Ten Barriers

to Small Scale Renewable Energy

Executive Summary
The BCSEA knows of ten specific barriers that are slowing, impeding and deterring the development of small-scale renewable energy in BC. Most of these result from attitudes, regulations and criteria from the past era of abundant cheap hydropower being applied to the new renewable energy technologies, creating a "bad fit".

1. The disproportionately high cost of Electrical Code permitting for renewables
2. Lack of renewable energy training for BC Safety Authority Inspectors
3. The limitations of Canadian Certification Standards
4. Excessive service size requirements for renewable energy sites
5. The lack of renewable energy training for electrical engineers and electricians
6. The loss of PST exemptions
7. Excessive BC Hydro manual disconnect requirements
8. Excessive municipal tax assessments on renewable energy
9. Lack of integrated design requirements for Remote Communities Electrification
10. Expensive red tape in renewable energy planning & approvals

Our recommendation is that the government establish a Small-Scale Renewable Energy Barriers Working Team to examine the barriers, evaluate possible solutions, and give consistent leadership until they have been resolved.

April 20, 2010

An Achievable Goal
BC is seeking to reduce its greenhouse gas emissions by 33% by 2020, and to lead the world in sustainable environmental management.

BC has also set a goal to become a Clean Energy Powerhouse, and to win the race to leadership in renewable energy in North America.

Many strategies will be needed to fulfill these goals, one of which should be that BC becomes a jurisdiction in which there are *no regulatory or bureaucratic factors that prejudice a consumer's choice against the use of renewable energy and greater energy efficiency.*

This is an achievable goal.

For the small-scale renewables industry there are some frustrating barriers that result from the old energy behaviour, when efficiency was not a concern, and cheap power in BC was delivered reliably by big hydro, natural gas or diesel. The age of renewable energy calls for a holistic, integrated approach to energy, and the rethinking of regulatory approaches to optimize them for renewable energy.

Some barriers are already being resolved, such as the important clause being proposed for the 2011 Building Code that would enable municipalities to require pre-plumbing for solar hot water and pre-wiring for solar PV in all new buildings, as Vancouver is already doing. Another barrier has been removed through BC Hydro's Net Metering and Standing Offer Programs, which allow small-scale renewable energy producers up to 10 MW to sell their power to the grid.

To tackle the ten remaining barriers that we are aware of, the BCSEA is recommending that a Small-Scale Renewable Energy Barriers Working Team be established, and announced alongside the Clean Energy Act to examine the barriers, generate and evaluate possible solutions to ensure that the best options are chosen, and give consistent leadership until they have been resolved, enabling the renewable energy sector in BC to grow more rapidly.

Without a focused effort, these troublesome barriers may remain in place for many years, causing continuing frustrations and impeding the development of the sector.

Such a Working Team might include representatives from renewable energy businesses that experience the barriers on a regular basis, sustainable power-users who live with the barriers, BC Hydro, and the relevant government and regulatory agencies.

Ten Barriers

1. The Disproportionately High Cost of Electrical Code Permitting for Renewables
The cost of electrical code permitting is set as a percentage of the net installed cost. Renewables have a big upfront cost, followed by decades of free energy, so this approach makes permitting for renewable energy proportionally far more expensive than (eg) for diesel installations.

The BC Safety Authority is a self-sustaining not-for-profit corporation, which recovers its costs through revenues generated by the fees charged to customers, so any reduction of fees would require a restructuring of the way permitting fees are charged. One solution might be to use the existing fee structure, but to divide the result by 20, to represent the minimum 20 years of free energy that renewable energy systems provide. Another solution might be to exclude power generating and storage equipment from permitting costs entirely, to reflect their importance in meeting BC's climate action and energy goals.

2. The Lack of Renewable Energy Training for BC Safety Authority Inspectors
BC's Safety Authority Inspectors do not receive any specific training in renewable energy, and this results in different inspectors giving contradictory rulings, or turning down an installation that has been previously approved by another inspector. This is a source of intense frustration for the installers, who tend to know more about the technology than the inspectors.

One solution might be a formal Renewable Energy Inspectors Training Program, so that the Inspectors can acquire a common understanding of the safety rulings required, and support the clean energy drive with confidence and pride.

3. The Limitations of Canadian Certification Standards
There are many different international safety standards for electrical apparatus, but BC only recognizes certain types, which is causing some renewable energy products such as small microhydro turbines and wind generators to be not approved for use in BC.

The Canadian Standards Association is a not-for-profit membership-based association, and not part of the government, as many assume. CSA approval can be very slow and expensive, causing manufacturers to decide not to spend the time and money required for yet another certification to enter the limited Canadian market.

For example, for the 24V DC Sun Frost fridge - the most energy efficient fridge in the world - the compressor and controller have a CSA sticker, but the unit as a whole does not, so its use is not allowed in Canada. BC companies are denied the ability to sell these non-certified products, causing customers to shop directly with US-based companies.

Similar problems affect solar hot water heaters, where many models exist which have been approved for use in Europe and the USA. In Canada, however, only six systems have been certified by the CSA, of which four are available in BC and only one has a double wall and is not seasonal. (Enerworks single wall HX; Enerworks double wall HX; Thermodynamics; Globe Solar).

The solution might be for BC to adopt a streamlined approach that recognizes other widely accepted certification standards and accepts equivalencies between standards, making it easy for manufacturers to sell in BC.

4. Excessive Service Size Requirements for Renewable Energy Sites
The size of an electrical service (eg 200 or 400 amps) is based on the square footage of a building. In a normal grid-connected home, the increased cost of a larger service is negligible.

Since net zero and other green buildings require much less energy use, helping BC Hydro meet its energy conservation goals, the solution might be for the Electrical Code to allow smaller electrical services to such homes, to reflect the reduced demand.

At remote sites that intend using diesel generators to provide primary power, a very high standard of energy efficiency should be mandated, and modifications permitted to allow power plants to be sized to the actual load, not the code.

5. The Lack of Renewable Energy Training for Electrical Engineers and Electricians
Renewable energy technologies are relatively new, and many engineers and electricians design and install renewable energy systems that don't work well, due to their unfamiliarity with the technology.

The design of a properly functioning renewable energy system requires a different mind-set, involving an integrated consideration of the overall site characteristics to optimize the system as a whole for efficiency, solar, wind, waste heat and other potentials. Such an integrated design

process enables higher performance buildings to use less energy, to the benefit of everyone involved.

One solution might be a requirement for engineers and electricians who anticipate working on renewable energy systems to take a short training course that would upgrade their skills to the new technologies. The Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) might offer a certification program for its members as part of their regular training upgrade; this way engineers who are required to do so many hours of upgrade a year could earn a Renewable Systems Design certificate at the same time.

6. The Loss of PST Exemptions

For the past few years, and until July 2010, solar panels, wind generators and microhydro turbines have benefited from a 7% PST exemption in BC (though paradoxically not the batteries, which are essential for most off-grid systems). The loss of this exemption with the transition to HST will cause an instant 7% price increase for renewable energy installations, which is causing much concern within the industry.

The federal government's formal list of point-of-sale HST exemptions does not have a line item for renewable energy systems, however, making it impossible for the provincial government to extend the previous PST exemptions into HST.

As a two-step solution, an approach to the Department of Finance in Ottawa is needed to persuade them to include such a line item that would allow renewable energy technologies to benefit from point-of-sale exemptions, and the continuing point-of-sale exemptions for transport and residential heating fuels might be lifted, allowing the provincial government to use the permitted HST exemptions in a more targetted manner to support the government's climate and clean energy agenda.

7. Excessive BC Hydro Manual Disconnect Requirements

The UL1741 criteria for grid-tie inverters require that they automatically disconnect should the grid go down, to protect the electrical worker. Many inverters have a manual disconnect integrated into the inverter, such as the Xantrex GT series, designed in Burnaby. BC Hydro also requires an external manual disconnect, so that hydro workers can de-energize, which costs $160.

BC Hydro is now also requiring a manual disconnect with a visible window, so that someone can verify that the circuit is open, which costs $420.

When you include the special location and routing needed for the visible window, the cost could run into $1000s, adding significantly to the cost of an already expensive solar grid-tie system.

The solution might be to drop the "visible window" requirement altogether, since every grid-tied inverter listed to UL1741 has this protection built in - if it senses no power on the grid, it shuts down in a nanosecond or two.

8. Excessive Municipal Tax Assessments on Renewable Energy

The BC Assessment Authority taxes a property on its market value, so when an owner adds solar PV or solar hot water, the valuation and assessment is increased accordingly, using a formula designed to mirror the supposed increased value of the property.

The same criterion is *not* being applied to an investment in high performance windows or super-insulation which would have a similar energy-saving impact as the solar panels, or to the installation of an air-source or ground-source heat pump, simply because these are less visible.

Ann and Gord Baird, builder-owners of a green home in Victoria, have installed a 2kW solar PV system and a solar hot water system. The PV generates 2400 kWh a year, and the solar hot water saves 2500 kWh a year, saving BC Hydro 4,900 kWh a year. For their pains, their property taxes have been increased by $400, which will cost them $10,000 over the life of the systems. Staff at the BC Assessment Authority have said (off the record) that this does not make sense, but they take their instructions from the Ministry of Finance, which has not responded in a positive manner.

There are three possible solutions:

(1) That the Ministry of Finance instruct the BC Assessment Authority not to count renewable energy and energy efficiency systems in the valuation of a property;

(2) That the BC Assessment Authority be asked to create a Renewable Energy Tax credit, allowing the assessment to value the house appropriately;

(3) That the BC Assessment Authority be asked to create a new province-wide housing classification using a set of criteria to assess green/natural/zero-energy buildings, since they differ in many ways from the traditional building styles. This would require a small budget for training, and to hire staff to administer applications for natural built/green status applications. It would also allow the government future flexibility for tax-breaks to encourage more green building.

9. Lack of Integrated Design Requirements for Remote Communities Electrification

At Toad River, at Mile 422 on the Alaska Highway, BC Hydro has spent capital costs of $2.24 million and is committed to operating costs of $400,000 - $600,000 a year to power about 35 homes.

If BC Hydro was enabled to approach the design of Remote Communities Electrification projects with a wider mandate, more cost effective and environmentally appropriate solutions might be found that could deliver the same level of reliability with a lower risk of power outages, with similar or lower capital costs, while greatly reducing the operating costs that are otherwise dominated by fuel costs.

This wider mandate might include:

- developing appropriate standards and performance targets for individual circumstances;
- integrating energy conservation and efficiency;
- factoring in greenhouse gas emissions reductions as a significant goal; and
- balancing cost with performance.

Under the current rural areas electrification program, many customers will shift from propane or carbon-neutral firewood to diesel-powered baseboard heating, burning 0.4L/kWh of diesel a day, which is the most inefficient way to extract energy from diesel, since 70-80% of the energy is lost in generation and transmission.

There are 30-40 more Remote Communities Electrification projects ahead, and unless there is an intervention they will all head down the same carbon-intensive path, removing that much opportunity from the clean energy path.

One solution might be for BC Hydro to pilot the renewable energy approach before proceeding further, and to actively encourage small-scale private energy companies to tender on the Remote Communities Electrification projects by offering contracts to design and install best practices renewable energy, including demand-side management and home-by-home audits.

10. Expensive Red Tape in Renewable Energy Planning & Approvals

There can be a serious amount of bureaucracy involved when consumers seek planning approval for small-scale renewable energy systems. One man who wanted to put ten solar panels on his roof in Vancouver, weighing 400 pounds, was told that he needed an engineer's drawing and stamp to get it approved, costing $600 to $1,000. A small wind turbine can cost up to $10,000 for paperwork and processes. All this merits analysis and simplification.

Similarly, small-scale microhydro systems under 50 kW merit a streamlined process, and a super-streamlined inexpensive process for picohydro systems under 5 kW. The Province should seek an enhanced cooperative relationship with the relevant federal permitting agencies, DFO in particular, to find ways to support such projects.

Conclusion

This paper has been researched and assembled using insights and experiences shared by industry players in the small-scale renewable energy sector.

It is clearly important that these barriers be addressed; left to drift, they might still be in place in ten years, frustrating the development of the renewable energy industry and slowing the achievement of the province's climate and clean energy goals.

Our recommendation for the formation of a small Working Team seems to us to be the best way to move forward, as there needs to be a focus of responsibility that can persist with the file, and pursue the solutions until they are resolved. We are also open to other organizational approaches.

Guy Dauncey
President, BC Sustainable Energy Association
April 20, 2010

guydauncey@earthfuture.com
250-881-1304