

Status of Social Economy Provision of Wind Electric Energy in Alberta



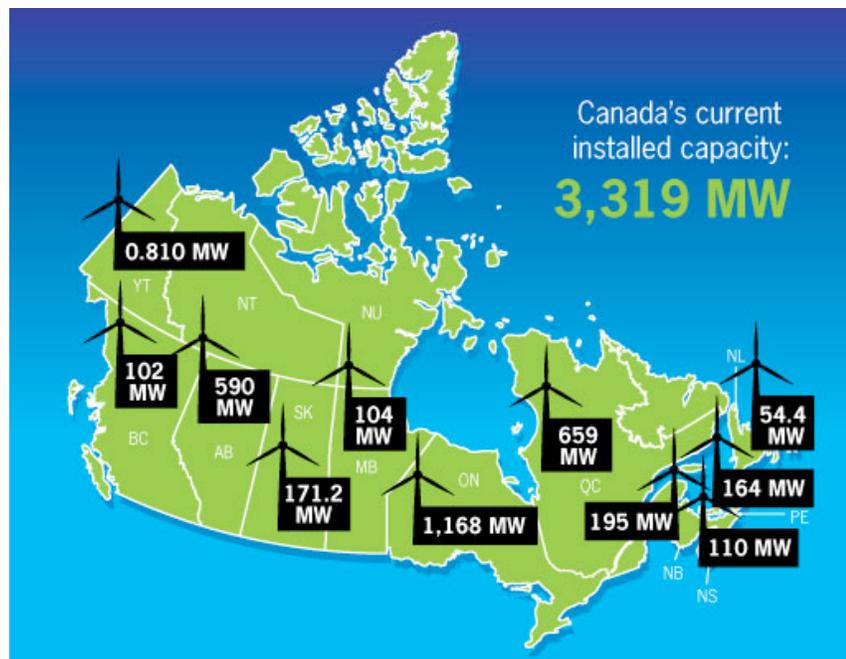
Photo: Wind turbines at Pincher Creek, AB

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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, 2009a¹), 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).

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

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.

affordability) is. It is also important to note that wind is a variable source of power it often produces electricity at between 25 to 35 per cent of installed capacity (NEB 2009; see also Bocard, 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 a 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 security². 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 24³. 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.

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