



R&D&I DIVISION

The **added value**
of our **projects**



2022 was characterised by drafting the Division's Strategic Plan that will set the organisational, technical and financial strategies until 2027

In line with this, innovative solutions were refocused, taking into account the 'Horizon 3' projects of the company's business divisions and the rest of the Magtel Group's related companies. In this sense, the ideas that have been presented to regional, national and European calls for aid have been diversified, with propositions in the field of solar thermal technology with supercritical CO₂, green hydrogen, solar panels, ICTs in critical infrastructures for defence and in the agricultural sector in the scope of smart irrigation.

Highlights include the award in competitive competition of two projects in the Missions 2022 call, for which a significant number of the best technology companies in Spain submitted proposals, specifically the AD-GRHID project (on the green hydrogen value chain and microgrids) and the SUNRISE PV project (photovoltaic), and the award in a dual national and regional call (civil and defence) of the CRITICALFOG project (critical infrastructures).

Finally, the implementation of the last phase of the Life Green Sewer, Tec-Med and SIES 2022 projects has continued.

> Energy

- » Hydrogen
- » Solar thermal energy
- » Photovoltaic
- » Energy storage and electricity
- » Microgrids

> ICT

- » Industry 4.0
- » IoT
- » Monitoring systems
- » Predictive maintenance
- » Blockchain
- » Artificial intelligence

> Environment and infrastructure

- » Water treatment
- » Waste management and recovery
- » Desalination
- » Smart irrigation

> Companies and technology centres:



> Universities:



> Co-financing entities:



> Sunrise PV

Magtel's R&D&I Division will lead the Sunrise PV project to promote the new generation of photovoltaic technologies to reduce energy costs through circular strategies. The consortium is made up of eight companies: Magtel, Cegasa, CEN Solutions, Isfoc, Mondragon, Mugape, Soltec and Técnicas Reunidas.

This initiative, which will run until 2025, proposes solutions and innovations in the different phases of the value chain (solar panels, trackers and support structures, power converters, photovoltaic inverters, storage, plant operation and maintenance), focusing research on three points.

The first of these refers to new materials and manufacturing processes for photovoltaic modules and the rest of the components, achieving greater conversion efficiency and reduced manufacturing costs. The second issue concerns new operation and maintenance processes for a more durable, efficient and reliable use of PV systems.

Finally, research covers new processes for the recovery and reuse of critical materials and components in the solar photovoltaic value chain to increase their usefulness and improve the environmental impact of the technology.

These three lines of action converge in a final objective, which is to optimise the production of renewable energy - of photovoltaic origin - with a reduction in the energy and economic cost of the technology (improvement of the LCOE), as well as to make significant progress in the efficiency, flexibility and management of photovoltaic plants, in an environment of environmental, economic and social sustainability.

The Centre for the Development of Industrial Technology (CDTI), part of the Ministry of Economy, Industry and Innovation, awarded Magtel the Sunrise PV project, as part of Mission 1 'Strengthening technological capabilities for safe and sustainable energy autonomy (fusion, hydrogen and renewables)', within the framework of the Missions 2022 call for proposals.

This initiative, which focuses on the optimisation of energy production and costs, its integration into electricity grids, as well as the environmental impact of photovoltaic plants, was awarded an incentive of 4.2 million euros out of a total budget of 6.5 million euros.



> Ad-Grhid

Magtel is leading the Ad-Grhid project, which focuses on research and development into new hydrogen-related products and systems.

Magtel's R&D&I Division is leading the Ad-Grhid project awarded by the CDTI, also within Mission 1 'Strengthening technological capabilities for safe and sustainable energy autonomy (fusion, hydrogen and renewables)', in the Missions 2022 call for proposals.

This initiative covers an important part of the hydrogen value chain, aimed at researching and developing new products and systems. The project was awarded an incentive of EUR 3.3 million out of a total budget of EUR 4.8 million. The source was the Recovery and Resilience Fund under the Next Generation EU instrument.

In addition to Magtel, Ad-Grhid is made up of a consortium of seven other companies: Ingelectus, Eléctrica de Villanueva de Córdoba, H2B2 Electrolysis Technologies, Nasika, Premo, Protio Power and Tequinson Servicios.

The project, which will delve deeper into industrial research, is supported by the University of Cordoba and Loyola University, as well as the AICIA, AIMPLAS and IREC technology centres. Thus, a research ecosystem is being created that will enable us to respond to the ambitious challenges that lie ahead, including smart grids, through the management and engineering of integrated distribution networks with hybrid AC/DC microgrids; power electronics; the development of electrolyzers and fuel cells; and hydrogen storage.



Images courtesy of the University of Cordoba

The objectives of the project include improving the energy density of storage, decreasing the capital cost of solid oxide electrolyzers, increasing energy efficiency, and the supply continuity of microgrid services to distribution grids through renewable energy.

Research is encouraged for the development of high added value products of Spanish origin, which could be important in the transition towards a future with greater circularity in the use of materials and carbon-neutral energy consumption.



AD-GRHID

> Investing in research and development as a key link for creating long-term value for tech-based companies



JOSÉ LUIS ARANDA HIDALGO
Director of the R&D&i Division



Investments in research and development are important for companies, and even more so for technology-based companies.

Society is increasingly demanding, intelligent and committed to sustainability and the environment and, as a consequence, demands that companies offer products and services that, in order to integrate these premises, must necessarily be innovative.

This applies to all sectors, where developments are accelerating, and to all companies, whether they are margin-based, volume-based or a mix of both.

The amount to be invested in R&D&I must be even greater in those companies that want to base their growth on the margin, as they must present differentiated products to this ultra-demanding society, with high added value, committed to the environment, and in record time. These investments allow companies to be flexible and able to continuously evolve their products and services to adapt to frequent changes in demand.

But, how much to invest? It is assumed that investment should be high in those companies based on research and development, and at which the return on investment of each product developed could be estimated and quantified, for example, a drug resulting from discoveries in the laboratories of a pharmaceutical company. This exercise is not so easy in many other companies, which, although they define themselves as technological because of their areas of activity, many of their products are not the result of their internal research, but of their suppliers. At these companies, which are not based on in-house research, the qualitative part must be taken into account, which is difficult to estimate in numbers, where the positioning and brand image that can be generated by a pilot R&D&I project can be key to contributing to margin growth, developing a new service or product, or even adding a new

business area, diversifying the company, making it more resilient to continuous change and improving its chances of survival in an increasingly competitive market.

Estimating the qualitative value and the quantitative part to be capitalised in the future by commercial businesses as a consequence of R&D investment is extremely complex and uncertain, as success is not assured, and the return is long term. As a result, companies are often too conservative or reluctant to invest in R&D&i.

And, what to invest in? Depending on whether a company's foundations are R&D or not, it must invest to a greater or lesser extent in materials, but there is no doubt that, in both types of tech-based companies, the key investment is in the people with the talent to create and transfer knowledge within the organisation. This knowledge is acquired through complex R&D&i projects, which only highly qualified professionals are capable of leading.

There is clearly a close relationship between the image of companies and the increase in their investment in R&D, and while, years ago, investment in innovation and development was something extraordinary with which they sought to improve and strengthen their position in the market, today it is essential to remain competitive. Those organisations that manage to keep a constant growth rhythm are those that adapt to change, anticipate the future and are prepared for each new challenge that comes their way. They are organisations that do not improvise because they are currently launching the ideas that germinated years ago in their research.



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