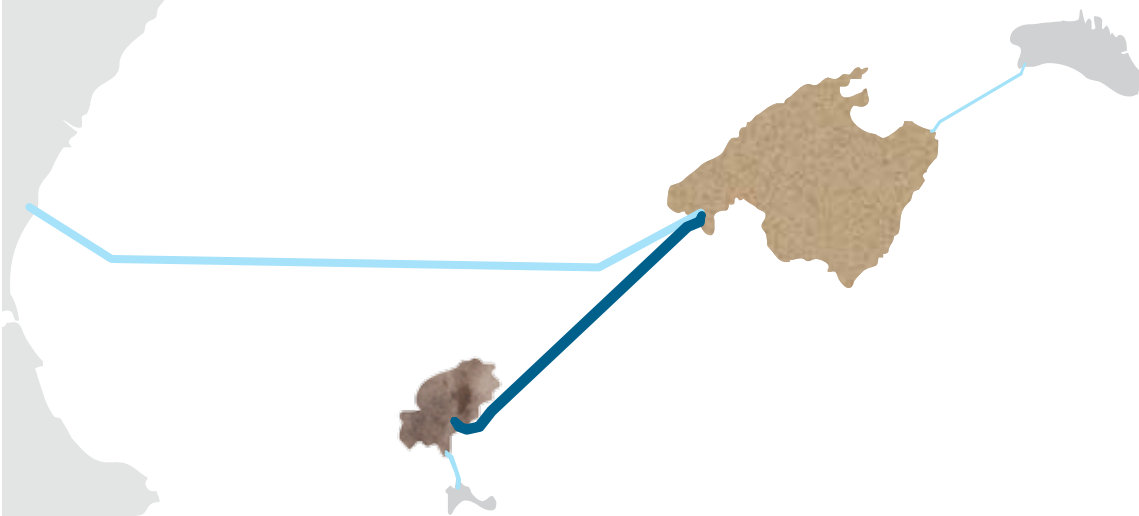


# ELECTRICITY LINK MAJORCA -IBIZA

Safe and sustainable energy  
for the Balearic Islands



**Rómulo2**  
INTERCONEXIÓN ELÉCTRICA  
MALLORCA-IBIZA

## A STRATEGIC AND INTEGRATING INFRASTRUCTURE FOR IBIZA AND FORMENTERA

The Majorca-Ibiza submarine electricity interconnection is one of the most important investments made by Red Eléctrica from the point of view of security of supply and the structuring of the territory as it connects the two existing electricity sub-systems in the Balearic Islands and connects them to the Iberian and the Europe electricity market. This new link strengthens the electricity interconnection process between the Spanish peninsula and the Balearic Islands, which began with the Rómulo project.

**The main objective of this second phase of the Rómulo project is to finish with the current 'isolation' of the electricity system of Ibiza, in addition to saving costs for the system and promoting competition in energy generation.**

**The electrical integration of the Balearic Islands with the Spanish peninsula is essential to ensure the reliability of the supply in the archipelago, as well as in any other point of the peninsula.**


**225 MILLION  
euros investment for  
the interconnection  
with Ibiza**

# MAJORCA-IBIZA ELECTRICITY INTERCONNECTION: A PIONEERING INTERCONNECTION AND A TECHNOLOGICAL CHALLENGE OF THE HIGHEST ORDER

The second phase of the Rómulo project has been carried out via a tri-polar double link which is 126 km in length. The electricity connection between Majorca and Ibiza is carried out using alternating current at a voltage of 132 kV and 2 x 100 MW of power.

**THE PROJECT INCLUDES A LAND SECTION** of 3 km in Majorca, to the Santa Ponça substation and 5 km in Ibiza, to the Torrent substation. The route was selected so that the cable leaving Majorca runs in parallel with the previous link with the Spanish peninsula, and at its entrance on Ibiza it shares the route with the future Ibiza -Formentera link, thereby reducing the impact of the route on the territory.

**A RECORD-BEATING SUBMARINE INFRASTRUCTURE**  
The Majorca-Ibiza submarine double-link is world's longest in alternating current and the deepest of its kind to run along the sea bed at depths of up to 800 metres.



## THE PROTECTION OF FLORA, FAUNA AND PATROMONY ARE KEY ASPECTS IN ALL PROJECT PHASES

Red Eléctrica maintains a strict commitment towards the protection of flora and fauna when their facilities cross protected areas or areas of interest.

**THE SECOND PHASE OF THE RÓMULO PROJECT** incorporates rigorous planning of preventive and corrective measures to protect both flora and fauna and archaeological patrimony, in order to minimise the effects of the new infrastructure on the environment in which it is located. The Company also establishes environmental improvement actions which enhance biodiversity in the areas through which the infrastructure runs.

**USE OF NON-INVASIVE TECHNIQUES**  
The route of the interconnection has been designed so as to pass through areas with sparse vegetation and, if needed, those where there is less canopy cover of Posidonia seagrass meadows. To do this, in the submarine route, the burying of cables and its protection system is carried out in a special way so as to ensure the conservation of this plant species that is protected throughout Europe.



### Specific environmental measures of the interconnection

» The environmental requirements of the works demand the prior location and inventory of noble pen shell specimens. Once their presence is confirmed in the coastal areas of the route, they are removed and transferred to sites with similar hydrodynamic characteristics.



» An action protocol has been established in the case where cetaceans (marine mammals) are sighted and that are strictly followed by the cable-laying crews. These measures are also extended to the land works so as to protect species such as the Spur-thighed tortoise should they be sighted or located.



» In areas close to the shore, controlled microtunneling works are carried out in order to house the cables with the aim of minimising the impact on Posidonia seagrass and the beaches, and that once the works have finished, the areas are restored.



» As part of the oceanographic campaign carried out prior to the drafting of the project, a study was performed of the cultural patrimony that confirmed the absence of any archaeological or paleontological remains along the subsea route. However, monitoring works are carried out for the land works at either end of the cable and these are supervised by an archaeologist.

## GENERAL PROJECT DATA

Current system  
**ALTERNATING**

Number of circuits  
**TRI-POLAR LINK**  
(2 CABLES OF 126 km EACH)  
Circuit 1: without splicing  
Circuit 2: with two splicing

Nominal voltage  
**132 kV**

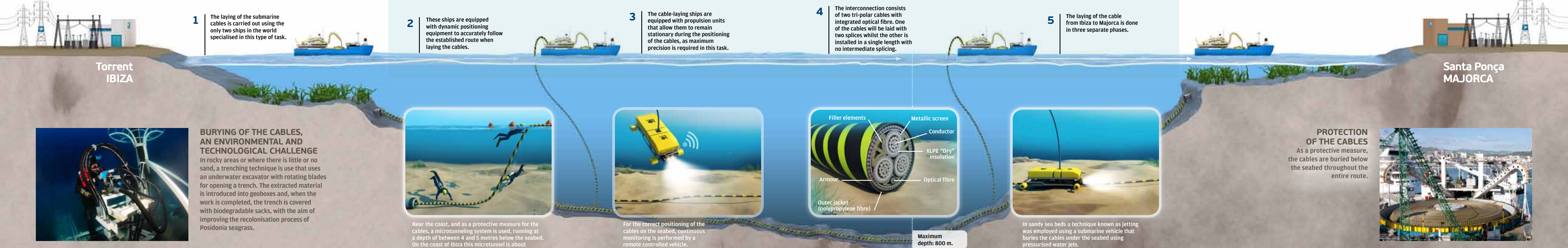
Power  
**2 x 100 MW**

Length of the link  
**2 x 126 km**

Submarine section:  
**118 km**  
Land section:  
**3 km (SANTA PONÇA. MAJORCA)**  
**5 km (TORRENT. IBIZA)**  
The entire section will be buried

Submarine cables  
**TWO CABLES**  
(WITH INTEGRATED OPTICAL FIBRE)  
Diameter: 18-21 cm  
Weight: 61-92 kg per metre

Maximum depth  
**800 METRES**



**1** The laying of the submarine cables is carried out using the only two ships in the world specialised in this type of task.

**2** These ships are equipped with dynamic positioning equipment to accurately follow the established route when laying the cables.

**3** The cable-laying ships are equipped with propulsion units that allow them to remain stationary during the positioning of the cables, as maximum precision is required in this task.

**4** The interconnection consists of two tri-polar cables with integrated optical fibre. One of the cables will be laid with two splices whilst the other is installed in a single length with no intermediate splicing.

**5** The laying of the cable from Ibiza to Majorca is done in three separate phases.

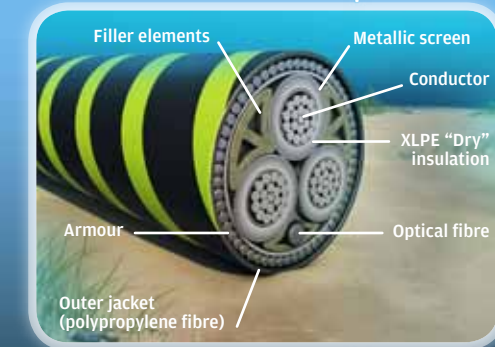
**BURYING OF THE CABLES, AN ENVIRONMENTAL AND TECHNOLOGICAL CHALLENGE**  
In rocky areas or where there is little or no sand, a trenching technique is used that uses an underwater excavator with rotating blades for opening a trench. The extracted material is introduced into geoboxes and, when the work is completed, the trench is covered with biodegradable sacks, with the aim of improving the recolonisation process of Posidonia seagrass.



Near the coast, and as a protective measure for the cables, a microtunneling system is used, running at a depth of between 4 and 5 metres below the seabed. On the coast of Ibiza this microtunnel is about 700 metres long, the maximum possible according to the type of link.



For the correct positioning of the cables on the seabed, continuous monitoring is performed by a remote controlled vehicle.



Maximum depth: 800 m.



In sandy sea beds a technique known as jetting was employed using a submarine vehicle that buries the cables under the seabed using pressurised water jets.

**PROTECTION OF THE CABLES**  
As a protective measure, the cables are buried below the seabed throughout the entire route.



# INTERCONNECTION WITH THE SPANISH PENINSULA: BENEFITS FOR THE BALEARIC ISLANDS' ELECTRICITY SYSTEM

1

## Reduce generation costs

In its first year of operation the Spanish peninsula-Balearic Islands' link has represented significant cost savings. Because in the peninsular system there is a more diverse and economic electricity generation structure, the supply of energy from the interconnection represents an overall annual savings for the system of 50 million euros.

2

## Improve the security of the electricity supply

The interconnection is a guarantee for the quality and security of the electricity supply in the Islands. The average contribution of the Majorca-Peninsula link has been almost 30% of the global consumption of the insular system, at times reaching 40%.

3

## Reduce CO<sub>2</sub> emissions

The contribution of the Majorca-Peninsula interconnection has also been very positive in environmental terms. The annual reduction of CO<sub>2</sub> emissions from electricity generation has been estimated at 285,000 tonnes.

4

## Improve energy efficiency

The interconnection with the Peninsula, in addition to reducing the need to construct new power stations in the Balearic Islands, also allows for increased competition in the islands' generation market, thereby improving energy efficiency.



The two ships specialised in laying submarine cable: the Norwegian ship, the Skagerrak (left) and the Italian ship, the Giulio Verne.

More information  
Find out about our environmental  
commitment.



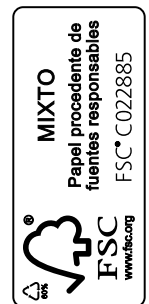
RED ELÉCTRICA DE ESPAÑA

Rémulo2

INTERCONEXIÓN ELÉCTRICA  
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