They operate in BC, Alberta and Ontario. The company agrees to use customer fees to fund wind power into the grid at an equal amount to their usage. They sign contracts to purchase power from renewable sources as well as sometimes directly invest in the project themselves. In 2007 they agreed to purchase almost all the power from the Alberta Wind Energy's Oldman River Farm in Pincher Creek and subsequently also invested in that company (Bullfrog Power, 2009).

Moving forward: opportunities and barriers

The Pembina Institute's *Greening the Grid Report* clearly outlines the need for Alberta to re-orient the production of electricity toward greener sources. With only one per cent of Alberta's wind potential harnessed there are clearly opportunities for social economy actors. They can contribute and ensure that the financial benefits of such development are not all captured by investors, rather than the communities that tend to host the turbines and transmission lines. Social economy groups are also well positioned to work in areas where governments are either unwilling or unable to act. In the current context in Alberta this may mean education, investment in wind projects, creation of wind funds, and similar projects.

It is, of course, also possible for co-operatives to develop their own wind power generation projects. This would most likely take the form of a partnership with a municipal utility or private sector wind developer with deep pockets. The challenges presented for social economy actors in Alberta are that the competitive market favours large corporate developers. Communities will be in competition for the best (most profitable) wind sites, for contracts with green power purchasers and for renewable energy subsidies (of which there aren't many since the federal ecoENERGY program is out of funds). All of this suggests that in order to succeed in developing a wind project significant networking, mobilization and political support will be necessary.

One niche that social economy actors may have is in the development of small wind projects that aren't profitable for larger developers. It needs to be remembered that the smaller projects are less financially viable (the fixed costs per MWh are higher) (ENVint, 2008), but may prove a preferred option for farms or rural communities wanting to produce their own power or go off-grid. Micro-generation for less than 1MWh is covered under the Alberta MicroGeneration and Alberta Utilities rule 24[3]. Weis and Bell argue that Rule 24 will help address some of the interconnection issues that other microgen projects have faced. They will still, however, have to overcome the administration and red tape that larger companies are set up to deal with.

In Alberta the relationship between micro-gen projects and local REAs may prove an important factor. There seems, from the BALTA interviews on this subject so far, to be a tension between groups wanting to generate and the line owners (REAs) over who should pay for the distribution costs and line upgrades that may be needed. For example, when more electricity is being fed in to the grid this sometimes requires upgrades to the distribution system (or, at the macro scale, the transmission system). The issue is whether the farm or consumer who is paying for the micro gen, solar panels, for example, should be billed for the costs of any upgrades or not. Doing so would make microgen projects even less affordable. The REAs are concerned that their members will have to pay for these upgrades, on behalf of a few members who want to (or have the financial resources to) generate. More consultation on these challenges needs to take place. If wind is developed for sale in to the grid, reliability and transmission capacity also need to be taken in to account. Significant investment is slated for Alberta's transmission system in the near future, which will facilitate the distribution of more power sources. In particular, this will facilitate bringing wind from the south-west of the province up to populated areas in the north.

Ultimately, the role that social economy actors have played in the provision of wind in Alberta has been minimal. Significant market barriers exist for small and community

[3] Rule 24 refers to the Alberta Government's 2008 Micro-generation regulation. It is overseen by the Alberta Utilities Commission and allows interconnection to the grid. In order to qualify applicants must be proposing renewable generation of less than 1MW primarily for own-use. For more information see: http://www.auc.ab.ca/rule-development/micro-generation/Pages/default.aspx

based projects. However, the existing networks of distribution co-operatives in Alberta may prove an opportunity to get some momentum going in the future. Alberta Energy will also be developing a policy discussion white paper in early 2010. This presents an opportunity to develop and articulate the case for policy supports for community based renewable power.

Annotated Bibliography- Wind Power Canada

Bell, Jeff, and Tim Weis. 2009. Greening the Grid: Powering Alberta's Future with Renewable Energy. Calgary: Pembina Institute.

Excellent overview of Alberta's electrical system based on source of generation, history, power pool prices and the like. They cover a wide range of options, from increasing efficiency of use, to developing wind, hydro, biomass, geothermal, recovered industrial energy, carbon capture and storage, micropower, etc. They compare a pale green and a green scenario (where coal is phased out). They recommend steps for the Alberta government: a renewable energy task force, an energy efficiency and conservation strategy, assessment of RE for Alberta, and earmark funds for RE.

Benjamin, Chris. 2009. Wind power breaks down in Nova Scotia. *The Coast*, September 10, 2009.

The article provides a good overview of the major issues with developing wind power in Nova Scotia. The Environmental Goals and Sustainable Prosperity Act was passed in 2009 and requires double the renewable electricity in 6 years. NS wind hotspot. Discusses production for export to the United States. NDP in NS supports feed-in tariffs. The article discusses Germany, Pembina's work and Ontario. Excellent look at the pros and cons of wind in NS. Connection issues, small vs big, etc.

Boccard, Nicolas. 2009. Capacity factor of wind power realized values vs. estimates. *Energy Policy* 37:2769-2688.

Bolinger, Mark A. 2005. Making European-style community wind power development work in the US. *Renewable and Sustainable Energy Reviews* 9:556-575.

Cases in Wisconsin, Iowa, Massachusetts, Minnesota. Argues that fundamental difference in how governments supported was key. Private producers developed, took tax breaks and then flipped to community groups, so, to benefit you'd need a big tax liability. Looks at definitions of community wind power, identifies some criteria. Focuses on grid connected and production for sale. There are possibilities for ramp up of community wind.

Brown, Kerry, Barbara McNeil, and Karla Reesor, 2006. Final Report of the SAAEP Advisory Committee. Lethbridge: Southern Alberta Alternative Energy Partnership.

This report contains summaries of all the community consultations that he partnership undertook as well as makes key suggestions on where progress can be made. They make recommendations to industry, local governments, the Alberta government, community members, post secondary institutions and themselves. The advisory committee was formed in 2006, and they launched the green growth plan in 2007 to analyze the region's capacity for development in the RE industry. Very pie in the sky. No political economy considerations. Very 'consultative'. There is a good section around p.26 with what the provincial input was.

Bullfrog Power. 2009. *New Projects.* Accessed Dec 30, 2009. Available from: http://www.bullfrogpower.com/clean/newprojects.cfm

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Christianson, Russ. *Danish Wind Co-ops Can Show Us the Way* [cited. Available from www.wind-works.org/.../Russ%20Christianson%20NOW%20Article%201.pdf

Echo, Pincher Creek. *Wind opportunity wasted on reserve* 2006 [cited. Available from http://www.pinchercreekecho.com/ArticleDisplay.aspx?archive=true&e=1957846.
The article describes how the proposed wind farm on the Piikani reserve was moved and the band was left in debt and with one (the winddancer) turbine.

ENVINT Consulting, and Ontario Sustainable Energy Association. 2008. Guide to Developing a Community Renewable Energy Project in North America. Toronto: Commission for Environmental Cooperation.
79 page report covering a wide range of issues to get a community energy project up and going. Pages 20-25 talk about using the co-op model specifically, articulating to co-op difference and models that may work in renewable energy projects. The report also covers budgeting, permitting, and how to make a return on the project (via various financial supports/grid connection systems). Page 64 contains and interesting comparison between Canada, USA and Mexico on a number of permitting issues. The final pages compile a list of useful websites for assessing, costing, many of which are Canadian and co-op centered. Overall, an extremely useful resource for groups looking to start a generating project.

Freeland, Benjamin. 2009. *A Mighty Wind*. AlbertaVenture 2009 [cited December 29 2009]. Available from http://www.albertaventure.com/environment/a-mighty-wind/?year=2009.
This article describes the development of Alberta's wind resources, including locations, statistics and prospects for future development. It also mentions some opposition from local landowners citing bat mortality and views.

Gil, Hugo A., Geza Joos, Jean-Claude Deslauriers, and Lisa Dignard-Bailey. 2006.

Integration of Wind Generation with Power Systems in Canada- Overview of Technical and Economic Impacts: Natural Resources Canada, CANMET Energy Technologies- Varennes.
Fairly long technical paper that goes over both policies in five provinces: Quebec, Ontario, Manitoba, Alberta and BC. The authors argue that partnering wind with hydro can help with the variability issue. They also argue that Canada's wind resources are vastly underdeveloped.

Gipe, Paul. *Comments on New Brunswick's Community Wind Initiative*. WindWorks 2008 [cited. Available from http://www.windworks.org/coopwind/New%20Brunswick%20Community%20Wind%20Comments.pdf.

Gipe, Paul. 2007. Wind Energy Cooperative Development in Anglophone Canada: Canadian Cooperative Association.

Glover, Leigh. 2006. From Love-ins to Logos: Charting the Demise of Renewable Energy as a Social Movement. In *Transforming Power: Energy, Environment and Society in Conflict*, edited by J. Byrne, N. Toly and L. Glover. Piscataway, NJ: Transaction Publishers.

van der Horst, Dan, and David Toke. 2010. Exploring the landscape of wind farm developments; local area characteristics and planning process outcomes in rural England. *Land Use Policy* 27 (2):214-221.
The authors explore the degree and ways in which 'local' matters in wind development. They argue that "the emerging landscape of wind energy development in England is uneven and sometimes inequitable". They find that low voter turnout is a predictor of positive planning outcomes for windfarms. They also find that communities with lower crime also associate with refusals, and grow stronger after appeal. The article includes a discussion on environmental inequality.

Indian and Northern Affairs Canada. 2004. Sharing the Story: Aboriginal and Northern Energy Experiences. Ottawa: Indian and Northern Affairs Canada.
This fairly long report profiles various renewable energy projects (including the Alberta Piikani turbine) initiated by First Nations communities across Canada. These include: small hydro, wind, solar, district heating, and energy efficiency projects. The aim of the report is to chart best practices for groups to contribute to combating climate change. The goal was also to highlight self-sufficiency and community development. While it is 6 years out of date (the interviews were 8 years ago) there are good points about selecting locally appropriate technologies and that any community developments are part of a broader need for policy change.

Lipp, Judith. 2005. Community Power Canadian Style. *REFocus*.
The short article is an overview of the TREC/Windshare experience in Toronto, ON. She outlines the benefits of using the coop model in developing a wind project.

Contains good quotes from members of TREC and a good overview of the project history.

Loring, Joyce McLaren. 2007. Wind energy planning in England, Wales and Denmark: Factors influencing project success. *Energy Policy* 35:2684-2660.
Using 18 in-depth case studies of community wind planning she assesses the degree of local participation in the planing process. Results are that high levels of participatory planning are more likely to be publically accepted and successful, also, stable supporting networks are more likely to form. The presence of a stable network is not found to be related to project success.

National Energy Board. 2009. Canadian Energy Overview 2008, edited by N. E. Board: NEB.

Pahl, Greg. 2007. A Case Study in Community Wind: Denmark. In *The Citizen-Powered Energy Handbook: Community Solutions to a Global Crisis*. White River, Vermont: Chelsea Green Publishing.
Excerpt in word format from Lena on co-operatives

Provey, Joe. 2009. Wind Communities; Why Smaller Might be Better. *E Magazine*, 32-33.
Argues community based wind has advantages over capital intensive big wind farms. Eg. diverse but interconnected small can make better use of the resource than big in same area. Discusses the Community Wind 101 report commissioned by the Minnesota Legislature found that wider distribution could reduce the time that no wind is produced. Article says that small and local projects have a better chance of permits because the community reaps the benefits. Very optimistic.

Rohan, Shannon. 2004. Co-operative power: Leading the Way in Renewable Energy. *Intersector: Newsletter of the Canadian Co-Operative Association* 8 (1).
wind

Sovacool, B.K. 2008. Is the Danish Renewable Energy Model Replicable? *Scitizen*.
Good article with the key lessons from the Danish case. Recommends adopting. Very short.

Statistics Canada. 2009. Electric Power Generation, Transmission and Distribution 2007, edited by Manufacturing and Energy Division: Government of Canada.
Statistical tables of electricity production by source, exports, imports, inter-regional transfers. Includes disposal by sector (lighting, transit, residential). It also contains and interesting comparison between private and public electric utilities.

Toke, David, Sylvia Breuers, and Maarten Wolsin. 2008. Wind power deployment outcomes: How can we account for the differences? *Renewable and Sustainable Energy Reviews* 12:1129-1147.

The authors compare implementation of wind power in six country cases: Demark, Spain, Germany, Scotland, the Netherlands, and England/Wales. They explore the impact of planning systems, financial support mechanisms, landscape protection organizations, and patterns of ownership. They argue that on variables one and two they are necessary but diversity works. They argue that local ownership corresponds with high levels of development more than remote corporate ownership. Good summary table on p. 1139.

Valentine, Scott Victor. 2010. Canada's constitutional separation of (wind) power. *Energy Policy*.

Very recent article on different policy instruments for the development of wind power in the Canadian federal system. In particular he focuses on the impact of the federal government.

Warren, Charles R, and Malcolm McFadyen. 2010. Does community ownership affect public attitudes to wind energy? A case study from south-west Scotland. *Land Use Policy* 27 (2):204-213.

The authors argue that in the Scottish cases the towns were more positive and accepting of the wind resource when it was community owned versus developer owned. Interestingly they conclude saying that the Danish model was good, but temporally specific citing evidence that now larger wind developers have started to take over.

Weis, Tim, and Roger Peters. 2008. Feeding the grid renewably. Calgary: Pembina Institute.

The primer argues that feed-in tarrifs are the most effective policy mechanism to build renewable energy capacity. 2/3 of worlds wind and half of solar PV developed because of FIT. The report defines key terms, and has simple charts showing the major barriers to RE development and how FIT policies can help overcome them. Some comparatives are addressed, such as quotas, as are Germany and Spain's systems. They use the danish example to say that they are good for the development of community energy. Includes status and profile of FIT programs around the world.

Windfall Ecology Centre. no date. Ontario First Nations and Renewable Energy, Context Opportunities, and Case Studies: Ontario Sustainable Energy Association.

This 23 page report was probably prepared around 2005 by the Windfall Ecology Centre in Ontario for OSEA. It lists a number of First Nations and Northern community renewable energy projects for Ontario FNs to build on. It also contains a useful breakdown of Federal, Provincial and other funding sources/jurisdictions to help communities get going. One success story profiled was the Piikani's Winddancer turbine in Alberta.