

## ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name of person updating the form

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Date submitted

July 4, 2012

Project name: FRI-EL Seapower – Messina Project

Planned  In Operation  Completed

Project description:

*Project Developer:* Fri-El Sea Power

*Technology Developer:* SEAPOWER

*Technology type:* Fri-El Seapower

*Resource (wave, tidal):* Marine currents

*Project scale (test site, prototype, array, commercial):* Several devices from prototype to full scale

*Installed capacity (MW):* 500 kW

*Project Website:* <http://www.fri-el.it/>

*Launch Date:* July 2008

*Additional Description:* The Fri-El seapower system consists of a vessel or pontoon, moored to seabed, to which several lines of horizontal axis hydro turbines are attached. The same pipes, connecting the turbines through cardanic joints providing the necessary flexibility to the system, transfer the power captured from the water on board of the pontoon. Pipes are here connected to electrical permanent magnet generators (PMG) that are kept out of the water in order to simplify and diminish their maintenance. The electric generators transform the power carried by the transmission lines into electrical energy, which can be directly fed into the grid through an undersea cable, connecting the individual floating structures to a submarine hub, which in turn is connected to the shore by a single submarine cable. Alternatively, the systems can be installed offshore far away from the coasts and hydrogen can be produced with the electricity generated by the turbines.

Location:

*Ocean/Water body:* Strait of Messina, Sicilian Coast

*Closest city:*

Country: Italy

Depth:

Coordinates (please use Mercator): 38.245885°, 15.651455°

Process status: After several numerical simulations, a first validation of the studies has been made by testing a prototype of the system in the water towing tank of the Naval Engineering Department of the University of Naples “Federico II”. Soon after the controlled tests, a series of open water prototypes tests have been carried out in the Strait of Messina in order to check the system well working in real conditions.

In July 2008, a reduced scale of Sea Power prototype (6 kW - 2.5 m/s; Messina I) was launched and in 2009 later another bigger prototype (20 kW - 2.5 m/s) was tested in the same waters (Messina II). The final system (Messina III) has been designed to be installed in the Strait of Messina and it is conceived to produce up to 500 KW with a nominal flow speed of 2.5 m/s. The real scale prototype has not yet been built but several theoretical analysis, numerical predictions, tests in towing tank and real conditions on a scaled prototype have been already carried out. To this aim, the new SEAPOWER public/private consortium has been already constituted by FRI-EL Sea Power Company and University of Naples “Federico II”. The consortium will develop not only the FRI-EL Sea Power system but it will also set up and manage a real field laboratory in the Strait of Messina opened to Italian and to foreign companies that want to test prototypes in the Strait of Messina.

Licensing information (brief description): Permits to deploy the final system (Messina III) are expected for the middle of 2012.

Key Environmental issues: *brief description on the most important environmental issues raised by the project (e.g. Sensitive species/habitats/areas that were of particular concern and/or received special protection) and how they were addressed.*

Environmental webpage: *link to project official environmental webpage (if available)*

Baseline studies and project effects studies: Fri-El Seapower – Messina Project				
General description				
Receptor	Study description including question and/or objective (several can be listed per receptor)	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Physical environment				
Benthos				
Fish and fisheries				
Large vertebrates				

Birds				
Marine uses / users				
Other* (can be named)				
<b>Reports or Papers</b>	(Key papers on the areas addressed should be listed here; when possible the files themselves can be made available in downloadable PDF format, alternatively links to the files or project website can be provided when available e.g. SeaGen.)			
<b>Research Projects</b>	(past or on-going environmental research projects at the site)			

<b>Monitoring and adaptive management: Fri-El Seapower – Messina Project</b>				
<b>General description</b>				
<b>Receptor</b>	<b>Monitoring program description including question and/or objective (several can be listed per receptor)</b>	<b>Design and methods (brief description)</b>	<b>Results (brief description)</b>	<b>Status (planned, underway, completed, with dates)</b>
Physical environment				
Benthos				
Fish and fisheries				
Large vertebrates				
Birds				
Marine uses/ users				
Other* (can be named)				
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