A Revised COMFIT Program: New solutions for an old problem

Kaitlin Stansfield
Dalhousie University

Abstract

Nova Scotia's energy provider, Nova Scotia Power (NS Power), is obligated to offer a program that will allow customers to generate their own electricity and sell back any excess. This obligation was created partly out of an attempt to reach the province's ambitious renewable energy targets. Upon reviewing the present state of the province's renewable energy programs, a recommendation is made here to revisit the Community Feed-In Tariff (COMFIT) program that was ended last year. Suggestions are made for possible improvements to the program that could be further researched by the province moving forward. Suggestions include an auction system that would ensure a lower buy-back price for electricity that is generated by COMFIT projects. Lower buy-back electricity prices could help the province avoid the rise in energy costs that prompted the end of the previous COMFIT program. The methods for this paper involved conducting a literature review, the goal of which was to analyze Nova Scotia's failed COMFIT program, examples of successful feed-in tariff programs, and possible strategies that could be applied in Nova Scotia. The goal is to design a program that would foster innovation in renewable energy technology and help fulfill the province's renewable energy commitments in an economically sustainable manner.

Introduction

Nova Scotia's electricity production contributes more to the province's greenhouse gas emissions than any other sector in the province (Nova Scotia, n.d.-d). Given the widespread goal of emissions reduction, this makes electricity production a key focus area for the improvement of Nova Scotia's environmental sustainability. The province's *Electricity Act* states that "[t]he Minister shall make regulations requiring the achievement of forty per cent renewable electricity by 2020" (Electricity Act, p. 16). This is a very ambitious goal and will require a great deal of innovation.

In 2005, only 8% of the province's energy generation came from renewable sources (Nova Scotia, n.d.-d). This percentage increased dramatically over time, reaching 22% in 2014 (Nova Scotia, n.d.-d). The province exceeded its goal of 25% renewables by 2015, with 27% of power being produced by renewable sources (Nova Scotia Power, n.d.-c). Though there is still a long way to go for the province to achieve its 40% target, the growth in renewable energy from 2005 to 2015 is promising.

In addition to environmental benefits, a move towards renewable electricity will provide Nova Scotians with additional energy cost stability (Nova Scotia, n.d.-d). In the decade leading up to 2015, power prices increased by over 70%, partly because of the climbing international price for coal (Nova Scotia, n.d.-d). A shift away from coal power could therefore reduce climbing energy prices.

Though there is no dispute as to whether renewable energy needs to be developed further to meet the province's target, there is still uncertainty as to how this is to be achieved. Nova Scotia Power's forecast of renewable energy in 2020 indicates that they anticipate hydro and tidal power to have the greatest growth (Nova Scotia Power, n.d.-a). This plan relies largely on

the success of two major tidal projects – Maritime Link and Cape Sharp Tidal (Nova Scotia Power, n.d.-a). While it is important to develop energy projects of this caliber and scale, it is also important not to overlook the contributions of small-scale, community based renewable energy production. Nova Scotia Power is required under the *Electricity Act* to "develop and maintain a program that will permit any customer to generate electricity for the customer's own use and to sell any excess electricity to the public utility at a rate equivalent to the rate paid by the customer for electricity supplied to the customer by the public utility" (Electricity Act, p. 3). Since Nova Scotia Power is required to offer such a program, it is the goal of this paper to identify the most beneficial program option that will allow the province to meet its renewable electricity goals for 2020 and beyond.

Methods

The method used here to identify the best option for community-based energy projects moving forward is generally a review of available literature. Government websites and documents, academic sources, news articles, and other relevant sites were read to gain a general overview of (i) the province's current goals, strategies, and budget, (ii) community-based renewable energy programs currently in place, and (iii) feed-in tariff programs. Sources were prioritized based on year and relevance. Date was particularly important for subjects that are subject to change, for example provincial energy sources and improvements in renewable energy technology.

Past Small-Scale Energy Programs in Nova Scotia – COMFIT

Nova Scotia's Community Feed-In Tariff (COMFIT) program was the first feed-in tariff in the world that was aimed towards local renewable energy projects (Mudasser, Yiridoe & Corscadden, 2013). The feed-in tariff is a guaranteed rate per kilowatt hour given to energy

producers for a fixed period. In the case of Nova Scotia, rates for energy production projects were guaranteed to be paid by Nova Scotia Power for 20 years (Nova Scotia, n.d.-a). Guaranteed payments are a key feature of feed-in tariffs, as they provide energy producers and investors with the confidence and security necessary to invest their money in renewable energy technologies (Rowlands, 2005). The main short-term goal of feed-in tariff programs is to foster the use of available renewable energy technologies that are not yet able to compete with alternate sources of energy. In the long-term, the goal of feed-in tariffs is to develop renewable energy technologies to the point where they can compete directly with other forms of energy production without the use of subsidies (Lesser & Su, 2008).

The COMFIT program had a tremendous amount of support. It worked well as a contributor towards community economic development and Nova Scotians contributed a total of $35 million to the program in direct investments (Nova Scotia, 2015). COMFIT projects reached a production level of over 80 megawatts (MW) of power by the time the program was ended, and an estimated 125 MW by the end of 2015 (Nova Scotia, 2015). Unfortunately, the success of the program was partly why Energy Minister Michel Samson announced the end of the COMFIT program on August 6th, 2015.

When the COMFIT program was designed, the province had assumed that technical and financial barriers would prove to be insurmountable for most project proposals (Nova Scotia, n.d.-d). However, programs like the Community Economic Development Investment Fund (CEDIF) made it easier for communities to fund renewable energy projects (Wind4All, n.d.). CEDIF is a program that was created following public consultations from 1996-1998 (Community Economic Development Investment Funds, n.d.). The program encourages investment in local business, partly by providing local investors with up to 65% non-refundable

provincial equity tax credits (Wind4All, n.d.). CEDIFs allowed corporations like Natural Forces Wind Inc. to establish various companies that would be sponsored locally and create large, successful COMFIT projects.

COMFIT was also a very attractive option to Indigenous communities who were looking to create their own energy. Mi'kmaq communities in Nova Scotia used the COMFIT program to establish four large wind farms that have a combined generation capacity of 22.9 MW (Tattrie, 2016).

Since feed-in tariff policies (including COMFIT) tend to pay energy generators at rates above energy market price, excessively high payments can result in higher energy bills for customers (Lesser & Su, 2008). The prevalence of these small-scale energy projects resulted in expensive payments from Nova Scotia Power that were carried over into Nova Scotians' energy bills (Nova Scotia, n.d.-d). The result was the termination of the COMFIT program.

Nova Scotia's Current Plan for Small-Scale Energy Programs

In the wake of COMFIT's closure, the province has been focusing on collecting data from pilot projects to instruct future decisions on energy policies and programs (Nova Scotia, n.d.-c). Substantial funding in the form of $410,000 and 5 FTEs have been dedicated to electricity reform and innovation funding in 2016-2017 (Department of Energy, n.d.). The pilot projects on which these resources are focused are the Community Buildings Solar PV Pilot Program, the Electricity Innovation Pilot Program, adjustments to the Net Metering Program, and the development of projects that explore new ways to manage electricity use (Nova Scotia, n.d.-c).

The Community Buildings Solar PV Pilot Program encourages the installation of solar panels on community buildings such as fire halls and community centres. The Electricity

Innovation Pilot Program awards funding to relevant research projects on a competitive basis (Nova Scotia, n.d.-d).

Nova Scotia's Enhanced Net Metering system is arguably the most promising small-scale renewable energy program since the end of COMFIT. Under the program, residents can install low-impact renewable energy sources for their homes (e.g. a wind turbine, solar panels, hydro, or a biomass generator). If the energy source creates more energy than the customer consumes, the extra electricity will flow onto the local grid. The customer can still draw energy from the grid when they are using more electricity than is generated by their renewable energy project. The government of Nova Scotia is responsible for installing a bi-directional electricity meter to monitor a house or business' flow of electricity. The customer gets a credit applied to the next month's energy bill if at the end of the current month they have produced more energy than they used. If the customer has produced a surplus of electricity at the end of a year, he or she will be given a cash payment for the electricity that has been added to the grid. As of December 18th, 2015, eligible renewable energy projects must have a maximum capacity of 100 kilowatts (kW). A customer is permitted to use their energy source to power multiple owned properties within a set distribution zone, but the capacity limit will remain 100 kW (Nova Scotia Power, n.d.-b).

Critique of Current Programs

While Nova Scotia's commitment to providing its residents with renewable energy options is extensive, one could argue that none of Nova Scotia Power's small-scale renewable energy projects are optimal for fulfilling the project requirement under the *Electricity Act*. Indeed, Nova Scotia Power's representation of its forecasted renewable energy contributions in 2020 indicate that they do not anticipate any great increase in wind or solar, which would likely be the two renewable energy technologies that would be most frequently developed by small-

scale producers. Wind energy production increased from 1% to 18% between 2007 and 2016. To frame this differently, the number of homes powered by wind energy has increased from 5,000 to 90,000 (Nova Scotia Power, 2017). Most of this dramatic increase in wind production came from COMFIT projects and independent power producers (Nova Scotia Power, n.d.-d). Since the forecasted increases in wind energy are nowhere near comparable to the increase that was seen during the existence of the COMFIT program, Nova Scotia Power does not seem to expect the new small-scale renewable energy projects to have as great an impact on the province's energy portfolio as COMFIT did.

One indicator of a successful renewable energy program is that it encourages the development of economically viable energy sources. Programs that limit participation to one customer as opposed to a larger community focus the weight of initial costs on a few or even one person. The capital and energy capacity constraints could inhibit the production of wind power. The Enhanced Net Monitoring program limits energy projects to 100 kW (Nova Scotia Power, n.d.-b). According to Mudasser et al., who compared the efficacy of 2 MW, 900 kW, and 100 kW turbines, the 2 MW turbine provided the most electricity per kW capacity, had the lowest production costs per kilowatt hour (kWh), and had the shortest pay-back period (Mudasser et al., 2013). The energy capacity cap of 100 kW would restrict local wind energy projects to the least efficient turbine scale. Initial capital demands could also prevent customers from investing in wind energy. Del Río and Gual (2007) found that though wind projects had greater generation and capacity in gigawatt hours (GWh) and MW than solar, small hydro, and biomass as well as the lowest average price in cents per kWh, they also had the greatest additional costs. Therefore, the province's current renewable energy programs could prevent residents from establishing

wind power projects, which have been found to be more successful than alternate renewable energy projects (Del Río & Gual, 2007).

Recommendation: A Revised COMFIT Program

It is the recommendation of this paper that Nova Scotia dedicate a portion of its electricity reform and innovation funding towards researching a revised COMFIT program. Though feed-in tariff programs can be administratively challenging, they are effective at promoting the development of renewable energy sources. The challenges and benefits of feed-in tariffs will be discussed in the following two sections, followed by an overview of the proposed area of focus for future research.

Challenges of Feed-in Tariffs

There are many challenges associated with feed-in tariff programs that would have to be overcome to roll out an effective new program in Nova Scotia. Some of the literature expresses the concern that guaranteed prices may reduce incentives for renewable energy generators and equipment producers to compete amongst themselves, resulting in inefficient projects (Rowlands, 2005). It is also possible that guaranteed prices could stifle innovation (Del Río & Gual, 2007).

It is very difficult to set the right price for a feed-in tariff program. There is a need to maximize economic efficiency while avoiding extreme profit margins, which can be challenging (Rowlands, 2005). A price that is too high may result in payments being shifted towards energy consumers (Lesser & Su, 2008). For example, the weight of feed-in tariff costs on consumers in Spain prompted a reduction in premium and fixed prices in 2000 and 2003 (Del Río & Gual, 2007). Alternatively, a price that is too low may not generate the interest that is needed to

achieve renewable energy targets (Lesser & Su, 2008). Policymakers need to be able to predict long-term trends in energy prices and renewable energy technology (Lesser & Su, 2008).

Benefits of Feed-in Tariffs

Possibly the biggest benefit of feed-in tariffs is that they reduce uncertainty for potential investors, giving them the confidence necessary to invest large amounts of money in renewable energy projects (Rowlands, 2005).

Feed-in tariffs are the most prevalent strategy in Europe used to promote renewable energy and have been credited with stimulating renewable electricity development in European countries (Rowlands, 2005).

Feed-in tariffs allow for greater investment in research and development and technical learning. Producers are paid for surplus energy, so there is incentive to innovate to produce a great deal of energy for low costs. Furthermore, the fixed prices allow producers to think in the long-term when deciding in which technology to invest, which has greatly stimulated the turbine industry (Del Río & Gual, 2007).

Del Río and Gual (2007) found that electricity generation from wind and small hydro projects are socially beneficial because their avoided external costs (e.g. environmental consequences of using non-renewable energy sources) are higher than their total generation costs.

Proposed Area of Focus

As is evident from the previous two subsections, the largest and most seemingly insurmountable challenge for the implementation of a feed-in tariff is setting a price for generated energy. This paper proposes that the government of Nova Scotia should research the implications of solving this problem with an auction system like the one proposed by Lesser and

Su (2008). The authors proposed a two-part feed-in tariff program that will use market mechanisms, will be easy to implement and monitor, and will ensure installation and generation efficiency and the achievement of policy goals (Lesser & Su, 2008).

The two parts of the program are an auctioned capacity payment and an energy payment based on electricity market price (Lesser & Su, 2008). The government of Nova Scotia would design several renewable energy contracts with various capacities and contract lengths. Nova Scotia Power could then auction off the contracts by energy price. These prices would start high and decrease as the auction continued. This way the government could be sure that specific renewable energy goals were being met and Nova Scotia Power would be sure that it is paying the lowest possible amount to energy developers. Though it could be difficult for smaller community groups to take part in the auctioning process, it would still be possible with greater coordination and the use of CEDIFs.

Auctioning off capacity payments would have many beneficial effects. Developers would elicit truthful information while bidding for energy prices (Lesser & Su, 2008), meaning they would use their best knowledge of future energy prices and technology improvements when deciding their lowest acceptable price. Since developers would be trying to generate as much energy as possible with their fixed-capacity projects, there would be a great deal of incentive for them to find the most efficient sites and technologies possible (Lesser & Su, 2008), leading to potential innovation in renewable energy technology. Over time, this would make renewable energy more competitive and may eventually eliminate the need for the COMFIT program.

The second part of Lesser and Su's proposed program was an energy payment based on electricity market price. The authors' idea here was that renewable energy developers would be able to sell their own power directly to wholesale and retail energy suppliers. I believe that this

part of Lesser and Su's plan would be rather difficult to implement given the restriction of distribution zones and the challenges that this could create for smaller community-based projects. However, it is still something that the province could study, especially since the *Electricity Reform Act* opened the province's electricity market to competitors, provided they sell renewable energy (Nova Scotia, n.d.-b).

One final measure that could be researched to address the problem of price-setting in feed-in tariff programs is contract length. COMFIT's original contract length was 20 years (Nova Scotia, n.d.-a). Contracts of this length can be problematic because of the possible fluctuations in energy prices and technology developments that can take place in two decades. Rowlands suggests that the best course of action would be to have fixed prices for 10 years, at which point payments would drop to reflect technological improvements (Rowlands, 2005). This could be a good option for the government to investigate.

Funding

Significant funds would be required to research and implement this plan. While it is not the goal of this paper to outline the entire funding plan for the revised COMFIT program, there are some options that will be mentioned for consideration.

First, as was mentioned earlier, the Department of Energy has indicated in its Business Plan for 2016-2017 that it has dedicated $410,000 and five FTEs to electricity reform and innovation funding. Some of these resources could be directed to researching the feasibility of an improved COMFIT program.

Second, the province could potentially shift proceeds from its future cap-and-trade system into subsidizing guaranteed energy prices for a new COMFIT program. Following Prime Minister Trudeau's announcement that provinces were required to adopt carbon price plans by

2018 (Government of Canada, 2016a), the governments of Canada and Nova Scotia agreed on a strategy involving a coal phase-out equivalency agreement in conjunction with a cap-and-trade system (Government of Canada, 2016b). Just as Ontario plans to focus a portion of their cap-and-trade proceeds towards actions focused on pollution reduction (Ontario, 2016), Nova Scotia could aim funding at the development and operation of a COMFIT program.

Conclusion

In conclusion, though many community renewable energy projects are being developed in Nova Scotia, none of them have the potential to create the same level of development in renewables as was achieved by the COMFIT program. Nova Scotia Power is relying heavily on large-scale tidal projects to meet the 40% renewables goal for 2020, but after considering the potential opportunities in renewable technology development afforded by feed-in tariff programs, it would be wise to shift attention to improving upon a program that was partly responsible for an 18-fold increase in wind energy production over nine years (Nova Scotia Power, 2017).

References

Community Economic Development Investment Funds. (n.d.). *Local Investing: The Nova Scotia CEDIF Program*. Retrieved from http://cedif.ca/

Del Río, P., & Gual, M. A. (2007). An integrated assessment of the feed-in tariff system in Spain. *Energy Policy*, *35*(2), 994-1012. doi: 10.1016/j.enpol.2006.01.014

Department of Energy. (n.d.). *Business Plan 2016-2017*. Retrieved from http://novascotia.ca/government/accountability/2016-2017/2016-2017-Energy-Business-Plan.pdf

Electricity Act, Statutes of Canada (2004, c. 25). Retrieved from Nova Scotia Legislature website: http://nslegislature.ca/legc/statutes/electricity.pdf

Government of Canada. (2016, October 3). *Government of Canada Announces Pan-Canadian Pricing on Carbon Pollution*. Retrieved from http://news.gc.ca/web/article-en.do?nid=1132149

Government of Canada. (2016, November 21). *The Government of Canada Announces Approach with Nova Scotia on Pricing Carbon Pollution and Coal Phase-Out Equivalency Agreement*. Retrieved from http://news.gc.ca/web/article-en.do?nid=1158199

Lesser, J. A., & Su, X. (2008). Design of an economically efficient feed-in tariff structure for renewable energy development. *Energy Policy*, *36*(3), 981-990. doi: 10.1016/j.enpol.2007.11.007

Mudasser, M., Yiridoe, E. K., & Corscadden, K. (2013). Economic feasibility of large community feed-in tariff-eligible wind energy production in Nova Scotia. *Energy Policy*, *62*, 966-977. doi: 10.1016/j.enpol.2013.07.108

Nova Scotia. (2015, August 6). *Minister Announces COMFIT Review Results, End to Program*. Retrieved from http://novascotia.ca/news/release/?id=20150806001

Nova Scotia. (n.d.-a). *Community Feed-In Tariff Program Facts*. Retrieved from http://energy.novascotia.ca/sites/default/files/comfit_facts.pdf

Nova Scotia. (n.d.-b). *Competitively-Sourced Commercial Renewables*. Retrieved from http://energy.novascotia.ca/renewables/programs-and-projects/commercial-renewables

Nova Scotia. (n.d.-c). *Nova Scotia's Electricity Future*. Retrieved from http://energy.novascotia.ca/sites/default/files/Electricity-Plan-Summary.pdf

Nova Scotia. (n.d.-d). *Our Electricity Future*. Retrieved from http://energy.novascotia.ca/sites/default/files/files/FINAL%20Our%20Electricity%20Future(1).pdf

Nova Scotia Power. (2017, January 15). *Today's Power*. Retrieved from http://www.nspower.ca/en/home/about-us/todayspower.aspx

Nova Scotia Power. (n.d.-a). *2020 Forecast*. Retrieved from http://www.nspower.ca/en/home/about-us/todayspower.aspx#forecast

Nova Scotia Power. (n.d.-b). *Enhanced Net Metering*. Retrieved from http://www.nspower.ca/en/home/for-my-home/make-your-own-energy/enhanced-net-metering/default.aspx

Nova Scotia Power. (n.d.-c). *Renewables*. Retrieved from http://www.nspower.ca/en/home/about-us/todayspower.aspx#renewables

Nova Scotia Power. (n.d.-d). *Wind Farm Map*. Retrieved from http://www.nspower.ca/en/home/about-us/how-we-make-electricity/renewable-electricity/wind-farm-map.aspx

Ontario. (2016, December 29). *Cap and Trade: Program Overview*. Retrieved from https://www.ontario.ca/page/cap-and-trade-program-overview

Rowlands, I. H. (2005). Envisaging feed-in tariffs for solar photovoltaic electricity: European lessons for Canada. *Renewable and Sustainable Energy Reviews*, *9*(1), 51.68. doi: 10.1016/j.rser.2004.01.010

Tattrie, J. (2016, September 27). Mi'kmaq energy summit gives update on wind farm projects. *CBCNews*. Retrieved from http://www.cbc.ca/news/canada/nova-scotia/mi-kmaq-energy-and-innovation-summit-wind-farm-turbine-1.3781065

Wind4All. (n.d.). *About Us*. Retrieved from http://wind4all.ca/about-us/