

Sardinia-mainland Italy (SA.PE.I) cable: a study-case for environmental monitoring

SA.PE.I in a nutshell



- Transmission capacity: 1,000 MW (double 500kV DC submarine cable), which corresponds to over 50% of Sardinia's electricity demand)
- Length: 435 km (420 km submarine)
- 1,640 m below sea level at its deepest point
- Consenting process overall duration: 14 months
- Consenting started in 2006, cable operating since 2011
- Investment: 750 million euros

The SA.PE.I cable lies on the sea floor of the Tyrrhenian Sea, crossing a vast submarine territory rich in different habitats and encountering numerous and varied types of flora and fauna. Most important marine areas were monitored, particularly the "Santuario dei Cetacei - Cetacean Sanctuary" and the Posidonia oceanica prairies.

Posidonia Oceanica



Posidonia oceanica is a seagrass species that is endemic to the Mediterranean Sea. It forms underwater meadows that are of significant ecological importance since they are host to numerous animals and plants and protect the coastline from erosion. Posidonia oceanica has been defined as a priority habitat by the European Union.

Environmental studies and actions

A series of actions was undertaken to ensure the protection of the ecosystem along the cable route, in particular:

- Detailed studies that were carried out in the preliminary planning stage aiming at giving a clear picture on the physical, chemical and biological conditions within which SAPEI would operate. This allowed to accurately define the best route for the cable and also provided essential elements to anticipate and limit any interference with the marine habitat.
- Arranging and planning technical measures for placing the cable on the Posidonia Oceanica to minimize any impact on the habitat. The cable was indeed placed by means of special anchoring systems in order to prevent the cable's lateral movements along the sea floor from harming the prairie.
- A monitoring project, which enabled the evaluation of the interaction between the cable and the marine environment both during the laying and the operation of the cable, through the analysis of water, sediment and the ecological community.

Environmental monitoring plan

The environmental monitoring plan, which was designed as an integrated plan and coordinated by the Italian Higher Institute for Environmental Research and Protection (ISPRA), lasted for about four years, starting end of 2007 before the cable laying phase until 2011 after all cable-laying operations had ended. It was conceived to provide the best description of the environmental quality status of the marine ecosystem.

The monitoring plan included a thorough analysis of the conditions of the marine ecosystem (physical and chemical analyses, eco-toxicological assays, ecological and acoustic investigations), prior to the beginning of the work, the so-called "white phase" and at the work's completion, the verification phase.

During the cable-laying operations, a series of parameters were also systematically monitored along the cable route to study the conditions of the Posidonia Oceanica, also through videos filmed of the sea floor (up to 50 m in depth) in order to immediately identify any damage that the prairie could suffer owing to mechanical causes.

The plan intended to identify spatial-temporal trends of the possible alteration that could occur in relation with the project. The comparison between the conditions of the sea floor ecosystems immediately prior to the cable-laying operation, during cable-laying activities, and after the completion of the work showed the absence of any disturbance to the ecological community involved.

The results of the monitoring were sent every four months to various Italian Authorities during the entire duration of the monitoring works. A large quantity of environmental data was collected, which can potentially help assess and monitor further offshore projects in the future (non only grid projects).

More information

[SAPEI - The record cable](#): TERNA's dedicated website to the SA.PE.I cable"

[An Environmental Monitoring Plan related to the laying of marine power cables: the case study of SAPEI project](#): scientific publication describing the environmental monitoring plan and its results

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