Small-Scale Renewable Energy

Issue

AESO (Alberta's Electricity System Operator) is pursuing a complex transition to move Alberta's energy market from an EOM (Energy Only Market) to a CM (Capacity Market). One of the goals of this new market is to achieve 30% renewable energy generation by 2030. The chief obstacle to encouraging the kind of growth and diversification of generation required to move the energy market away from traditional carbon-based generation systems to renewable sources is a historically low market price for electricity combined with a government commitment to cap consumer power prices at 6.8 cents per KwH for the foreseeable future. (The pool price for generators is currently about 1/3 of this). This challenging price market has made it difficult for small-scale renewable energy projects to enter the market. However, there are distinct advantages to promoting the growth of small-scale renewable energy projects across the province. This paper will argue in favor of measures which will enable that growth.

Background

Due to new initiatives by the Government of Alberta, the province's electrical systems are facing major changes over the next decade, changes that bring with them their share of challenges, as well as opportunities. Acting on the recommendations put forward by the Climate Change Advisory Panel, the government has directed AESO to pursue a target of "30 by 30", or 30% renewable electricity generation by 2030, with the goal of eliminating coal-generated electricity by 2030. Furthermore, the very structure of the electrical market will be changing from an Energy-only Market, a market model where power plants are paid only for the energy they actually produce, to a Capacity Market Model, where generators are paid for having generation available to supply, whether or not any energy is actually produced and supplied. This market change is being made in the expectation that it will develop an energy grid that is more reliable and resilient.

These changes are being made in a very challenging environment. For one, the operator is looking to phase out coal-generation, while growing renewable capacity, in a rapid-growth market. According to AESO, the demand for electricity in Alberta is projected to grow by 2% per year, for the next 20 years. That's equivalent to adding a city the size of Red Deer each year. Furthermore, Alberta is coping with a historically low energy price, a situation that is great for consumers, but which makes attracting investment – especially small-scale investment – a real challenge. In November 2016, the provincial government also capped energy prices at 0.068$ per KwH (about double what it is now) in order to provide consumer protection in the event of rising prices.

The result is that while the government is looking for new renewable energy generation projects to diversify the market, add capacity, and offer clean alternatives to traditional Firm Generation methods, market forces make it infeasible for new projects to be pursued. Even utility-scale projects cannot be attracted without the supports designed into the current Renewable Electricity Program to make them viable. The result is that investment is constrained and will be isolated into a small number of large-scale projects rather than diversified into numerous smaller projects.

There are distinct advantages to encouraging the development of small-scale renewable energy projects through regulatory means. First, most large-scale renewable energy projects are Intermittent Generation facilities, meaning that they do not generate energy continuously, but rely on environmental factors such as wind or sunshine to produce electricity. With a growing portion of the electrical grid relying on these generation methods, and insufficient battery facilities available to distribute power production over time, it is important for AESO to explore ways to encourage Firm Generation methods that rely on renewable technologies. These facilities do exist in the form of biogas generation plants, geothermal generation, and several others, however they are relatively expensive to construct and operate, are more difficult to scale up, and most fall in the range of small-scale renewable energy projects (up to 5MW). However, encouraging the development of these facilities and technologies will build reliability, stability, and capacity into the electrical grid, while contributing to the '30 by 30' target. Investments in this sector will also encourage innovation in renewable energy production, as enterprising operators seek ways to make the processes more efficient, scalable, or pursue new methods of renewable production. Smaller generators such as these will necessarily be distributed more evenly around the province, creating local system dependability, relieving capacity pressure on expensive long-range transmission systems, and building firm generation capacity into local grids to offset dependency on Intermittent Generation.

In the current policy environment, while investment money exists in public coffers, it only makes sense to hedge our public bets by diversifying into the small-scale renewable energy market.

The Alberta Chambers of Commerce recommends the Government of Alberta:

1. Create a program or carve-out for small-scale renewable electricity generators (0.1MW - 5MW) to specifically address the gap in market regulations and programs for renewable electricity generators exporting to the grid with a plant capacity of < 5MW.
2. Use a levelized cost approach to subsidize electricity prices at a fixed price for these small generators in order to make the industry viable, as an investment in capacity building and innovation within the sector. The carve-out would allow project developers to apply to sell electricity at this price, within this carve-out, which would be fixed and guaranteed for 20 years in order to provide the necessary investor confidence. This fixed price system within the carveout would foster investor confidence, ensure investment return and continued plant operation, while allowing small-scale renewable generators to operate, innovate, and contribute to the climate leadership plan and AESO's '30 by 30' targets.
3. Grandfather existing small-scale renewable generators into the new program or carve-out to support their continued operation.
4. Prioritize grid connection for small-scale, renewable (low-carbon) generation capacity. Grid connection costs, metering and infrastructure costs should be reduced or subsidized.
5. Fund this program through an appropriate source, such as revenue generated from the Climate Leadership Plan.