

ENERGY FOR THE FUTURE. ITALIAN EXCELLENCE

SARDINIA: RECORD-BREAKING LABORATORY FOR HIGH-PERFORMANCE TECHNOLOGY FOR SMART ISLANDS

Testing, research and development for the sustainability of the smaller islands

The Codrongianos hub is the multi-technological laboratory - from storage systems to synchronous condensers, from the Storage Lab to the record-breaking SA.PE.I. undersea connection - which is today, in practice, the technologically most advanced energy centre in Europe and which has enabled Terna to begin testing various examples of technological excellence and transforming them into concrete projects. A true energy laboratory from which work began on developing the integrated Smart Island system, a cutting-edge project launched by Terna to make the smaller islands not connected to the national electricity grid more sustainable, independent and environmentally friendly.

WHAT THE SMART ISLAND PROJECT IS

The testing carried out and the innovative ideas developed in Sardinia have opened the way to the application and diffusion of smart-grid systems also on some smaller islands not yet connected to the mainland. The island of Sardinia was, in effect, the precursor of this process assuming a fundamental role in the development of new hi-tech electrical solutions, oriented to greater respect for the environment, increased security of the electricity grid and lower energy costs for all Italians.

Installing, experimenting with and testing the efficiency and performance of the different technologies in Sardinia made it possible to also apply this model, launched successfully, in other areas of the country with great cultural and landscape value, putting it into practice in the Smart Islands project, which represents a tangible example of Terna's research and development model, bringing benefits for all.

The Smart Islands project arises from the need to improve the environmental sustainability of energy infrastructures on the smaller islands, which are equipped with self-sufficient energy generation and distribution systems with expensive and polluting diesel generators, to the detriment of end users, both from an economic point of view, with higher energy costs, and from an environmental perspective. In this context, Terna has organised initiatives aimed at transforming the energy system of these islands in a sustainable direction, to make them intelligent, innovative and hi-tech, through gradual conversion of electricity supplies into a hybrid system that uses plants with renewable sources (which will gradually complement traditional generators), storage systems, active demand-management systems, electrical mobility, intelligent public-lighting systems, and

applications for monitoring and controlling electricity consumption. This is a highly innovative project with positive effects and evident benefits in reducing environmental pollution connected with lower CO2 production, as well as a better quality and reliability of the service and active involvement of residents. These are systems that are eco-compatible, efficient and that can represent solutions which promote a new direction in the electricity sector, today increasingly moving towards a sustainable and green business model.

GIGLIO, the first Smart Island in Italy: Terna plans to start a project for the modernization of the electricity grid on the island with technological solutions integrating green resources, energy storage and urban mobility that respect the surrounding landscape. An innovative hybrid electricity system that will make it possible to improve the quality of the electrical service and increase environmental sustainability. In its first stage, the project will involve replacing a significant proportion of the electricity production of the Giannutri island, today relying on diesel generators, with that of a photovoltaic plant associated that features a highly-advanced storage and control system, generating benefits in terms of reducing CO2 and other chemical pollutants.

PANTELLERIA: a project is beginning to make the island (the largest of those not interconnected with the national electricity system) a model of sustainability and cutting-edge technology, thanks to intelligent and integrated grid management, capable of generating evident economic and environmental benefits. Solutions are being studied to integrate clean energies and storage systems, a new system for electrical mobility, plans for greater energy efficiency, reduced pollution and lower costs compared to diesel generation.

CERTOSA: an atypical island, as it is already connected to the mainland, it represents a unique opportunity for testing new technologies in a natural laboratory in an extraordinary location, a short distance from the centre of Venice. An environmental recovery project is being studied, incorporating innovative solutions, eco-compatible engineering technologies and clean energies. The project to make Certosa an island which is renewable, smart, sustainable and more self-sufficient from an energy point of view is focused on localised energy management and, at the same time, the reduction of polluting emissions, thanks to less use of traditional production sources, with evident positive effects for the territory and for the activities that will be developed on the island, which will therefore be an important testing ground for smart technologies also in an on-grid context.

Getting technology to move forward hand in hand with sustainability: this is Terna's aim in pursuing the projects on the Smart Islands to demonstrate the sustainability of hybrid models (renewables + thermal + batteries) that are easily exportable to all similar locations, including beyond the national borders.