Case Study
Underground works: the multidimensional city and Tunconstruct

Current society presents mobility challenges requiring improvements in the transport network and in services for the citizen, and which forces the demand for railways, motorways, channels and urban transport systems resolving the current traffic congestion to be prioritized.

DRAGADOS has actively taken part in the construction of the some of the main domestic and international underground infrastructures, completing over 400 projects in 14 countries on four continents.

The policies of the Spanish and European Union authorities include a revaluation of underground spaces, both for the improvement of connections between urban space, and for the implementation of measures to resolve the complex problems currently affecting the urban areas.

DRAGADOS, the leader in underground construction, is involved in the main innovation initiatives and carries out several types of activities with respect to underground construction. Inter alia, there are currently two R&D projects under development in Spain and Europe: The Multidimensional City and Tunconstruct.

The Multidimensional City, led by DRAGADOS, is the only project within this field approved by the Spanish Ministry of Education and Science in 2005, and groups together 35 organizations in all of Spain. Its four-year budget amounts to more than fifty million. The objective of this project is to develop new underground space construction processes using intelligent materials, integrated highly efficient and sustainable processes with little environmental effect.

The integrated European project TUNCONSTRUCT, backed by the European Union as part of the Sixth Research Framework program groups together organizations and countries from eleven countries, with a budget of 26 million for four years. DRAGADOS leads one of the four sub-projects and several work packages. Its objective is to make European technology the worldwide leader in terms of competitiveness and efficiency for the construction of tunnels, and to offer new generation services from design to operation and maintenance throughout the full life cycle of the infrastructures.

Within these projects, new technologies for construction are being developed. These come from the field of the exploration and production of hydrocarbons and allow for in-depth knowledge of the lands, the development of new customized materials which adapt to the changing circumstance of the surroundings, new environment and land modelling and behaviour simulation systems which allow contract work to be performed under difficult circumstances with greater assurances, and systems providing for the usage of the geothermal energy and residual heat arising from the various activities by recycling the marginal products generated.

These projects aim to develop the technologies required to enable underground works to be undertaken in a competitive profitable and safe manner on any land and under any circumstance, with extensive freedom as to size and shape, minimum consumption of resources, and in the least period of time possible, by automating processes and increasing the efficiency thereof. Lastly, the development of underground works with minimal effect on the environment is sought, thus improving the company's technological level and the satisfaction of clients and users.