Alberta's unique Micro-Generation Regulation has gone a long way to remove regulatory barriers to the grid-connection of micro-generators in the province. Now that the regulators and industries have had four years of experience with it, it is time to enhance it to keep it up to date with changes in technologies and market growth.

Alberta's Micro-Generation Regulation – Next-Stage Enhancements –

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When Alberta's unique and successful Micro-Generation Regulation[1] came into effect on 2009 January 01, it removed some significant barriers to the grid-connection of solar photovoltaic (PV) systems and micro-wind generators along with other innovative electricity generating technologies such as those that use the weight of pump-jack strings and oil-patch pressure reducers. As with Alberta's other energy industries and the related forward-acting government regulations and incentives from decades ago, the result of this regulation provided Alberta's micro-generation industries with opportunities to strengthen and grow its supply-chain and customer relationships.

The Micro-Generation Regulation (MGR) was set up to expire on 2013 December 31, unless it is renewed. Alberta Energy will be conducting a departmental review of the MGR in 2013 to consider the changes that need to be made to it. This is an important opportunity for the Alberta government to effect positive change in advancing renewable energy in the province, especially considering that Alberta Energy's focus is on ensuring that electricity generation is a win-win-win balance for the economy, environment and society. The existing MGR has much strength to it. Improvements to it would, in very timely manner, strengthen its ability to facilitate greater electricity generation from renewable and alternative energy technologies, especially considering the dramatic reduction in solar PV system costs over the last 5 years.

[1] Alberta's Micro-Generation Regulation, *Alberta Regulation 27/2008, Electric Utilities Act, Micro-Generation Regulation*, can be found at http://www.auc.ab.ca/rule-development/micro-generation/Documents/Micro_Generation/Microgen_Regulation.pdf.

I was tasked by the Canadian Solar Industries Association (CanSIA)[2] to prepare and deliver a presentation to CanSIA's Solar West 2012 conference in Edmonton in October <http://solarwestconference.ca> that provided an overview of the Micro-Generation Regulation and present recommendations for changes to be made to it and to the provincial micro-generator grid-connected processes in order to assist Alberta's micro-renewable and alternative industries in securing the market stability needed to continue to grow.

Micro-power systems have been connecting to Alberta's electricity grid since at least 1995, when I turned on my own 2.3 kW grid-dependent solar PV system [3], the 1st system west of Big Trout Lake in Ontario, and the 12th in Canada. Initially the grid-connection approval process was costly and complex to work through because Alberta's Electric Utilities Act considered the PV system to be an industrial electricity generation unit, complete with two $650 grid-connection application fees, the weight of $755 per year for municipal industrial property taxes and the cost of $250 per year in grid-connection fees from the Alberta Electric System Operator (AESO) – all at a PV system cost of $30,000+ and for the purpose of generating some $200 worth of electrical energy per year! My how times have changed.

Part of the change for Alberta has been the Micro-Generation Regulation along with the Alberta Utilities Commission's (AUC) Rule 024 [4] that implemented the regulation. It is a progressive regulation with the strong intent to be very flexible in how it is implemented. It simplified the metering and sale of electricity from **Micro-Generation Generating Units** (MGGU), and simplified the approvals process for mini-MGGUs though the approvals were still overly complex for small and large MGGUs.

Briefly, a MGGU shall:

i) Use renewable energy or alternative energy (emissions of less than 0.418 kg of CO_2 equivalent per kWh of electrical energy generated) sources;

ii) Meet all or a portion of customer's [annual] electricity needs;

iii) Have a nominal generating capacity that is less than the rating of the customer's service;

iv) Not be greater than 1 MW in rated capacity; and

v) Be located on customer's site or adjacent site.

There are two sizes of MGGUs: "large", from 150 kW to 1000 kW, and "small", from 0 to 150 kW. An additional sub-category, "mini", covers 0 to 10 kW if the grid interface is an inverter (instead of a synchronous or induction generator).

For MGGUs, the costs for grid-connection are to be borne by the electric utility company (known as the Wires Service Provider (WSP) in Alberta), particularly the WSP's costs of handling the application for grid-connection, the meter purchase and installation, the meter

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2 Canadian Solar Industries Association, www.cansia.ca

3 Howell, D.G., S. Marsh and M. Oprisan. 1996. *Edmonton Power's Grid-Connected Photovoltaic System*. Proceedings of the 22nd Annual Conference of the Solar Energy Society of Canada, Inc. Orillia, Ontario.

4 The Alberta Utilities Commission's Rule 024, *Rules Respecting Micro-Generation*, can be found at http://www.auc.ab.ca/rule-development/micro-generation/Documents/Micro_Generation/Rule024.pdf.

reading and meter data management, and all other WSP's costs for grid-connection except if the Alberta Utilities Commission approves that extra-ordinary costs are to be paid by the MGGU owner (referred to as the "Micro-Generator" or MG).

The process for applying for grid-connected under the Micro-Generation Regulation is:

a) Apply to the Wires Service Provider with a 1-page form, plus site plan and electrical single-line diagram. No fees. Maximum 14-day response time from the WSP.

b) Application to the AUC for approval if the MGGU is in the small or large size.

c) A dispute process shall be initiated by the Wires Service Provider to the AUC using a one-page form if the WSP disagrees with the application for a MGGU. Note that the WSP is not permitted to deny the MGGU, nor charge additional costs, but can only apply to the AUC to deny or charge extra.

d) A complaint process can be initiated by the Micro-Generator to the AUC using a one-page form if the WSP does not install the correct bi-directional cumulative meter (for a small and mini-MGGU) or bi-directional interval meter (for a large MGGU).

The electrical energy exported to the grid is purchased by the Micro-Generator's Energy Retailer (under Alberta's re-regulated electricity industry) and not by the WSP. The price paid is any price agreed-on between the Micro-Generator and the Energy Retailer. If no agreement is reached (of course not), then the purchase price is the same price as Energy Retailer's retail energy price. Alberta has a net-billing arrangement (which is better than net metering), based on the exported amount of energy, with the purchase value credited to next month's electricity bill. If there is any credit still left over at end of the year, then a cheque is written from the Energy Retailer to the micro-generator.

I solicited recommendations from CanSIA's Alberta solar PV membership for enhancing the MGR and its AUC implementation rules, and present a summary of them here. These recommendations are not in any way to denigrate the Regulation or Rules as they now stand – indeed the Alberta government is to be strongly congratulated for the insight into which it developed this regulation as a first-step to facilitating a growing and significant micro-generation industry in Alberta serving customers of all sizes.

Enhancement 1. Increase the size of mini-MGGU from 10 kW to 25 kW (AUC Rule 024 1(f))

- To reduce the number of MGGUs that need to go through the more lengthy and complex AUC approval process.

Enhancement 2. Release for public consumption, data showing the aggregated MGGU capacity by generator type, on a monthly basis

- To enable the renewable and alternative energy industries, WSPs, policy makers and planners see how the markets are growing.
- The AUC used to provide monthly capacity information quarterly, but abruptly stopped this after 4 years citing that this was not their mandate.

Enhancement 3. Raise the maximum amount of exported energy from MGGUs in order that exported electrical energy sales from a MGGU may be used to zero out the Micro-Generator's electricity bill over a year plus an additional amount (10% to 25% of the value of the bill) (MGR 1(1)(h)(ii))

- To enable customers to achieve a zero or slightly negative annual electrical energy bill.
- 10% to 25% is arbitrary number to enhance the value of renewable energy systems for customers.
- Customers will still be paying for all "fixed" (time-based) charges of the Energy Retailers and Wires Service Providers, but the energy-export credits will fund this.

Enhancement 4. Define "rating of the customer's service" (MGR 1(1)(h)(iii)) to mean "rating of the service box on the customer's electrical panelboard"

- To prevent under-sized WSP transformers and feeder lines from unfairly restricting a generating unit from being classified as a micro-generation generating unit just because of the Wire Service Provider's own choice to run their transformers and feeder lines at out-of-spec operating temperatures.

Enhancement 5. Raise the MGGU upper limit from 1 MW to 5 MW (MGR 1(1)(h)(iv))

- To enable larger-capacity systems, which are still "micro-sized" when compared to large generating units, to take advantage of the MGR's benefits.
- 5 MW is the same as the cut-off between connection to the transmission system *vs*. distribution system.

Enhancement 6. Permit the electrical energy generated by a MGGU to be assigned to its owner(s) (singular or multiple) regardless of where the energy is generated in the province relative to where the owners' loads are physically located (MGR 1(1)(h)(v))

- To enable the concept of community-owned renewable energy systems (solar PV, wind, farm biomass and biogas) to be established with multiple owners.

Enhancement 7. All export meter readings to be shown on electricity bills along with the export credits (AUC Rule 024)

- In the same manner as how energy consumption is shown on bills, including past export meter reading, present export meter reading, exported energy calculated from the readings, and price of the exported energy.
- To increase the trust between MG and the Wires Service Provider.
- For example:

  now ENMAX Energy doesn't show export meter readings or exported energy on their bill, just the amount credited with no data proving the credit;

  now EPCOR Energy shows energy exported, exported price and exported credit, but not the two export meter readings.

  Central Alberta Rural Electrification Association does it the right way: two export meter readings, the energy exported, the price for exported energy and the credit for the energy exported.

Enhancement 8. Eliminate the AUC's requirements for:

  – Noise Impact Assessment (NIA) on solar PV systems that do not use separate transformers (AUC Rule 012)
  – Public Involvement Programme (PIP) for solar PV systems on buildings (AUC Rule 007)

- Solar PV systems do not generate noise; the on-line AUC grid-connection process doesn't ask for a NIA as a result, and yet the AUC is asking for NIAs to be submitted on some PV systems on buildings.
- A PIP mandates that a personal consultation about the electricity generator be provided to all occupants, residents, and landowners within 800 metres of site boundaries, and that a public notification be provided to all occupants, residents, and landowners within 2000 metres of the site boundaries. It appears that the PIP rule was not written in consideration of PV systems on buildings and yet it is being applied by the AUC without rational thinking about PV systems.
- These Rules need to be judiciously applied so that they are not seen as an abuse of authority.

Enhancement 9. Require all retailers to offer a minimum premium price for electrical energy exported to the grid from solar photovoltaic MGGUs (*e.g.*, 15 ¢/kWh)

- The framework for premium pricing is already established within MG regulation

- This permits energy from solar photovoltaic MGGUs to be valued at actual daytime retail off-set prices along with starting to recognise the cleanliness of its energy.

As further steps towards the province's goal of becoming a leader in reducing its emissions:

Enhancement 10. Require the AESO to publish daily estimated emissions data for all of Alberta's generating plants

- To be transparent about the size and sources of Alberta's electricity emissions.

Enhancement 11. Introduce an environmental-relief rider (ERR) on electricity prices that is equivalent to the value of the burden that fossil electricity generators are placing on the environment

- It is not appropriate that fossil electricity generators be permitted to use the environment (air, water, soil, land and habitat) as a free sewer.
- Our electricity bills already include a number of riders for different reasons, so implementing a mechanism for an EER wouldn't be any different.
- Distribute funds collected from ERR to renewable energy systems as to how they proportionately reduce emission loads on air (carbon, mercury, SOx, NOx, particulates), water, soil, land and habitat, as compared with the exploration, extraction, processing and transportation of fossil-generated electricity.

An enhanced Micro-Generator Regulation will:

- Reduce the logistics barriers and economic barriers for grid-connected MGGUs;
- Help the MGGU industry in Alberta continue to grow in a measured sustainable way;
- Assist MGGU technologies in taking their rightful place in Alberta's electricity generation mix, and help them catch up to the existing energy sources that have had large incentives in the past that continue to the present day; and
- Help develop Alberta's home-grown renewable energy market and industry so that the Alberta government can meet its goals for Alberta to be a leader in partnerships for renewable energy technologies.[5]

Photo credits: Gordon Howell

[5] Alberta Premier Alison Redford's energy strategy. http://www.standingstonedevelopments.com/premeir.html