#473, 3553 - 31st NW
Calgary, Alberta T2L 2K7
www.newenergycorp.ca

NewEast Energy Corporation Marine Renewable Energy Application Public Circulation Document

NewEast Energy Corporation, a wholly owned subsidiary of New Energy Corporation Inc., has been awarded a permit from the Nova Scotia Department of Energy to deploy up to 800kW of tidal power generation equipment in the Minas Passage at a location next to the existing Fundy Ocean Research Center for Energy (FORCE) Crown Lease Area. The installation will consist of an array of floating grid connected New Energy EnviroGen™ Power Generation systems based on the Darrieus vertical axis cross flow turbine. Energy produced with these turbines will be conditioned and supplied to the Nova Scotia Power grid system through the existing FORCE substation located near the tidal generation site.[1]

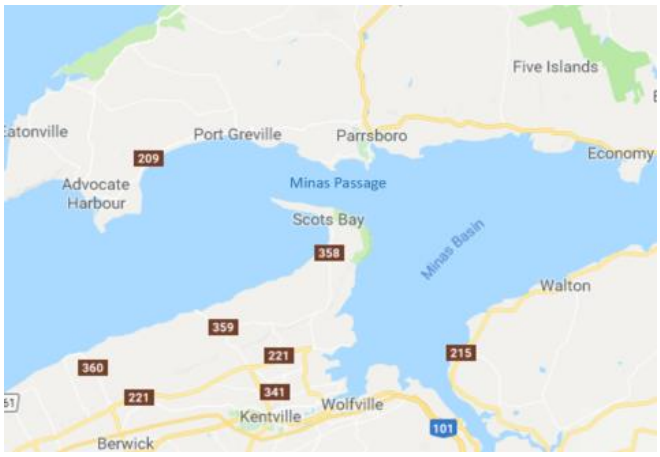

Fig.1 Map of Bay of Fundy showing Minas Passage

The project timeline consists of a 3-year development window and up to a 15-year demonstration phase.

The Technology

The EnviroGen Power Generation systems are based on a vertical axis cross flow turbine. This is a slow turning turbine oriented across the moving water column. These systems are typically floated to keep the electrical equipment out of the water and position the rotor in the highest water velocity regime.

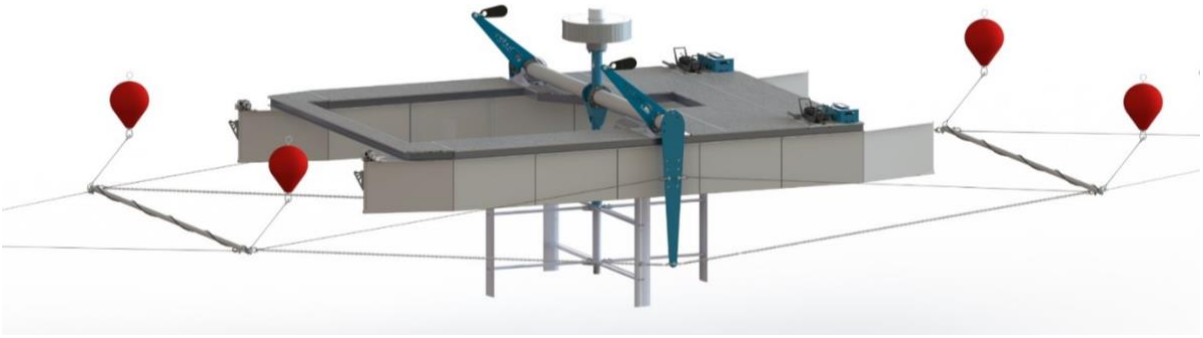

Fig.2 Rendering of a 25kW EnviroGen system with bi-directional mooring

[1] Subject to the review and approval of the FORCE Board and Nova Scotia government agencies connected to the permitting process

The platform and turbine genset are held in place by anchors on the sea bed – the only contact with the sea floor other than an electric cable back to shore.

New Energy has extensively monitored its turbines for impact on aquatic life. An independent study initiated by the Electric Power Research Institute (EPRI) and supported by Natural Resources Canada was conducted by the S.O.Conte Anadromous Fish Research Center located in Turner Falls, MA, on juvenile Atlantic Salmon and adult American Shad to determine the impact of a 5kW New Energy turbine on fish having to traverse a restricted channel. The fish were instrumented with transmitters, released into the channel, and behavior monitored. Even though this was an extreme situation with the fish having to pass very close or through the turbine, no mortality or injuries were observed.

Fig.3 EnviroGen turbine installed and operating in the test flume where fish were released and monitored.

Staged Approach to Project Development

While New Energy has completed fresh water applications in rivers, canals, and industrial outflows, and is currently working on several more along with an initial tidal energy demonstration project, the Bay of Fundy project will represent the first salt water (tidal) commercial demonstration of the EnviroGen Power Generation systems. Logistic and other issues not present in fresh water applications, will be addressed as part of the project plan.

To minimize risk and complete the project with the highest level of certainty, the project will be executed following a staged approach that includes an initial pilot installation using New Energy's existing and proven 25kW (rerated to 50kW) power generation hardware. This initial pilot phase involves the installation of two 25/50kW EnviroGen Power Generation systems, that once proven, will set the stage for the scale up and full build out phases, consisting of the installation of three 250kW units, by proving out all steps required to assemble, deploy, interconnect, and operate the power plant without incurring the potential high costs of having to rework the processes and procedures with the larger systems.

Fig. 4 Preparing for installation of a 25kW low flow unit on the Yukon River, Alaska

Fig. 5 Two 25kW units operating on the Chilla Canal in Northern India

Phase 1 – Pilot Installation

Phase 1 includes two main objectives:

1. To demonstrate the installation and operation of New Energy's EnviroGen Power Generation Systems through a limited deployment of 100kW of generating capacity to shake out logistical or technical issues in deploying and operating the power generation systems prior to the main deployment. This experience will then be used to fine tune the process used to deploy the larger systems and incorporate any modifications required to ensure successful operation of the full plant.
2. To engage with stakeholders who have varying interests including: environmental concerns, impact on livelihoods, local and regional economic benefits including opportunities for employment, and even benefits to the provincial electrical system. The floating systems offer the opportunity for stakeholders to physically see the equipment in operation allowing them to gain a better understanding of how they work and giving them an opportunity to provide any feedback as to operational improvements. This engagement process will be used to better develop the long-term project plan for the full plant build-out taking into consideration the broader implications of the project.

The units are assembled on shore using a loader or small crane. Deadweight anchors will be floated into position along with mooring lines and buoys (or simply carried from shore if a large enough vessel is used) and lowered to rest on the bottom at the appropriate positions. As the flow is bi-directional two anchors will be used for each unit approximately lined up with the direction of flow. One mooring line from the closest platform will also include the electrical cable back to shore. With the two 25/50kW units in transport mode, the platforms and units will then be moved into position with a small tug or other boat and connected to the mooring lines and electrical cable. The cable will then be connected to the pre-installed electrical line running back to the FORCE substation.

The two 25/50kW systems will be supported by floating barges that provide buoyancy for the equipment but also serve as a convenient platform for mounting electronic equipment, taking measurements, and monitoring and servicing the system. Each boat will include power conditioning componentry, plus any supporting instrumentation. The boats will be placed close to one another (may be connected) such that overhead cabling can be used from one to the other. The system closest to shore will also be used as a summing station and will house the cable connection to shore.

The entire installation is designed to minimize cost and complexity of deployment, making it very easy to remove equipment for repair or other reasons, and to easily re-deploy when repairs are complete or other issues must be addressed. With the equipment in place, a detailed commissioning procedure will be undertaken to confirm all systems are operating as intended. An extensive 6-month test and data acquisition phase will be used to gather as much data as possible on all aspects of the installation to be used as inputs to the scale up and full build out phases which will include interconnection to the Nova Scotia Power grid.

During this phase NewEast will strive to make opportunities to physically view the equipment in operation in a safe manner. Barring that, video will be made available demonstrating how the equipment operates under various flow conditions.

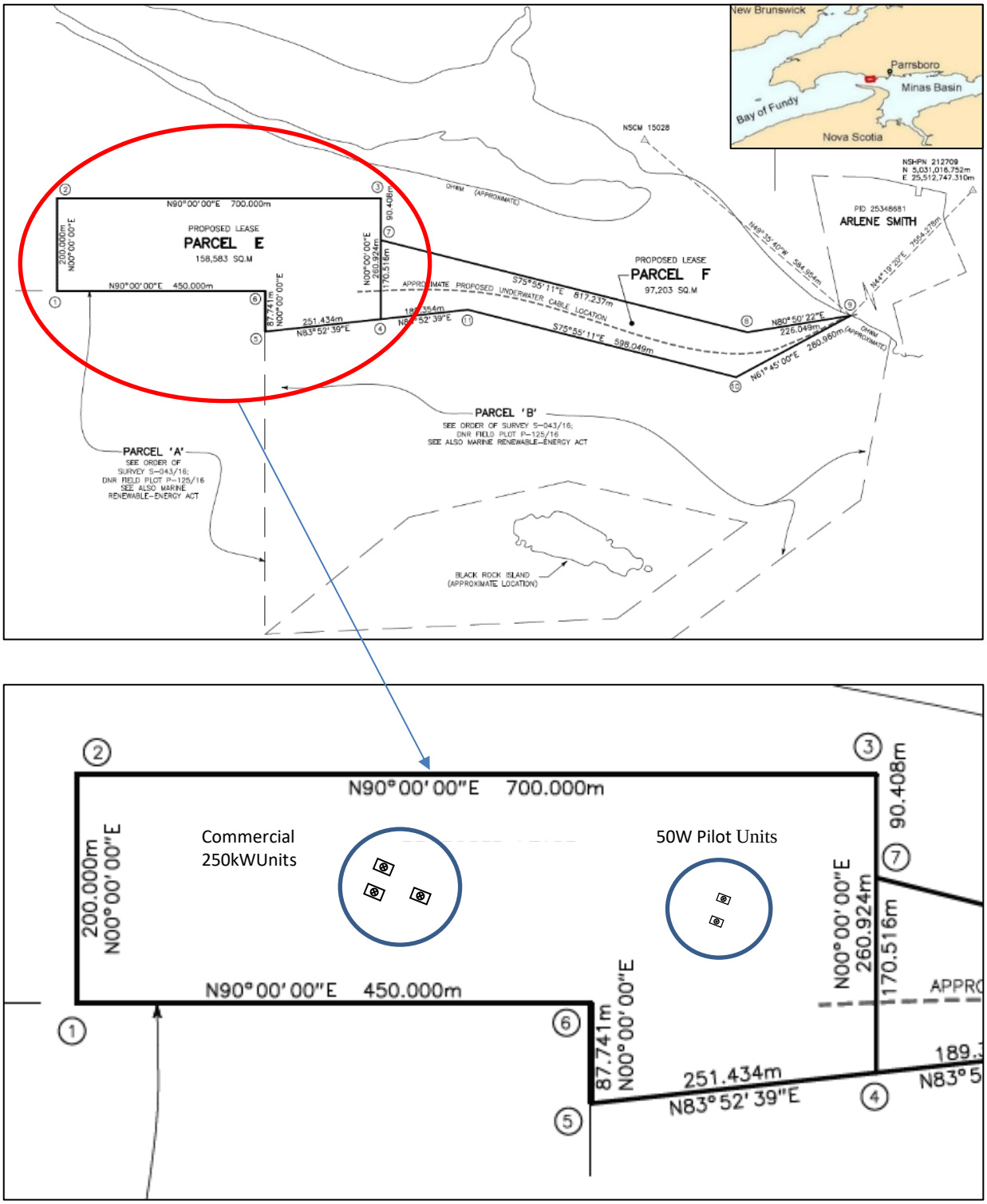

Fig. 6 Proposed lease deployment area showing one possible array configuration, and cable corridor showing approximate cable route to shore.

Phase 2 – 250kW Scale Up

Phase 2 will scale the systems from 50kW to 250kW. The scale up will accomplish two basic objectives:

1. Scale-up the design from the proven 25/50kW system size to a full 250kW size including input from Phase 1 of the project.
2. Prepare for the full roll-out of the array of 250kW systems.

Once the 25/50kW systems have been installed and operational for a defined time (approximately 6 months) without any systemic issues, a scaled-up version of the 25/50kW systems will be built and deployed incorporating any learning from the test program. The scaled-up version will ultimately have an output capacity of 250kW.

Manufacture of the 250kW units will be coordinated locally with the support of local industry, taking advantage of local marine expertise, providing local employment, and minimizing shipping costs. As with the 25/50kW units, the 250kW units will be assembled at a staging area near the deployment location or at a local mobilization base. Once assembled the system will be moved to a location at low tide using a specially fitted trailer to be floated out during high tide.

Anchoring and mooring of the 250kW units will also essentially be scaled up based on the 25/50kW concept and procedures. Dead-weight anchors will be assembled on shore during low tide, floated into position during high tide, and sunk in a similar fashion to the 25kW units or with the use of a barge. Details of this process will be further developed through the deployment of the 25kW anchors.

While most power conditioning equipment is expected to be situated on the individual unit boats, a separate floating platform may be deployed for use as a summing station for the entire array, including the final above water connection to the cable to shore. This boat can also be used to house power conditioning equipment, instrumentation, data collection equipment, etc, as required.

Due to the unique characteristics of a vertical axis cross flow turbine, spacing of turbines in a multi-unit (array) configuration can be much tighter than horizontal propeller type turbines according to recent studies. To validate and quantify this conclusion, a separate effort will be undertaken with the Canadian Hydrokinetic Turbine Test Centre in Manitoba to establish spacing of the turbine array. Multiple systems will be installed at the CHTTC and tested in a variety of configurations to establish array spacing and arrangements. The results of this study will be used to influence spacing of the 250kW units.

Phase 3 – Full Build-Out

Once the initial 250kW system has been deployed and operated without any systemic issues for approximately 6 months, the final phase of the project will deploy the remaining two 250kW units in an array configuration with the initial unit following the procedures established in the previous phases. With all equipment built, deployed and in operation, an extensive monitoring program will be undertaken of the systems for performance, environmental impact, and impacts on any other stakeholders.

The plant will be operated for the duration of the 15-year demonstration program, after which decisions will be made for extending the life of the plant and/or deployments in other locations regionally, nationally, and internationally.