

November 16, 2010

Nova Scotia Department of Energy

400-5151 George Street

PO Box 2664

Halifax, Nova Scotia

B3J 3P7

Attention: Elisa Obermann

Re: Marine Renewable Energy Legislation discussion paper

FORCE

Thank you for the opportunity to comment on the Nova Scotia Department of Energy's discussion paper on marine renewable energy.

FORCE is a not for profit, public purpose company incorporated under the laws of Nova Scotia with the objectives of

1. Building and operating a facility for the testing and demonstration of tidal instream energy converters (TISECs);
2. Monitoring their interaction with the environment of the Bay of Fundy – FORCE works closely with developers, regulators, and the scientific community;
3. Serving as a catalyst for the research and economic development opportunities related to TISECs.

At its fundamental level FORCE's role is to support informed decision making by all of these people and ultimately the public. FORCE is neutral as to the technologies but is founded on the belief that TISECs have the potential to play a significant role in Nova Scotia's energy mix and its economic development.¹

¹ For more information see <http://fundyforce.ca/> .

Douglas J Keefe QC Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5 Ph 902.406.1166

Doug.Keefe@fundyforce.ca | www.fundyforce.ca

TISECs: an emerging technology

FORCE is concerned exclusively with TISECs. For the purposes of this exercise it is important to keep two fundamental TISEC characteristics in mind.

1. Though they are sometimes referred to as underwater windmills, unlike windmills which operate at the bottom of a very deep ocean of air, TISECs typically operate in relatively shallow tidal races that alternate directions twice every day. So the space they occupy and energy they remove must be carefully managed. In this one respect TISEC farms will be like petroleum fields requiring sophisticated energy conservation regimes.
2. TISECs are an emerging technology and, while Nova Scotia has established capacity in the marine supply and service sector, a tidal energy industry does not yet exist in its own right. It is impossible to say with precision what form of regulation will be required in the long run. And it would be easy to overburden the industry, the ratepayers, or the taxpayers, or all three with an expensive administration, and the sort of rents and levies common in the petroleum sector.

GENERAL COMMENTS REGARDING THE LEGISLATION

FORCE suggests Nova Scotia's first marine energy legislation cover the essentials clearly and provide scope for flexibility and adaptation in what we refer to below as the "complementary" areas. The technology and techniques will evolve in unpredictable ways. Overly broad or prescriptive approaches may soon be outdated. So, as a general approach at least, the act should rely on laws of general application and collaboration between existing federal and provincial regimes, and the governor in council should have broad power to deal with a wide range of "complementary" matters by regulation.

THE ESSENTIALS

Marine renewable energy legislation is essential if the power in and on the ocean is to be developed beneficially. It may do many things but it must do these things:

- Establish a root of title to the energy – in Nova Scotia this is conventionally the Crown in Right of Nova Scotia
- Provide a means for project developers to acquire an exclusive right to explore and exploit the energy in a specific location
- Prohibit energy extraction except in accordance with the act
- Establish a process for controlling energy extraction in order to conserve the resource
- Provide one or more mechanisms to obtain compensation for the *in situ* value² of the public resource through royalties or other forms of rent such as economic benefits favouring local industries or employees.

² When an *in situ* value exists, which is likely many years in the future.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

COMPLIMENTARY FEATURES

Energy legislation may do other things such as mediate and arbitrate between competing uses of the resource or production sites; and create specialized regimes for regulation of associated fields such as safety and the environment. Obviously an integrated regime specially tailored to marine renewable energy is attractive. But it would be a massive undertaking and existing laws of general application can be relied on to protect workers and the environment.

So pursuit of a consolidation of environmental and resource allocation powers should not interfere with the essential work of either the energy legislation or the generic legislation.

JURISDICTIONAL ISSUES

The first point is that in this day of collaborative business systems, it is not necessary to create a single vertically integrated organization to accomplish tasks. All federal and provincial regulators worked well together in the assessment of FORCE and they continue to cooperate.

The second point is that there are two kinds of jurisdiction: subject matter and geographic.

GEOGRAPHIC JURISDICTION

The ownership of *in situ* resources and the exercise of sovereign powers by a province are limited to the boundaries of the province. The seaward extent of Nova Scotia has never been finally determined. The Bay of Fundy however is within the provinces of Nova Scotia and New Brunswick respectively.³

The geographic jurisdiction issue will require some form of federal/provincial legislation to grant “mirror” rights in the disputed areas and, even though we assume the Bay of Fundy would not be included, we are concerned that even the attempt at legislating jurisdictional certainty would create uncertainty where none exists. At least until someone wants to develop a project in the disputed zone governments should concentrate on less formal means of collaboration such as MOUs and meetings.

That said, it would be wise to enable adoption of federal boards and regulatory legislation by regulation as is common in Nova Scotia’s energy legislation in case events on the Atlantic seaboard move more quickly

³ By the Offshore Petroleum Resources Accord (OPRA) Canada and Nova Scotia set aside the debate in respect of petroleum. Mirror legislation established a joint regime to administer petroleum activities in the offshore area which includes the Bay of Fundy. It is important to note that the legislation refers respectively to the “Nova Scotia lands” and the “the Canada lands” in the offshore area. That is, neither party claims the entire area. Instead each claims there are unspecified lands in the offshore that are (respectively again) in Nova Scotia or aren’t in Nova Scotia. The Bay of Fundy was included in the offshore area not because Nova Scotia’s claim to it was in doubt but because it wasn’t. The Nova Scotia act could have been struck down if it were shown there were no Nova Scotia lands in the defined offshore area. So it was vital to ensure there was at least one area that was incontestably “Nova Scotia lands” in the offshore area.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

than anticipated. Very broad enabling legislation would not require agreement of the federal government.

The bottom line for FORCE however is: don't jeopardize or confuse Nova Scotia's jurisdiction in Fundy

SUBJECT MATTER JURISDICTION

As your narrative explains Nova Scotia is taking a staged approach: the SEA, the RFP to select technologies, establishment of FORCE, and now deployment and monitoring of commercial scale demonstration TISECs. We believe the stages have been well managed and are in the correct order.

The Department of Energy early on brought federal and provincial regulators together to familiarize them with the project and discuss how their processes might be coordinated without cutting corners or interfering with independent statutory mandates. This worked particularly well and suggests that collaboration among existing regulators will be sufficient if not optimal for the foreseeable future.

ENVIRONMENTAL AND SOCIAL ISSUES

Creation of FORCE was recommended by the Strategic Environmental Assessment. So it is, in a very real sense, part of the exploration of environmental and social issues.

ASSESSING ENVIRONMENTAL RISK

Environmental monitoring has been underway since September 2009. The key priorities for monitoring are fish and mammal movement and behavior in the marine turbine demonstration area. FORCE's Environmental Effects Monitoring Program (**EEMP**) was approved by the provincial and federal regulators and has received expert advice from an independent Environmental Monitoring Advisory Committee (EMAC). Both the regulators and EMAC recognized the unique challenges for environmental monitoring of new technologies in the Minas Passage because of the high currents and tides. As a result, an "adaptive management" approach for the EEMP was agreed to by all parties, so that the monitoring programs continue to adapt based on the lessons learned as the project proceeds.

Risks should be assessed and managed in their total context. One good argument for consolidating environmental assessment in marine energy legislation is that it could explicitly take into account the relative merits of all energy sources. Our present electrical generation does significant harm to the environment – contributing nearly half the total greenhouse gas emission in the province, and other pollutants such as mercury and sulphur. There is no "do nothing" option for Nova Scotia because we are already doing something.

This is not an argument to substitute one form of environmental degradation for another. Indications are that marine energy can be managed in a way that has significantly less impact than conventional energy sources. So the threshold test for alternative sources of electricity should not be, as the (otherwise excellent) discussion paper says, "no adverse environmental effects." No human activity meets this test and if legislated we would have to continue to burn coal.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

FORCE's environmental effects monitoring and research programs will contribute to understanding the environmental effects of TISECs. And of course they are small parts of research going on world-wide as well as in the Bay of Fundy – much of it with the support of the government through the offshore research associations. We urge the government of Nova Scotia to continue to support marine energy research and to develop the capacity in the region to disseminate and assimilate this data and knowledge so regulators and the public make informed choices along what promises to be a long road.

PARTICIPATION IN MARINE RENEWABLE ENERGY DEVELOPMENT

FORCE has established a community liaison committee (CLC) which includes private individuals, municipal leaders, and fishers from the local area, and Mi'kmaq representatives, and meets twice yearly in Parrsboro.⁴ FORCE also engages the Mi'kmaq and fishers directly and through the EMAC. We have held numerous public meetings, most recently to explain our plans for a transmission line (Parrsboro August 5, 2010). We are in the process of developing interactive displays for our interpretive centre at our site and our website. We will continue to seek ways to involve and inform communities and stakeholders.

Both federal and provincial environmental review processes already require project proponents to engage stakeholders and communities. If a social and environmental review process is to be included in marine energy legislation it must displace, not duplicate the generic processes.

We do not believe the details of community engagement should be specified in legislation but rather left up to the regulators and developers to tailor to the specific project. That is, the answer to how "community interests (should) be considered....by government and regulators?" is that it depends on the project and the community or communities affected.

TREATING COMPETING USES FAIRLY

The first principle should be to treat the ocean fairly. The second is to optimize the public benefit from ocean uses in a way that is consistent with the first principle.

If marine energy is to play a role in Nova Scotians meeting their GHG targets it must be treated as a desirable user of ocean resources and not as an intruder simply because it is new. That is, marine energy must have a "right to be there" too.

There should be two separate steps: the first is resource allocation and the second is compensation for economic loss.

⁴ See <http://fundyforce.ca/committees> for more information on our Environmental Monitoring Advisory Committee and Community Liaison Committee including reports and membership.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

Competing uses should be shaped to accommodate each other to the extent possible⁵ and then rights allocated in accordance with the optimal public benefit. Incumbency and reliance may be relevant at the compensation stage but not the allocation stage.

THE OPPORTUNITIES

Because this is an emerging technology facing a great many challenges the opportunities are indistinct and the timing uncertain so care must be taken not to treat an unknown egg as a golden goose.

Marine renewable energy costs more than coal today and, while we believe it is inevitable that coal will cost more than coal today, today is when the decisions that can make marine energy competitive begin to be made.

Under-priced carbon and the advantages of incumbency it enjoys temper the opportunities marine energy can offer. Unlike the carbon world where there are excess profits to be recovered through royalties, taxes, levies, and preferential benefits, the marine sector needs support if it is to advance here in Nova Scotia and Canada. Without support – in R&D, infrastructure, and price – that day will be much further off, and the economic opportunities will belong to others more committed to the pursuit.

BENEFITS

Marine energy offers benefits. Attempts to impose benefits programs can be counterproductive and should be carefully considered because:

1. Marine energy will not have excess profits for many years to come so a transfer to some Nova Scotians will come from all Nova Scotians – taxpayers or ratepayers or both;
2. Competing sources of electricity, such as coal-fired generating plants, were built without regard to community benefits and often confer community detriments without compensation;
3. All Nova Scotians benefit from the reduction of GHG emissions and development of a secure energy source.

CLEAN ENERGY POTENTIAL

There is no standard measure of the kinetic energy resource in the Bay of Fundy. Estimates range from 300 MW to 8,000 MW and no one knows how much energy may be safely extracted.

The clean energy potential can be achieved most cheaply and with the lowest economic risk if we wait for others to perfect the technologies and then, when we are sure they work safely, purchase them. There

⁵ For example, FORCE maintains a fishers contact group and adjusts its members' activities whenever possible to avoid interference with the fishery. For example FORCE's submarine cables will be installed following closure of the spring/summer 2011 lobster season.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

will still be work locally maintaining the sites but opportunities that can accrue to early entrants will have been lost. FORCE is one indication that the governments of Nova Scotia and Canada have decided to seek early entrant benefits as have FORCE's members.

ECONOMIC OPPORTUNITIES

Economic development strategies should change over time according to circumstances. The best strategy at this stage of marine energy technology is to develop a world-leading project and that requires the best components at the best prices the world has to offer.

This is less about legislation than about sound policies and managing expectations.

FORCE has a role in developing economic opportunities for Canadians, and Nova Scotians in particular. To date FORCE has sourced all its goods and services from inside the Province except cable manufacture. This was not the result of a buy Nova Scotia policy but because what we needed was here and was competitive. But this sector is so young that it must have access to the best technologies and services at the best price the world can offer if it is to develop in Nova Scotia.

FORCE was created to encourage competition in order to hasten innovation. It does not pick a winning technology but provides opportunities to demonstrate a variety of technologies. Protectionist measures would defeat this strategy. Nova Scotia's economic strategy should instead seek areas of competitive advantage in marine energy. Local preferences will only delay projects and increase costs – a dangerous strategy when innovation is required above all else; and one that would justify barriers against our potential exporters.

TISECs require a suite of technologies and techniques, not just turbines, each of which can provide an economic opportunity for Nova Scotians and Canadians. There are export opportunities associated with things we have already done: finding and assessing "hot spots"; establishing environmental monitoring programs; fabrication; and TISEC deployment. FORCE has utilized skills and tools that were developed for fishing, offshore petroleum, electrical and civil engineering, and government and academic research. Next summer International Telecom, a Canadian company with world-wide operations, will marshal its facility in Halifax to lay four 34.5kV submarine cables at our site.

Because the worldwide potential for marine energy is so great, the Nova Scotia government should continue to seek ways to support development of a local supply chain that can compete world-wide.

A good way to do this is by encouraging research. We are only beginning to tap Atlantic Canada's formidable engineering and marine research and service capacities to marine energy. During this stage of the development this cost must fall to governments. A great deal of work is being done and efforts by **OEER | OETR** and **FERN** (and more recently FORCE) to coordinate the efforts are significant and a step in the right direction. But more will be needed if Nova Scotia and Canada are to develop high value goods and services for the world market.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

GRID INTERCONNECTION

Intermittent energy – even predictably intermittent energy such as tidal power – is best utilized as part of a large supply/demand pool. It is to everyone’s advantage to have a strong, interconnected regional transmission system – the broader the market, the better it can balance each partner’s intermittent sources, and the more viable each partner’s renewable projects become. Border controls and constrictions will delay marine energy development.

RIGHTS ALLOCATION GENERALLY

When marine energy technologies reach a mature, commercial stage the development framework used for offshore petroleum (where blocks are offered competitively, exploratory permits awarded which include rights to explore and, if desired, obtain a production authority and lease) might be suitable. An auction has the twin benefits of allowing government to obtain the present net value of the resource *in situ* while allowing developers to pace their investment and protect the real value their efforts to identify and develop it.

But the petroleum analogy is not a good fit.

For one thing marine electricity rights must be adapted to the more rigid electricity market and infrastructure.⁶ And it may be difficult to define the extent of the “exploratory” rights in ocean energy. The paper suggests an R & D phase where “pre-commercial” technologies are tested for survivability and so on. This phase, it is suggested, would extend to placement of small arrays.

It is unlikely there will be crisp lines between exploratory, “R & D”, and commercial phases in marine energy as there is in the petroleum sector.

Demonstration facilities such as FORCE aside, marine energy deployment costs are so high relative to payback that developers are unlikely to deploy even one device unless they are confident they can develop a field around it. One device would not justify a submarine cable and substation. So it may be preferable to issue “all in one” leases which confer the right to produce and sell electricity at certain levels within certain specified years. Regulatory approvals such as environmental and safety matters would be dealt with separately and would have the potential to stop the project or slow it without directly affecting the lease. They would affect the lease only to the extent they prevent the lessee achieving its stated projected targets – which in the worst case would lead to forfeiture.

TENURE AT FORCE

⁶ If they are to have value marine energy rights will have to be issued with a power purchase agreement through the Renewable Electricity Administrator.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

There may be four rights holders at FORCE when this legislation comes into force. There is likely to be at least one community-led small scale tidal energy development elsewhere as well. The four at FORCE will have gone through a competitive process and obtained a right to occupy a berth for up to four years. The question is whether that is all they will be entitled to or whether they enter the legislative regime with transitional rights in recognition of the risk and effort associated with introducing new technologies in a new environment. It is really for the individual developers to make a strong case for special transitional rights but the legislation should allow them the opportunity when the time comes. FORCE suggests the following as worthy of consideration:

- The value of efforts to introduce a new and unproven technology in an unknown legal regime over those who arrive later ought to be recognized.
- The next stage of TISEC development is array testing and demonstration.
- FORCE's cables will be capable of four small arrays producing up to 64MW continuous power and the rest of its infrastructure can be upgraded to that level with relatively little waste and expense.
- Four single device demonstration berths are not likely to be required in the long term at FORCE and FORCE may not be required at all if TISECs develop quickly. However the facility will become a significant advantage to pre-commercial and commercial development in such a circumstance.⁷
- The act should respect prior rights granted by the Province so berth holders transition to the new regime at an appropriate place on the track to commercial development. This would encourage current berth holders to utilize the infrastructure purchased largely with public funds.
- This would not remove berth holders from regulatory supervision, simply the need to re-start tenure processes.

We do not have a specific recommendation but government may find it useful to have the ability to designate areas such as FORCE as special development areas where the legislative scheme may be amended by regulation so that pre-commercial development rights may be tailored to the unique circumstances of the berths at FORCE. We do not suggest that environmental or health and safety regulations be relaxed. The special development area would be in respect of tenure only.

SUMMARY

1. Marine energy is free but converting it to electricity is not.

For the foreseeable future, the cost to generate electricity from marine energy will be significantly higher than fossil fuels; to proceed, it will require subsidy, specialized pricing, or both. Provision should be made for the Crown to recover excess economic rents but it will be important to manage expectations of both the public and developers in this regard.

⁷ FORCE as a not for profit would presumably divest itself of the assets and be wound up.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

2. Projects should be evaluated in the largest context including environmental and social effects of not proceeding.

Existing generic environmental legislation can accomplish this but will require the Nova Scotia government to continue to show strategic and regulatory leadership.

3. Marine Energy legislation should do what it must do with clarity and then it should enable adaption and adoption of complementary measures.

Energy legislation must establish

- root of title to the energy and site,
- means to assign exclusive rights to developers including the right to sell electricity
- resource conservation rules and tools.

4. Efforts to consolidate environmental and resource allocation jurisdictions should not interfere with the essential work of either the energy legislation or the generic legislation.

Marine energy justifies environmental assessments that explicitly balance other possible energy sources since it is intended to displace fossil fuels and will compete with other ocean uses. Energy legislation should ideally create specialized regimes to regulate environment and occupational health and safety but the level of project activity would have to justify the administrative burden and there should be a demonstrated case for greater efficiency or effectiveness than can be achieved through non-legislative means such as coordination or collaboration. Don't give up on collaboration.

5. Resource legislation is, first and foremost, an exercise of Nova Scotia's crown ownership rights so the geographic extent of the Province is the foundation.

The disputed area of the offshore is seaward of the Bay of Fundy. Initiating negotiations with Canada over the "offshore area" as defined in petroleum legislation could stifle federal cooperation in other areas of the offshore. The act should enable joint administration of the disputed area but the Province should proceed carefully.

A credible marine energy regime in undisputed areas of the province may be the strongest argument for federal/provincial cooperation in the disputed areas.⁸

6. The government should resist efforts to impose import and export restrictions on the marine energy sector.

⁸ It may be possible for Nova Scotia to claim marine energy from a disputed area of the offshore as it enters an undisputed part of the province as "arise" in the province. Section 109 of the Constitution Act, 1867 (formerly the British North America Act) refers to provincial property in mines, minerals, and royalties in the province or arising in it. It has been argued that this is the basis for the Province continuing to collect royalties from coal mined in the Sydney coal fields after they had been found to be outside the province. The argument could be adapted to converted marine energy.

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca

The technologies and techniques that will eventually make up the tidal energy sector will be extensive and many will offer export opportunities for Nova Scotians. Economic opportunities are already accruing because Nova Scotia is competitive in many of the required goods and services. It is better to encourage the first project using the best inputs regardless of origin.

Artificially increased costs are effectively a tax on renewable energy at a time when it requires subsidies. Local preferences increase costs (otherwise they aren't doing their job) and these costs would be passed to electrical consumers, which would reduce Nova Scotia's overall economic competitiveness.

Thank you for this opportunity. Just as the technology is in its early stages so is some of our thinking. If there are questions about this paper or you feel further discussion would be helpful we certainly share that view. Our intention is to be helpful so please do not hesitate to contact the undersigned.

Sincerely,

Douglas J Keefe

Douglas J Keefe QC, Executive Director, FORCE

6350 York St. Halifax, NS B3H 2K5. 902.431.6530

Email: Doug.Keefe@fundyforce.ca Website: fundyforce.ca