

# RENEWABLE ENERGIES

# Renewable Energies

ElectroRayma applies a strategy of constant growth and expansion, which has led it to firmly support the use of renewable energy sources, as a part of the company's natural development since its origins in the industrial and naval sectors.

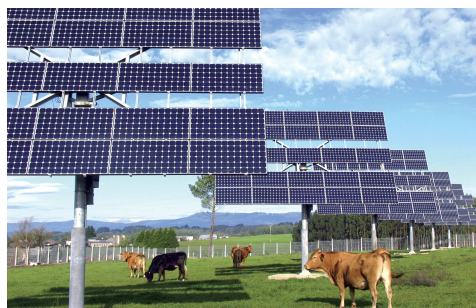
Backed by its experience in both sectors, ElectroRayma implements a policy of specialisation and constant improvement, which together with investments in research, development and innovation and the company's major technical capacity, has allowed it to consolidate its position in the renewable energy sector –wind power, biomass, thermal and photovoltaic solar power, geothermal power and hydraulic power– with facilities throughout the whole of Spain, offering an integral service that includes planning, design, installation and maintenance.

## ACTIVITIES

### WIND POWER



### PHOTOVOLTAIC SOLAR POWER



### THERMAL SOLAR POWER



### BIOMASS



### HYDRAULIC POWER

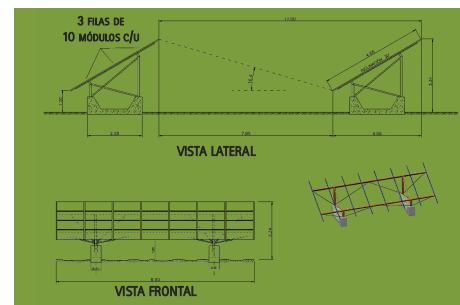


### GEOTHERMAL POWER



### ENGINEERING

- ▶ Project design and management
- ▶ Preparation and processing of administrative licences and permits
- ▶ PLC and SCADA programming
- ▶ Commissioning
- ▶ Technical assistance



### MANUFACTURING

- ▶ Assembly of electrical cabinets:
    - Wind farms, solar plants...
  - ▶ Control and power equipment
  - ▶ Distribution cabinets
- Transformation centres and electrical power plants  
Distribution for secondary installations





## INSTALLATION AND ASSEMBLY

- ▶ High and low voltage
- ▶ Programmable controllers
- ▶ Instrumentation
- ▶ Electrical tracking
- ▶ Measurement and certification of communications networks:
  - Fibre optics and structured cabling



## ELECTRONICS AND COMMUNICATIONS

- ▶ Repair of electronic equipment
- ▶ Repair of electronic power equipment
- ▶ Standard and special connections
- ▶ Fibre optics:
  - Fusing
  - Connectorization
  - Loss verification
- ▶ Verification and adjustment of instrumentation



## MAINTENANCE: PREDICTIVE, PREVENTATIVE AND CORRECTIVE

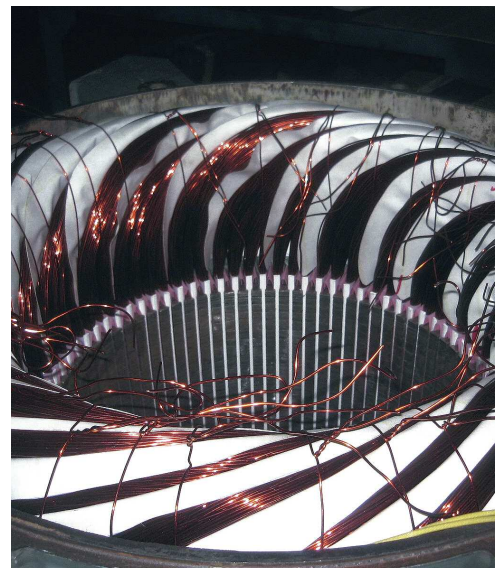
### Electrical and mechanical

- ▶ Predictive:
  - Ferromography, vibration measurements and endoscopy videos
- ▶ Controllers, PCs, CNC, HMI:
  - Programming adjustments and modifications
- ▶ AC, DC variators:
  - Programming and commissioning
- ▶ High/low voltage installations and DC systems:
  - Thermographic analysis of equipment and connections
  - Refurbishment of cabinets, cabling and equipment
  - Fault detection and correction
  - Dry cleaning / cryogenic cabinet cleaning
  - Verification of torque at connection points
  - Verification of cabling condition and replacement
- ▶ Study, analysis and registration of power grids



### Rotary machinery

- ▶ Predictive and preventative maintenance:
  - Vibration analysis
  - Intensity analysis
  - Shockwave test
- ▶ Corrective maintenance:
  - Windings
  - Dynamic rotor balance
- ▶ Tests:
  - Vibration analysis
  - Intensity analysis
  - Shockwave test
  - Insulation resistance
  - Dielectric strength



# ElectroRayma

## History and Departments



ElectroRayma was founded as a company in 1990. Since the outset, it has focused special attention on the technical and technological needs of companies with regard to the manufacture and maintenance of electrical systems and equipment.

To do so, it has placed a particular emphasis on its Technological Research and Development Departments, to respond to the requirements of the industrial, naval and renewable energy sectors.

ElectroRayma currently has installations in the Río do Pozo Industrial Estate in Narón (A Coruña, Spain) covering a total built surface of 2,600 square metres.

As a company that has applied a strategy of constant growth and diversification, ElectroRayma employs more than 120 technicians and specialists, with all the human, productive and technological resources that guarantee competitiveness and customer service.

Quality is the cornerstone of our work, and for this reason the rigorous application of methods is fundamental. As a result, in 1998 the working procedures of ElectroRayma were certified by the Spanish Standardisation and Certification Agency AENOR according to the ISO 9001 standard.

Safety is another of our priority objectives. Our Safety Department has specialised technicians who produce and implement Safety Plans that make it possible to prepare for any type of incident, certified as per the OHSAS 18001 standard.

Respect for the environment also forms an integral part of our activities, and as proof of this ElectroRayma has established an action plan aimed at the company being certified according to the ISO 14001 Environmental Management standard.



