

October 17, 2013

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Attention: **Integrated Resource Planning Team**

Subject: **Comments - August 2013 Draft Integrated Resource Plan
Marine Renewable Energy**

Thank you for providing an additional consultation opportunity for the IRP as requested by the BC Ministry of Energy and Mines. We apologize for not making a submission sooner on this critical planning exercise. I am writing on behalf of SRM Projects Ltd, a small renewable energy engineering firm trying to establish itself on Vancouver Island, and as a member of the board of directors of Marine Renewables Canada (www.marinerenewables.ca).

Long term electrical utility planning is clearly a complicated puzzle and the comments contained here are not intended to take away from the good work that has been done in assembling the draft IRP; rather, the comments are intended to inspire BC Hydro to make small but important changes to the IRP to better comply with the Clean Energy Act by including emerging renewable energy sources, like wave and tidal, as a planned part of future portfolios. These minor changes will not noticeably affect ratepayer costs or power supply reliability but will have substantially positive effects on economic development for coastal First Nations and other communities, many still struggling after the decline of the forest industry. On the national scale, these minor changes could make the difference between Canada becoming a leader in the budding world marine renewable energy industry (with the associated economic rewards), or a follower, purchasing equipment and expertise from others. In recognition of the importance of being proactive to stay in the game, Canada made a successful bid to host the *International Conference on Ocean Energy* in Halifax in 2014. The stakes are a lot higher than the BC IRP currently reflects.

Marine Renewable Energy Sources Dismissed in IRP

The IRP is a long time frame planning document (to 2033) and as such it must consider that technology will continue to evolve to meet the needs of society. Emerging renewable energy sources like offshore wind, geothermal, wave and tidal energy have been excluded from the 2013 IRP portfolio consideration simply because they have not yet been proven in BC (IRP 3.7.2). In fact, to varying degrees, these technologies are already being adopted in other parts of the world such as Europe, and are making commercial power today.

In the case of marine renewable energy, which is a focus of this letter, there are commercial tidal energy installations in Strangford Lough, Northern Ireland (Marine Current Turbines “Seagen”, producing commercial power since 2008 <http://www.marineturbines.com/>), Den Oever, Netherlands (Tocardo “T100”, producing commercial power since 2008 <http://www.tocardo.com/>) and Cobscook, Maine (Ocean Renewable Power Company “TidGen”, producing commercial power since 2012 <http://www.orpc.co/default.aspx>). Verdant Power (<http://verdantpower.com/>) completed multi-year grid connected demonstration trials in East River New York and grid connected installations at FORCE (<http://fundyforce.ca/>) in Nova Scotia are also expected very soon in addition to smaller demonstration size projects in BC (Canoe Pass, Dent Island) and Nova Scotia (Digby Gut and several others).

In addition, major global energy equipment suppliers such as Alstom Power, Voith Hydro, Andritz and Siemens have marine energy product lines in advanced development. Following a typical commercialization development curve, we expect these technologies to advance rapidly while costs continue to drop.

Tidal energy provides a cyclic but constant on average power supply that is not affected by seasons or weather and can be predicted accurately many years in advance. Wave energy in BC would provide the most power during our winter, exactly when we need it. These attributes make marine energy attractive additions to the BC Hydro power portfolio, which is encumbered by freshet oversupply.

Also, while many in BC are focusing on LNG, interest in marine renewable energy is high and building, with about 38 investigative license applications registered with the Ministry of FLNRO at this time. Another reflection of this interest is in the formation of the Pacific Tidal Energy Development Committee in February 2012. The committee includes members from industry, First Nations, cities, equipment developers, government and academic institutions (<http://srmprojects.ca/engineering/community>).

Finally, BC signed a MOU with Nova Scotia to collaborate on advancing tidal energy initiatives in September 2012 (see attached). The draft IRP fails to support this MOU.

For the reasons above, there must be an allowance in the IRP for future portfolios that have some exposure to renewable energy technologies which are emerging today and have application in BC, like marine energy, but will be commercialized before the end of the planning time frame.

Further, as enabled by the Clean Energy Act (Part 4 Section 16), BC Hydro should recommend a capacity limited Feed In Tariff (FIT) be created specifically for marine renewable energy. Nova Scotia has implemented a \$652/MWh community FIT (COMFIT) for small projects and is poised to launch a full FIT for larger projects: (<http://thechronicleherald.ca/business/1154448-tariffs-proposed-for-tidal-energy>). If BC was to follow a similar marine energy industry development policy as in Nova Scotia, our calculations suggest that a \$500/MWh FIT could kick off a 50MW pilot industry with \$200-300 million in investment.

Intent and Spirit of Clean Energy Act Not Fully Recognized in IRP

British Columbia Energy Objective 2(d)

“to use and foster the development in British Columbia of innovative technologies that support DSM and the use of clean or renewable resources”

The draft IRP as written only fosters the development of more traditional clean resources like hydro power and wind power. In BC, with much of the population living near the ocean, there is another important clean resource that is abundantly available to harness and that is marine renewable energy. The IRP needs to go a step further and foster innovative new technologies, like tidal and wave power generation, to support BC/Canadian companies like Clean Current, Mavi Innovations, SurfPower, Waterwall Turbine, Accumulated Ocean Energy, Mermaid Power, Idenergie, Jupiter Hydro and New Energy Corporation who are all working diligently to create new economic opportunities.

British Columbia Energy Objective 2(k)

“to encourage economic development and the creation and retention of jobs”

While building conventional technology power generation facilities by itself does create jobs, it only creates short term construction jobs and limited ongoing operational and maintenance jobs. In contrast, providing limited critical support to enable the *creation of a new industry*, such as for marine renewable energy, would provide construction, operational and maintenance jobs *plus* jobs in manufacturing/sales of new equipment technology as well as development of an entire new design and installation/retrieval supply chain capable of serving a national and global market. This new supply chain could also include equipment rebuild shops that service wind, tidal and wave power generation units at 3 to 5 year intervals (typical power farm arrays would cycle individual units out on a staggered basis, creating a constant demand for rebuild services). What we want to see is BC Hydro take an active role in nurturing and encouraging the development of this new and promising industry - instead of taking a passive wait and see approach which will simply assure that we will be buyers of other's technology and services.

British Columbia Energy Objective 2(l)

“to foster the development of First Nation and rural communities through the use and development of clean or renewable resources”

As stated above, the draft IRP as written only fosters the development of more traditional clean resources like hydro power and wind power. In BC, with much of the population living near the ocean, there is another important clean resource that First Nations and rural communities can harness and that is marine renewable energy.

Feedback from the IRP consultation process from First Nations and the Technical Advisory Committee (IRP pp 7-55, 7-64) clearly demonstrates a preference for clean power sources like tidal and wave energy. In addition, there was significant interest in replacing remote community diesel generation with clean power sources – a common situation for First Nations and other remote communities or resorts that exist in places like the Discovery

Islands (between Vancouver Island and the BC mainland). These kind of energy projects are important capacity building and economic development initiatives that promote wellness and higher living standards for residents of these remote communities.

While the Standing Offer Program works well on its own for traditional clean resources, it really doesn't help foster the development of clean marine renewable energy because the electricity pricing structure is not currently adequate for the emerging tidal and wave energy technologies. *This is another reason why we also need a FIT for small community size projects (up to 15 MW) as described above.*

Comment Summary

Marine renewable electricity has been reliably generated in other parts of the world since 2008. To fully support the intent of the Clean Energy Act in the goals of economic development and diversity of clean energy, BC Hydro should adopt an active, instead of passive, role with respect to marine renewable energy development in BC. Ideally, this should be done by making a small allowance specifically for future marine renewable power sources in the IRP. At a minimum, a general allowance should be made in the IRP for future power from emerging renewable energy sources with BC applications that are not currently installed in BC but are in advanced stages of development elsewhere in the world.

Most importantly, the IRP should include a recommendation to revisit and implement a marine renewable energy feed in tariff in 2014 to support the BC Clean Energy Act, the BC-NS MOU on tidal energy development collaboration and the Canadian effort to maintain a leadership position in the promising world marine renewable energy industry. We should not turn a blind eye to this significant, clean economic opportunity.

Yours truly,



Scot Merriam, P.Eng.
Principal

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