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Comment on:

Discussion Paper: Marine Renewable Energy Legislation for Nova Scotia

Conversion of renewable energy from the marine environment represents a significant opportunity for Nova Scotia at this time. Recent assessments of offshore wind, tidal stream and wave resources indicate that Nova Scotia could wean itself away from dependence upon fossil fuels within the next two decades, and move the province toward a more sustainable future based upon more stable energy costs, and – potentially at least – a robust and marketable expertise in aspects of environmental monitoring and environmental monitoring technologies. Offshore wind and tidal stream resources are substantial in Nova Scotia, and collectively could provide both a major displacement of fossil fuels and some potential for export; wave resources are similarly large, but for the most part are sufficiently distant from shore that they will be difficult to develop on a large scale. The comments that follow, therefore, relate to offshore wind and tidal stream (TISEC) resources, rather than the wave resource.

Development of either offshore wind or tidal stream energy conversion raises environmental concerns, and issues of potential conflict with other users of the marine environment. Consequently, enabling legislation needs to be crafted not only to encourage the development of marine renewable energy projects, and to foster the development of energy-related industries in the province, but also to ensure that planning mechanisms are in place to ensure that other beneficial and legitimate uses of the marine environment are accommodated as fully as possible.

For the sake of simplicity, I will address some of the questions raise in the Discussion Paper in the order in which they are presented. It is evident, however, that these questions are all interconnected.

1. What...are the most important opportunities for Nova Scotia? What are the values that government should focus on when developing legislation...?

As indicated above, tidal stream (TISEC) and offshore wind technologies offer the best opportunities for renewable energy capture in Nova Scotia, while wave technologies are limited in scope to those devices that operate in a micro- or mesowave environment close to shore. However, over and above the prospects for displacing fossil fuels with renewable energy, the major opportunities in this sector relate to a) the development of exportable expertise in assessing resources and monitoring environmental effects, and b) potential development of new or improved technologies for environmental monitoring. In respect of the latter, Nova Scotia has a diverse array of small, innovative industries (e.g. Vemco™) which are already, or are capable of, developing marine sensors and deployment techniques that are marketable around the world wherever energy developments (not just TISEC) are being considered. The potential market is huge, and it will be highly beneficial for Nova Scotia to use its present leading

position in experimental testing to further the success of these companies. This does not require legislation *per se*, but would benefit from an appropriate, far-sighted policy to facilitate the development of these companies and technologies.

Marine energy conversion, of whatever kind, will take place in an environment that is already extensively used for other purposes: fishing, aquaculture, fossil fuel exploration and extraction, conservation and recreation (etc). With the exception of large scale hydrocarbon exploration and development, the other uses are very closely tied to coastal communities in Nova Scotia. Displacement of any of these resource uses to accommodate marine renewable energy (MRE) development, therefore, may engender difficulty or even hardship at the local community level. It is therefore critical that one of the values enshrined in or underlying any enabling legislation should be that of maintaining or ensuring community sustainability, with the focus on those communities in close proximity to the site of MRE development. The Strategic Environmental Assessment conducted by the government in 2008 clearly indicated that, while Nova Scotians are generally supportive of the testing of MRE devices in the hope that they will enable the Province to address its energy and carbon output problems, they are adamant that the benefits of MRE should flow in the first instance to the affected or proximal communities and province rather than be realized only by those living far away. Export of energy and earning of revenue through exports are not precluded thereby, but there is a desire to see that local needs are met first.

A second value relates to the principle of not compromising the coastal environment in which the development is taking place. This is not simply a matter of evaluating the immediate environmental effects of installation and operation of MRE devices, such as is typically the focus of environmental assessment statements provided by proponents. The coastal ecosystems that offer great potential for MRE conversion are intrinsically dynamic, interactive systems: as was realized during earlier investigations of tidal power development in the Bay of Fundy, removal of energy from these systems has the potential to change important properties of the system – tides, waves, upwelling processes, sediment dynamics, food web and migratory behaviours, for example – that might have effects over the whole system, not just in the vicinity of the development. Large scale, distant effects such as those above, are often not adequately addressed in EAs, so that the full implications of development may not be recognized. Similarly, in the absence of an assessment based upon the whole ecosystem, the cumulative effects resulting from a number of separate site proposals – what has been called the “tyranny of small decisions” – may be underestimated. An intrinsic value, therefore, that should underpin the enabling legislation should be that no scale of MRE development should be permitted that compromises a critical operational characteristic of the ecosystem¹. As illustrated by the Bay of Fundy, this is an ecosystem that is of global significance, as evidenced by the large number of species that migrate between there and the rest of the Americas, Europe, and the North Atlantic: Nova Scotia has a

¹ In this connection, it should be noted that the Western Australian government recently amended its environmental assessment requirements in respect of a proposal for tidal power development to include: “*a description of the biophysical interactions that characterize the ecosystem..*”, and an assessment of: “*impacts on biophysical processes currently operating within the ecosystem...*”. [Source: **Guidelines for the content of a draft environmental impact statement on the Derby Tidal Power Project, Western Australia**, EPBC ref. No. 2010/5544].

stewardship responsibility to preserve those dynamic features that are critical to the system's role in the hemispheres.

2. What should the government ... do to ensure all users of the marine environment are treated fairly?

I believe that so far, the NS government has shown a creditable degree of responsibility in pursuing the MRE options in a relatively open, transparent manner (e.g. the SEA, and the present round led by Dr. Fournier). However, at this early stage it is easy. The present policy of transparency and consultation (full, not token) needs to be strictly followed as we move to consideration of commercial scale projects. In this context, the absence of a clearly defined Coastal Management mechanism that would provide a process for comprehensive, multistakeholder involvement is a disadvantage. I know that a coastal policy has been under consideration for some time, but we cannot wait much longer for it to be established, because the opportunities represented by MRE development will soon pass to other areas if we do not act on them soon. We need to ensure that approval for commercial scale MRE projects is based on a fair and thorough examination of alternate uses. Resource use is a privilege, not a right. If awarding a privilege to MRE developers results in restriction of other privileges enjoyed by other people, there must be a mechanism to ensure that those people affected are provided with alternative means to benefit from the marine environment, whether by training, financial compensation, or the offering of alternate means of livelihood. It may be of no net benefit if we merely substitute one resource use for another unless the original users are provided alternate opportunities.

3. What lessons can we learn from renewable offshore energy policies around the world?

At present, relatively few countries have proceeded far with MRE developments. Those that have – notably Denmark (offshore wind), Scotland (wave and tidal), Ireland (wave and TISEC), Britain (wave, TISEC and offshore wind), and Portugal (wave) – have moved aggressively to develop support programs, designated coastal areas that would be set aside for testing and development, and developed enabling legislation. Nova Scotia needs to do the same; however, the other leading MRE countries have to operate within the context of the European Union, with constraints that are not mirrored here. Therefore I am not sure what insight (other than the manner of dealing with competing resource uses) we will really gain from abroad.

4. How should community interests be considered...?

As indicated above, a transparent, comprehensive assessment of the compatibility of a new (MRE) use in the coastal environment in relation to existing uses is critical. In the absence of effective coastal planning policy within which such a process could be conducted, it is essential that the government initiate a mechanism to ensure that community engagement. An important element of that is public education. It continues to be my experience that most members of the public are VERY poorly informed about MRE and its implications: media coverage is appallingly limited in quality as well as quantity; people do not visit websites and read the documents provided therein; distrust of government and the utility is commonplace; and prejudices built upon past considerations of tidal power preclude many

from taking an objective view of the options. In order to facilitate community-based decision-making, I think it essential that more extensive efforts be made to enhance public understanding of both the technologies and the implications. While not part of the legislation, it is an essential part of the initiative that that legislation is to enable.

I am completely in agreement with the decision to address MRE opportunities at two scales; that providing for grid-connected arrays that will displace fossil fuel contributions to the grid, and local, small scale projects aimed at supporting community economic development. It is my own view that small-scale TISEC developments will be environmentally acceptable and ultimately prove more valuable to Nova Scotia and other parts of Canada than the larger arrays.

5. How should Nova Scotia and Canadian authorities/legislation/regulation work together to ensure environmental protection?

I think it is important to recognize the dynamic, interactive *system* properties of the coastal environments in which MRE may be developed. These systems do not match the political and regulatory boundaries that we have established, and this leads to common problems of conflicting jurisdiction. Since the provincial boundaries have not always been clearly and agreeably defined (e.g. in the Bay of Fundy) between all relevant governments, the potential for conflict over jurisdiction remains. It is my understanding that establishing final provincial boundaries in some cases would require opening up the constitution, something that could not be effectively done in time to enable MRE development to proceed; consequently, I believe that a federal-provincial memorandum focused on providing a shared, integrated approach to management of issues raised by MRE development should be established, and that quickly. What is absolutely critical is that a single, integrated plan for environmental protection be developed between the parties that is based upon recognition of the system characteristics of our coastal waters, and of their intrinsic values a) for conservation, and b) for other resource use. This is essentially a requirement for a shared, collaborative plan for ocean management. If we do not establish a sensible, unitary management model to which all regulatory parties subscribe, the future of MRE development in Nova Scotia is at risk: developers will readily find alternate locations for their investments. The absolute bottom line, however, is that valuable natural features and resources in those coastal waters that are of interest for MRE development must be protected from unacceptable effects of energy extraction.

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