Changing Tides: A Business Case for Tidal Energy in Nova Scotia, Atlantic Canada and Canada
KEY MESSAGES

Background

Understanding the present and future value of developing Canada's world class tidal energy resource is essential for governments and industry to understand when considering further investment in tidal technologies and their deployment. To accomplish that goal, the Offshore Energy Research Association of Nova Scotia (OERA) commissioned a consultancy with economic and energy expertise to determine the business case (or "value proposition") for tidal energy in Nova Scotia, the region, and Canada. Recognizing that most of the initial in-stream tidal development will occur in Nova Scotia, the direct impacts are concentrated in Nova Scotia, with spill-over effects in the Atlantic Region and elsewhere in Canada.

The main objective of the study was to produce a comprehensive assessment of the potential value, broader benefits and potential economic impacts of tidal power development to Nova Scotia, the Atlantic Region and Canada. Meeting this objective required casting the net widely for relevant information and lessons learned in other parts of the world.

Findings

Similar to the onshore wind industry 25 years ago, tidal enery technology is still at an early stage of development and significant cost reductions are required before it is market competitive. The areas for bringing costs down to levels that can compete with the alternative supply options are reasonably understood and with continuing investment in research, development, innovation and demonstration (RDI&D) can be achieved.

The study identifies where investment can have the greatest impact and the value that can be realized in employment, the economic impacts of domestic and international supply of goods and services, and reductions in carbon and other atmospheric emissions. The following identifies some of the key findings from the study and in particular the opportunities arising from the development of this resource:

- Globally, there is vast potential for renewable energy from ocean sources (1,200 million mega watt hours per year) (IEA Ocean Energy Systems), enough to power over 170 million homes or 13 times more homes than in all of Canada.

- The key drivers and benefits for investing in tidal energy are: economic growth, energy security and climate change.
- Canadian suppliers are in an excellent position to meet 60-70% of the goods and services required for tidal energy development in the Bay of Fundy. Most of this could be supplied at or near the tidal development site, bolstering rural economies.

Over the next twenty-five years, the tidal energy industry is expected to contribute $1.7 billion in gross domestic product (GDP), create 22,000 full time positions and generate $815 million in labour income. These impacts are largely concentrated in NS with spillover to Atlantic Canada and rest of Canada.

- Export opportunities would be strengthened if Canada is an early adopter or 'first mover' in tidal energy development. Some of the promising areas of global opportunity for Canadian suppliers are:
  - Resource modelling and site characterization
  - Constructing purpose build vessels and work boats
  - Fabrication of support structures
  - Sensors and instrumentation
  - Marine cable installation, interconnection, and electrical systems expertise
  - Blade manufacture
- Studies of the extractable tidal resource potential for Nova Scotia indicate as much as 2,500 mega watts (MW) of extractable power, leading to 500 MW of installed capacity by 2032.
- Uncertainty and risk exist within the sector. The nature and and level of policy support for tidal after 2020 is not clear in any jurisdiction. Consistent across all jurisdictions is the need for further public funding to ensure the global rate of installations is high enough to achieve the industry learning that is essential to reducing costs and improving competitiveness.
- Governments in Europe and Canada have provided a policy environment and financial incentives (eg., feed-in tariffs) to enable tidal energy to continue to develop given the costs of tidal energy currently exceed a number of other renewable energy options such as wind.
- The impacts from tidal energy development are substantial. However, they can only be realized through continued collaborative action involving government, industry and communities.
- Current technology is still at the pre-commercial stage of development but advancing with the first arrays of turbines likely within the next three years or sooner, a major milestone.

Investing in tidal energy displaces fossil fuels, leading to reduced costs arising from avoided GHG emissions valued at almost $1B.

Future Considerations

The Governments of Nova Scotia and Canada are able to influence some of of the risk factors as they apply to the tidal industry development within Canada. Among the key steps for consideration are:

- Establish a *Tidal Energy Working Group* consisting of individuals from the provincial government and industry to guide next steps in delivering the study to key stakeholders.
- Examine options (eg., future feed-in tariff programs) to support capacity installation beyond currently approved levels to support large scale arrays.
- Implement the regulatory elements outlined in the Nova Scotia Department of Energy's *Marine Renewable Energy Strategy*.
- Advance industry-enabling infrastructure development to encourage supply chain interest/participation in tidal opportunities.
- Develop a strategic, collaborative tidal energy research and innovation initative.
- Create a federal-provincial innovation strategy for marine renewables in research, development, innovation and demonstration (RDI&D) to bring costs down.

For more information, please visit our website at www.oera.ca or contact:

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