



Untapped Potential in Our Natural Resources

**Considerations in the development of a renewable
energy plan for Newfoundland and Labrador**

October, 2019

Recommendations emerging from member
and partner consultations

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1.0 Background

In April of 2018, the Provincial Government – through the release of its *Way Forward: Building Our Future* document – committed to the development of a renewable energy plan for Newfoundland and Labrador.

On October 10-11, 2018, with the intent to advance a series of comprehensive recommendations for consideration in the development of this plan, the Newfoundland and Labrador Environmental Industry Association (NEIA) invited representatives from the private sector from multiple industries to participate in a facilitated workshop to discuss renewable energy growth opportunities for the province.

In the year that followed, this workshop was supplemented by wide-ranging one-on-one consultations with NEIA members and strategic partners.

A first draft of recommendations was completed in February, 2019. NEIA worked through the Winter, Spring, and Summer with stakeholders to validate and refine its recommendations.

The final iteration of this document summarizes the ideas, challenges, and perspectives that came to light as a result of NEIA's engagements.

The overarching theme of this series of recommendations is a recognition that – within a number of challenging circumstantial restraints – there is significant potential for renewable energy growth in Newfoundland and Labrador.

2.0 Executive Summary

The development of Muskrat Falls waterpower has brought with it a series of challenges and opportunities relating to further development of Newfoundland and Labrador's renewable energy assets. Associated costs have created a situation where it is in the taxpayer and/or ratepayer interest to maximize use of the electricity generated at Muskrat Falls, discouraging the development of new generation. Yet the project has also created transmission pathways for electricity that provide for new export possibilities.

Within these parameters there are opportunities for the development of renewable energy in NL in the short and long term. These focused and niche opportunities – allowing options for entrepreneurs, small businesses, industries, communities, and a labour force increasingly interested in working in a renewable energy related industry – could lead to significant growth for the industry in NL and thus diversification of the economy at large.

Identified renewable energy opportunities include: understanding and exploiting current electricity export capacity; aligning with electricity rate mitigation measures (e.g. electrification, peak load reduction); integrating with other natural resource activities (e.g. mining, aquaculture, agriculture, oil and gas, etc.); displacing diesel-dependency in remote communities; refining net metering programming; and committing to maintaining NL's 98% renewable energy mix advantage; and the pursuit of additional export pathways in collaboration with other jurisdictions the facilitate large-scale clean energy development. Tangential opportunities worth exploration include: leveraging NL expertise in and around marine and harsh environments and also waterpower to contribute to renewable energy innovation internationally; the opportunities that hydrogen may present for renewable energy development in NL; and the development of required and niche skillsets.

The advancement of these opportunities will require deliberate policy and regulatory interventions by the provincial government. As the regulator of electricity systems and industry, the role of the government in enabling renewable energy development cannot be understated. Provincial government leadership is required to exploit renewable energy growth opportunities, and the development of a plan in partnership with external stakeholders is an excellent starting point.

3.0 Renewable Energy in the NL Context

Before offering recommendations for the growth of renewable energy in NL, it is important to understand the circumstances within which planning must take place.

3.1 The Muskrat Falls Conundrum

The development of Muskrat Falls waterpower has had a number of impacts – positive and negative – on the state of renewable energy in NL.

- Muskrat Falls will help reduce greenhouse gas emissions (GHGs) in NL, and the 98% clean energy mix it contributes to represents an extraordinary marketing and communications asset for the province. It also displaces significant GHGs in Nova Scotia.
- The choice to pursue the development of Muskrat Falls was at the expense of the other renewable energy technologies and applications, as their implementation became highly restricted. The highly regulated and controlled nature of the province’s electricity grid further compounds these challenges.
- The financial cost of the development is to be covered by NL ratepayers and/or taxpayers and therefore has created a situation where domestic use of the resource is important in mitigating its impact on electricity rates; there are pressures to discourage activities that reduce demand for electricity from this single source (e.g. new renewable energy development).
- The Muskrat Falls project includes two new infrastructure assets – a fixed cable link from Labrador to Newfoundland, and a fixed cable link from Newfoundland and Nova Scotia. These links provide for interesting new possibilities related to the transfer and export of electricity.

3.2 Unintended Consequences of Muskrat Falls

The pursuit and development of Muskrat Falls, and the regulation introduced that restricted other electricity generation initiatives, has had a number of unintended consequences for NL's economy.

- NL has a wealth of renewable energy resources – from onshore and offshore wind to marine (e.g. wave, tidal) – and the inability for developers, entrepreneurs, and other stakeholders (such as municipalities) to engage in projects that exploit these resources is a substantial missed economic development opportunity.
- Many industrial operations, through the nature of their activities (e.g. farming, manufacturing, sawmilling, etc.), generate energy. In other jurisdictions, businesses would be able to use this energy to generate electricity to either (a) support their own operations, (b) sell excess supply back to the grid generating a new revenue stream, or (c) a combination of both. As this practice is not permitted in NL, industry located in the province finds itself at a disadvantage competing on cost when the bottom lines of competitors benefit from such activities. This could be an obstacle in industry / business attraction and retention.
- Local business owners have not been inclined to experiment with renewable energy applications related to their own products or services (e.g. integrating renewable energy into a wastewater treatment system). These are missed opportunities for innovation. NL firms have been at a disadvantage internationally where competitors are integrating renewable energy systems into their products and services for markets that are starved for solutions that lead to GHG-reductions.
- Hydropower is a clean, renewable technology, but with the potential environmental impacts from large scale developments like Muskrat Falls, public perception about hydropower – large, or small – is often negative. Coupled with the current and future economic impacts of Muskrat Falls on the province, public support for a hydropower project of any scale will be difficult to garner. Industry has shifted to the term ‘waterpower’ to reinforce the technology as a clean, reliable, renewable source of power and to shed negative perception.

3.3 Considerable, But Stranded Assets

Various research and studies indicate NL has substantial renewable energy potential relating to mature technologies (waterpower, onshore and offshore wind, biofuels) and emerging technologies (wave/tidal energy, hydrokinetic, hydrogen development). Yet the domestic demand for this energy is limited and the ability to export is complicated by the capacity of existing infrastructure, lack of federal energy transmission policy and regulation cross provincial boundaries, and the economics of transmitting electricity across jurisdictions.

3.4 Renewable Energy as a Driver of Economic Development

Facing these barriers to development, it is important to underscore the potential associated economic growth and diversification opportunities of renewable energy as to reinforce the need for a renewable energy plan.

- Renewable energy development offers an opportunity for economic diversification and can create jobs. This is true for both small-scale development (e.g. grid tie-ins, biomass) and large-scale development (e.g. onshore and offshore wind farms, hydro, etc.).
- In the case of small to medium-scale renewable energy, the adoption of clean energy technologies in industry (e.g. mining, forestry, agriculture, manufacturing, etc.) can reduce costs and increase the productivity and competitiveness of local firms while providing employment related to system design, installation, and maintenance.
- In the case of large-scale renewable energy development, such as offshore wind where supply chains are expansive, the local economic impact may be significant. Where regulatory changes or infrastructure investments are required to support renewable energy development, the associated costs may be outweighed by the economic benefits.
- Expertise and skillsets established locally in developing and maintaining renewable energy systems can be exported for use in national and international markets and projects.

- Nationally and internationally, the development and operation of renewable energy systems has emerged as a successful approach for communities in achieving financial sustainability.
- Renewable energy research and development is an untapped source of innovation in NL. Though the end-use-market for creations and refinements may not be within NL, the demand for clean energy technologies continues to grow exponentially worldwide. Solutions developed here can be exported internationally.

3.5 Renewable Energy as a Combatant Against Climate Change

NL will soon boast an electricity grid that is composed of 98% renewable energy. But this is not the beginning and end of the climate change discussion and renewable energy's role in the province's efforts to mitigate its contributions.

- There are opportunities beyond the scope of the electricity grid (e.g. remote communities, alternative fuel sources for building heating and industrial processes) where renewable energy development would further reduce the province's contribution to climate change.
- The electrification of transportation – including personal vehicles, commercial vehicles, marine vessels, and aircraft – can reduce greenhouse gas emissions in an area that is a substantial contributor in NL; as technology advances and electricity demand rises, renewable energy is an enabler for this approach to clean growth.
- New electricity generation will at some point in the future be required for grid capacity or reliability reasons; renewable energy development would ensure minimal environmental impact and protect the province's 98% renewable energy mix.
- There are other jurisdictions in Canada and beyond that have substantive climate change objectives or requirements that they cannot meet with internal resources; NL may be able to help these jurisdictions through the development and export of renewable energy.

- International pressures to decrease environmental impact will continue to mount for natural resource industries, including those key to NL's economy – offshore oil and gas, mining, and aquaculture. Renewable energy development incorporated into the growth of these industries would minimize the province's contribution to climate change and ease international pressures on the local manifestations of global industry.

3.6 We Are Not First, and We Are Not Alone

While the circumstances NL is experiencing may feel unique, renewable energy policies have been in practice internationally for some time. Renewable energy development precedence exists in jurisdictions that face or have faced similar challenges (e.g. activities in island settings, export-surplus situations, limited export potential, etc.) and NL can learn from and in some cases emulate these international examples.

4.0 Recommendations for Renewable Energy Growth

It is recognized that it is in the taxpayer and/or ratepayer interest to maximize use of the electricity generated at Muskrat Falls. It is also recognized that NL's capacity to export electricity is at present limited.

Yet within these parameters there are opportunities for the development of renewable energy in NL in the short and long term. These focused and niche opportunities – allowing options for entrepreneurs, small businesses, industries, communities, and a labour force increasingly interested in working in a renewable energy related industry – could lead to significant growth for the industry in NL and thus diversification of the economy at large.

But the pursuit of these opportunities will require deliberate policy and regulatory interventions by the provincial government. As the regulator of electricity systems and industry, the role of the NL government in enabling and fostering renewable energy development cannot be understated; the

growth of the renewable energy industry in NL is contingent on leadership from the provincial government.

Within the context established, and drawing on the experiences and insights of NEIA's membership and partners, the following recommendations are made in the interest of renewable energy industry growth in NL.

4.1 Exploiting Current Export Capacity

Transmission cables between Quebec, Labrador, Newfoundland, and Nova Scotia conceivably create export opportunities for renewable energy, however there are differing opinions as to how much capacity exists through this infrastructure for export. It is understood that the priority for transmission will be the export of excess power from Muskrat Falls generation, however if available transmission capacity was explicitly defined the private sector could react accordingly. Where opportunity for export does exist, NL could potentially engage the private sector in an expression of interest or 'challenge' to stimulate renewable energy activity in the province. There may be regulatory, technical, or economic challenges associated with the opportunity, but the private sector – with all of the information available to it – may be able to offer new and innovative approaches to mitigate issues if it had the opportunity to do so.

4.2 Exploring Future Export Opportunities

There is a growing demand in North America for clean energy solutions, and NL has the resources to provide them – if it had an avenue to export. Sizeable renewable energy development in NL will require new or enhanced pathways for transmission to other markets. An appetite exists in Canada for collaboration between provinces on energy, and investments in transmission infrastructure could help NL get its resources to market. With an expressed American interest in Quebec electricity, NL can leverage its known water and wind assets to engage neighbouring provinces in export partnerships that include significant NL renewable energy developments.

4.3 Rate Mitigation: Electrification

The electrification of energy-driven activities and processes has been identified as a promising avenue to assist in mitigating electricity rates in NL. A deliberate strategy can be developed to support the electrification of passenger vehicles, transport vehicles, public transportation systems such as busses and ferries, port infrastructure, home heating, and industrial activities.

Electrification presents an opportunity for renewable energy development in two ways. First, in aggregate it will increase the demand domestically for electricity (e.g. electric vehicles) meaning either more export potential or more local use. Second, large new industrial users of electricity (mines, aquaculture facilities, data centres, etc.) may add significant burdens on the grid that can be mitigated through complementary renewable energy developments.

Incentives, or even simply regulatory exceptions, can be offered to project proponents where renewable energy generation is practical. This private-sector led approach to meeting project-based electricity needs reduces risk for the ratepayer where demand may not be long-term.

Electrification, as a strategy, is not a new concept and is well underway with the application of commercial technologies in other international jurisdictions. It should be noted that supply vessels and even drilling operations taking place in Norway, where significant investments are emanating from in NL in offshore oil and gas and aquaculture, are progressively becoming electric. These industries will increasingly, over time, desire access to electric infrastructure to meet their own climate change objectives. As many electrification initiatives would have a positive impact on the province's greenhouse gas emissions, there may be opportunities for significant federal investment.

4.4 Rate Mitigation: Reducing Peak Loads

It is understood that electricity intended for export that can be guaranteed (firm) is much more valuable and lucrative than electricity that may or may not be available depending on the season or time of day (non-firm). This means that the more NL can do to decrease its electricity consumption in the Winter months and at typically demanding times of the day (e.g. reducing peak loads), the

more electricity is available for sale at premium prices. This reality may provide opportunities for renewable energy development. Can renewable energy economically play a role in the reduction of peak loads? Can the strategic use of renewables at heavy industrial sites help manage loads when required? These are questions that are worth exploring in the short term to allow for long-term planning.

It should be noted that thermal generation from the Holyrood Generating Station or the import of electricity from non-renewable sources via the Maritime Link can be used as options to address load capacities. These approaches would be harmful to the environment, limit renewable energy development opportunities, and should be discouraged for both reasons.

4.5 Renewable Energy in Natural Resources

In an international environment where major industries are facing significant and increasing pressures to reduce their environmental impacts, renewable energy development could potentially play an important role.

4.5.1 Mining and Aquaculture

Key growth industries in NL like mining and aquaculture require significant energy for their operations. In both existing operations and new investments, NL could encourage or require operations to be complemented by renewable energy generation – as is becoming commonplace globally. Such action would mitigate (or reduce) the associated GHG increases and potential impacts on the grid and its load capacities. In remote areas renewable energy solutions may be more economically viable than traditional diesel generation, especially when synergies are possible with neighbouring community power needs.

4.5.2 Offshore Oil and Gas

In the most advanced jurisdictions like Norway and the UK, renewable energy is playing an important role in reducing the impact of the offshore oil and gas industry. Powering offshore assets with renewable energy (through on-shore generation or in-situ) is identified as the single most effective method of reducing the GHGs associated with extraction. NL could mandate that future

developments in its offshore that meet particular resource thresholds operate utilizing renewable energy. This action will enable NL to maintain competitiveness with or establish an advantage over other jurisdictions where markets are increasingly demanding a ‘greener’ barrel of oil.

4.5.3 Agriculture

Renewable energy can also play an important role in agriculture. In NL, where increasing food security and local food production have emerged as priorities. NL can consider incentives for operators in this industry – an industry which is typically environment and sustainability conscious – to provide for their own energy needs through renewable energy developments. This may stimulate activity for both agriculture and renewable energy industries simultaneously.

4.5.4 Ports

In all of NL’s natural resource industries, supply and export operations are most often taking place via marine transport. In this regard, investments in ports to enable them to provide electricity to vessels for both their stationary needs and to power their electric propulsion systems would contribute to minimizing their collective environmental impact.

Geographically, NL may be positioned to benefit from increasing marine traffic through the Northern Passage. It is foreseeable that there will be global GHG targets for operators, and in order for applicable NL ports to maintain their competitiveness, electrification may be required.

4.6 Exploring the Hydrogen Opportunity

Hydrogen could enable renewable energy development in NL. Hydrogen can be created through electrolysis using excess electricity, creating a potential storage medium that can accessed when needed. As such, it could play a role in addressing peak load challenges. New renewable energy production could be used in the Winter months to reduce demand, while in warmer months this excess energy could be used to produce hydrogen – energy that would be stored and used in the next Winter cycle or transported and used for other activities. Hydrogen can also be produced through the reform of natural gas, an asset that NL currently has not exploited. The opportunity for hydrogen production in NL should be studied and better understood.

4.7 Net Metering 2.0

The implementation of a net metering program in NL in 2017 was an important step forward in enabling micro-generation activity in the province. Uncertainty around future electricity prices relating to the Muskrat Falls project has made it challenging for firms providing renewable energy services at the micro level to model energy cost projections, payback periods, and demonstrate to clients that the adoption of clean energy technology is worth the investment. Recent commitments relating to rate mitigation are helpful in this regard.

Progress and rates notwithstanding, challenges remain that impede the growth of the micro-generation industry (e.g. consumer-level solar and wind energy):

- The cap of 100 KW per project for the net metering program is a barrier for growth of the renewable energy industry, particularly in industrial applications where the business case can be more attractive (and potentially impactful from a GHG perspective).
- The cap of 5MW for the program overall discourages investment and activity in the business of renewable energy, contributing to competitiveness issues.
- In other jurisdictions, renewable energy generation is embraced by communities and municipalities as a tool to assist in achieving economic sustainability – however the restrictions of NL’s net metering program (including the inability to aggregate meters) discourages this.

It is understood that widespread adoption of net metering is a challenge in NL for reasons discussed in section 3. Yet a new balance could be struck to allow for the grassroots growth of the province’s renewable energy industry. Can micro-generation play a complementary role in other NL priorities – e.g. electrification, peak load reduction? Can incentives for micro-generation be offered where these and other objectives are met? Such avenues for growth of micro-generation can be explored in the development of a renewable energy plan for NL.

4.8 Diesel Dependent Communities

A clear and present opportunity in renewable energy development in NL is related to the remote communities dependent on diesel for their electricity. Ensuring that NL firms and professionals are involved in the pursuit of these opportunities will help build capacity and expertise within the province relating to renewable energy.

A recently released *Expression of Interest* from the provincial government relating to this opportunity is an encouraging sign that investments may be made in this space. Additionally, several Indigenous communities are developing their own independent plans relating to their energy needs and their approach to emissions reductions. These community-based energy plans should be supported.

4.9 A Commitment to Maintaining NL's Energy Mix Advantage

NL's energy mix – soon to be 98% renewable – is to be commended and embraced. This can be viewed as a marketing and investment attraction asset. It is also an achievement to be protected to both mitigate the province's contribution to climate change and open the door to future investment into renewable energy development.

New electricity generation will be required at some point in the future to meet growing electricity demand and/or increase the resiliency and reliability of the grid. A recent report from NL Hydro identifies gas turbines as being the least cost option to meet increasing electricity demand. In the interests of GHG reduction and economic development, any new introduction of energy to the grid should not be fossil fuel based. Such an investment would increase the province's greenhouse gas emissions, impact its favourable renewable energy 'story', and further aggravate an industry that has had enormous challenges in NL.

A commitment to maintaining this energy mix 'advantage' will create new (and predictable) opportunities for renewable energy development in the future.

4.10 The Adjacent Possible: Leveraging Expertise

Innovations are often the natural consequence, or evolution, of other existing creations combined with one another in new and interesting ways; the deliberate pursuit of innovation in this regard can be referred to as ‘the adjacent possible’. There are relatively unique aspects of the NL environment that can lend themselves to NL applying existing expertise towards renewable energy innovation.

4.10.1 Marine Expertise

NL’s economy and expertise is heavily reliant on marine based industries (i.e. fishing, offshore oil and gas, aquaculture, shipping, tourism, transportation). As a result, there is a wealth of local marine expertise that can be leveraged in the development of marine based renewable such as offshore wind farms.

4.10.2 Harsh and Remote Environments

The harsh and remote environments that NL has established world-class products, services, and process around can also be applied towards renewable energy research, development, and commercialization. NL could become a testing ground to explore how renewable energies perform and endure these environments, for the modification of existing technologies to become more resilient in these circumstances, and provide training for international skilled workers on the peculiarities of operations in this climate.

4.10.3 Waterpower

Waterpower is another area of niche proficiency from which NL can draw upon. Despite the challenges presented by the Muskrat Falls project, the fact remains that the development of this renewable resource was a significant accomplishment that many NL firms and experts participated in. This is just one of many waterpower resources that are operated and maintained in NL. This intimate understanding of the waterpower industry can be embraced and NL can explore how it should exploit this expertise to support the growth of the renewable energy industry.

These are just three examples of NL expertise being used to contribute to and benefit from the renewable energy industry, and others may exist. Innovation in this space should be supported; access to funding for such activities is not difficult but innovators will need willing partners (e.g. utilities, governments) to assist in the testing, demonstration, and refinement of technologies and a regulatory framework that supports such pilot projects.

5.0 Other Considerations

5.1 Engaging Internationally

While there is expertise locally available in and around renewable energy industries, because there has been little domestic development that experience is limited. In the creation of a renewable energy strategy for NL, guidance from the international community would be invaluable in bringing fresh perspectives towards addressing perceived barriers.

At the same time, the provincial government and its partners have been strong supporters in industry's efforts to engage internationally to gain a greater understanding of clean growth. It is important to continue supporting international business development activities that help NL firms learn about renewable energy development and applications, and how these innovations can be applied in the NL context.

5.2 Empowering the Private Sector

Stringent regulatory frameworks and public sector-led development approaches have restricted the private sector's ability to engage in renewable energy development and the mapping of renewable energy strategy. For NL to reach its full economic growth potential through renewable energy development, the private sector needs meaningful and continuous opportunity to contribute its expertise, experience, ideas, and solutions. The development of a provincial renewable energy plan, in collaboration with private sector partners, is an important first step.

5.3 Skills Requirements and Development

From increased micro-generation to major renewable projects, from the electrification of energy activities to peak load management, new skills will be required within the NL workforce to engage in the emerging low-carbon economy. This will be particularly important for trades workers, engineers, and technical professionals who will need the skills to build this industry and will be increasingly required to work in and around electrical systems.

This presents opportunities for post-secondary institutions, an opportunity that may extend beyond the requirements of just the NL workforce if the training were niche. There are examples in smaller jurisdictions than NL that embraced renewable energy training – where institutions developed programming that achieved excellent placement rates and regional recognition.

Increased interest and renewable energy activity will require new (to the province) best practices and standards for work in and around these technologies; the sector requires a skilled labour force that can be counted on to deliver safe and quality work.

5.4 Accelerating Future Developments

Secondary barriers to renewable energy may exist that could have the potential to slow down planned developments. Examples of such secondary barriers could include environmental assessment and permitting processes that were designed without deliberate consideration for renewable energy projects, or Canada-NL jurisdictional complications that may arise where activity takes place in ocean environments. Proactive work to identify such secondary barriers associated with the priorities of a renewable energy plan will minimize frustrations and unnecessary delays during implementation stages.

5.5 Investment Attraction

Where renewable energy developments can reduce GHGs or otherwise reduce environmental impact, there are a variety of funding programs that can be accessed and leveraged to help finance capital costs changing the economics of projects and their payback periods.

There are also first-mover advantages associated with embracing technologies either at the front end in research and development or at commercial application when new to a region. For example, Nova Scotia has become an international area of interest because of its expressed support for tidal energy. There is a ripe opportunity for NL to become a first mover in the offshore wind energy industry, attracting international interest and investment in an industry where no development has yet to take place yet in Canada.

Clear government policy on the renewable development strategy and policy will be required to de-risk and therefore unlock any international investment.

5.6 Avoiding Prescriptive Approaches

The development of a renewable energy plan should entertain the economic development potential from a variety of possible sources (e.g. onshore and offshore wind, solar PV, wave and tidal, hydro, biomass, geothermal, power from shore, etc.) and not be so prescriptive in scope as to prefer or discourage one technology over another. Developers and clients need the flexibility to choose the solution that best fits their practical and/or strategic needs.

The renewable energy industry is changing at a rapid pace in terms of: (1) the availability of new technologies – whether that be related to generation or storage; (2) the effectiveness and efficiency of existing technologies; and (3) the decreasing costs of technologies. Projections and cost modeling will be important to assess opportunity for renewable energy development in NL, but it must be understood that the assumptions made in these projections can become outdated in a very short

period of time. With this in mind, a renewable energy plan should avoid being overly prescriptive in terms of specific technologies and applications.

5.7 Engaging Openly on Renewable Energy

For reasons explored in section 3 of this document, the conversation around renewable energy in NL has been subdued for some time.

There is an inspired segment of the population very drawn to the idea of renewable energy that is waiting for an opportunity to become involved. Though there are many avenues to pursue clean growth, renewable energy is among the easiest to be understood. The lack of visible activity in this regard has been frustrating for many who have strong environmental values and perhaps skews the perception of the province's performance and activity in and around sustainable growth. This segment skews younger and is an important one to retain (and attract). An open discussion on the possibilities and opportunities for renewable energy in NL may help create clear pathways for this segment to get involved in the industry, whether this is achieved in schools, post-secondary institutions, communities and municipalities, businesses, or through other industries.

Increased discussion on renewable energy is also important to help dispel myths that industry is encountering. Several powerful misconceptions exist in NL around the technologies that are hampering growth (e.g. it's too windy for wind energy, it's too foggy for solar panels). Industry needs assistance in educating the public and casting aside these misunderstandings.

Another misconception that resonates with the public is the notion that renewable energy development is somehow a competing force to the oil and gas industry in NL. These industries are not mutually exclusive pursuits. In some cases, renewable energy development may in fact increase the competitiveness of the oil and gas industry. In many cases, the industries require complementary skills and technologies. The global demand for both continues to rise, and in the NL context the growth of one does not negatively impact the other. There is much to gain looking at both through a broader lens of 'sustainable energy' as the Norwegians have and focusing on the potential synergies that may arise in taking this perspective. This thinking is aligned with the

provincial government's "*Advance 2030: A Plan for Growth in the Newfoundland and Labrador Oil and Gas Industry*" strategy that identifies the development of a world class energy cluster that incorporates both offshore oil and gas and renewables as priorities. To meet this target, this cross-industry collaboration needs to happen as soon as possible.

Finally, it is important to be open to new and big energy ideas. What may seem overly ambitious, futuristic, or far-fetched may be within the realm possibility if creative and deliberate steps are taken to explore and pursue them. Australia partnered with Tesla and built the largest lithium ion battery in the world to increase the reliability and resiliency of its energy grid – in 100 days. Norway intends to mandate all domestic air travel be electric by the year 2040. Electric passenger and freight trains are rapidly emerging worldwide. Orkney, an archipelago off the northeastern coast of Scotland, has become an international low-carbon centre of excellence despite its remoteness and population of just 22,000. None of this is to say that NL should emulate the actions of others, but it should foster a culture that embraces new ideas and entertains those that pitch them and are passionate about them. Many in NL are passionate about energy and the environment, and it is entirely possible that one or more of their ideas are achievable and if pursued could bring with it a wave of interest, excitement, and investment in the province.

6.0 Conclusion

Renewable energy represents an area of untapped economic growth and diversification potential for Newfoundland and Labrador. The development of a renewable energy plan, as committed to by the provincial government in April 2018, is an excellent start to exploiting these opportunities. Advancement will require deliberate policy and regulatory interventions by the provincial government to enable private sector investment and activity. The leadership role the NL government must play in fostering renewable energy development cannot be understated.