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PRIAMO project: a feasibility study on Sicilian sites for sea power plants in coastal waters

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The increasing demand for renewable energy sources has recently favoured the exploitation of wind energy and photovoltaic, with strong repercussions on the landscape due to the visual impact of wind turbines and of the photovoltaic panels. A policy protecting the landscape suggests to focus on innovative solutions that enable the use of renewable energy and a low visual impact. This can be done with extensive offshore diving equipment installed in the sea, formed by turbines that use ocean currents to produce electric energy. The accommodation at sea, as well as offering greater availability of sites, has the advantage of giving a better and relatively constant resource with maximum efficiency and productivity. The international scenario suggests the need to identify sites potentially suitable and safe for energy use, placed at a distance from the coast at depths with bathymetric characteristics that make the power plant installation safe and technologically and economically feasible.
In this context, the project PRIAMO (Planning, Research and Innovation in a Oriented Marine Environment), funded by the European Commission through the Sicilian Regional Operational Programme (POR), aims to verify the potential suitability of two Sicilian coastal sites, i.e. the Strait of Messina and a stretch of coast near Capo Granitola (Strait of Sicily).
The work is realised with a view to the exploitation of marine currents that will be studied through the use of existing or new numerical models from the open sea to the coastal scale, then evaluating its cost-effectiveness in collaboration with Atlantis Resources Corp. Pte. Ltd (UK), European manufacturer of underwater turbines. An environmental study is done through monitoring and remediation techniques to assess the potential size of the foundation structure: sedimentological and morpho-bathymetric characteristics of the bottom, depth, steepness of the seabed, benthic biocoenoses, and load-bearing capacity of the area affected by the foundation at depths of 30-50 meters. The risk of vessels in transit, tides and the main currents through a fixed mooring and ship acquisitions will be analyzed starting with the first survey scheduled in January 2012. These data will be also used to validate the numerical systems. Furthermore, an analysis of the effects of the removal of soil or accumulated material from the areas of contact with the foundation (scouring) will be conducted and any recovery technique of portions of the seabed and organisms (i.e. replanting of *Posidonia oceanica*) will be analyzed.
Then the project PRIAMO aims at developing the concept of a sustainable use of the marine environment, both with high environmental value or marginal and degraded, through the development of innovative methodologies for the proper characterization of the sites to be used for the installation of underwater turbines. This is aimed to meet the reduction of CO_2 emissions required by the Kyoto Protocol and in the framework of European strategies for a competitive, sustainable, safe energy production (EU Communication on Energy Strategy 2020 and EU Council Conclusions of February 2011).