Provincial Response

to the Update to the Bay of Fundy Strategic Environmental Assessment and the SEA for the Cape Breton Coastal Region inclusive of the Bras d'Or Lakes

May 2014



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1 Introduction

The Government of Nova Scotia is pursuing an innovative approach to energy. Harnessing the power of the tides to generate clean and reliable energy for Nova Scotia is becoming a reality. Nova Scotia has a strong ocean technology and service sector, a concentration of research universities, and some of the highest and most powerful tides in the world, resulting in a unique and competitive advantage in the tidal energy sector. Following in its commitment to pursue an incremental approach to tidal energy development that is well informed by robust research and consultation, the government commissioned an update to the 2008 Strategic Environmental Assessment (SEA) for the Bay of Fundy. Additionally, an SEA for the Cape Breton Coastal Region and Bras d'Or Lakes has been completed in preparation for an in-stream tidal energy development proposed for that region but still in the planning stages.

The Strategic Environmental Assessments form the first step in deciding how and under what circumstances in-stream tidal energy will occur in each area under study. In Nova Scotia, several recent advancements in tidal energy have generated discussion across the province on the opportunities and challenges associated with responsibly developing Nova Scotia's immense in-stream tidal energy resource. These include the creation of a Developmental Tidal Feed-in-Tariff (FIT), the award of two berths at the Fundy Ocean Research Centre for Energy (FORCE) resulting in proposals for a full complement of devices at the site, the holding of the inaugural Tidal Energy Research Symposium and Forum (2013), and the completion of both the Cape Breton SEA and the update to the Bay of Fundy SEA. The government is confident in its approach to in-stream tidal energy development as outlined in the *Marine Renewable Energy Strategy (2012)*.

1.1 What is a Strategic Environmental Assessment?

SEAs serve as a way to integrate environmental considerations early in the policy development process to proactively identify knowledge gaps and policy barriers, and address potentially adverse environmental and socioeconomic effects arising from a specific development or shift in policy. SEAs also allow for a broader consideration of possible impacts of a policy or, in this case, the development of an industry such as the consideration of cumulative environmental effects.

The Government of Nova Scotia has adopted SEAs as the tool for developing a base of knowledge and to facilitate integrated decision-making on in-stream tidal energy development. The Nova Scotia SEA process places a particular emphasis on early stakeholder consultation and engagement and future-oriented approaches to ensuring that potential impacts to the natural and human environment are considered. In 2007, the Government of Nova Scotia commissioned the Offshore Energy Environmental Research Association (OEER) (now the Offshore Energy Research Association (OERA)) to carry out an SEA focusing on Nova Scotia's Bay of Fundy, an area known for its immense tidal energy potential. This assessment focused on offshore renewable energy development in the area and culminated in a report outlining strategic recommendations for action. Overall, this process provided the Nova Scotia government with a path forward in developing its marine renewable energy resource.

1.2 Why are we doing a follow up to the 2008 SEA, and why are we investigating Cape Breton?

Since the release of the 2008 SEA for the Bay of Fundy, the tidal energy industry has evolved globally, as well as in Nova Scotia. Tidal-energy devices are being deployed around the world, and there is a focus on installing arrays. Consequently, the government commissioned the Offshore Energy Research Association (OERA) to complete an update to the 2008 Bay of Fundy SEA, and an SEA for the Cape Breton Coastal Region inclusive of the Bras d'Or Lakes. The need to examine Cape Breton arose as a result of the government's award of two in-stream tidal energy projects in the Barra Strait and the Great Bras d'Or Channel as part of the Community Feed-In Tariff (COMFIT) Program. By commissioning an SEA for Cape Breton, the government is ensuring responsible development of tidal resources in that region. The development of both sites in Cape Breton is still at a very early stage, and the SEA helps to identify issues in advance of those projects moving forward in those areas. The two primary objectives of the Bay of Fundy SEA Update and the Cape Breton SEA were to:

1. Describe the contemporary state of the tidal energy industry both regionally and globally; and,

2. Present the current scientific and community knowledge base on the impacts of marine renewables in the Bay of Fundy and the Cape Breton Coastal Region, including the Bras d'Or Lakes.

1.3 The Strategic Environmental Assessment Process

Each SEA comprised two phases. The first phase was the development of a Background Report consisting of a review of the current science, policy, and local knowledge related to marine renewable energy (MRE) technology and development, ecosystem components —including fisheries—as well as socio-economic issues, such as potential employment and industry development opportunities, in each of the areas under study. The second phase involved the development of a Community Response Report, consisting of input drawn from a consultative process discussing the findings of the Background Report completed for each region with community, industry, and government stakeholders including a distinct process to engage the Mi'kmaq of Nova Scotia. In addition, a Stakeholder Roundtable was established for each SEA area, consisting of Mi'kmaq, fishers, local government, academics, MRE industry representatives, and regulators to assist in providing input to the background report, but also to provide guidance on stakeholder consultation and to bring their unique perspectives to the SEA.

2 Recommendations

The government is pleased to accept the recommendations presented in both the Bay of Fundy SEA Update and the SEA for the Cape Breton Coastal Region, with the recognition that both documents are forward-looking and, as such, not all recommendations need to be addressed at this time.

The Bay of Fundy SEA Update and the SEA for the Cape Breton Coastal Region and Bras d'Or Lakes have provided a wide array of recommendations related to how and under what circumstances MRE should occur in both regions. Both sets of recommendations carry common themes, specifically:

- A need for consistent or expanded monitoring;

- A need to continue ongoing research in key areas of environmental data collection and engineering;

- Support for ongoing engagement and consultation with stakeholders and the Mi'kmaq of Nova Scotia; and,

- Exploration of economic opportunities to become involved in the burgeoning in-stream tidal energy industry.

While the Bay of Fundy SEA was focused on how things have changed since the 2008 SEA, the Cape Breton SEA was primarily focused on identifying what needs to be understood prior to development of in-stream tidal energy in the Cape Breton context.

Many of the recommendations made in each SEA relate to the Government of Nova Scotia's overall approach to tidal energy, including research support, regulatory frameworks, consultation and engagement, and industry development. Both SEAs reconfirmed the government's incremental and adaptive approach to in-stream tidal energy. Stakeholder consultations revealed some concerns about developments in the Bay of Fundy and Cape Breton, related to whether or not there was sufficient knowledge on tidal in-stream energy converters (TISECs) and their operation to inform the regulatory system.

There are fundamental differences between the Bay of Fundy and the Cape Breton regions, but ultimately the need for a coordinated multi-stakeholder approach to tidal energy research and regulation is essential for the responsible and sustainable development of the resource and the fostering of a unique made-in-Nova-Scotia industry. As the Cape Breton SEA was the first assessment of MRE development in that area, many of the recommendations for Cape Breton were based on a need for more information and investigation of the environmental, social, and economic characteristics of the region. This differs from the Bay of Fundy Update in that much of that work has been undertaken or is currently underway. The Cape Breton region also differs significantly from the Bay of Fundy region in terms of its much smaller resource potential. While it is accepted that Cape Breton will likely never have the same level of tidal energy development as the Bay of Fundy, it does offer opportunities for testing and research of smaller-scale deployments.

The following section addresses the government's approach to MRE with responses to recommendations from each of the SEAs. Responses are divided among the five key theme areas of the SEAs: monitoring, research, engagement and consultation, economic opportunities, and tidal-range projects.

2.1 Monitoring

SEA Recommendation: The need for extensive and ongoing monitoring of a number of environmental, marine life and human activities in and around TISEC developments has been identified in both SEAs. Specific areas to focus monitoring activities on include; fish behaviour, marine mammals and birds as well as electromagnetic fields (EMF) and noise from TISEC projects. In addition, it was suggested that cumulative effects of TISECs be explored through hydrodynamic modelling.

Overall, emphasis was placed on the need to support research and information sharing and establish suitable protocols to capture all the necessary data in a timely manner to ensure the responsible development of in-stream tidal energy in Nova Scotia. At the federal level, Fisheries and Oceans Canada may require monitoring of specific projects if, after undergoing regulatory review, it is determined that a Fisheries Act Authorization is required. Monitoring requirements will depend on potential risks and uncertainties identified during the review.

As outlined in the *Marine Renewable Energy Strategy* (2012), the government has determined that tidal energy will be developed in an incremental, adaptive manner that protects the interests of all Nova Scotians. Effective monitoring is an essential component to adopting this approach. Both SEAs recognized the importance of monitoring and the need to take a generalized approach where knowledge is emerging on the impacts of in-stream tidal energy generation, and a more focused approach where more is already known. A significant point raised in the SEAs is that knowledge about the impacts of TISECs in the Bay of Fundy or the Cape Breton region cannot meaningfully progress until deployments occur.

The recommendations from the SEAs expressed a need to have operating TISECs to provide realistic scenarios under which to monitor impacts of EMF and noise among other potential effects from TISEC installations on fish behaviour, marine mammals, marine birds, as well as the need to increase the understanding of cumulative effects from TISEC projects.

The government is supportive of demonstrating and testing pre-commercial tidal technologies for the purposes of making improvements to environmental monitoring. Projects at the FORCE and Fundy Tidal Inc.'s COMFIT projects are enabling that work to take place.

As projects at FORCE and those of Fundy Tidal Inc. progress, the government will collect data and monitor effects of the technologies on the environment to ensure that knowledge regarding the impacts of in-stream tidal energy is enriched. An environmental monitoring programme has already been established at FORCE for which all demonstration projects at the facility will be required to participate. The projects being completed by Fundy Tidal Inc. will also be required to participate in an effects monitoring programme to be determined by the multiple regulatory bodies involved in reviewing the project proposals.

The government's approach corresponds to that taken by the Department of Fisheries and Oceans Canada, which also supports the use of an adaptive approach, one that incorporates and continually improves on policies and practices by learning from the outcomes of operational programs and regulatory decisions.

Nova Scotia continues to grow its knowledge base through memorandums of understanding (MOUs) with national and international organizations and institutions, supporting collaborations on monitoring research and technologies, at levels ranging from undergraduate to post-doctoral. OERA, in particular, plays a significant role in pursuing MOUs on research collaboration.

In addition, FORCE, with support from the Government of Canada, Encana, and private partners, is building the Fundy Advanced Sensor Technology (FAST) platform: a recoverable instrument platform designed to monitor and characterize the FORCE site that, in future, could be applied to other locations. Using a variety of onboard sensing equipment, the platform will enable the following:

- Operation and testing of multiple underwater sensing instruments
- New instrument improvements for success in high flow environments
- New Canadian expertise in site characterization, instrumentation, and deployment techniques
- New standards for high-flow turbine monitoring worldwide—a "black box" prototype for all tidal turbines.

2.2 Marine environment and marine life

SEA Recommendation: It is essential that marine habitat and life are sufficiently protected as MRE developments move forward. Fisheries and fish habitat are of central concern to the province from an environmental perspective, and for the economic, cultural, and heritage value they have for First Nations communities and Nova Scotians.

Through the SEAs, research funded through OERA, and other collaborative mechanisms such as the Federal-Provincial One Window Standing Committee on in-stream tidal energy, the

government is seeking to ensure that all reasonable steps are taken to protect and manage Nova Scotia's marine resources. The government also recognizes the need to ensure that experiential and traditional knowledge from groups such as the Mi'kmaq and fishers be taken into account as MRE projects advance. An example of this commitment is the use of Mi'kmaq Ecological Knowledge Studies (MEKS) to help inform tidal projects in advance of deployment, such as those done for the FORCE site and Fundy Tidal Inc.'s sites in the Bay of Fundy. An MEKS will be required as part of the permitting process for TISECs projects in the Cape Breton region.

2.2.1 Fish behaviour

Research funded through OERA is currently underway that uses hydroacoustic technology (electronic tagging of fish) to track migratory movement and behaviour of various fish species over a scale of kilometers. The study will collect data on several fish species of interest, including Atlantic sturgeon, striped bass, and others that migrate through the Minas Passage to assess the potential for environmental effects on fish from TISEC deployment. The data will be used as baseline information and, in future, will be analysed against new research data that will be collected following TISEC deployment in the Passage.

2.2.2 Marine mammals, birds and EMF and noise

Both the FORCE and in-stream tidal COMFIT sites are subject to environmental monitoring programs funded by proponents or supported by FORCE. Examples include marine mammal, fish, and bird movements through sites and their ability to avoid TISEC infrastructure and impacts of EMF on the behaviour and growth cycles of marine life. EMF and noise are important focal points for TISEC monitoring and research. Both the federal Department of Fisheries and Oceans and OERA have funded research on EMF and noise and their effect on underwater life that will inform the development of policy and permitting of in-stream tidal energy projects in Nova Scotia. Examples of research commissioned on marine mammals includes work assessing harbour porpoise activity in the Minas Passage in advance of TISEC deployment at FORCE to determine the potential risk for interaction with turbine infrastructure. The study collected useful information on harbour porpoise, but findings indicated that winter monitoring would also be needed to have a more robust baseline. That work is currently underway through funding from OERA.

2.2.3 Cumulative effects

The importance of understanding cumulative effects, in particular, when moving to arrays of TISECs, is echoed in both SEAs with emphasis on hydrodynamic modelling. The Department of Energy and the federal Department of Fisheries and Oceans both support the consideration of cumulative effects in regulatory decision-making.

Completed and ongoing research in the Bay of Fundy will help to establish a baseline from which regulators can seek to assess the cumulative effects of in-stream tidal installations; however, without actual deployments of TISEC devices all assessments of cumulative effects remain speculative. Federal and provincial regulators agree on using an adaptive management and an incremental-development approach to TISEC deployments. These management practices will inform decision-makers on when to slow development and gather more information. Many challenges still exist in hydrodynamic modelling for sites like those in the Bay of Fundy, but research will be ongoing. As hydrodynamic modelling methodologies and technologies advance, the government will revisit this recommendation.

2.2.4 Unacceptable levels of impact

The Bay of Fundy Update and the Cape Breton SEA both expressed concern over understanding what would constitute an "unacceptable" level of impact to critical biophysical processes and organisms from tidal energy development.

Each regulatory body involved with the marine environment has its own area of responsibility and criteria on what would be an unacceptable impact level. Under the Federal-Provincial One Window Standing Committee review process, each regulatory body will outline necessary studies and monitoring required for TISEC developments. This process recognizes that not all TISEC projects are the same and some may require special attention due to design, location, or scale-of-development. Should impacts move into the unacceptable range, projects will either have to adapt or, should the project developer be unable to remedy the situation within a set period of time, the project may be decommissioned. For example, the Department of Fisheries and Oceans has the authority to require the removal of a device in the event that impacts to fish and fish habitat are greater than predicted or if the work, activity, or undertaking contravenes federal legislation (such as the Species at Risk Act or the Fisheries Act) or, in the event that conditions of any potential Fisheries Act Authorization are not met. The government will continue to work towards refining understanding of the impacts of in-stream tidal energy to better inform regulatory decisions. The stakeholder forum, once it is established, will seek to work with stakeholder groups and the Mi'kmag to understand the impacts of TISEC deployments.

The government is currently developing a Statement of Best Practice (SOBP) for in-stream tidal energy development-and-operation that encompasses the necessary elements and overarching principles for an adaptive approach to the growth of the tidal industry in Nova Scotia and is an essential element to the success of this growing sector. The creation of the SOBP is an opportunity to develop an innovative tool to harmonize development and environmental interests that ensures the industry grows in an environmentally and socially responsible manner. This SOBP will provide a guide for developers, industry, regulators, and the public on how to best approach tidal energy development.

In addition, the government will continue to work collaboratively through MOUs with national and international regulators and researchers, and to work towards refining our understanding of the impacts of in-stream tidal energy through supporting technological innovation, improved monitoring methodology, and developing standards that are evidence-based.

2.3 Research

SEA Recommendation: MRE is an emergent industry and consequently research remains a focal point of all developments. One of the goals of the SEA process is to identify research needed for development to proceed with confidence.

Since 2008, research on in-stream tidal energy in Nova Scotia has been ongoing both in the natural and social sciences.

The potential effects of TISEC installations on physical processes (tidal currents, vertical mixing, and sediment dynamics) constitute a key area for continued and ongoing research. This information is important both for more accurate resource assessment and for modelling environmental effects.

Turbulence remains a major uncertainty in terms of how it will affect the TISEC infrastructure and how it may result in near and far field effects at installation sites.

The Bay of Fundy and Cape Breton SEAs suggest that there is a need to collect more information on those aspects of fish and fish habitat most likely to be disrupted by projects at FORCE and those at COMFIT sites, and that TISEC project developers should work with fishing groups to collect data for fisheries, as well as protocols for identifying and managing impacts.

2.3.1 Energy extraction

With the support of the government, OERA has completed a number of studies since 2008 to characterize the types of and potential effects of energy extraction and TISEC installations on physical processes. These include modeling studies to estimate the resource potential that could be safely and sustainably extracted from the Bay of Fundy; sediment modeling to assess the far field effects on the inter-tidal ecosystems; and turbulence and bottom-stress modeling, to name a few. This collective effort has contributed significantly to the body of knowledge of how the environment could possibly respond or be impacted by in-stream tidal power extraction. To date, data has been collected for the Digby Neck COMFIT projects for shorter time durations, typically one-month deployments using technology to measure currents and flow. There is strong merit to collecting data for longer time periods to build the datasets for use by various stakeholders to support decision-making regarding the COMFIT sites.

OERA projects, together with extensive studies undertaken by academia, government, and industry, both locally and nationally, have provided a suitable level of confidence, moving the industry closer to development. Based on the existing knowledge of environmental impacts, the tidal energy industry, taking an adaptive-management approach and with the commitment to continue environmental research and monitoring to support decision-making, could develop safely over time.

2.3.2 Turbulence

Research on turbulence is ongoing. Through strategic research collaborations initiated by the government, regulators and researchers will have access to domestic and international research that will advance understanding of the interrelationships between turbulence, the marine environment, and TISEC deployment.

2.3.3 Fisheries and fish habitat

Potential risks to fish and fish habitat that support fisheries will be evaluated as part of any Fisheries Act regulatory review process.

Fisheries and Oceans Canada currently maintains records of commercial fishing data. This data can be provided to external parties on request. Detailed information is best obtained through continual engagement of local fishers. Tidal-energy developers are strongly encouraged and, in some cases, required by regulators to engage with local fishers to exchange information and help address potential conflicts. All proposed deployments of TISEC devices are subject to review under the Fisheries Act, and impacts to fish and fish habitat, including potential impacts to productivity, would be evaluated as part of this review.

All TISEC projects would be expected to collect the necessary data and information to reasonably assess impacts to the local ecosystem, including fish and fish habitat. The government would expect project developers to work with local fishers and the Mi'kmaq to complete the necessary due diligence regarding fish habitat. At FORCE, a Community Liaison Committee has already been established to provide information on how projects at the facility are progressing and to keep a line of communication open with the local community, including fishers.

2.3.4 Marine benthos

Where pre-existing information is absent, the government will encourage all TISEC projects to engage in surveys of the marine benthos using the most appropriate method based on the scale of the project.

2.3.5 Heritage resources

Research is expected to be undertaken for each proposed project to determine the cultural or heritage significance of the proposed site. Upon initial analysis, any sites that may have cultural or heritage significance may require an environmental screening of the project, as deemed necessary by the Department of Communities, Culture and Heritage.

2.4 Engagement and consultation

SEA Recommendation: Engagement and consultation featured prominently in the recommendations from both SEAs. In particular, a need to engage on how TISEC devices may impact on other users of the marine environment and how to avoid or mitigate negative impacts, such as damage to fishing gear, was expressed. Coastal zone planning and marine spatial planning were highlighted as possible mechanisms that would both mitigate conflict, but also lead to a more streamlined and a less cumbersome regulatory process. There was interest in the potential spin-off and positive community development and economic opportunities arising from TISEC developments. In particular, focusing on increasing both understanding of TISEC technology and the economic opportunities they present for all communities in Nova Scotia was recommended. It was further recommended that, to the extent practical regulators tasked with engaging and consulting Mi'kmag communities should work with the Mi'kmag to determine the most appropriate consultation process—which may include the Kwilmu'kw Maw-klusuaqn Negotiation Office—other Mi'kmag organizations such as the Unama'ki Institute of Natural Resources and the Mi'kmaq Conservation Group may also provide assistance in the development of more effective information and education programs targeted for the specific interests and needs of Mi'kmag people.

2.4.1 Area use conflicts between users and Mi'kmaq concerns

The government will continue to consult on projects and decisions that may have any impact on Mi'kmaq rights.

The Department of Energy will continue to consult with the Mi'kmaq of Nova Scotia through the agreed Terms of Reference for Consultation process with respect to tidal energy development in Nova Scotia. This includes consultation with Mi'kmaq communities and the Assembly of Nova Scotia Mi'kmaq Chiefs, primarily undertaken with the Kwilmu'kw Mawklusuaqn Negotiation Office. Energy also undertakes formal consultation on a regular basis through the Energy Consultation Table with the Kwilmu'kw Maw-klusuaqn Negotiation Office and the Assembly of Nova Scotia Mi'kmaq Chiefs designated Chief.

As the government has committed to an incremental approach to TISEC development, user conflicts will be a distinct area of focus. Transport Canada has jurisdiction over marine navigation in the Bay of Fundy area and all TISEC projects will be reviewed to ensure that navigation concerns are addressed. Coastal management within the provincial government is coordinated by the Provincial Ocean Network (PON). This committee is composed of representatives from provincial departments, including the Department of Energy, and agencies with responsibilities and interests in coastal and ocean management. The PON committee is led by the Department of Fisheries and Aquaculture. Internally, the Department of Energy is exploring how the use of management strategies such as marine spatial planning or coastal zone planning could apply to in-stream tidal energy activities; however, there may be a need to develop a "made-in-Nova-Scotia" solution, that best meets the needs of Nova Scotians.

As development proceeds to arrays, the government will work with developers, the appropriate regulators, the Mi'kmaq, and local stakeholders to develop a framework for determining what mitigation or other measures may be required to address fisheries displacement, damage to gear, or other impacts.

In the long term, the government will look to initiate the Tidal Energy Stakeholder Forum and the Tidal Energy Research Forum, as outlined in the 2012 *Marine Renewable Energy Strategy*, as vehicles for informing and educating the public.

2.5 Economic opportunities

SEA Recommendation: In both SEAs there was general interest in understanding the economic opportunities that could be realized from MRE development, both in terms of supply chain growth and energy export. Mi'kmaq communities and communities in Cape Breton and the Bay of Fundy expressed interest in learning about opportunities for investment in, and economic growth opportunities from, tidal-energy development.

2.5.1 Economic growth and investment

Canada's *Marine Renewable Energy Technology Roadmap* (2011) estimates \$2 billion in annual economic value to Canada by 2030, assuming Canada can establish and maintain a leadership role in the tidal power industry. Nova Scotia is leading the country in achieving this goal. The government's *Marine Renewable Energy Strategy* (2012) sets a long-term objective of developing commercial tidal projects in the Bay of Fundy of up to 300 MW. At this level of activity, a robust supply chain and domestic and export industry is anticipated.

OERA is currently overseeing the completion of a Value Proposition for Tidal Energy Development. This study will look at the provincial, national, and international role the tidal industry could play in job creation and industrial expansion in Nova Scotia.

The Marine Renewable Energy Strategy (2012) outlines a commitment to maintaining engagement with the Mi'kmaq on economic opportunities arising from the creation of an in-stream tidal energy industry. The government intends to maintain this commitment through both the Energy Consultation Table and through requiring TISEC project developers to engage with both the Kwilmu'kw Maw-klusuaqn Negotiation Office and individual Mi'kmaq communities.

2.5.2 Energy export strategy

The provincial Electricity Review, announced in the fall of 2013, will include a study of the market trends for the supply and demand of electricity in Nova Scotia. Part of this study will look at potential export markets. This will include a discussion of the various renewable-energy export opportunities to neighboring jurisdictions and an assessment of the potential benefits for ratepayers.

As part of the Atlantic Energy Gateway, a study was conducted that explored regional cleanand-renewable energy market opportunities. Additional studies continue to explore these opportunities, including enhanced collaboration in energy electricity planning among the Atlantic Provinces.

2.6 Tidal range projects

SEA Recommendation: Both SEA's recognized the potential for negative impacts from irreversible technologies such as tidal range projects. Consequently, there is an identified need for specific and detailed information on any tidalrange project. Major environmental issues for consideration include: effects on hydrodynamics; effects on mammals, fish and fisheries; and sedimentation—both near-field and far-field.

Experience with the Annapolis Tidal Station suggests that tidal-range projects can have significant impacts on marine life and the environment. As noted in the *Marine Renewable Energy Strategy* (2012), proposals for non-incremental or irreversible technologies, such as lagoons, would need to clearly demonstrate that the project has no impact on in-stream tidal energy development and has no expected significant adverse environmental or socioeconomic effects or impacts.

Any proposals for tidal lagoons in Nova Scotia would be subject to a thorough Environmental Assessment (EA). The provincial EA would be triggered at 2 MW, and the federal EA at 5 MW. Including, and in addition to, an environmental assessment an array of studies to investigate impacts on marine life, physical processes, and any potential dangers to other users of the marine environment would have to be completed. Another significant hurdle to developing a tidal-range project is securing a market for the energy. Nova Scotia is currently constrained in the type and amount of energy that it can accept into the transmission and distribution system, and there is no set price or feed-in-tariff for energy generated from tidalrange projects.

3 Outstanding Recommendations from the 2008 Bay of Fundy SEA

The Bay of Fundy SEA Update identified several outstanding recommendations from the 2008 SEA that have yet to be fully addressed. These related to four specific areas:

• Data quality and accessibility: specifically developing standards for location-based ecological and fisheries data and to develop a joint Nova Scotia, New Brunswick, and Canada effort to develop location-based tools to support allocation of marine renewable energy in the Bay of Fundy

• Fishers and gear: the need for a formalized approach to deal with possible displacement of fishers and damage to gear

- Coastal zone management: developing an integrated coastal zone management (ICZM) policy for the Bay of Fundy
- Consultation: developing procedures and protocols for consulting with fisheries stakeholders, both by the government and by proponents, before large-scale commercial marine renewable energy developments are allowed to proceed.

The government recognizes the benefit of location-based data in informing decisionmaking, and has initiated work under an internal strategy for sharing this information across government. Currently GeoNova, the Government of Nova Scotia's gateway to geographic information about Nova Scotia, serves as the primary repository for this data. As development increases, the government may consider a more detailed approach to data collection and database management; however, given the current stage of development of TISEC projects, it is not a priority in the near future.

The need for compensation has not, at this point, arisen. As development proceeds to arrays, the government will work with developers, regulators, and stakeholders to design a framework for determining what mitigation or other measures may be required to address fisheries displacement, damage to gear, or other impacts should they occur. Consultation with fishers will remain the responsibility of TISEC proponents.

4 Conclusion

Nova Scotia has a strategic opportunity to develop a strong marine renewable energy industry; however, there remains much work ahead to grow this sector. The SEAs are an essential step towards ensuring that Nova Scotia's tidal energy resource and its emergent MRE industry develop in a sustainable and responsible manner.

The Bay of Fundy SEA Update and the Cape Breton SEA have further advanced the engagement and planning for the development of this new industry in Nova Scotia. The Nova Scotia Department of Energy is committed to working with its partners and stakeholders in developing the industry in a manner that is reasonably consistent with the recommendations of the SEAs.

As technology continues to improve and evolve, and knowledge is expanded through research and testing, the government remains committed to seeing marine renewable energy succeed, resulting in benefits for all Nova Scotians.

Glossary

- MRE Marine Renewable Energy: a renewable energy source created from either the movement of waves, water salinity, temperature differences between different water depths, or tidal cycles.
- TISEC Tidal In-stream Energy Convertor: a device that converts tidal flow into electricity.
- SEA Strategic Environmental Assessment: a tool that contributes to informed decisions in support of sustainable development by incorporating environmental and socio-economic considerations into the development of public policies and strategic decisions.
- COMFIT Community Feed-in-Tariff Program: encourages community-based, local renewable energy projects by guaranteeing a rate per kilowatt-hour for the energy the project feeds into the province's distribution electrical grid.
- EMF Electromagnetic Field: a physical field produced by electrically charged objects.
- OERA Offshore Energy Research Association: an independent, not-for-profit organization that funds and facilitates collaborative offshore energy and environmental research and development, including examination of renewable energy resources and their interaction with the marine environment.
- FORCE Fundy Ocean Research Centre for Energy: a research centre for in-stream tidal energy located in the Bay of Fundy, Nova Scotia.
- SOBP Statement of Best Practices for In-stream Tidal Energy Development and Operation: an initiative to develop best practices that harmonize industry, regulatory, socio-economic, and environmental concerns regarding in-stream tidal energy development and operation.
- KMKNO Kwilmu'kw Maw-klusuaqn Negotiation Office: also known as the Mi'kmaq Rights Initiative supports the Assembly of Nova Scotia Mi'kmaq Chiefs in the Made-in-Nova Scotia Process and the Mi'kmaq–Nova Scotia–Canada Consultation process.
- UINR Unama'ki Institute of Natural Resources: this represents the five Mi'kmaq communities of Cape Breton, called "Unama'ki" in the Mi'kmaq language, and was formed to address concerns regarding natural resources and their sustainability.
- FIT Developmental Tidal Feed-In-Tariff: a rate per kilowatt-hour for the energy produced from a tidalgeneration facility of single devices, or an array of a capacity greater than 0.5 MW.