

ALENTEJO'S GEOLOGICAL AND MINING STUDIES CENTER – CEGMA 2.0 PROJECT

Alentejo Regional Operational Program, Op. ALT20-03-0246-FEDER-000045.
Aviso ALT20-46-2018-13, Level 3 – Research, Technological Development and Innovation.

NUT II Alentejo

August 2022

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PROJECT GOALS

The CEGMA 2.0 project includes the expansion of the LNEG Aljustrel facilities (Main Building and Core Shed – borehole cores collection - CEGMA 1.0), including a new renewable energies research area. The project is supported by the Alentejo Regional Operational Program. The CEGMA 2.0 goals are: i) provide new equipment related to analytical and rock/minerals processing techniques, applied in research projects - stratigraphy, mineral prospecting, geochemistry, petrography and thematic mapping (geological, geochemical and geophysical); ii) expansion of the LNEG's repository capacity and improve the preservation and access to data collection; iii) improve new research projects on renewable energies, in particular photovoltaic conversion technologies for solar energy, making the LNEG Aljustrel an energy efficient and self-sufficient infrastructure.

METHODOLOGY

Research in geological resources and renewable energies

LNEG's Aljustrel Campus is located in one of the main mining centers of the Iberian Pyrite Belt (IPB), and is dedicated to the study of the geological resources of the Alentejo region, particularly in the IPB and in the Ossa-Morena Zone. The infrastructure is equipped with a Main Building and borehole Core Shed, which support R&D projects dedicated to geosciences and research on base and precious metals mineral deposits. Easy access to the repository collections has been essential in supporting mining companies and researchers surveys. In addition to subsoil investigation, the underway Aljustrel RD activity encompasses other areas such as thematic mapping (geological, geochemical), hydrogeology, geological risk and land use planning. Research activities are carried out in close collaboration with LNEG's Alfragide and São Mamede de Infesta teams. Regional partners include the Évora University and the Hercules Laboratory. Through CEGMA 2.0 Project a new research line begins under the responsibility of the Renewable Energies and Energy Efficiency Unit of LEN and dedicated to the study of photovoltaic conversion of solar energy. The location of the Aljustrel Campus in the Baixo Alentejo great sun exposure region, favors this knowledge.



**NEW KNOWLEDGES AND/OR
ADDED VALUE FOR EUROPE****KEY MESSAGES FOR
DEFINITION OF POLICIES,
COMPANIES, UNIONS AND
CIVIL SOCIETY****END CONSUMERS**

ALENTEJO GEOLOGICAL AND MINING STUDIES CENTER

The CEGMA 2.0 project has a positive impact on the Alentejo economy, corresponding to the goals indicated by the Regional Smart Specialization Strategy (EREI) defined by CCDR Alentejo to the Mineral Resources Economy. The project promotes the sustainability and development of Aljustrel, contributing to the formalization of a local cluster specialized in geological resources that includes several mining companies. With CEGMA 2.0, new RD activities in the field of renewable energies begin. By improving the conditions of access to the LNEG extensive repository collection formed by boreholes, thematic maps and technical reports and samples of rocks, soils and stream sediments. New and innovative research proposals are promoted based in raw data. The ongoing investment also provides new services for mining companies and entities in the area of land use planning and management. The CEGMA 2.0 project also makes a strong contribution to the establishment of specialized human resources in the Alentejo region.

CEGMA 2.0 Project thus responds to the challenges of the EREI of Alentejo, collaborating for the development of the extractive industry in the region and establishment of this territory as one of the key mining areas in Europe. This supports a growing degree of specialization in the research of base and precious metals, namely copper, zinc, lead, silver, gold and other elements such as nickel, chromium, indium, selenium and rare earths. This type of resource is also critical for the economy, so CEGMA 2.0 also meets the challenges of the European Commission on *Critical Raw Materials*. The expansion of knowledge about these elements includes the circular economy of the mine life cycle – prospecting, assessment, mining and rehabilitation.

Mineral Exploration

Research in geological models applied to mineral prospecting scenarios, including the definition of guiding horizons for deposits of base and precious metals.

Renewable energy

Research on the photovoltaic conversion of solar energy.

Mining companies, universities and polytechnic schools, entities related to land use planning and photovoltaic solar energy.

RELATED PROJECTS DEVELOPED AT LNEG ALJUSTREL BETWEEN 2019 AND 2022

EXPLORA/Alentejo2020/FEDER, Definição de novos vetores de conhecimento geológico, geofísico e geoquímico para a região setentrional de Neves-Corvo. Prospecção mineral em contexto mineiro, estratigrafia de alta resolução. LNEG (Líder), Universidade de Évora/Laboratório Hércules, parceria com SOMINCOR/Lundin Mining

ZOM 3D/Alentejo2020/FEDER, Modelos Metalogénicos 3D da Zona de Ossa Morena: Valorização de recursos minerais do Alentejo. Prospecção mineral e divulgação. Univ. Évora (Líder), LNEG e CCV Estremoz

GEO_FPI/Interreg Poctep, Observatorio transfronterizo para la valorización geoeconómica de la Faja Piritica Ibérica. Cartografia, estratigrafia, arquivos e património. Instituto Geológico e Mineiro de Espanha (Líder), LNEG, Junta de Andaluzia, CM Aljustrel.

CHPM2030/EU H2020, Combined Heat, Power and Metal extraction from ultra-deep ore bodies. Potencial geotérmico. Univ. Miskolc (Líder), Earth Science & Engineering Fac., Univ. Szeged, European Federation of Geologists, British Geol. Survey, LNEG, VITO, La Palma Research Centre, Agency for int. mineral policy/MinPol, Geol. Inst. of Romania, KU Leuven, Geol. Survey of Sweden.

SMART EXPLORATION TM/EU H2020, New Ways to Explore the Subsurface. Modelação geofísica, prospecção mineral. Univ. Uppsala (Líder), Geo-Vista, MIC Nordic, Geological Survey of Sweden, LNEG, Somincor/Lundin Mining, TU Dekft, Seismic Mecatronics, Freiberg Univ., MIC, Politécnico de Turim.

FRAME-GeoERA, Forecasting and Assessing Europe's Strategic Raw Materials Needs, Establishing the European Geological Surveys Research Area to deliver a Geological Service for Europe. Recursos geológicos. LNEG (Líder), Federal Inst. Geosciences and Natural Resources, Bureau de Recherches Géologiques et Minières, Czech Geological Survey (GS), GS Estonia, GS Sweden, GS Ireland, GS Finland, GS Croatia, Greek Institute of Geology and Mineral Exploration, Inst. Geológico y Minero de España, Mining and Geological Survey of Hungary, GS Norway, Polish Geological Institute, Royal Belgian Institute of Natural Sciences, State Informational Geological Fund of Ukraine, Institutul Geologic al Romaniei, Geološki Zavod Slovenije, Inst. Superiore per la Protezione e la Ricerca Ambientale

PLANAGEO, Plano Nacional de Geologia de Angola. Cartografia temática das regiões do sul de Angola, em parceria com o Instituto Geológico y Minero de España e a empresa Impulso.

INCARBON, Carbonatação *in situ* para redução de emissões de CO₂ de fontes energéticas e industriais no Alentejo. Universidade de Évora (Líder), LNEG.



PANAFGEO, Pan-African Support to the EuroGeoSurveys-Organisation of African Geological Surveys (EGS-OAGS) Partnership, EuroGeoSurveys. Património geológico e mineiro. LNEG, Serviços Geológicos Europeus e de Moçambique, Angola, Cabo Verde e São Tomé e Príncipe

AGEO/Interreg Atlantic Area, Platform for Atlantic Geohazard Risk Management. Deteção Remota, Cartografia, Riscos Naturais. IST, Associação Portuguesa de Geólogos, La Palma Research Center, Inst. Geológico y Minero de España, Univ. Bretagne Occidentale, GS Northern Ireland, Univ. College Dublin, Centre d'Etudes et d'Expertise sur les Risques Environnement Mobilité et Aménagement, LNEG, Univ. La Lagunam, LNEC, CM Lisboa, Univ. da Madeira.

ASGMI - Associação Serviços de Geologia e Mineração Ibero Americanos. Grupo Património Geológico e Grupo Metalogenia e Recursos Minerais.

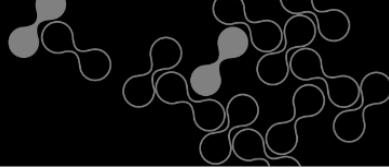
LOUMU/FCT, Muon Tomography In Lousal Mine. Modelação geofísica. LIP (Líder); Universidade de Évora, ICT, CCV Lousal, LNEG.

START/HORIZON-CL4-2021-RESILIENCE-01-07, Sustainable Energy Harvesting Systems Based on Innovative Mine Waste Recycling - transforming mining waste into materials for waste heat recovery and sustainable supply chain and a corresponding business-innovation ecosystem for tellurium-free thermoelectric green energy harvesting products. LNEG (Líder), 3drivers, ASGMI, BGR, EPMA, GeniCore, GEO-U, GBA, LPRC, MBN, RGS, SGUDS, SINTEF, TEGnology, IGME-CSIC.

GSEU/GeoERA - Waste INSPIRE compliant. Avaliação de escombreiras mineiras. LNEG, Serviços Geológicos Europeus.



Infrastructure expansion areas - Main Building (left) and Core Shed (right).



ADITIONAL INFORMATION

LNEGwww.lneg.pt**GEOPORTAL**<https://geoportal.lneg.pt/>**CCDR Alentejo, Estratégia Regional de Especialização Inteligente**<http://www.alentejo.portugal2020.pt/index.php/documentacao/category/10-estrategia-regional-de-especializacao-inteligente>