

Going with the Flow: Tidal Regulation in Atlantic Canada

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Increased demand for renewable energy has led to an interest in the immense potential for tidal energy development in Atlantic Canada. Unlike the sun or the wind, tides are predictable and easier to integrate into existing power distribution systems.¹ However, the powerful tides have not made it easy for baseline data collection or technology testing.² The many unknowns combined with a multitude of stakeholders and government jurisdictions have led to questions on how to adequately and effectively regulate tidal development. It has been said that “tide and time wait for none” are regulators doing enough to keep up with the flow?

TIDAL POWER GENERATION

There are two main types of tidal power generation: tidal range and in-stream. A tidal range system generates power through the difference in the height of water and can be in the form of a dam, barrage or lagoon.³ In contrast, in-stream tidal energy is generated by the open flow of water through turbines.⁴ In-stream turbines can be installed one at a time and are easier to remove than tidal-range barrages.⁵ The Fundy Ocean Research Center for Energy (FORCE) has secured multiple berths located in the Minas Passage on Nova Scotia’s Fundy Coast in which developers can test their in-stream turbines. These berths have created international interest in tidal energy development in Atlantic Canada.

WHO’S IN CHARGE?

It may be surprising to learn that maritime boundaries in Atlantic Canada are not clearly defined. This includes federal-provincial as well as interprovincial boundaries.⁶ Even within provincial waters, both federal and provincial governments have jurisdiction.⁷ Municipal governments may also require certain permits and licenses for tidal power generation. Within the multiple levels of government, certain environmental reviews seem to overlap. It is only in recognizing the perspective and expertise of each stakeholder, whether the various levels of government or other organizations, that tidal power regulation can be purposeful and effective.

Federal Regulation

Although provincial governments have jurisdiction over power generation facilities, there are many aspects of tidal power which fall under federal authority. The legislation listed in Table 1 provides a general overview of the types of federal requirements that would apply to a tidal project. For example, any in-stream tidal project of 50 MW or more would trigger an environmental assessment under the *Canadian Environmental Assessment Act, 2012* (“CEAA”).⁸ This environmental assessment may be completed under the auspices of a “Responsible

¹ Acadia Tidal Energy Institute, *Community and Business Toolkit for Tidal Energy Development* (2013) at 13.

² *Ibid* at 82; “Failed tidal turbine explained at symposium”, *CBC News* (July 8, 2011).

³ *Supra* note 1 at 11-13.

⁴ *Ibid*.

⁵ Fundy Force, “Barrage vs In-stream”, online: Fundy Force <<http://fundyforce.ca>>.

⁶ Meinhard Doelle et al, “The Regulation of Tidal Energy Development Off Nova Scotia: Navigating Foggy Waters” (2006) 55 UNBLJ 27 at 34-41.

⁷ *Ibid* at 35.

⁸ SC 2012, c 19; *Regulations Designating Physical Activities*, SOR/2012-147 at 2-3.

Authority” such as the National Energy Board.⁹ Smaller tidal projects may also require environmental assessments under the *CEAA* where there is significant public concern or environmental effects.¹⁰ Additionally, tidal projects would require permits such as those required under the *Fisheries Act*¹¹ and the *Navigation Protection Act*¹².

Table 1: Federal Regulatory Overview	
<i>Canadian Environmental Assessment Act, 2012</i>	Environmental assessment if over 50 MW
<i>National Energy Board Act</i>	Approval for inter-provincial power lines
<i>Navigation Protection Act</i>	Permit – watercourse alteration
<i>Species at Risk Act</i>	Permit – interference with species at risk
<i>Migratory Birds Convention Act</i>	Permit – interference with migratory birds
<i>Fisheries Act</i>	Permit – interference with fish
<i>Oceans Act</i>	Ocean management
<i>Canada National Marine Conservation Areas Act</i>	Protection of designated conservation areas
<i>Canada Shipping Act, 2001</i>	Shipping requirements
<i>Canadian Environmental Protection Act</i>	Permit – ocean disposal

Under the *CEAA*, consultation and cooperation between departments and with other levels of government is required as part of the environmental assessment.¹³

Provincial Regulation

In Atlantic Canada, each province has chosen a different approach to tidal power development and regulation. In 2012, the PEI Energy Commission determined that tidal development costs could be “prohibitively high” for the province, although it remained open to future reassessment.¹⁴ Similar conclusions were reached in Newfoundland & Labrador.¹⁵ In the meantime, the province is willing to share its knowledge and experience in dealing with hostile environments.¹⁶ In New Brunswick and Nova Scotia, the powerful tides of the Bay of Fundy have led to a more active involvement in tidal power development.

⁹ *CEAA*, *supra* note 8, s 15.

¹⁰ *Ibid*, s 14(2).

¹¹ RSC 1985, c F-14, s 35.

¹² RSC 1985, c N-22, s 5.

¹³ *Ibid*, s 18.

¹⁴ PEI Energy Commission, *Final Report: Charting Our Electricity Future* (Sept 2012) at 40, 60.

¹⁵ E4tech, *Newfoundland & Labrador Energy Innovation Roadmap: Priority Identification* (Aug 2010), p 13.

¹⁶ *Ibid*.

New Brunswick

The Province of New Brunswick has required that, by 2020, 40% of in-province electricity sales must be from renewable resources.¹⁷ In support of tidal power development, the Province created the *Allocation of Crown Lands for Tidal In-Stream Energy Conversion Projects* (“NB Policy”) in 2011 which replaced a prior interim policy.¹⁸ Under the NB Policy, different regulation parameters would be applied to each stage of the project.¹⁹ These projects would also be subject to provincial legislation as shown in Table 3. Since the creation of the NB Policy in 2011, tidal power development in New Brunswick has remained stagnant over recent years. However, a recent summit held in Saint John may create a surge in interest in this type of energy generation.²⁰

<i>Clean Environment Act</i>	Environmental assessment if power facility over 3 MW
<i>Electricity Act</i>	Application for power facility
<i>Crown Lands and Forests Act</i>	License/leases for Crown land
<i>Heritage Conservation Act</i>	Protection of historic sites
<i>Fish and Wildlife Act</i>	Protection of fish and wildlife
<i>Species at Risk Act</i>	Permit – interference with species at risk
Allocation of Crown Lands for Tidal In-Stream Energy Conversion Projects	Guideline - tidal regulation
Submerged Land Policy	Guideline - underwater structure regulation
Coastal Areas Protection Policy	Guideline - coastal protection

Nova Scotia

Similar to New Brunswick, the Province of Nova Scotia has also set a goal of 40% of renewable energy by 2020.²¹ However, contrary to its neighbouring province, Nova Scotia has forged ahead with tidal-specific regulation.²² The regulations under the Nova Scotia *Environment Act* and the *Electricity Act* set out environmental requirements based on the size of the tidal project.²³ The Province has also established a guaranteed feed-in tariff (“FIT”) with the province-wide electrical utility for commercial development²⁴ and community-owned projects (COMFIT)²⁵, although the latter has since been closed because of high costs.²⁶ Nova Scotia also recently

¹⁷ *Electricity from Renewable Resources*, NB Reg 2015-60, s 3(1).

¹⁸ Government of New Brunswick, *Allocation of Crown Lands for Tidal In-stream Energy Conversion Projects* (2011).

¹⁹ *Ibid* at 28-20.

²⁰ Government of New Brunswick, *Tidal Energy Opportunities Summit to be held* (April 26, 2016).

²¹ *Renewable Electricity Regulations*, NS Reg 155/2010, s 6A.

²² Robert O. Fournier, *Marine Renewable Energy Legislation: A Consultative Process* (2011) at 16.

²³ *Environmental Assessment Regulations*, NS Reg 26/95; *supra* note 21.

²⁴ Feed-In Tariff.

²⁵ Community Feed-In Tariff.

²⁶ *Supra* note 21, s 19, 21; Government of Nova Scotia, *COMFIT*, online : <[http:// energy.novascotia.ca](http://energy.novascotia.ca)>.

introduced the *Marine Renewable-energy Act* (“MRA”) (not yet in force).²⁷ The MRA has provided a legislative framework for a tidal project permit system. An overview of Nova Scotia legislation applicable to tidal projects is included at Table 3.

<i>Environment Act</i>	Environmental assessment if over 2MW
<i>Marine Renewable-energy Act (not yet in force)</i>	Tidal project permit
<i>Electricity Act</i>	Tidal project approval
<i>Crown Lands Act</i>	Leases/permits for Crown land
<i>Special Places Protection Act</i>	Protection of historic sites
<i>Wilderness Areas Protection Act</i>	Authorization of the Minister required
<i>Endangered Species Act</i>	Permit - interference with endangered species
<i>Beaches Act</i>	Permit – structures located on the beach
Statement of Best Practices for In-Stream Tidal Energy	Guideline - tidal regulation

The first major in-stream tidal project in Atlantic Canada was the installation of the FORCE demonstration site in the Minas Passage. For the project’s environmental assessment, both the federal and provincial governments agreed to collaborate through a “one-window” joint review.²⁸ The federal *CEAA* and Nova Scotia’s *Environment Act* have specific provisions allowing collaboration between governments.²⁹ The one-window process allows for more certainty on behalf of the tidal developer that all applicable permits and licences have been requested, as well as reducing time and resources for the inter-governmental review where certain sections of review would have overlapped if done separately. The provision for a permanent tidal-specific one-window committee has since been added to Nova Scotia legislation.³⁰

MARINE AREA PROTECTION

Marine areas in Atlantic Canada are home to diverse inhabitants and activities. Certain areas are designated for protection through federal legislation, such as the *Oceans Act* or the *Species at Risk Act*, as well as provincial legislation. Protected areas may also be designated by organisations, for example, the UNESCO Fundy Biosphere Reserve. Aside from protected areas, a potential tidal project may come into conflict with fishing rights, navigation, aquaculture installations, recreational activities or other energy projects.³¹

Different approaches have been brought forward to minimize any potential conflicts. Under the NB Policy, a developer must ensure that the proposed project does not encroach on other activities and is located at least 100 m away from any designated area. The NB Policy also

²⁷ SNS 2015, c 32 (not in force).

²⁸ AECOM, *Fundy Tidal Energy Demonstration Project Volume I: Environmental Assessment* (2009) at 7.

²⁹ *CEAA*, *supra* note 8, s 18; *Environment Act*, SNS 1994-95, c 1, s 47.

³⁰ *Supra* note 21, s 35.

³¹ AECOM, *Tidal Energy: Strategic Environmental Assessment (SEA) Update for the Bay of Fundy* (2014) at 125.

limits tidal projects to a maximum output of 7.5 MW in the “Resource High Activity Area” located around Grand Manan Island. In contrast, the province of Nova Scotia has established a list of Marine Renewable Electricity Areas (“MREA”) which are the most suitable for tidal projects.³² Any addition to the list must undergo a public consultation process and environmental assessment.³³ Additionally, all MREA’s are to be reviewed within 20 years to minimize any impact on other marine activities.³⁴

There have also been concerns expressed over the scope of environmental reviews in relation to protected areas. Existing environmental review classifications are based on the size of the tidal project.³⁵ However, this factor does not account for the size of the marine area or the proximity to protected areas.³⁶ Additionally, in-stream tidal projects can easily be expanded and it is important that any initial environmental review take this into consideration.³⁷ Further, multiple turbines or projects in one area could create cumulative effects over time.³⁸ Finally, there are also natural changes which occur in the marine environment.³⁹

RISK ASSESSMENT AND MANAGEMENT

In 2011, a series of models were created to study the environmental effects of offshore renewable energy which included in-stream tidal energy.⁴⁰ Although these models provided light on the types of environmental risks, there are still many unknowns related to risk assessment and management in tidal projects.

Many environmental legislative regimes specify a precautionary approach with regard to environmental risks.⁴¹ However, there is certain knowledge that will only be gained when the technology is tested in real circumstances. This type of risk mitigation is known as an adaptive approach.⁴²

In July 2016, the Fundy Inshore Fisherman’s Association launched a judicial review of the Nova Scotia Minister of the Environment’s decision to allow deployment of the Cape Spear Tidal

³² *Supra* note 27, s 13-16.

³³ *Ibid*, s 20.

³⁴ *Ibid*, s 23.

³⁵ *Regulations Designating Physical Activities*, *supra* note 8, s 2-3; *Environmental Assessment Regulations*, *supra* note 23; *Environmental Impact Assessment Regulation*, NB Reg 87-83.

³⁶ Acadian Estuarine Center for Research (ACER), *A Framework for Environmental Risk Assessment and Decision-Making for Tidal Energy Development in Canada* by Lisa Isaacman et al (2012) at 19-20.

³⁷ *Ibid* at p 18.

³⁸ *Ibid*; *supra* note 28 at 204-205; *supra*, note 22 at 61.

³⁹ *Supra* note 36 at 8; *supra* note 1 at 83.

⁴⁰ Fisheries and Oceans Canada, *Pathways of Effects for Offshore Renewable Energy in Canada* by Lisa Isaacman et al (2011).

⁴¹ *CEAA*, *supra* note 8, s 4(2); *Environment Act*, *supra* note 29, s 2(b)(ii); Justin G. Fisch, *Tidal Energy Law in Canada: Hindering an Untapped Potential for International Primacy* (2016) at 54.

⁴² *Supra*, note 36 at 9-10; Fisch, *supra* note 41 at 54.

Venture at the FORCE test site.⁴³ The judicial review application concerns, among others, the applicability of the precautionary and adaptive management approaches within the current regulatory system.⁴⁴ This case illustrates the difficulties with risk assessment in tidal project and also the importance of consultation. Many stakeholders will be closely watching the outcome of the judicial review application scheduled to be heard in early 2017.

FUTURE FRAMEWORK

It is generally agreed that tidal energy is more environmentally viable than traditional energy sources.⁴⁵ However, the many unknowns associated with new technology and its effects on the environment raise many questions and concerns. This is where effective regulation can bridge the gap between emerging technology and renewable energy goals. Regulation must ensure that important water resources are protected while also encouraging renewable energy initiatives.

Going forward, an effective regulatory framework will involve continued collaboration between all levels of government and other stakeholders. The province of Nova Scotia has already specifically provided for tidal development in its legislation, whereas the province of New Brunswick may be left behind when commercial tidal development becomes reality. Although it is important to establish a regulatory framework, it should be periodically assessed as technology advances. Atlantic Canada has the opportunity to set an example in tidal energy development and this includes providing a framework to ensure minimal environment impact.

⁴³ *Bay of Fundy Inshore Fisherman's Association v Nova Scotia Minister of the Environment* [No 453771], Amended Notice of Application for Judicial Review (July 25, 2016); Letter from the Minister of the Environment to FORCE (June 20, 2016).

⁴⁴ *Ibid.*

⁴⁵ Fisch, *supra* note 41 at 55.