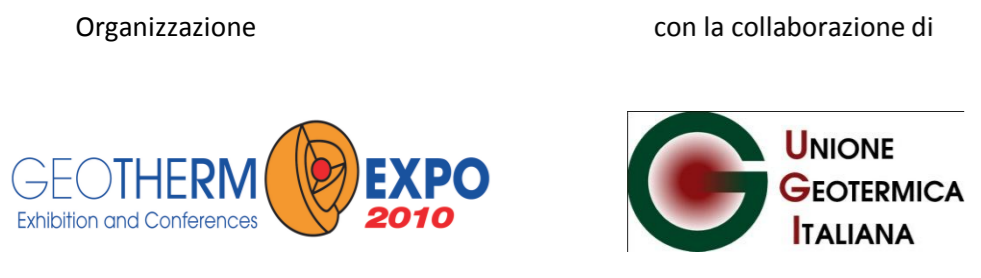


# A NEW APPROACH ON GEOTHERMAL POWER IN ITALY

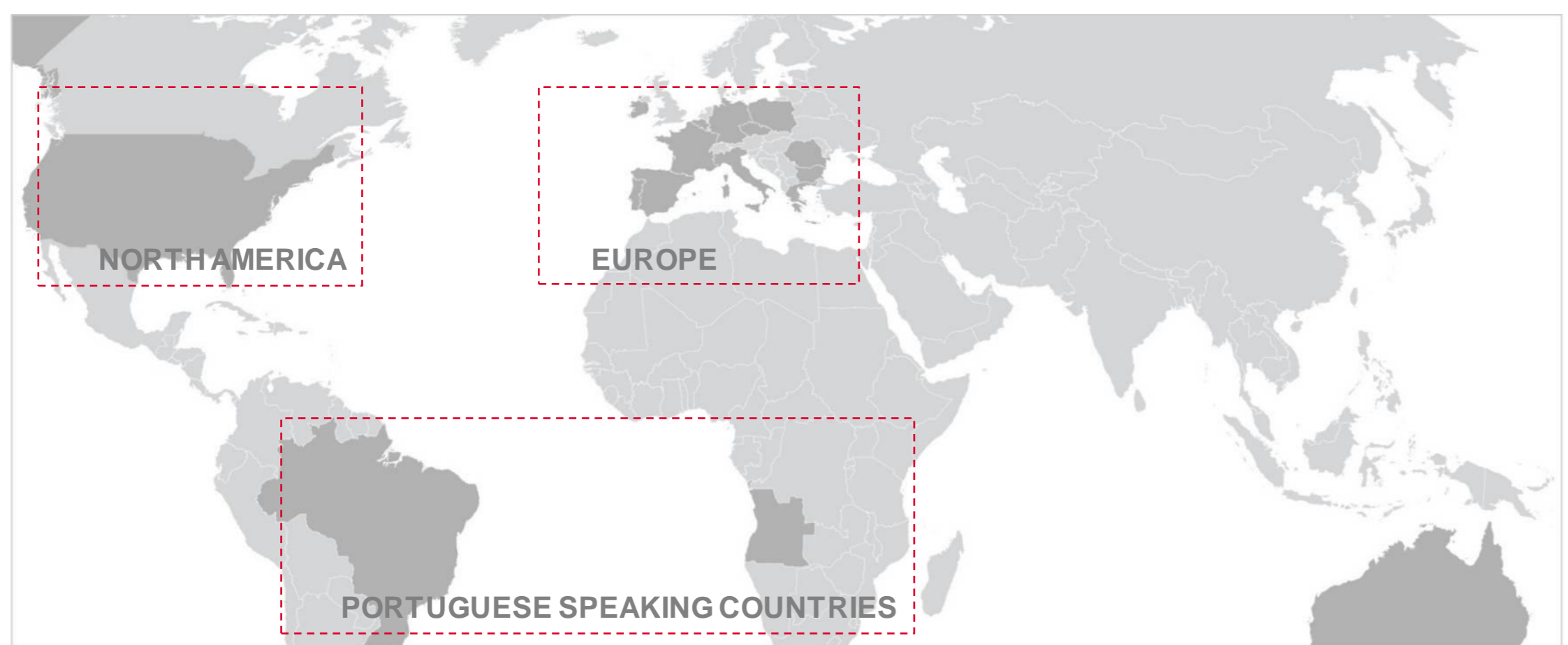
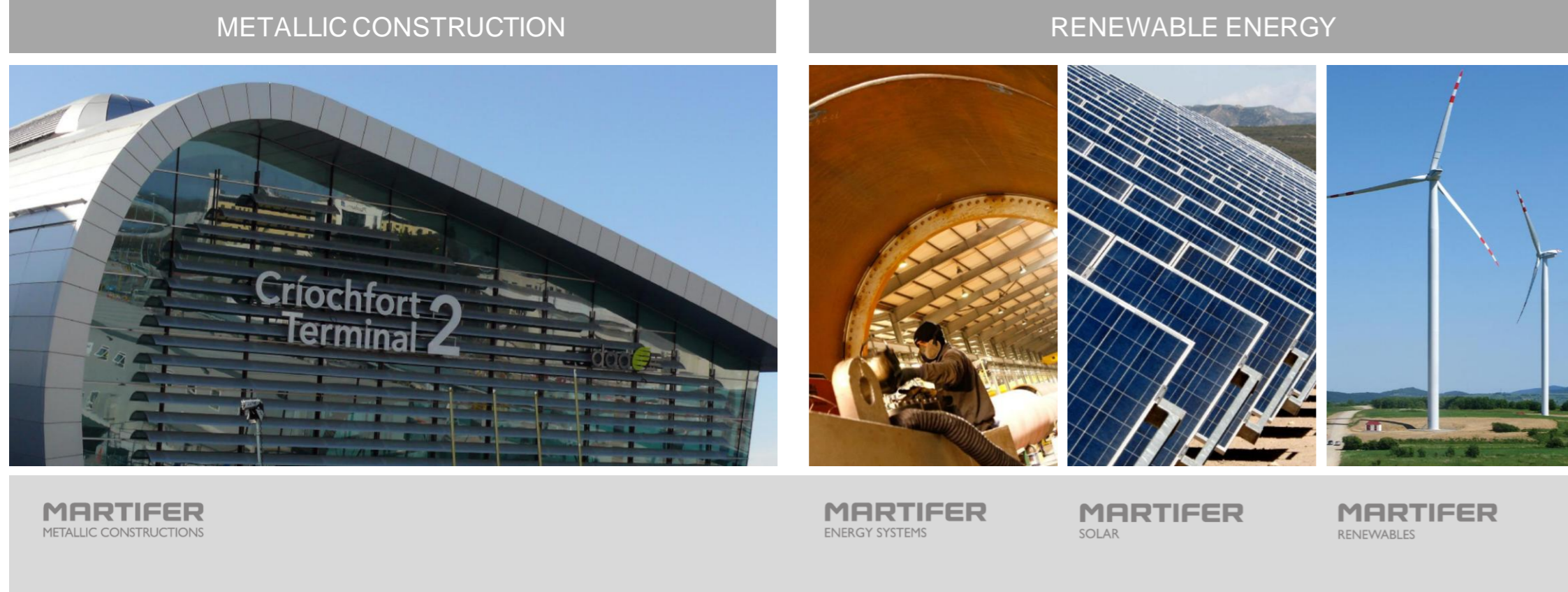


Ricardo Caranova (Project Leader)

ricardo.caranova@martifer.com

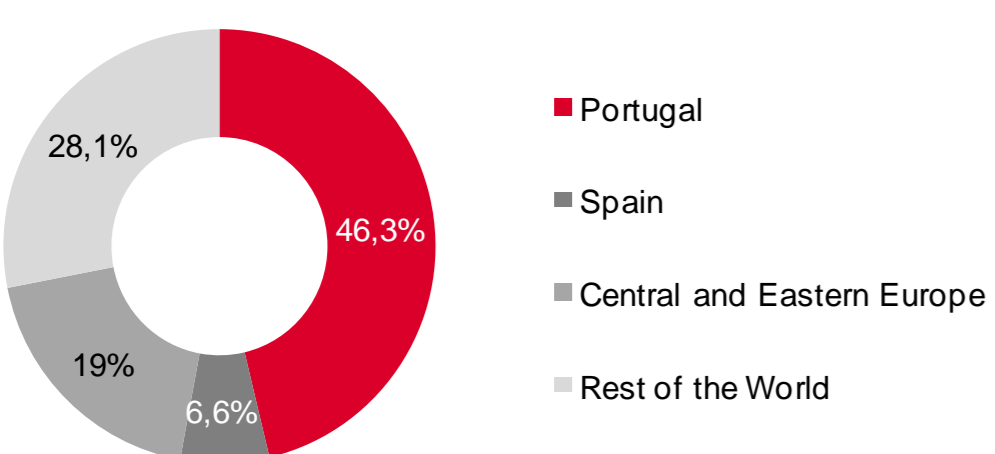
## MARTIFER GROUP

- Portuguese Company
- Over 600 million euros in Revenues in its core activities
- Approximately 4,000 employees (on December 31, 2009)

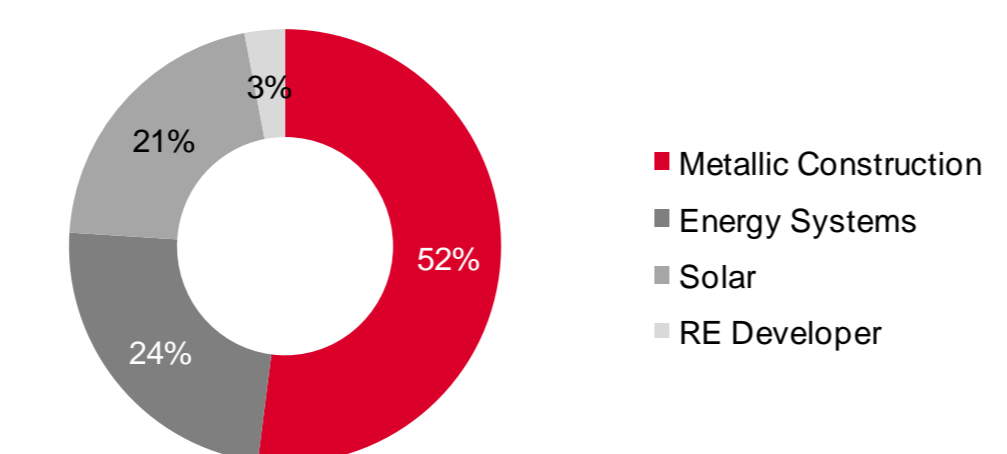


PORTUGAL	BELGIUM	BRAZIL	GREECE
SPAIN	GERMANY	AUSTRALIA	USA
ITALY	CZECH REPUBLIC	FRANCE	BULGARIA
IRELAND	POLAND	ROMANIA	ANGOLA

### BY GEOGRAPHY IN 2009



### BY BUSINESS IN 2009

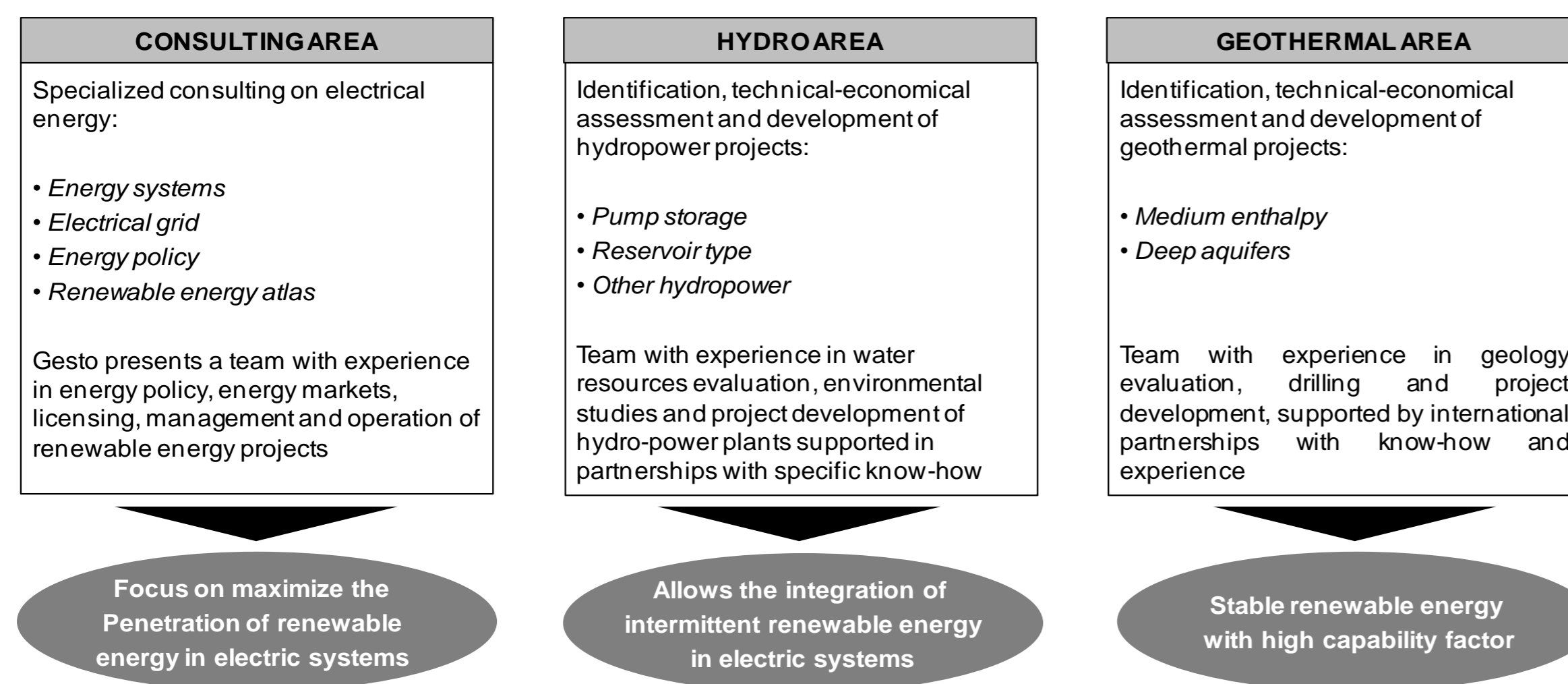


- Renewable business areas and external markets are playing a growing role in Martifer Group
- External markets represent 53% of the Group's Revenues, in particular Central and Eastern Europe (Poland, Romania and Germany), but also Spain and Angola

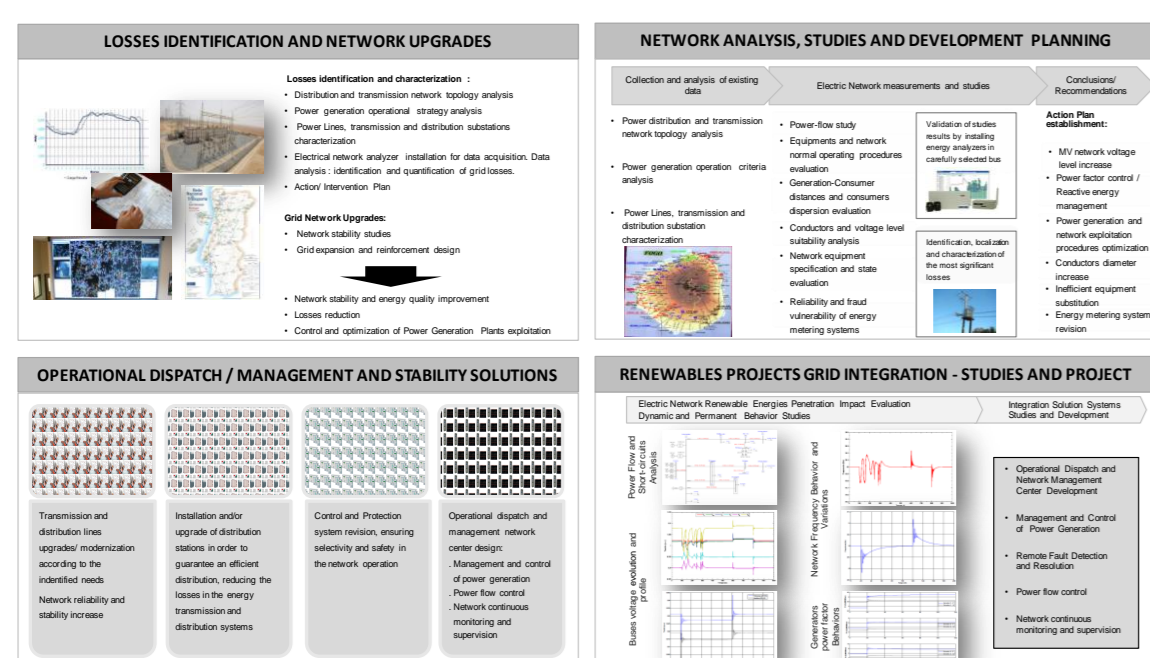


GeSto mission is to develop studies and structural projects that can add value with technical and economic rational, and that allow bigger penetration of renewable energies in the electric systems.

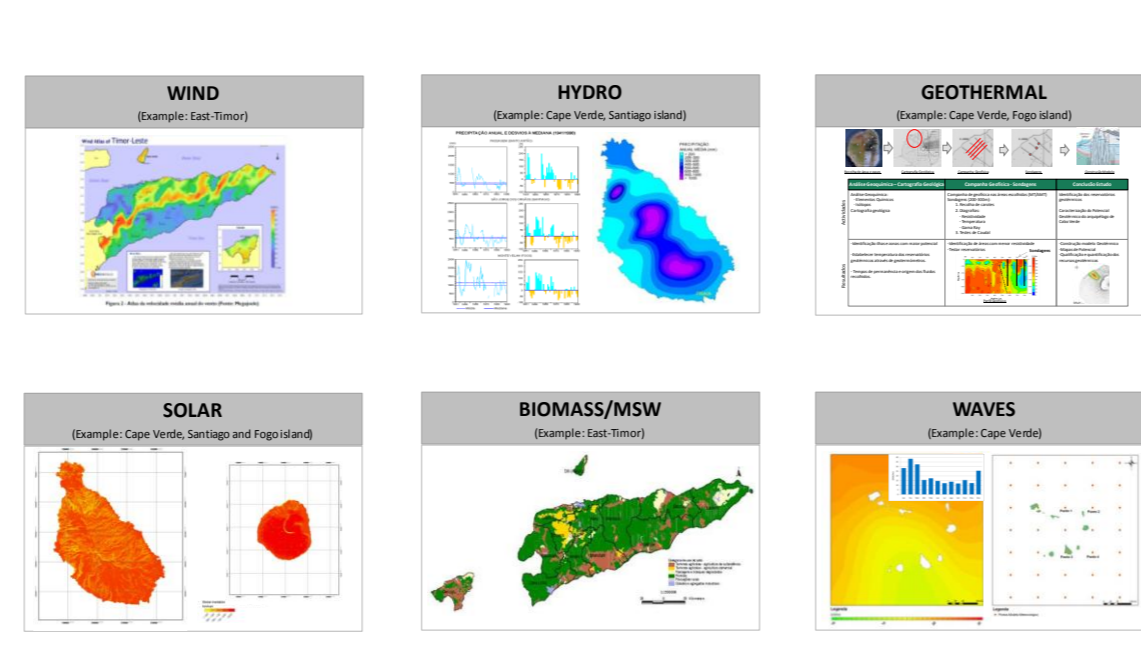
GeSto's operational strategy is based on a highly skilled team focused on energy consulting and also on identification, planning and development of large scale energy generation and storage projects on the area of hydropower and geothermal energy.



GESTO HAS EXPERIENCE IN ELECTRIC GRID SOLUTIONS ...



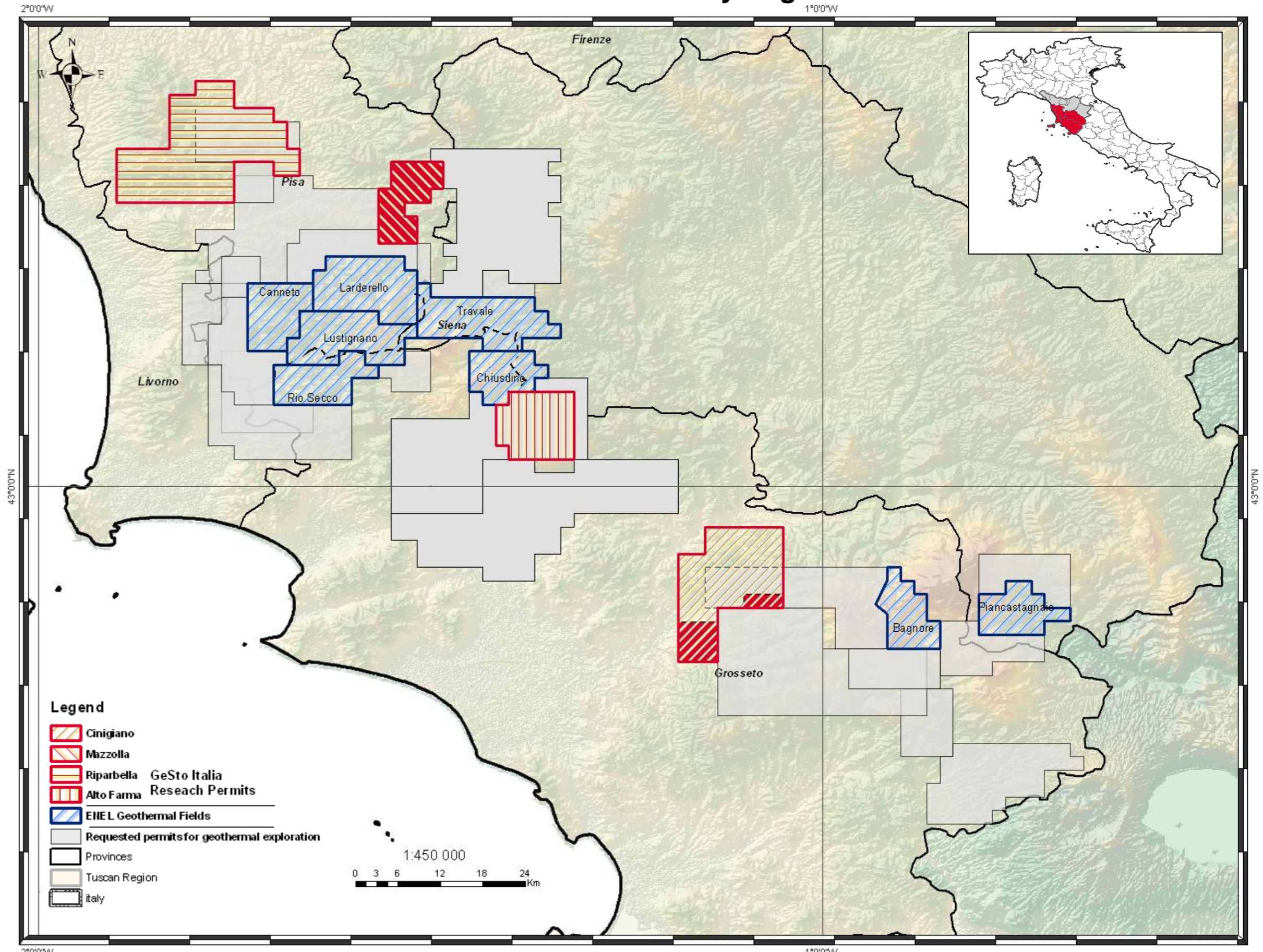
... AND IN RENEWABLE RESOURCES EVALUATION



## GESTO ITALIA

- GeSto Italia was founded in September 2009 and is the Martifer Group company dedicated to project development of geothermal energy, in Italy;
- GeSto Italia was the first company to start the identification of promising areas to develop geothermal projects in Tuscany after beginning the discussion about new geothermal policy;
- GeSto Italia activities are supported by Gesto team in Portugal and by an Italian expert and local partners;
- GeSto already requested a total area of 484 km<sup>2</sup>, corresponding a four areas, to regional authorities for the development of geothermal research activities (next figure);
- After Gesto started, more than 27 research permits were requested by several national and foreign companies that are now investing in Tuscany;
- GeSto is the only company among the others present in geothermal research in Tuscany that have already permission to start the exploration activities;
- A total area of more than 80km<sup>2</sup> was already granted to GeSto Italia for development of geothermal activities (red areas in next figure).

### Research Permits in Tuscany Region



## THE PROJECT

### Project status:

- Collect available information of geology, geophysics and wells
- Preliminary evaluation and prioritization of areas
- Selection of the best suited technology for the projects
- Definition of sites to begin research activities

### Next steps:

- Geological Studies (field and laboratory measurements, modeling hydrogeological conditions);
- Geophysical studies (seismic, resistivity and magnetotelluric methods);
- Drilling gradient boreholes;
- Integration on GIS of all data
- Processing and interpretation of available well data
- Integration of all data for definition of drilling sites.

RESOURCE	CHARACTERISTICS	TECHNOLOGY
• Temp. 100-120 °C • Depth < 1500 m • Geothermal flow: 30 to 70 kg/s	• 2 production wells; • 1 injection well; • 3 to 4 modular turbines • 8.4 GWh/year	Binary modular turbines 

## BENEFITS

Italy will be one of the first countries in Europe to implement low and medium enthalpy geothermal power

- Reaffirming Italy's European leadership in geothermal power;
- Highly innovative technology with potential synergies with local Universities and Research Institutes;
- Tuscany region will be at the forefront of this new technology in Europe.

### Creation of jobs and development in the Tuscany region

- More than 50 jobs during the drilling and construction phase;
- More than €30M investment in total project during the next years;
- Better knowledge of the regional and local geology;
- Royalties from energy power to the region and provinces of Tuscany

### Contributions to the environment

- Increase energy production from renewable sources;
- Decrease CO<sub>2</sub> emissions;
- Clean energy with minimal impact.