

1: Can marine renewable energy technologies, and specifically tidal in-stream technologies, be developed in the Bay of Fundy without significant impacts on the marine ecosystem?

I don't feel you can clearly answer this question yet as there is such a lack of environmental data. There is a high level of uncertainty of environmental damage since aquatic ecosystems aren't fully understood yet. These areas are identified as Data Gaps in the report. Moving forward, I think a site specific environmental assessment would help to clear up some of this uncertainty. I would also recommend referencing other offshore structures such as previously installed oil rigs for Sable Island. As for the fish stock, once initial disruptions from installation are over the only thing I could see that may stop them from returning to the area is vibrations or sound from the turbine. The impacts from noise and vibration could be detrimental to navigation and communication of several species and are the area where I am most concerned. I would imagine birds would be fine, except during installation. But again more Fundy specific information needs to be collected to make accurate estimates of the environmental effects.

2: Can these technologies be developed without significant socio-economic impacts on fishers and the fisheries and on other marine and coastal resource users?

Yes I feel they can be developed without significant socio-economic impacts on all resource users. Certain regulations will have to be introduced to protect the areas that turbines are located. If fishing gear were to get tangled in the turbines or under sea cables it would in damage and destruction. Perhaps marking the areas with buoys and preventing fishing around that buoy. As the son of a commercial fisherman, I know that there is sufficient water for commercial fishing, even though they may feel restricted by zoning. A proper set of regulations would need to be developed, taking into consideration everyone who uses the Bay of Fundy.

3: What contribution can marine renewable energy technologies make to community and regional economic development in Nova Scotia?

I feel the contributions to our economy could be enormous. Renewable energy is seeing unprecedented growth around the world and the tidal market is in its infancy. Adopting and testing a new renewable energy source would have positive implications for the region in terms of image and precedence. It could develop our limited economy by creating new sectors locally, attracting investment and preventing the mass outflow of educated Maritimers to Alberta. This project could also boost our academic profile in terms of cutting edge research leading to commercialization. There would be a lot of data and information that scientists and engineers around the world be interested in seeing. Even if the project does not lead to commercialization, there will be benefits to the community from the research alone.

4: Under what conditions should pilot projects be permitted?

Individual sites should be chosen that are thought to minimize environmental effects on marine environment. I don't see the pilot projects affecting the fishing or tourist markets very much if at all. This is going to draw a certain amount of attention as tidal energy is very new, especially in Canada. If the project is rushed and environmental impacts are not properly mitigated, the work will look sloppy and will result in resentment towards the project, renewable energy in the region and future developments. A strict maintenance programs needs to be followed as oil spills would be devastating. Realistically I think the design would need to be fully self contained with a comprehensive leak protection plan. Working in the wind energy industry has given me a clear picture of what happens when a gear box nears the end of its life. In certain cases, the gearbox casing can be compromised, resulting in large amounts of lost oil. In the wind industry, such a disaster is contained in the nacelle and tower structure, and such a practice should be followed with tidal projects. The project is as much about the actual testing as it is about raising the profile of the area and attracting international attention. It should only be carried out under strict supervision.

5: What ongoing research and monitoring is required to gather the information needed to make decisions about commercial developments?

The pilot projects should be monitored very thoroughly, for all vibrations, sound, power output. Underwater cameras should be monitoring all activity around and through the turbine to look for potential hits. This would take care of all the people that think the fish will swim into the blades and die, similar to birds in wind turbines. Initial environment assessments and final assessments should be carried out to show effects on marine life. Local scour should be documented, more importantly global scour should be studied in other applications to predict the potential effects that will occur in the Bay. As for under sea cable that is well understood and used globally. As a test for EMF implications, the proposed cable routing should be observed. Set up underwater sounding, video and temperature equipment at certain locations along the cable path to record fish activity before the cable is put in place. Install the cable, and complete the same field tests in the same locations as before and compare the results. Or even easier run high voltage cable past a fish tank in a lab for a few months and see if fishy goes belly up.

6: What other steps are required to determine whether, where and how commercial projects should be developed, regulated and managed?

I feel these questions are too far off from even being considered. The technology is new, the marine life is not fully understood in most areas of our planet. Regulation should be

based on what is existing for offshore wind projects with appropriate adjustments for underwater turbines.

One idea that came to me while answering these questions would be to attach underwater turbines to the towers of wind turbines if the tidal and wind patterns aligned. The future off shore site potentially would include wind and water generation. Even better, attach a blanket of wave power intermeshed on the surface between the towers (Just came up with that one). If you're going to mess up the marine environment, might as well do a good job of it.

Looking forward to seeing the project in action.

Regards,

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