

***Magtel***



***Technology*** *for*  
***sustainable development***

**2021**

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ANNUAL REPORT

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***Magtel***



**Annual Report  
Magtel 2021**

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## Letter from the Chairman

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I am here to present this new Annual Report on Activities for 2021, a year full of contrasts, to say the least, due to the situation from which we came and the expectations we have to overcome one of the most difficult, "challenging" situations, as I described it in the previous Report, that companies and their professionals, and society as a whole, in short, have ever faced.

These contrasts have come, in essence, from the ongoing maintenance of precautions and protocols to protect us from successive waves of the pandemic that continued to restrict normal activity throughout the year, as opposed to compliance with and implementation of our 21-25 Strategic Plan, continuously adapted to the circumstances. Circumstances which, as we all know, have been changing and complex.

The year has passed between the impulses of a natural recovery of activities, as restrictions facilitated it. And the new obstacles that have appeared – mainly price rises in energy, raw materials and components of all kinds, – as we all know, have come hand in hand with difficulties and bottlenecks in global supply chains.

In this sense, we have tried to respond to this situation, always keeping our objectives in mind as a strategic company in technological transformation and digital innovation and as a main actor in the process of energy transition at the forefront of the development of clean energies, at a time, as we are seeing at the time of writing these lines, that is absolutely decisive for our future.

Finally I would like to acknowledge, once again, the role of the more than 800 professionals who build the leadership of a company like Magtel on a daily basis, a leadership of commitment, competence and purpose. That of showing and demonstrating the social value of companies in the present and always towards the future.

**MARIO LÓPEZ MAGDALENO**

Chairman of Magtel

# Our History

## 1990

Our journey begins!

- Foundation in Posadas (Cordoba)
- We are a subcontractor of Abengoa and Telefónica

## 1991

- Opening of a telephone shop
- Commercialisation of the first terminal models

## 1992

We all work at the Seville Expo '92!

## 1993

- Crisis: Search for new clients and new horizons

## 1994

- New clients are added: Alcatel, Radiotrónica, Cablinsa

## 1995

- Major fibre optic project: Enagás
- Deployment between the municipalities of Dos Hermanas (Seville) and Ciudad Real

## 1996

- We participated in the switch from analogue to digital for our client Telefónica

## 1997

- We added another major customer: Renfe
- We bought the first fibre optic and reflectometer equipment
- We are ISO 9001 certified

## 1998

- Deployment of 5,000 km of fibre optics for Renfe
- We added new customers following the liberalisation of telecommunications: Supercable and Uni2

## 1999

- We open new Delegations
- Opening of offices in Cordoba and Seville

## 2000

- We are involved in the development of industrial estates with two of our major clients: Supercable and Telefónica

## 2001

- We achieved EFQM certification in Communications and Security
- We deployed a large fibre rollout on AVE high-speed lines:
  - Madrid - Barcelona
  - Zaragoza - Huesca

## 2002

We are rewarded!

- Business Excellence by the Regional Government of Andalusia
- Recognition by the Association of Telecommunications Engineers
- 'Cordobeses del año'

## 2003

- Incorporation of radio and mobile telephony into our customer portfolio: Retevisión

## 2004

- We work with all major mobile operators: Movistar, Vodafone, Amena, Orange and Yoigo
- We are technologists from: Siemens, Nokia and Ericsson

## 2005

- Rehabilitating the Retevisión centres
- We enter the energy sector with Endesa as a new client

## 2006

Our customers continue to stand by our side with more confidence!

- Opening of the polyethylene pipe factory with fourteen production lines
- The Renewable Energies Division

## 2007

- The Water Division is created, developing quality projects, large infrastructures, building and civil works
- We build our first solar photovoltaic power plants

## 2008

- Internationalisation: Ericsson's first radio-link installation in Panama
- Commissioning of El Molino and La Castilleja
- Creation of the Systems Division

## 2009

- Incorporation of the company Magtel USA Inc. to develop photovoltaic projects in Texas (USA)

## 2010

- Start of construction of our first solar thermal power plant

## 2011

- New research in Libya, Colombia and Chile
- Opening of the Delegation in Morocco

## 2012

- Unification of the various Magtel companies into a single, much stronger company: Magtel Operaciones
- Commissioning of La Africana solar thermal power plant
- Opening of the Delegation in Peru

## 2013

- Start of FTTH (Fiber To The Home): Optical fibre to the home

## 2014

- Opening of the Delegation in Paraguay

## 2015

- Opening of the Delegation in Portugal

## 2016

- Promotion of more than 1,700 MW in photovoltaic energy

## 2017

- Supervision and site management of the deployment of Peru's national fibre optic backbone network

## 2018

- Creation of our Mining Division

## 2019

- Towards full digital transformation
- Promotion of +2,400 MW of renewable energy projects

## 2020

- We reinforce our essential status in the year of essential business for society

## 2021

- Read more







# Our areas of activity



## Energy

- > EPC
- > FACILITIES AND SERVICES
- > ENGINEERING
- > ENERGY EFFICIENCY

## Telecommunications and Digital Transformation

- > FIXED AND MOBILE NETWORK
- > CUSTOMER I&M
- > RAILWAY INSTALLATIONS
- > SPECIAL PROJECTS
- > ICT INFRASTRUCTURES
- > SMART SERVICES
- > PROCESS OUTSOURCING



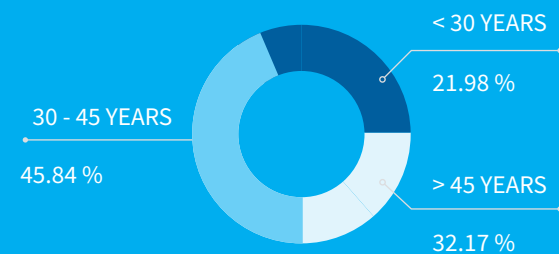
## Infrastructure

- > CIVIL WORKS
- > CONSTRUCTION
- > MINING



# We are Magtel

We are a **technology-based company** that applies the **most advanced systems** in the fields of **energy**, **telecommunications** and **infrastructures** always with sustainability and innovation as cross-cutting issues in all our activities



**+800**  
PROFESSIONALS



**+1,300**  
INDIRECT JOBS



**21**  
OFFICES



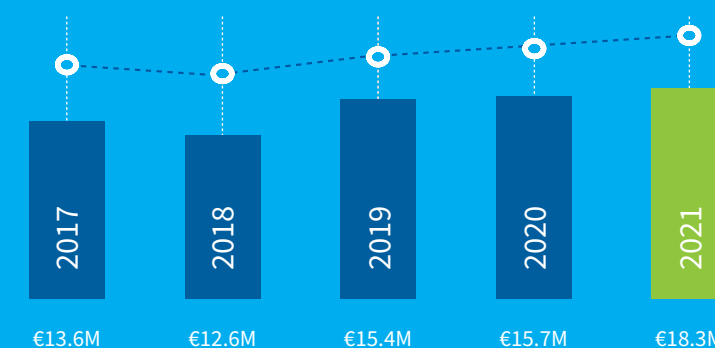
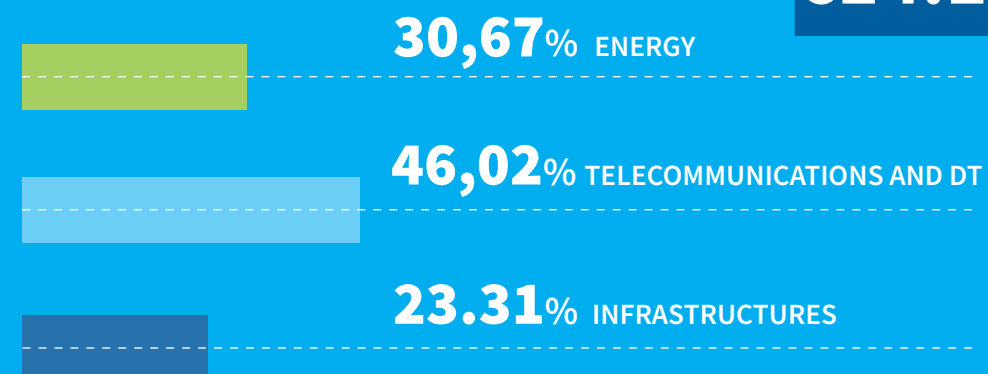
**37,7%** ENERGY

**43,2%** TELECOMMUNICATIONS AND DT

**19.1%** INFRASTRUCTURES

**R&D&I**  
investment  
since 2008:

**€14.16M**



Evolution  
of the  
**EBITDA**



# Governing and Management Bodies

We are organised around our **Business Units and Corporate Services**, under the good governance of **Magtel's General Management and Board of Directors**

## Board of Directors

- > MARIO LÓPEZ MAGDALENO
- > ISIDRO LÓPEZ MAGDALENO
- > JUAN LUIS LÓPEZ MAGDALENO
- > ANTONIO MANUEL LÓPEZ MAGDALENO
- > JOSÉ CARLOS LÓPEZ MAGDALENO
- > AUXILIADORA LÓPEZ MAGDALENO

## General Management and Divisions

- MARTÍN SALGADO DEVINCENZI**  
Managing Director of Magtel
- JUAN MANUEL VIZCAÍNO GARCÍA**  
Director of the Energy Division
- ANTONIO TORRES ESPEJO**  
Director of the Telecommunications Division
- ENRIQUE RODRÍGUEZ GÓMEZ**  
Director of the Infrastructure Division
- JOSÉ LUIS ARANDA HIDALGO**  
Director of the R&D&i Division



## Our Mission

To provide infrastructures with the **most advanced technological systems** to contribute to **greater efficiency** in the use of natural resources and **improve the quality of life** for today's and tomorrow's society

## Our Vision

**To be protagonists of large technological projects** for sustainable development



## Our Values

- |                             |                     |
|-----------------------------|---------------------|
| ► People                    | ► Health and safety |
| ► Social commitment         | ► Sustainability    |
| ► Ethics and responsibility | ► Innovation        |
| ► Transparency              | ► Excellence        |





# Protagonists of **change** for **sustainable development**

MARTÍN SALGADO DEVINCENZI  
Managing Director of Magtel

The energy landscape is in the midst of a transformation and faces major challenges. We are seeing this in recent months with electricity prices and the impact that their continuous rises are having on consumers and businesses. This situation is not unique to our country, quite the opposite. It affects the European Union in particular, and each country to a greater or lesser extent, depending on its legal systems and its own energy mix.

However, we are facing a scenario that will place clean energies at the centre of the generation model, as established in the European Green Deal, but which will have to face the challenges of resource manageability and economic efficiency so as not to affect the end consumer.

This model is driven by environmental sustainability for obvious reasons. Climate change is a reality that has awakened the sensitivity of governments and citizens as key to the future of our society.

For this reason, at Magtel we have been deeply committed to the fight against climate change and the development of renewable energies for more than 15 years and we consider environmental sustainability to be an essential part of our mission.

This is reflected in our strategic plan, where our strategy is geared towards equipping the various infrastructures with the most advanced technological systems to contribute to greater efficiency in the use of natural resources and to improve the quality of life for today's and tomorrow's society.

This means that all our activities are conducted in a sustainable manner, which motivates us to continuously raise our standards to achieve excellence. To this end, we prioritise care and respect for the environment, and we are committed to training our teams for the best possible development and execution of projects.

Because we want to be protagonists of change for sustainable development. We have more than 15 years of experience in renewable energy and have participated in several developments in Spain, with practically all the technologies on the market.

Today, we are focusing on energy storage in all available technologies, as its manageability represents the great challenge to replace conventional sources.

In this regard, we believe it is essential to provide the energy system with efficient technologies that enable generation with zero CO2 emission sources to be considered manageable. The challenge in this area is permanent and investment in R&D allows us to participate in cutting-edge developments in the sector.

We also have a significant portfolio of photovoltaic, terrestrial and floating, wind, reversible pumping, cogeneration, biogas and green hydrogen generation projects. We participate in energy and thermal efficiency improvement projects in the industrial sector, providing specific solutions according to the needs of our clients. And we have a variety of R&D&I projects that allow us to anticipate the technologies that will prevail in the future.

## > A promising future

We are convinced that the future of the sector in Andalusia is very promising. We can count on the climate, the development capacity of companies, innovation, which is becoming increasingly decisive, the commitment of the public administrations and the value of public investment. And finally, something very important: the new possibilities for public-private collaboration, thanks to the various programmes included in this Green Agenda.

We are sure that the development of latest generation renewable energies in Andalusia will demonstrate that this change in the production model brought about by the energy transition will increase productivity, create quality employment and provide added value.



## Ethics and responsibility

Our Compliance system establishes the principles that must guide the professional behaviour of Magtel, our staff, subsidiaries, related companies and third parties.

We are committed to acting in accordance with the company's values in all interactions with customers, suppliers, public and private institutions and society in general, as well as among our members.

## Committed to sustainability

We promote sustainable development in all the environments in which our company is present. We promote and encourage the development of environmental actions through the projection of our company's know-how, always for the benefit of the environment.

We apply our environmental policy motivated by the desire for continuous improvement in this area, which translates into the best use of resources and the reduction or elimination of polluting sources.

## Continuous training

Magtel's Training Area carries out an annual training plan to improve our skills.

With a special emphasis on improving digital skills, this plan accounts for an annual average of approximately 400 training actions and more than 80,000 hours of training.

We highlight the following actions developed during 2021:

- > Renewal of the Telco training certification in Magtel Operations for the accreditation of Magtel workers and collaborating companies in the Telecommunications sector.
- > Implementation of 60 subsidised training actions for professionals, including those carried out on BIM methodology, English, and all mandatory training for staff due to client requirements.
- > High performance training for Management Committee and Corporate Services Committee staff.



## Recognised with the Equality in Business Flagship at national level

We increased the number of women in our workforce to 25.7%

Magtel has been awarded the *Distintivo Igualdad en la Empresa* (DIE) [Equality in Business Flagship], granted by the Instituto de las Mujeres (Women's Institute), an organisation dependent on the Ministry of Equality. This distinction is a mark of excellence that recognises at national level the commitment and work carried out in equality policies in the workplace. The upward trend in terms of parity promoted by the company has meant that, in the last five years, among other issues in this area, the Andalusian company has increased the presence of women in the workforce by 9.7 points, reaching 25.7%.

This recognition is in addition to that awarded by Malaga City Council as a Malaga, egalitarian and conciliatory company.



# Magtel Foundation

## Defending the company's contribution to society

Our Foundation, born in 2012, creates, supports and promotes initiatives that contribute to the construction of a better and more egalitarian society in the national and international context.

Through initiatives aimed at socio-occupational integration, social and technological innovation and social action, it promotes actions for the development and improvement of the quality of life of people and our environment, together with sustainable development and environmental protection.



## 'Estamos Contigo' (We're With You)

Commitment to improving the personal circumstances of Magtel professionals with children with disabilities

A commitment to adapting resources in a specialised manner

This initiative was born at the end of 2020 and continues today providing different types of resources: economic, to maintain access to rehabilitation therapies or physical/cognitive stimulation; improving family and work conciliation; or supporting the promotion of socio-labour insertion.

## Our Foundation's corporate volunteering programme promotes the involvement of our staff in its projects

Our company's employees are involved in the initiatives developed by the Magtel Foundation. Among the activities in which volunteering actions can be carried out are the preparation and distribution of food; accompaniment and talks with the elderly; or leisure and free time for minors.

## Social Action

> We encourage the construction of an egalitarian and committed society through the promotion of solidarity activities.



## Employability

> We contribute to the generation of employment opportunities among vulnerable groups or those at risk of social exclusion through training programmes and professional internships.

## Social Innovation

> We collaborate with Magtel's R&D&I and Telecommunications and Digital Transformation Divisions in order to apply their knowledge and experience to improve the quality of life of people with disabilities and dependent persons.



## International Cooperation

> We promote initiatives and projects that contribute to the development and improvement of living conditions in developing areas.



## Certified quality

Service quality is the basis of our work, optimising processes to achieve maximum efficiency

Management Systems implemented in Magtel:

- > Quality Management System (ISO 9001)
- > Environmental Management System (ISO 14001)
- > Occupational Health and Safety Management System (ISO 45001)
- > R&D&I Management System (UNE 166002)
- > Information Security Management System (ISO 27001)
- > Halal certified by the Halal Institute
- > Energy Management System (ISO 50001)
- > Quality System (PECAL/AQAP 2110)
- > Accreditation as an approved supplier for the construction of the low level waste and intermediate level waste cell closure slab with quality level II, awarded by Enresa (Empresa Nacional de Residuos Radiactivos, S.A.)

## Quality and Environment in our Works



We implemented operational instructions in our internal management to optimise quality on site, improving the process of drawing up quality and environmental plans.

We calculate and verify our carbon footprint for registration with MITERD (Spanish Ministry of Ecological Transition and Demographic Challenge).

## Target: Zero accident rate

OHS (Occupational Health and Safety) training for the promotion of a preventive culture

We are committed to acting in accordance with the company's values in all interactions with customers, suppliers, public and private institutions and society in general, as well as among our members.



**71**  
AWARENESS-RAISING ACTIONS



**+700**  
PROFESSIONALS  
TRAINED IN THE FIELD OF  
HEALTH AND SAFETY



**1,400**  
OHS TRAINING HOURS

## Digital transformation at the service of health and safety

Real-time communication and troubleshooting

During 2021, we implemented the verification and preventive planning of works through a mobile application. Thanks to it, prior to the start of each job, the technicians in charge verify the conditions of the site and/or facilities, the availability of the means necessary for its execution, the associated risks and the measures to be taken, being able to communicate in real time the impossibility of the execution of the same in the case of any type of incident both to the immediate manager and to the Health and Safety Department, which can propose immediate actions for its resolution.

In parallel and directly related to training, with the data extracted, specific talks have been planned to meet these needs according to areas, departments and/or types of work.



**W**e live in a scenario of constant change due to digital transformation, technology and innovation, with an increasing role in all areas. They are a reality in our day-to-day lives, in our daily lives, and also in companies, and, of course, at Magtel. Agility in adapting to change is vital in this context of permanent evolution, and here it is people who have to take the lead and make decisions, also in order to make these technological changes possible in an efficient manner.

In our trajectory, which began more than 30 years ago, we have been a company with an eminently innovative character; but we have never left aside the idea that it is the people who make possible each and every one of the projects that Magtel undertakes. Commitment, companionship, entrepreneurship, effort and perseverance are some of the values we defend, and with them, the value of people, which has been maintained throughout our evolution.

Today, at Magtel we are more than 800 professionals who combine experience and youth, but, above all, a lot of enthusiasm. We also have more than 1,300 people working with us indirectly. And it is clear to us that the most important value of companies is their people, who are, in fact, the ones who provide them with the differentiating element: an added value that makes us unique.

### > People at the centre

To keep moving forward and be a successful company, we must not only have the best team of professionals, but we must also know how to motivate them, establishing ways to manage and enhance their talent, as well as to retain it. One of the keys is to ensure that they are satisfied at work and have a good level of well-being. To this end, the strategies that companies use to promote and develop human capital must seek a balance between employee well-being, productivity and continuous training. These are the three pillars for which we advocate in our People Area.

Attracting, stimulating and retaining talent is one of the aspects that must be emphasised, as well as strengthening the work of middle management, the great connoisseurs of the qualities of their teams, and how to promote cohesion and joint work, now that, to an increasing extent, work is done on a project basis. We can and must all contribute to our company.

People remain the cornerstone of a company's development and success. In fact, the mission of the Corporate Services, of which the Area I direct forms part, is to promote and strengthen the management and development of the People who make up the Magtel team in order to achieve commitment, good performance, excellence and the achievement of the desired results.

A path that we are eagerly looking forward to.

We are  
**technology,**  
we are  
**innovation,**  
but above  
all **we are**  
**the people**  
who make it  
possible

**BEATRIZ LÓPEZ ALBA**

Director of Magtel's People Area





# Energy Division

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Active players in the  
energy transition





The Energy Division develops engineering, execution and operation projects for renewable electricity generation, transformation and distribution systems

Magtel's commitment to renewable energies generates a process of diversification, integrating lines of work in the field of energy efficiency.

We work to generate integral solutions based on the optimisation of thermal and electrical systems through the priority use of renewable sources, ranging from the residential sector to large industries and generation plants. In this way, we offer a catalogue of services with high added value.

The Energy Division promotes its activity around the environment through projects for the improvement and conservation of ecosystems, with sustainability and innovation being cross-cutting themes in all our activities.

## EPC

- > PHOTOVOLTAICS (TERRESTRIAL/FLOATING)
- > SOLAR THERMAL ENERGY
- > PUMPED-STORAGE HYDROELECTRICITY
- > OFFSHORE/ ONSHORE WIND
- > ENERGY STORAGE
- > ENERGY TRANSFORMATION, TRANSMISSION AND DISTRIBUTION INFRASTRUCTURES
- > BIOMASS. BIOGAS. GREEN HYDROGEN
- > HYBRIDISATION OF TECHNOLOGIES

## FACILITIES AND SERVICES

- > HV, MV AND LV INSTALLATIONS
- > LINES AND SUBSTATIONS
- > UNIQUE FACILITIES
- > OPERATION, MONITORING AND CONTROL
- > PREDICTIVE, PREVENTIVE AND CORRECTIVE MAINTENANCE:
  - » NETWORKS
  - » INDUSTRY
  - » GENERATION INFRASTRUCTURES

## ENGINEERING

- > CONCEPTUAL AND DETAILED ENGINEERING
- > TECHNICAL MANAGEMENT, CONSULTANCY AND TECHNICAL ADVICE

## ENERGY EFFICIENCY

- > THERMAL AND PHOTOVOLTAIC SELF-CONSUMPTION
- > ENERGY STORAGE
- > HYDROGEN. BIOGAS
- > LIGHTING
- > CLIMATE CONTROL
- > THERMAL ENVELOPE
- > SMART ENERGY MANAGEMENT
- > SHARED SELF-CONSUMPTION AND ENERGY COMMUNITIES
- > INFRASTRUCTURE FOR SUSTAINABLE MOBILITY



PROJECT DEVELOPMENT AND ENGINEERING



**+1,000MW**

Floating photovoltaics



**+3,800MW**

Reversible pumping



**+2,400MW**

Terrestrial photovoltaics



**+400MW**

Offshore wind



**+200Hm³**

Renewable desalination

DETAILED ENGINEERING AND CONSTRUCTION



**+40**

Projects



**+450MW**

Installed power

OPERATION AND MAINTENANCE



**+25**

Projects



**+300MW**

Managed



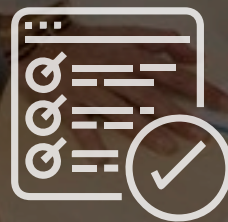
Project Engineering

We carry out all phases of the project in a comprehensive manner: From advice, consultancy and feasibility analysis to site management and supervision or the execution of technical development plans.



Inspection and self-monitoring

Our Magtel Joint Prevention Service (SPM, per the Spanish acronym) carries out an intense activity of inspection and self-control of the projects developed. We have a specific security review system following the IPAL (Occupational Accident Prevention Indicator) method.



Management and planning

We have a specific area dedicated exclusively to the supply of materials and equipment necessary for the correct development of the project. This allows us to be competitive and to offer better prices and quality, as well as to optimise planning times.





## Mercuria Project:

Initiative that will form part of a large renewable generation infrastructure in the province of Seville

For the company Mercuria Sostenible Magtel will carry out the complete EPC project of two electrical lifting substations and two overhead high voltage lines of 220 and 400 KV.

This project, located in the municipalities of Carmona, Alcalá de Guadaira, El Viso del Alcor and Mairena del Alcor (Seville), will enable the evacuation of several future photovoltaic solar plants to the transmission grid of Red Eléctrica de España (REE).

Magtel has highlighted its commitment to developing large EPC projects in the energy sector. The size of the Mercuria project highlights the weight that the Energy Division has in Magtel. In fact, contributing to energy decarbonisation and equipping infrastructures as efficiently as possible are among the company's priorities.



## PV installation for self-consumption by the El Fresno irrigation community (Huelva)

Installation of a 408 kWp photovoltaic plant to serve two 160 kW solar inverter drives

These elements will allow the hydraulic pumps used for the crops to be used directly by the solar panels.

The aim is to control the point of operation of the solar field and to adapt the energy generated by the plant to the operating requirements of the existing pumps. In this way, the irrigation community will be able to make the greatest possible use of solar energy for the proper supply of its plantations.

This project will lead to less energy dependence, as the pumping for which the photovoltaic installation is intended will consume less energy from the grid, with the consequent savings on electricity bills. The initiative will ensure the storage and supply of a larger quantity of water, saving costs and allowing for daytime pumping.





## Pumped-storage hydroelectric plants

Development of 21 projects to integrate 3.8 GW into the system

Reversible pumped-storage power plants are key to ensuring the transition to an emission-neutral economy and the effective integration of non-manageable renewable energies into the electricity system. This also brings flexibility to the system and stability to the network.

A team of more than 30 professionals of Magtel's Energy Division has developed 21 reversible pumped-storage power plant projects to make this possible.

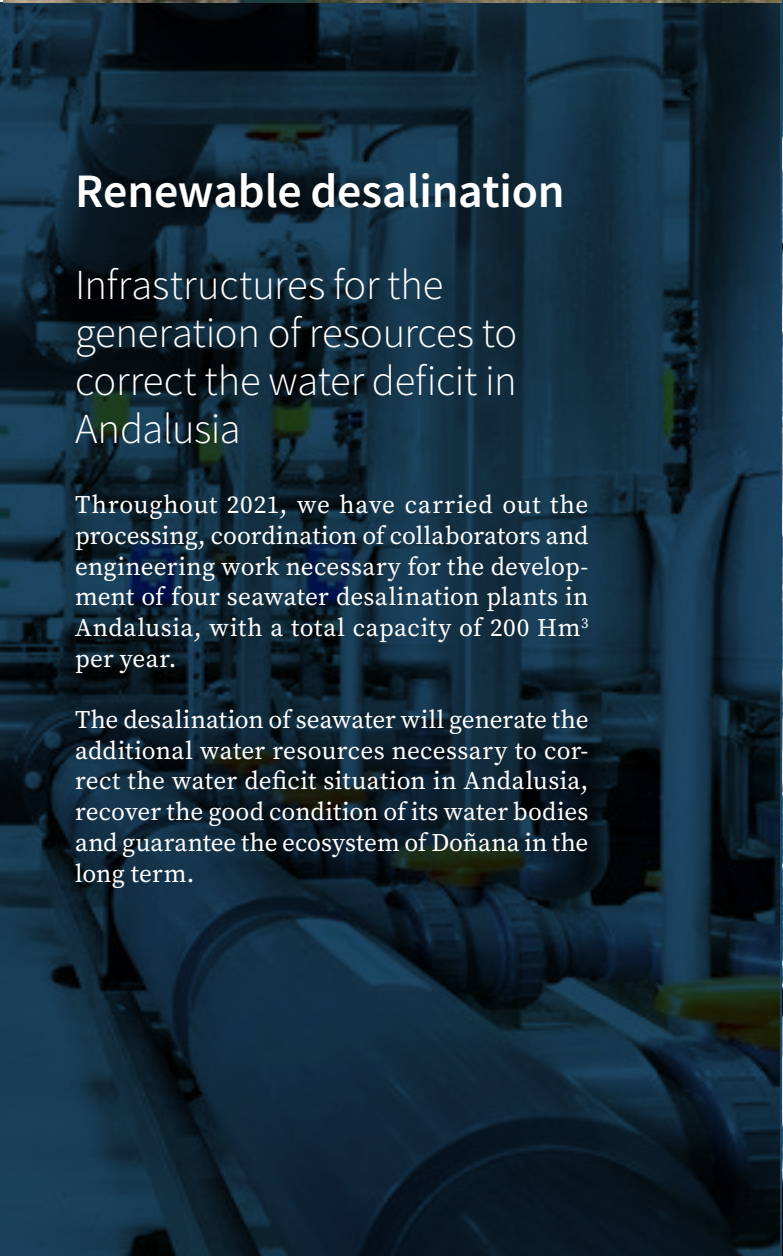


## Renewable desalination

Infrastructures for the generation of resources to correct the water deficit in Andalusia

Throughout 2021, we have carried out the processing, coordination of collaborators and engineering work necessary for the development of four seawater desalination plants in Andalusia, with a total capacity of 200 Hm<sup>3</sup> per year.

The desalination of seawater will generate the additional water resources necessary to correct the water deficit situation in Andalusia, recover the good condition of its water bodies and guarantee the ecosystem of Doñana in the long term.



## Terrestrial photovoltaics

Detailed engineering for renewable energy projects

In 2021, a team of more than 30 professionals with specific profiles in civil works, hydraulics, electricity, industry, environment and instrumentation and control, have carried out the engineering of lines, substations and construction of terrestrial photovoltaic plants for renewable energies, accumulating more than 2,400 MW in the projects developed.



## Floating photovoltaics

Engineering for the development of 18 projects to integrate 1 GW into the system

These projects are part of the energy transition towards a decarbonised model, in line with the National Integrated Energy and Climate Plan (PNIEC), contributing to the objectives of reducing greenhouse gas emissions, increasing the share of renewable energies and improving energy efficiency.



## Installations executed for Iberdrola

Adaptation of lines and transformer stations

### > Completion of the assembly of the HV 45 kV Abertura (Cáceres) - Logrosán (Burgos) line:

Laying of conductors; installation of anti-collision and anti-electrocution elements for birds; dismantling of old line; connection and commissioning.

### > Upgrading of section of the Ircio (Burgos) - Berantevilla (Álava) MV line:

Replacement of glass insulation with longer polymeric insulation and implementation of other bird protection measures.

### > Upgrading of a section of the Neila (Burgos) MV line:

Replacement of glass insulation with longer polymeric insulation and implementation of other bird protection measures.

### > Upgrading of a section of the Los Laras (Burgos) MV line:

Replacement of glass insulation with longer polymeric insulation and implementation of other bird protection measures.

### > Upgrading of section of the MV Palacios (Burgos) line:

Replacement of glass insulation with longer polymeric insulation and implementation of other bird protection measures.

### > Execution of the civil works necessary for the assembly of a new TC:

To eliminate an existing TC on support, in the town of Berantevilla (Álava).



## Deviations on AT/MT lines for the AVE high speed train connection at Almodóvar del Río (Cordoba)

Installation work to clear the construction site of the High Speed Railway connection

In this project, technical studies and proposals were carried out in 2020 to solve the problems posed by ADIF in order to resolve them.

During 2021, the undergrounding of a section of LAT 66 kV has been carried out, and is expected to be completed in mid-2022 after the diversions of the LMT have been carried out.

The works have been carried out for the joint venture formed by the companies Sogesa and Pavasal, the final client being ADIF Alta Velocidad.

## LV installations in the Guadalmedina station of the Malaga Metro

Low-voltage installation including switchboards, distribution conductors and lighting

This project, developed for the joint venture formed by the companies Sando and Acciona, is being carried out on the Malaga Metro infrastructures.



## Evacuation line for El Puntal II wind farm

Erection of 2 km of 30 kV high voltage line for the evacuation of the El Puntal II wind farm

Located in Sierra de Yeguas (Malaga), the wind farm will have a capacity of 15 MW. As part of this infrastructure, our Energy Division has carried out the construction of the 30 kV double-circuit overhead power line in La Roda de Andalucía (Seville), which will serve to evacuate the aforementioned wind farm.



## MV installations for Endesa

Provision and adaptation of existing electrical installations and construction of evacuation lines for small photovoltaic parks

During 2021, several medium-voltage installations contracted by private customers from the subsidiaries Endesa X and Endesa Ingeniería were executed, mainly in Almedinilla (Cordoba), Fregenal de la Sierra and Hinojosa del Valle (Badajoz).





## MV/LV installations for several customers

Provision and upgrading of existing electrical installations

Execution of actions in MV installations of private clients for their repair, alignment or adaptation to current regulations.

The works have been carried out for clients such as ADIF, ADIF Alta Velocidad and the Confederación Hidrográfica del Guadalquivir, mainly in Andalusia.



## Maintenance work for the Guadalquivir Hydrographic Confederation

Maintenance and technical service of about 40 installations in offices of the CHG's Applications Service

The project, with a heavy administrative burden, has been carried out in Andalusia.



## Maintenance for Gestión Integral de Aguas de Huelva (Giahsa)

Maintenance of nearly 400 MV/LV electrical installations and 24-hour breakdown service in the province of Huelva

The work includes the repair of the electrical component of the infrastructures, as well as the maintenance of the electrical equipment and the execution of the necessary civil works.



LV/MV maintenance for about 45 installations

Actions carried out in the provinces of Cordoba, Huelva and Jaén for clients such as Endesa X, Minera los Frailes, Cítricos del Andévalo, TJV Presas de Jaén.

## Maintenance for On Tower Telecom Infraestructuras (Retevisión)

Maintenance of around 120 MV electrical installations in Andalusia

The work includes a 24-hour breakdown service, as well as infrastructure maintenance and civil works.



## Other electrical activities

### > Execution of MV/LV installations for different clients

Actions carried out in Andalusia for clients such as Aguas del Huesna, Tragsa, Sandetel, RTVE, Alto La Era, Debla Castilla, Elecnor, etc.

### > Electrical workshop for Emacsa (Cordoba)

Overhaul, repair and execution of electrical installations integrated in drinking water treatment and wastewater treatment plants.

### > MT and TC installations for the Plaza Encarnación Hotel (Seville)





## Operation and maintenance of photovoltaic plants

We guarantee the operation of photovoltaic infrastructures through comprehensive operation and maintenance services

We carry out the following tasks:

- > Preventive maintenance
- > Predictive maintenance
- > Corrective maintenance
- > Monthly profitability reports
- > Photo reports
- > Thermography of electrical panels
- > Thermography of modules and inverters
- > IV Curve analysis
- > Cleaning of modules with osmosis water
- > Six-monthly herbicide treatment
- > Monitoring from the control centre
- > Face-to-face security or from CMS

Our current clients include MTB Ren, La Castilleja Energía, Sol de Moguer, Sando, etc.



## Actions to improve the thermal and lighting envelope

For a dozen projects located in Cordoba, Seville and Badajoz

We apply the latest technologies to our systems for refurbishment and improvement of the building envelope and the adaptation of its installations to optimise its energy performance to the maximum.

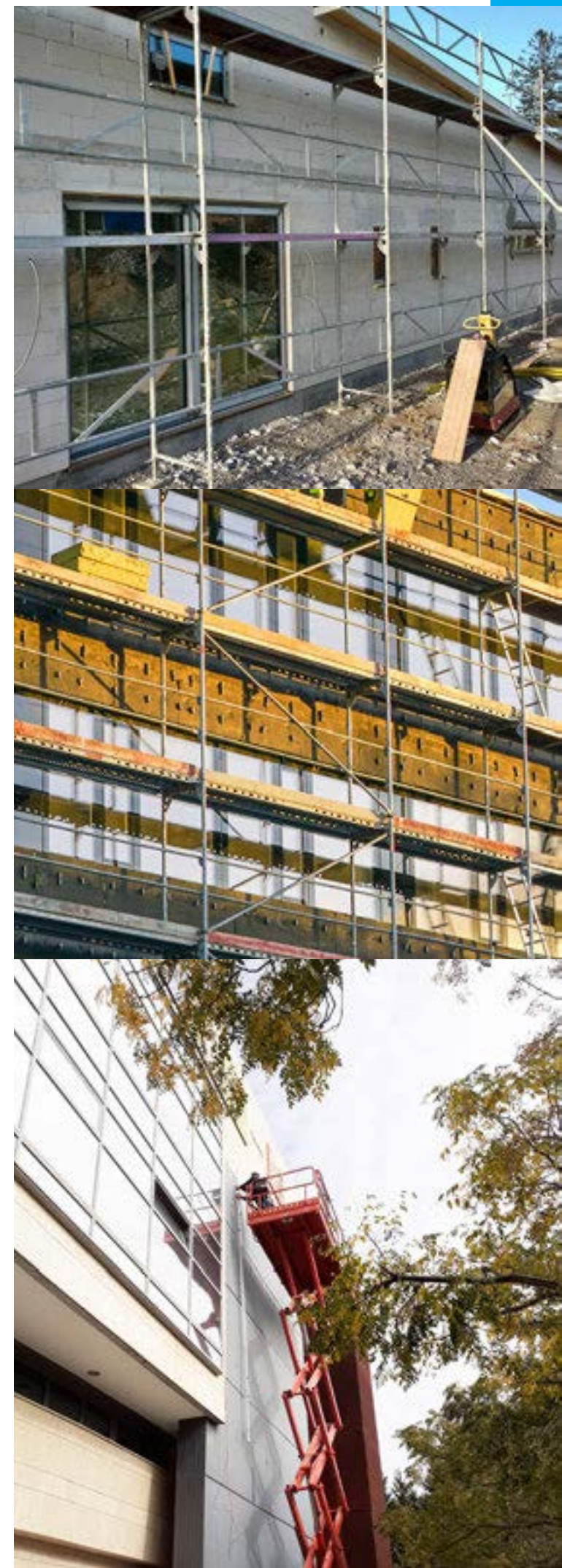
Specifically, we carry out actions such as:

- > Refurbishment of the external envelope by application of thermal insulation paint
- > Renovation of roofs by application of sand wich panels
- > Execution of ETIS (Exterior Thermal Insulation System) claddings
- > Replacement of existing carpentry with new thermal bridge break aluminium carpentry and air and argon gas chambers
- > Installation of low-emission glazing
- > Replacement of interior lighting equipment with LED systems

This type of work has been carried out in a series of educational facilities located in municipalities in the provinces of Cordoba, Seville and Badajoz, as well as in buildings of various types, such as the Cerro Muriano military base and the Palma del Río fire station.

These actions have contributed to:

- > Improve efficiency and energy savings compared to the baseline situation
- > Reduction of energy consumption accompanied by a reduction of greenhouse gases
- > Adaptation of the installations to current legislation



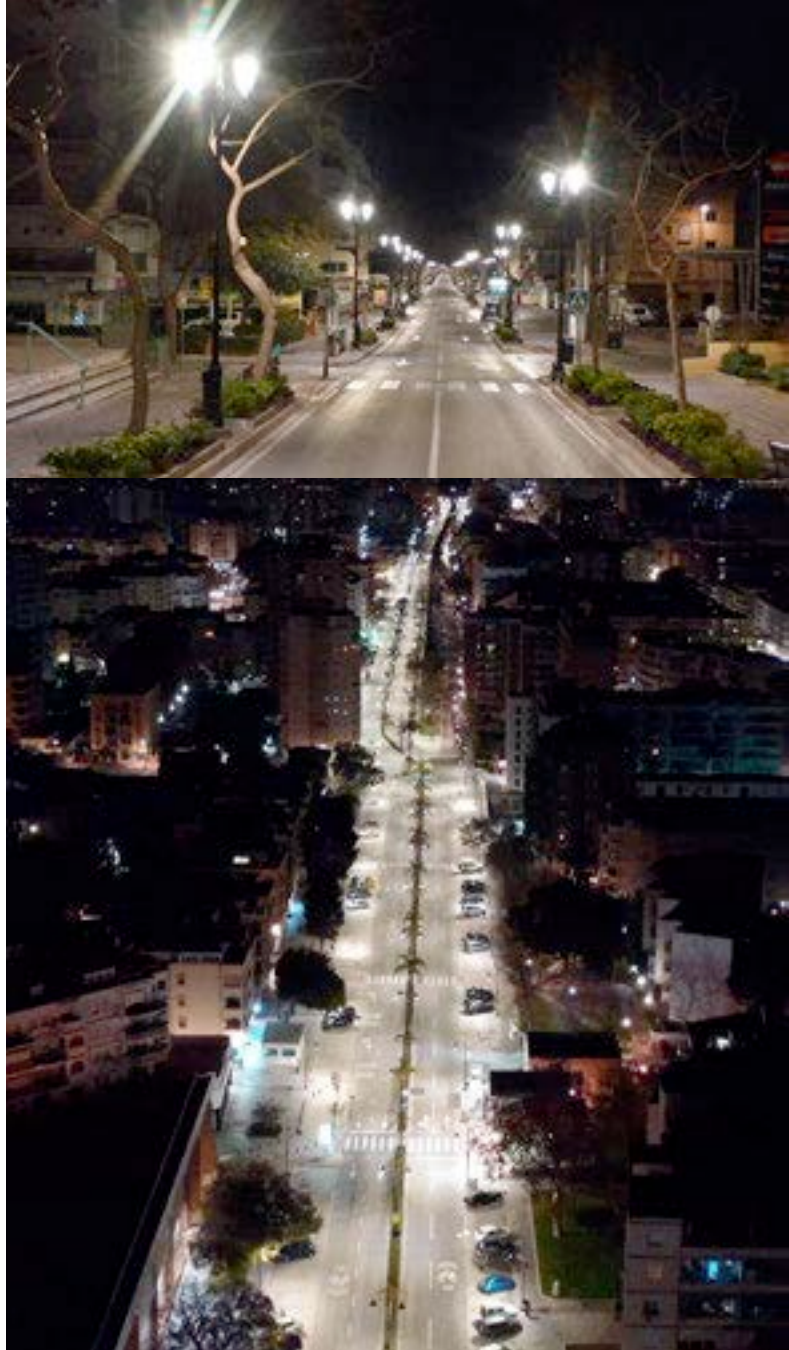


## Renovation of street lighting in the municipalities of Santaella (Cordoba) and Fuengirola (Malaga)

Thanks to the installation of LED luminaires, savings of 177 and 473 tonnes of CO<sub>2</sub> emissions have been achieved

Our Energy Division has replaced the outdoor lighting in the Cordoba municipality of Santaella, modifying the mercury lighting for LED lighting on a total of 1,058 points of light, favouring the process of transition to a low-carbon economy, achieving energy savings of 68.79%.

With regard to the execution of the work in Fuengirola (Malaga), the energy efficiency project has been carried out on 16 roads and 1,049 lighting points, with the adaptation of the 23 corresponding control centres.



## Conditioning of climatic chambers at the Segura Centre for Soil Science and Applied Biology of the CSIC

Specific climate control system for the simulation of ideal conditions for plant growth

At the Segura Centre for Soil Science and Applied Biology (Cebas-CSIC), we have built three climatic chambers using sandwich panel partitions and their subsequent lining in perforated stainless steel.

In addition, in these facilities of the Spanish National Research Council (CSIC), the refrigeration installation, evaporators and condensers, humidifiers, automatic control equipment and specific LED lighting installation with regulation control have been executed, with the aim of simulating the ideal conditions for plant growth.

It aims at reducing greenhouse gas emissions, sustainable water management and the maintenance or enhancement of environmental values that may be affected during tests and experiments at this research centre.



## Self-consumption photovoltaic installations

Improved energy efficiency through renewable energy installations

We carry out this type of work, mainly in Andalusia and Extremadura, for clients such as EDP, Factor Energía and private clients.

The actions consist of technical visits to the site, design, assembly of structures and modules, wiring, testing, as well as commissioning and legalisation of existing installations.



## Photovoltaic self-consumption installation for the Provincial Council of Granada

Installation of photovoltaic canopies

The project consisted of the installation of photovoltaic canopies in the car park of the CIE building to generate photovoltaic solar energy for self-consumption by the Provincial Council of Granada. High-power photovoltaic modules (655 W) were used for this purpose.







## Energy refurbishment of the thermal envelope of the municipal swimming pool in Pozoblanco (Cordoba)

Construction of retractable roof system and retractable carpentry enclosure with thermal bridge break

In the municipality of Pozoblanco, we have carried out the integral energy rehabilitation of the existing envelope of the swimming pool, to create a new efficient envelope system combining a retractable roof and a retractable carpentry enclosure with thermal bridge break between pillars and placement with low emissivity glass.

In addition, a new air-conditioning system has been installed, driven by two dehumidifiers, which will improve the air-conditioning of the swimming pool. With this new project, the thermal and insulation characteristics of the existing infrastructure are improved, achieving a reduction in CO<sub>2</sub> emissions into the atmosphere.

## Energy refurbishment of the Town Hall of Villanueva del Duque (Cordoba)

Actions on the envelope and improvement of installations for adaptation to biomass use

In 2021 we carried out the comprehensive energy refurbishment and renovation of all the facilities of the Villanueva del Duque Town Hall, contributing to the reduction of the building's energy consumption through the renovation of the thermal envelope, as well as the installation of heating through two biomass cookers for the generation of heat from a clean energy source.





# Magtel's **commitment to decarbonisation** is a priority

Greenhouse gas emissions  
to be reduced by 23% by 2030

**O**ur legal system definitely already has a Climate Change Law. A long-awaited and necessary standard with objectives that, as usual, have been assessed as more or less "ambitious" depending on the perspective of the analysis. For some, it falls short and for others, it should have been developed further. This is the norm.

However, we believe that the most important thing is to have a law. To have a legal framework to deal with the major present and future issue of climate change. As we know, the new regulation is based on the 2015 Paris Agreement, and the main objective is the decarbonisation of the Spanish economy. It moves towards sustainability in the use of resources and permanent adaptation to the evolution of climate change itself while generating what it calls decent employment. This idea is also part of making the labour model more productive and adapting it to the new socio-economic challenges.

## > Upward revision

In broad terms, greenhouse gas emissions must be reduced by 23% by 2030 (1990 baseline) and reach climate neutrality by 2050. In the next nine years, the penetration of renewable energies in final consumption must reach 42%; the electricity system must have at least 74% of generation from renewable energy sources and an improvement in energy efficiency that reduces primary energy consumption by "at least" 39.5% compared to the baseline in accordance with EU regulations. It must be taken into account that in 2023, these targets will be revised upwards.

Finally, and without any pretensions to being exhaustive, the law establishes the National Integrated Energy and Climate Plans and the 2050 Decarbonisation Strategy for the Spanish Economy as the instruments with which to carry out the roadmap.

It is important, as we said, to have the Law and to have established revisions of its objectives, which allows for its evaluation – which is crucial – as well as to resolve and improve the processes. And it is important to count on the Law as one of the pillars of the transversal transformation of our productive model in such a way that productivity and competitiveness of the economy becomes a reality and opens a new source of job creation.

## The IEA proposal

In this context, the International Energy Agency's report advocates zero emissions by 2050, accelerating the decarbonisation of economies and increasing electrification through renewable energies. This proposal, in addition to the strategic change it presupposes from the point of view of the message, will surely contribute to facilitating the objectives underway from the point of view of each country's regulations.

In this sense, the European Green Agenda is much more than a set of intentions. It is an arduous set of challenges and tasks to be accomplished at an ever-increasing speed. For this reason, and for our part, let us welcome the Law as a further step towards tackling climate change and as part of this great global strategy to deal with it. With clear concepts and simple words.

**ARTURO BUENAVENTURA POUYFAUCON**

Director of Hydraulics and Environment at Magtel





# Telecommunications and Digital Transformation Division

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Solutions for a digital world





Magtel's Telecommunications Division represents the past, present and future of the company

Since its creation in 1990, we have grown together with our clients, the main operators in the country, accompanying them in a process of accelerated transformation of the sector.

Our main areas of activity are the design, construction, operation and maintenance of ICT networks and infrastructures, the provision of Smart services and process outsourcing. In the Telecommunications Division, we want to improve our customers' competitiveness by transforming their key business processes and managing their ancillary processes.

We actively contribute to the development of our company's vision, promoting a more interconnected and sustainable world.

We invite you to get to know us.

## Telecommunications

### FIXED NETWORK

- > ENGINEERING, PERMITTING AND LEGALISATION
- > DEPLOYMENT OF FTTH-FTTN-FTTX-MAN-LD-HFC NETWORKS
- > EXTERNAL PLANT MAINTENANCE
- > SERVICES AFFECTED

### MOBILE NETWORK

- > E2E PROJECT DEVELOPMENT
- > INSTALLATION AND COMMISSIONING OF TELECOMMUNICATION EQUIPMENT
- > ENGINEERING SERVICES
- > RADIO LINKS
- > RADIANT SYSTEMS
- > CONSTRUCTION RURAL / URBAN SITES AND TECHNICAL ROOMS
- > INFRASTRUCTURE ADEQUACY BASE STATIONS
- > PLANT AUDITS

### CUSTOMER I&M

- > CUSTOMER INSTALLATION AND MAINTENANCE SERVICE

### RAILWAY INSTALLATIONS

- > COMMUNICATIONS
- > SIGNAGE
- > SECURITY
- > GSMR SYSTEMS

### SPECIAL PROJECTS

- > SAFETY INSTALLATIONS
- > CCTV
- > PUBLIC ADDRESS
- > CONTROL AND HOME AUTOMATION

## Digital Transformation

### ICT INFRASTRUCTURES

- > CORPORATE NETWORKS
- > DATA PROCESSING CENTRE
- > CONTROL CENTRE
- > CONTROL SYSTEMS

### SMART SERVICES

- > RE-ENGINEERING AND PROCESS AUTOMATION
- > ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING
- > INTERNET OF THINGS
- > ENERGY EFFICIENCY

### OUTSOURCING

- > PROJECT OFFICE
- > AUDIT
- > TECHNICAL ASSISTANCE
- > ENGINEERING
- > ADMINISTRATIVE AND COMMERCIAL PROCESSES



# Magtel deploys **more than 7,500 kilometres of fibre optic** for FTTH projects since 2013

We participate in the main telecommunications projects in the country

Since its inception in the 1990s, Magtel has deployed fibre optics for Telefónica's rings in Cordoba, as well as for the Enagás gas pipeline between Seville and Ciudad Real. Since then, it has been involved in the main fibre optic deployment projects in Spain.

Thus, more than 5,000 km of Adif's communications networks have been deployed, both on conventional and high-speed lines, with different neutral fibre optic operators. In addition, Magtel has participated in the deployments of the main operators in the country.

On the other hand, the boom experienced in the last 10 years with the large FTTH network deployments has positioned Magtel as one of the most important companies at national level. Since 2013, the company has served nearly 960,000 homes with the installation of more than 7,500 km of fibre optic cable for various operators.

The company continues to work with different operators in the deployment of fibre optics, also serving areas with lower population density, promoting equal opportunities in digital matters through access to telecommunications.

## > A benchmark in the telecommunications sector

This professional growth is due to a model based on technological innovation, sustainable growth and continuous training, making the company one of the leading Spanish companies in engineering, deployment and maintenance of urban and inter-urban fibre optic networks, as well as end-customer I+M.

The expansion strategy used by the firm is based on offering a fully comprehensive service, based on the enormous know-how acquired through Magtel's extensive experience in the sector. The services encompass the complete cycle of activities that make up these projects: from the request for permits; network design and engineering; civil works and infrastructure; laying and splicing; final test measurements; final installation at the customer's premises and maintenance of the entire plant. This experience has generated a great deal of trust in our customers, allowing us to expand new lines of business throughout the country.

## > The 5G challenge

The company is carrying out work on the sites and infrastructure that will house the new generation equipment for this technology. This is one of the most important challenges to maintain our position as a benchmark in the telecommunications sector and, after more than 30 years, we want to continue to actively participate in technological change. In this regard, the R&D&I Division has a specific telecommunications area from which to promote research and innovation initiatives on 5G.

This new generation of technology will bring three new use cases: ultra-reliable connections and reduced latency, improved mobile broadband and massive machine-to-machine communications. However, one of its biggest impacts is expected to be on the IoT (Internet of Things).

Among other options, it will be applied in the fields of energy, agriculture, health or security and defence, enabling its use in infrastructures and transport, in drone monitoring and industry 4.0, allowing the precise visualisation of virtual parts in the real environment.





## FTTH network deployment for Orange

Fibre-to-the-home network engineering and installation

Design and construction of 95,000 I.U., mainly in low population density cities in Andalusia, Extremadura, Castilla-La Mancha and Madrid. The work consisted mainly of permitting, design and as-built drawings, cable installation, fibre optic splicing and commissioning.

## Installation and civil works for fibre optic infrastructures

Optical fibre splicing and measurements have also been carried out at national level

For clients such as Reintel, Lyntia Netwok, Acciona, Tradia Telecom, ADIF, etc.



## Installation and Maintenance (I+M) for Orange/Jazztel customers

Around 92,000 installations carried out

Installation of FTTH and ADSL to the customer's home, connection, testing and commissioning of telephone, internet and television installations in Andalusia.

## Installation and Maintenance (I+M) for MasMóvil customers

Around 34,000 installations carried out

Installation of FTTH and ADSL to the customer's home, connection, testing and commissioning of telephone, internet and television installations in Andalusia, Extremadura, the Canary Islands and Castile-La Mancha.





## Civil Works project for Vodafone-ONO

Deployment of new FTTH and CTV networks

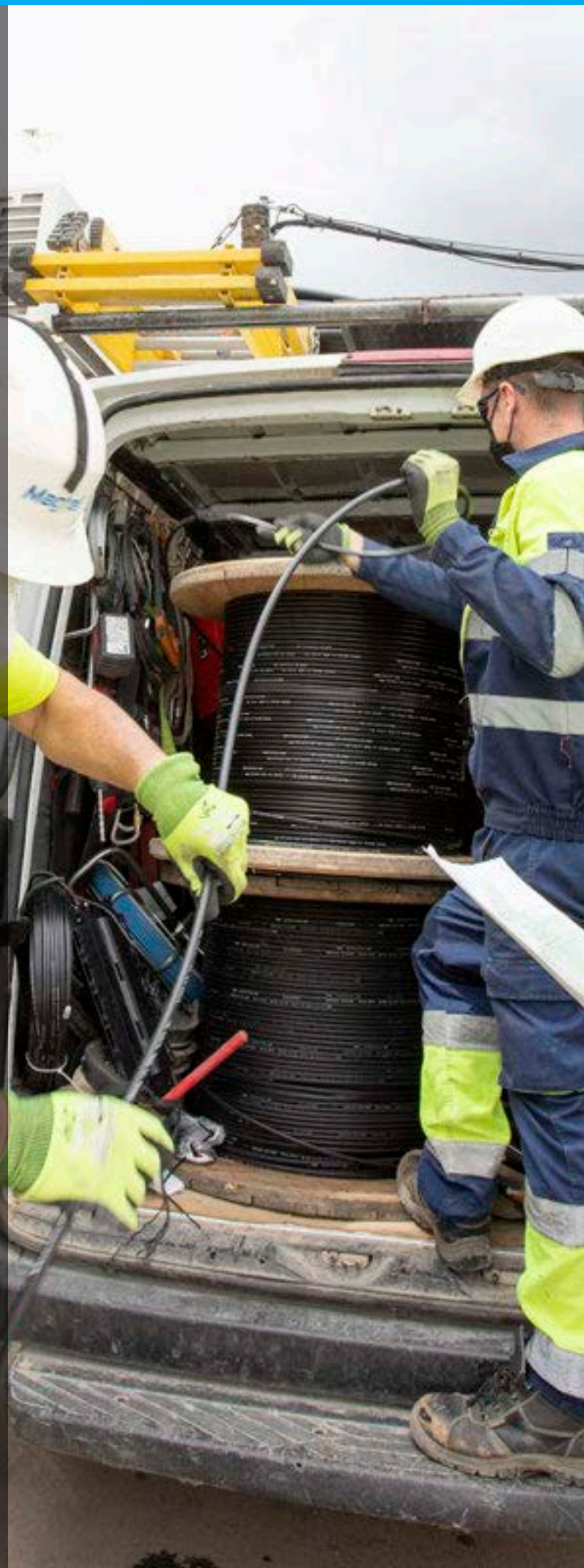
Maintenance and deployment of HFC and FO networks and installation of fibre optics for companies and organisations in Andalusia and Extremadura.

We have worked for more than 15 years with the different companies that have managed this operator (Supercable, Aúna, ONO, Vodafone).

## Outside plant maintenance for Orange

For more than 350,000 customers

Attention and resolution of faults in Orange's fibre optic network; extension of TCs due to saturation and maintenance of more than one million homes in Eastern Andalusia and Madrid.



## Installation and Maintenance (I+M) of mobile operator networks

High projection for 5G deployment

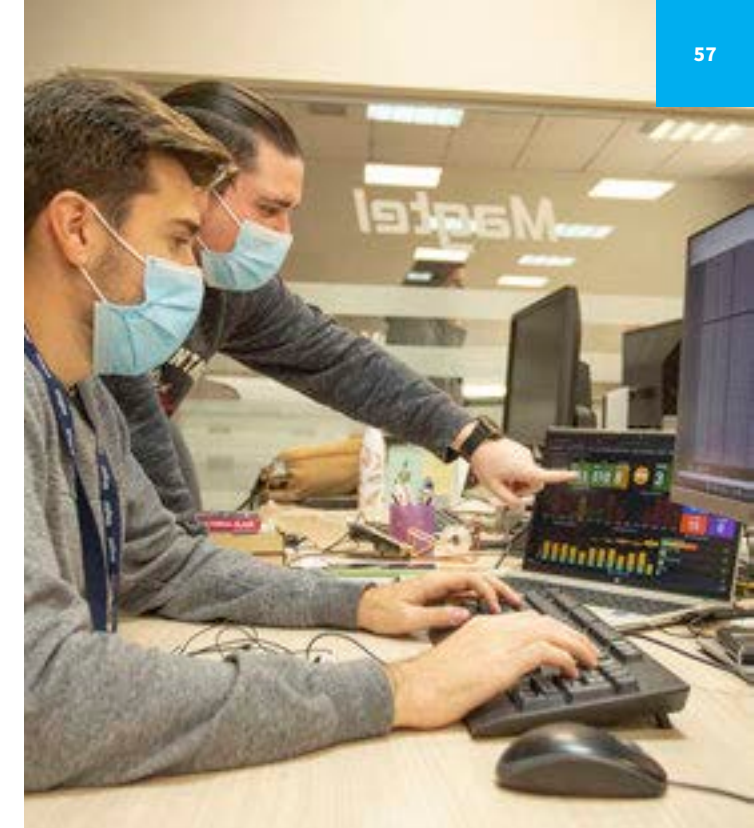
Development in Andalusia, Extremadura and Madrid of E2E projects and installation and commissioning of E2E:

- » Data processing equipment
- » Radio links
- » Radiant systems
- » Adequacy of infrastructures
- » Base stations (BS)
- » Construction of rural sites, urban sites, technical rooms and plant audits

## BLAU construction project with CTC Arahal-Fuente Piedra

Civil works and installation of telecommunication signalling, train protection and energy systems

For CAF Signalling, and as an end customer ADIF.





## Experts in rail infrastructure, communications and signalling

We are backed by 24 years of experience in projects executed throughout the national territory

Extensive experience in railway communications through the deployment of fibre optics, operation and maintenance of networks and communications on high-speed lines.

Road construction and maintenance

- > Assembly of turnouts
- > Track welding
- > Rail replacement
- > Construction of molehills
- > Approval for aluminothermic welding and stress relieving (special permit class C)
- > Infrastructure machinery operator's licence
- > Traffic Safety Rating (safety pilot)
- > ADIF-approved track welders, safety pilots and infrastructure machinery operators





# Technology and people

Digital transformation is a process of organisational change to seize the opportunities and meet the challenges of new digital technologies

Just 20 years ago, the third industrial revolution led to the consolidation of a new global digital culture characterised by different factors than those previously known. These include the presence of constant change in a volatile, uncertain, complex and ambiguous environment; global social behaviour with massive, real-time interactions; the promotion of collaboration and collective intelligence in open innovation environments, but also the reaffirmation of the individual with the establishment of a personal brand. And, above all, expectations of free services and the end of customer loyalty.

The digitalisation of society today is unstoppable: economic transactions, social relations, digital twins... this represents a real industrial revolution that is known by different names depending on the sector of activity: Industry 4.0, Smart Cities, e-Government and Digital Transformation.

This digital culture is leading to a transformation of organisations, whose business architecture is evolving, both from the demand for digital reinvention resulting from changing customer expectations and the availability of pervasive interconnectivity, and from the new outcomes made possible by digital technologies.

Digital transformation is a process of organisational change to seize the opportunities and meet the challenges of new digital technologies.

What are the main challenges posed by new digital technologies? I would mainly highlight the following.

Firstly, the management of scale and hyper-connectivity, i.e. the volume of data, known as Big Data.

Secondly, information security and data quality management. Security is what creates the necessary confidence in the use of information systems.

The third challenge I would highlight is managing the empowerment of users, who continuously improve our skills and abilities in the use of new technologies, and finally, but from my point of view the most important, the ability to achieve the agility demanded by our organisations.

But in addition to these challenges, there are several major dangers in this journey: on the one hand, the generation of expectations regarding the applicability of technology and, therefore, the misalignment of the digital transformation plan with the organisation's objectives, and, on the other hand, the absence of a cultural component within the transformation process.

The researcher, scientist and president of the Institute for the Future, Roy Amara, states, in my opinion quite rightly, that "we overestimate what technology will do in the short term, and underestimate what it will do in the long term".

Digital transformation is fundamentally about technology, but it is also about people. The engine of change of any kind in organisations is people. Therefore, at Magtel we accompany entities and companies in their digital transformation processes, because it is a strategic journey focused on people to incorporate efficient processes and technologies that improve organisational capabilities and face their business operations with guarantees.

To conclude, I have good news and bad news: the good news is that digital transformation is here to stay and will generate significant benefits for companies. The bad news, however, is that this is a process of permanent evolution and continuous improvement, in which complacency and inaction are out of the question, as the damage can be irreversible.

FERNANDO A. OLIVENCIA POLO

Deputy Director of the Telecommunications Division





## Air quality information panels of the Regional Government of Andalusia

Supply and installation of 49 led information panels

Implementation of the associated content management system, which guarantees the dissemination of information on air quality to the public at sites in the eight Andalusian provinces:

- > Implementation of content management system software
- > Supply and installation of outdoor LED screens with an aesthetic, light and vandal-proof design
- > Mobile connectivity for real-time content updates and remote access capability



## Specialised multi-channel support services

Provision of services in Seville, Cordoba and Malaga

For the Sociedad Andaluza para el Desarrollo de las Telecomunicaciones S.A. (Sandetel), Cordoba City Council and Malaga Provincial Council.

- > For the operation of the first and second level of attention to users (civil servants, employees and/or citizens) of different administrations (local, provincial and regional):
- > Advanced tax information and assistance services
- > General administrative information services of the Regional Government of Andalusia
- > Citizen's Advice Service 'Info.Vivienda'
- > Citizen's Advice Service 'Consumo Responde'
- > Technical support service in the use of the e-processing platform
- > Service and functional support for citizens needs in relation to the use of the e-Government platform (e-Offices and Virtual Office).



## Operational support services of the Regional Government of Andalusia

Operational support service for the Corporate Telecommunications Network and field operations support service

For the telecommunications of the Regional Government of Andalusia, carrying out:

- > Agency relationship management/Telecommunications technical office
- > Supplier management/Service level and quality management
- > Engineering management / Service provision management
- > Field support management/ Workplace service management
- > Management of the Nerea Network/ Management of the streaming service and P3S Gateway
- > Project office: management and co-ordination, communications, technical assistance in OHS and supplies
- > Field interventions: technical support, staking out and inspections, service migration, technical assistance, breakdowns and incidents and maintenance at customer site
- > Wiring and Installations/ Logistics Service/ Warehouse Management

## We developed the new citizen service system for Cordoba City Council

The project aims to improve the quality of the procedures of the City Council through new e-administration tools

The company has undertaken the new citizen service project for Cordoba City Council. This initiative aims to speed up and improve the quality of service in the City Council's procedures, and is financed through the European Edusi funds (Sustainable and Integrated Urban Development Strategies).

The aim is not only to provide users with information on the different citizen service tools, but also to provide information on how they work, as well as explaining and advising on the steps to be taken in order to solve the procedure required.

The new service offers several ways to make contact: by telephone and by e-mail.





# Infrastructure Division

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Sustainable  
construction





We participate in the implementation and maintenance of infrastructures essential for the provision of public services in areas such as communications and energy, applying innovation and technology

2021 has been a year of growth and territorial expansion. Several major projects have been undertaken in the provinces of Malaga, Cadiz and Huelva, in addition to those already consolidated in Cordoba and Seville. Some actions have also been initiated in the regions of Extremadura and Castile-La Mancha.

On the other hand, the building activity has been strengthened with the completion and delivery of the first housing development. At the same time, work continues on a portfolio of more than 200 dwellings, due to be delivered in 2022. Thus, we have been awarded public initiatives such as the construction of the Andalusian Employment Service (SAE) offices in Huelva and the animal shelter in Marbella, as well as the installation of a clean point in Dos Hermanas (Seville).

Also noteworthy are the projects related to the water sector, where work continues on the maintenance, renovation and refurbishment of supply networks through the execution of more than 1,100 supply connections and the replacement of approximately 25,000 meters.



## CIVIL WORKS

- > BRIDGES
- > LINEAR TRANSPORT INFRASTRUCTURES
- > CITY PROJECTS
  - » INTEGRAL WATER CYCLE
  - » DESALINATION
  - » TREATMENT
  - » INDUSTRIAL OPTIMISATION
  - » NETWORK OPTIMISATION
  - » IRRIGATION
- > SUPPLY AND SEWERAGE NETWORKS
- > PIPELINE REHABILITATION
- > URBANISATION
- > WASTE MANAGEMENT AND RECOVERY

## CONSTRUCTION

- > NEW PLANT
  - » SUSTAINABLE CONSTRUCTION (HOUSING)
  - » INDUSTRY
  - » TERTIARY USE
  - » PREFABRICATED SYSTEMS
  - » NEW MATERIALS
- > REFURBISHMENT
  - » REFURBISHMENT AND ADAPTATIONS
  - » HERITAGE OR PROPERTY OF CULTURAL INTEREST

## MINING

- > SOUNDINGS AND EXPLORATION
- > PROCESS PLANT
- > WATER TREATMENT PLANT



## Improvement and rehabilitation of the Villa del Río Bridge

We are working on strategic infrastructure and heritage in the province of Cordoba

The Department of Development, Infrastructures and Territorial Planning of the Regional Government of Andalusia awarded the works for the improvement and rehabilitation of the Villa del Río Bridge over the Guadalquivir River on the A-3101 road (Cordoba) to Magtel, in Temporary Joint Venture (TJV) with Hierros Fuente Palmera.

This project involves the widening of the existing platform on the masonry and metal part of the bridge, in order to increase the capacity of the roadway and improve the drainage system. The double lane width will be 9.20 metres.

For the construction process of the rehabilitation, each of the existing spans will be dismantled and widened so that the bridge can be used for traffic in both directions. In addition, various specific reinforcements will be made to the current structure to adapt it to the new stresses and loads it will be subjected to. This will be done by removing it from its current position, i.e. by dismantling it, rehabilitating it and replacing it once it has been extended and reinforced.

In this sense, the initiative involves the adaptation of the vehicle containment system in accordance with current regulations, carrying out the necessary reinforcements to adapt the new width. From a load limit of 26 tonnes, there will be no load limitation.

Other objectives are the conservation of the historical image of the bridge, as well as the landscape restoration of Special Areas of Conservation (SAC).



## Guadalmellato Dam: Improvement of facilities

Adequacy of safety and accessibility of infrastructure

Magtel has completed the works to improve the electrical installations, the lighting in galleries and the updating of access security at the Guadalmellato Dam, located in Adamuz in the province of Cordoba.

This project, financed by the Confederación Hidrográfica del Guadalquivir (CHG), has renovated part of the inside of the dam.

Firstly, stainless steel handrails have been installed in the areas open to the passage of personnel. Specifically, they are located on the sides of the inner corridors, facilitating accessibility between galleries and improving safety conditions inside the dam. New vertical staircases with trap doors have also been installed between each floor.

Secondly, the lighting system has been replaced. LED technology has also been incorporated. This type of lighting generates an increase in energy efficiency, avoiding a high percentage of heat loss and practically eliminating CO<sub>2</sub> emissions.

These improvements have led to greater safety, enabling a rapid and urgent exit in the event of an emergency.





## Maintenance of networks of Empresa Municipal de Aguas de Cordoba (Emacsa):

We guarantee the proper functioning of the supply and sanitation network

To this end, and as the main focus of our activity, we carry out continuous monitoring, maintenance and breakdown repair work.

Likewise, in coordination with Emacsa, we provide services for the renovation of existing pipelines, the installation of new networks and the execution of service connections. The actions carried out in 2021 were as follows:



### > Rehabilitation of the collector sewer in Avenida del Brillante:

The following systems have been considered in the execution:

- > Continuous structural sleeved casing with hot water curing system
- > Continuous structural sleeved casing with UVA curing system and rehabilitation by means of TIP tight casing

### > Renovation of the supply network in the Las Quemadas industrial estate:

Rehabilitation of the network of almost four kilometres of supply pipes in several streets of the industrial estate, and more than 100 house connections, in which the old asbestos cement pipes will be replaced by others of ductile cast iron, with better characteristics in terms of quality and durability.

### > Rehabilitation of sewerage collectors in the Centre, East and Southeast districts of Cordoba:

1,350 metres of collector sewer rehabilitated using trenchless technology

### > Renovation of the supply network in the Cerro Muriano neighbourhood (phase 1):

Almost two kilometres of asbestos cement pipe in the area has been renovated

### > Maintenance of networks in the Encinares de Alcolea housing development

Maintenance of networks and installations





## Other actions in supply and sanitation facilities:

### > Rehabilitation of sewerage collector in C/Cava street in Priego de Cordoba (Cordoba)

70 metres of sewer rehabilitated using trenchless technology.

### > Rehabilitation by continuous sleeving of the collector sewer in c/Cerrado de Los Molares (Seville)

Rehabilitation of collector sewer about 30 metres long using trenchless technology.

### > Installation of the sewerage network in the Puerta Barqueta building (Seville)

The sewerage and water supply network has been installed, as well as the asphaltting of the streets and the subsequent paving of the land.



## Execution of other works:

### > Jarquil connections

Water, sewage and telephone connections have been made, and the sewage and paving network for the new building has been extended.

### > Metrovacesa connections

Electrical connection and transformation centres, installation of water and sewage connections for the new building.

### > Avintia connections

Erection of water and sewage networks, electricity supply to the substation with the installation of two TC and paving for the new building.



## Urbanisation works:

### > Urban development work on c/Marqués de Cropani (Cádiz)

Urbanisation of the surroundings of the buildings corresponding to 92 dwellings

Consisting of paving of the public road, provision of services; supply, drainage, gas, telephony, irrigation, gardening, lighting, as well as the construction of two TCs.

### > Remodelling of basins on c/ Libertador Sucre (Cordoba)

The tree basins and pavements in poor condition in this area of the southern sector of the city have been renovated.



### > Dehesa Boyal industrial estate, Aldea del Cano (Cáceres)

Urban development works, including the MV/LV electrical connection, the installation of a water treatment plant and the execution of a drive under the motorway for the supply of water.

## Other construction work:

### > Project for the renovation of the perimeter enclosure of the Villa Azul DWTP

Replacement of the existing enclosure, more than a kilometre long and 30 years old, of the plot of land occupied by the Villa Azul Drinking Water Treatment Plant (DWTP), improving its security, especially at unguarded and singular points.





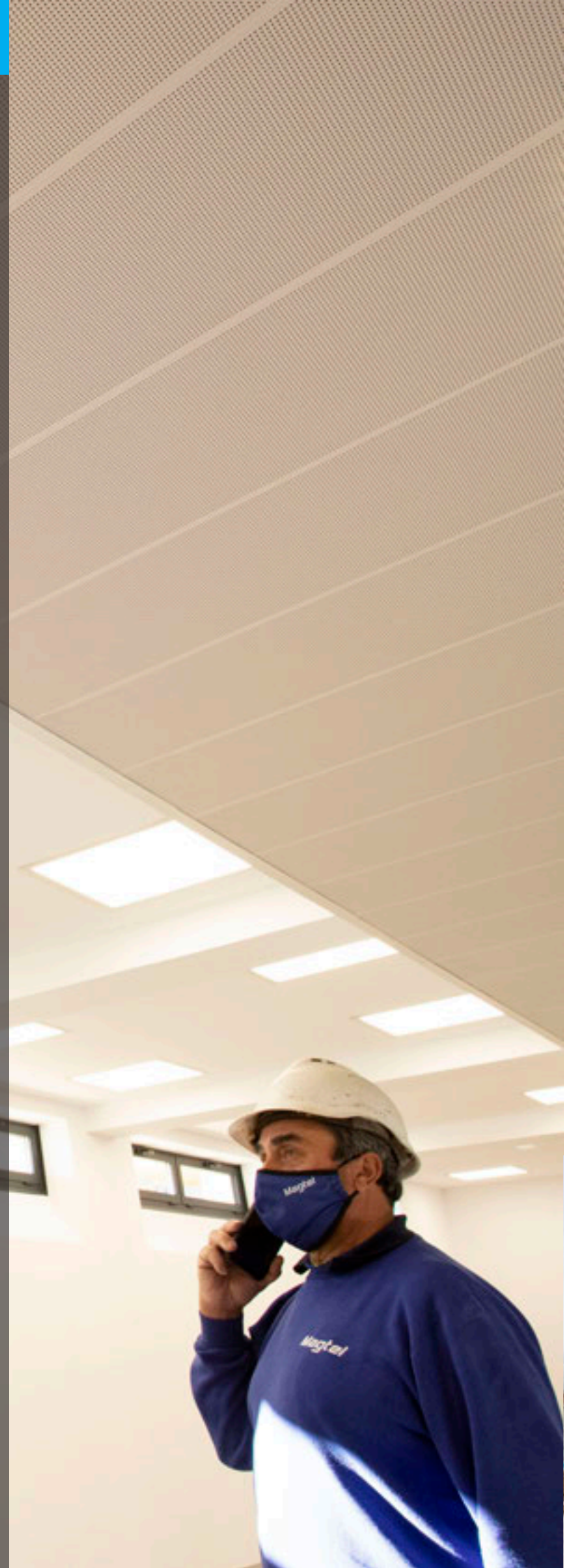
## Refurbishment of the research laboratory of the Institute of Fine Chemistry and Nanochemistry

At the Rabanales University Campus (Cordoba)

Magtel's Infrastructures Division has completed the refurbishment of house number six of the Colonia San José located on the Rabanales Campus of the University of Cordoba (UCO). In its place, the headquarters of the Institute of Fine Chemistry and Nanochemistry has been installed, bringing together all the scientific material and equipment available to the fifteen research groups that make up the Institute.

This project is financed by the European Regional Development Fund (ERDF). It has been built on a historic building in which the former teachers of the Universidad Laboral used to live. The existing structure has been maintained, adapting the building to current regulations and to its new use.

The planned building has an envelope suitable for limiting the energy demand necessary to achieve thermal comfort depending on the climate of the city of Cordoba, the intended use and the summer and winter seasonal regime. In particular, the treatment of thermal bridges has been taken into account in order to limit heat loss or gain and to avoid hygrothermal problems in the bridges.



## Construction of 56 subsidised housing units in the Huerta de Santa Isabel (Cordoba)

Magtel contributes to reducing the high demand for subsidised housing in Cordoba with the Atalaya de la Albaida development

The Infrastructure Division has carried out the construction of 56 subsidised housing units on plot 4.6 of the PAU-03 Huerta Santa Isabel East in Cordoba.

The building has been built according to energy efficiency criteria and has applied innovative systems such as natural ventilation of the garage through the construction of ventilators, which in turn serve as benches for seating in the open-air common areas.

## Construction of 23 subsidised housing units in Carrera del Caballo (Cordoba)

In 2021 we executed the project for the construction of 23 subsidised housing units, garages and swimming pool, promoted by the Sociedad Cooperativa Andaluza Mirador de Linares in avenida Rocío Jurado and calle Amalia Rodrigues, both in the district of Cordoba popularly known as the Carrera del Caballo.



## Construction of 166 subsidised housing units and commercial premises in Ciudad Jardín de Poniente (Cordoba)

The construction of 166 subsidised housing units (VPO, per the Spanish acronym), with storage rooms, 197 parking spaces, commercial premises, swimming pools and paddle tennis courts has also been undertaken in the northwest district of Cor-doba.

The complex, with a surface area of 20,421.73 m<sup>2</sup>, developed by the cooperative El Arcángel San Gabriel, is located on Block 23 of Sector PP.0-1 Ciudad Jardín de Poniente of the Plan for Urban Planning of Cordoba. Specifically, in the La Arruzafa area of growing urban expansion and next to the neighbourhoods of El Tablero, El Patriarca and San Rafael de la Albaida.



We are accredited as **approved supplier** for the construction of **LILW cell closure slab with a quality level of II** by the Empresa Nacional de Residuos Radiactivos, S.A.

### Execution of special works at the C.A. El Cabril facilities:

#### > Adequacy of the volumetric cubing system of Section I of Cell 29:

The network of leachate collection pipes in Section I of Cell 29, the storage cell for very low level radioactive waste (VLLRW), has been remodelled. A stainless steel tank has also been incorporated for the identification and control of possible water leaks.

#### > Construction of the closure slab of LIRW Storage Cell 20:

The closure slab of cell number 20 for the disposal of low and intermediate level radioactive waste (LIRW) has been installed by means of the construction of a reinforced concrete slab.



#### > Replacement of the fire-fighting piping in the auxiliary buildings area:

Replacement of the existing network of the fire-fighting plan of the facility's buildings by digging a trench, removing the old one and then laying a new ductile cast iron pipe, respecting the layout of the initial network.

#### > Modification of the leachate collection network of VLLRW storage Cell 29:

Modification of the leachate collection network in Cell 29 of the VLLRW storage cell, so that the three existing evacuation networks are independent up to discharge. In addition, three stainless steel tanks are introduced for intermediate leachate control.





## Services for mining activity in the pyrite belt

Support for the processing, coordination of subcontracting and engineering works for the pumping, treatment and discharge of accumulated water

These projects will lead to the authorisation of discharges, as well as the emptying of the mines, which are key milestones in the viability of the mines.

## Exploration campaign for boreholes in Tharsis (Huelva)

Wireline drilling to a depth of 700 metres for the extraction of mineral cores and complementary ancillary works such as the preparation of tracks, accesses, construction of ponds, water supply for cooling the drilling rigs and removal of sludge.

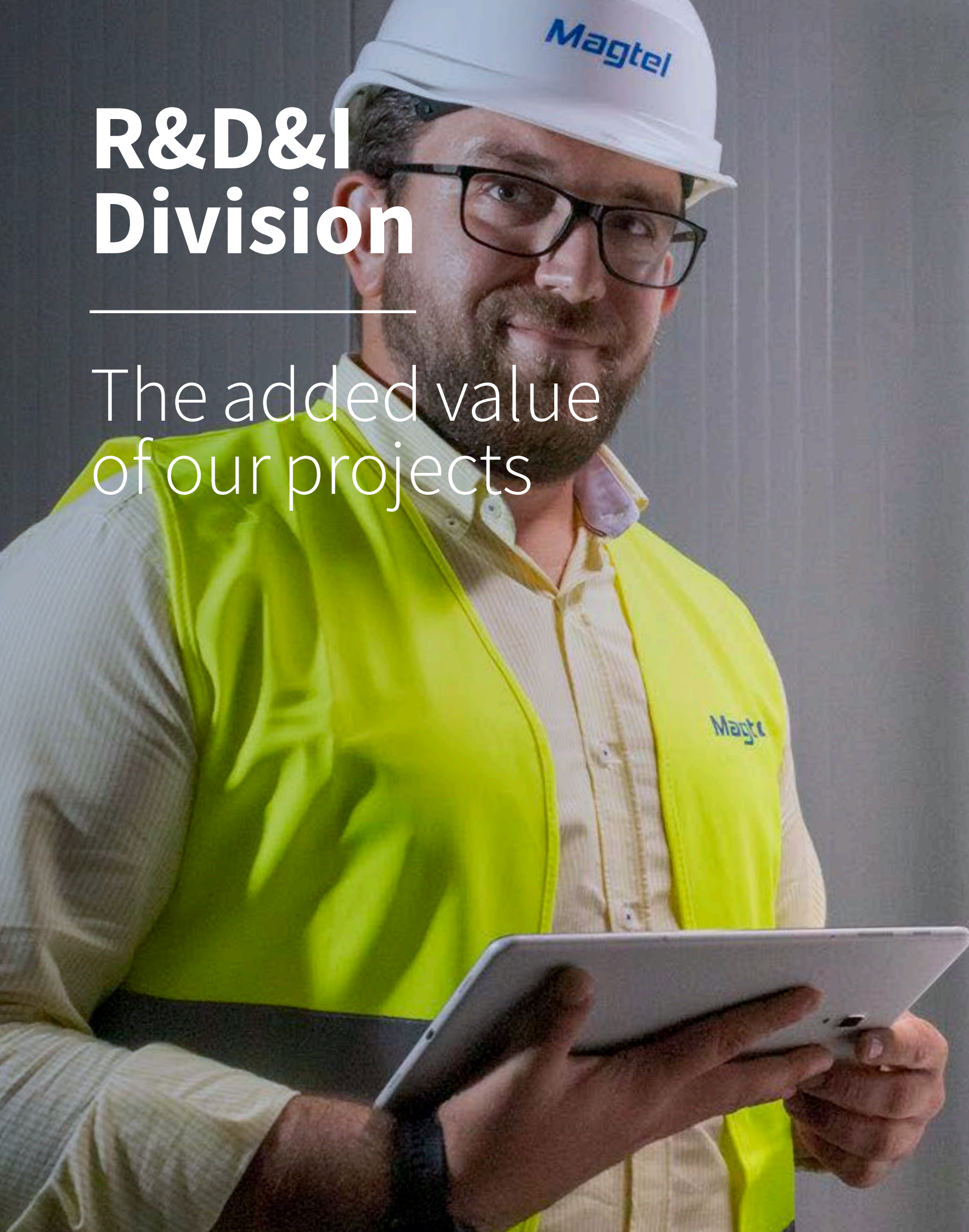




# R&D&I Division

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The added value  
of our projects





## New solutions and knowledge at the service of the needs and challenges of our society

2021 has been characterised by the continuous development of innovative technological solutions. During the past year, the Division has focused on new energy models, continuing the development of the SolarsCO2ol and SIES projects, initiatives focused on renewable energies. Respectively, they have focused on a new technology demonstrator, and the development of a green energy management platform.

In addition, progress has been made on the Life Green Sewer (secondary water treatment pilot) and Tec-Med projects. Among the finalised projects, InPower, Dragon, Hit Solar and Efichain stand out.

During 2021, there has been an extensive investment in the incorporation of personnel to the Division, and the technological facilities of the 4.0 laboratory located in Cordoba have continued to be invested in.



### ENERGY

- > HYDROGEN
- > SOLAR THERMAL ENERGY
- > PHOTOVOLTAIC
- > THERMAL STORAGE
- > ELECTRICAL STORAGE
- > BIOMASS AND BIOGAS
- > ENERGY MANAGEMENT SYSTEMS

### TELECOMMUNICATIONS AND DIGITAL TRANSFORMATION

- > INDUSTRY 4.0
- > IOT
- > MONITORING SYSTEMS
- > PREDICTIVE MAINTENANCE

### INFRASTRUCTURE

- > DESALINATION
- > WASTE MANAGEMENT AND RECOVERY
- > WATER TREATMENT
- > IRRIGATION TECHNOLOGY



# *Validation of a new photovoltaic plant concept with thermal cogeneration*

The Solar Blue initiative demonstrates the feasibility of producing solar photovoltaic and concentrated solar thermal power and will drive a new generation of selective filters for adaptation and use in different situations

Magtel's R&D&I Division has completed the demonstration of a new type of photovoltaic plant with thermal cogeneration developed at the company's facilities in Seville, specifically in the Aerospace Technology Park of Andalusia, Aerópolis.

The project, co-financed by the Centre for the Development of Industrial Technology (CDTI) under the Innterconecta call for proposals, began at the end of 2018, with the participation of three other firms, Ghenova Engineering, INNengine and the leader of the initiative, Capsun Technologies.

The project consists of demonstrating the feasibility of producing photovoltaic solar energy and concentrated solar thermal energy through the use of innovative selective light filters. These elements have been installed in the Aerópolis pilot plant, making it possible to measure thermal and electrical production.

"Solar Blue" will drive a new generation of selective filters for adaptation to different spectral conditions, to various photovoltaic technologies, as well as for other applications in the sector, with the aim of optimising module temperature.

Specifically, cogeneration occurs through the use of light filters that enable the generation of heat, with the premise of being used to provide storage or manageability of solar photovoltaic energy, and/or in industrial applications that produce electricity and heat (steam or hot water) at the same time.

In addition, new turbomachinery has been developed to improve the efficiency of steam turbines, which transform the energy from the steam flow into electricity.

## **> Sources of renewable energies**

The photovoltaic plant maintains the commitment to sustainability and the responsible use of natural resources, using renewable energy sources for the production of electricity.

As Miguel López Ariza, a technician in the Energy Area of the R&D&I Division, points out, "this project demonstrates the feasibility of producing photovoltaic solar energy and concentrated solar thermal energy. The challenges of compatibility of electricity generation have been solved by an intelligent energy management system developed by Magtel".

As a result of the development of this initiative, a new company called Solar Blue-Technology and solar and thermal cogeneration technology has been created, dedicated to the manufacture of light filters, while the economic viability of thermoelectric power plants has increased.







## SIES 2022 (smart and integrated energy system)

Consortium formed by Spain, Scotland and Turkey

It will allow a virtual power plant (VPP) system to evolve to add renewable energy generation systems, storage systems, hydrogen and heat.

The main objectives of this project are:

- > Supporting the transition from a centralised energy grid to a low-carbon, decentralised smart and integrated energy system (SIES)
- > Promoting the use of technology solutions that enable and place consumer needs at the epicentre of the system
- > Developing advanced control systems managed by IoT platforms (VPP)



## In Power

### Fresnel pilot plant

This project addresses the technical and economic optimisation of solar thermal generation, introducing multiple innovative solutions such as selective coatings or new structural materials.

Magtel's experimental plant in Seville, where it is being developed, has a fresnel-type technology that has demonstrated an improvement in efficiency through new mirrors, which improve reflectivity, and absorber tubes that improve absorbance. In addition, the photovoltaic plant is equipped with an antisoiling system, which will reduce the water consumption required for O&M (Organisation & Methods) and an innovative, low-cost solar tracker system.

The main conclusion at the end of the project is that In Power's results show that the technology used will increase the efficiency of future commercial installations and increase their profitability.



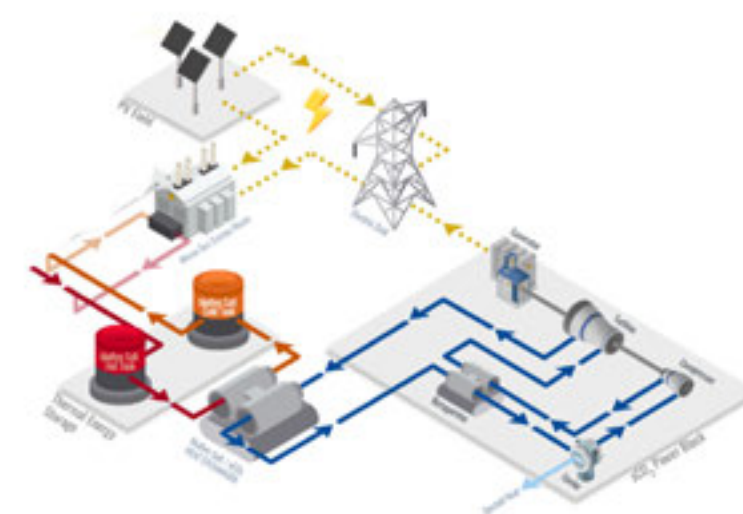
## SolarsCO<sub>2</sub>ol

Consortium formed by Spain, Italy, Sweden and Germany

SolarsCO<sub>2</sub>ol, an EU-funded H2020 project aimed at developing a supercritical CO<sub>2</sub> (sCO<sub>2</sub>) power block.

This is an innovative, economically viable and easily replicable initiative to demonstrate the use of sCO<sub>2</sub> cycles as a key potential technology to increase the flexibility of concentrated solar power (CSP) plants.

These developments will reduce the size of the CSP power block to one tenth, reduce the levelised cost of electricity (LCOE) to values below €10/kWh in Europe and promote innovative cycle design that does not require water.







## *The hybrid technology of the **project Dragon** will improve the lifetime of existing lithium batteries by 15%*

The initiative, in which Magtel participates and which has two European partners, combines lithium-ion batteries and supercapacitors

Magtel has successfully completed the Dragon project developed in the company's Industry 4.0 laboratory. This initiative, which started in March 2018, has been carried out together with the leading company Nawa Technologies (France), and the Swiss technology partner Almatech. Each has produced a demonstrator to validate the project in three different use cases: Magtel, in the use of residential self-consumption; Nawa, in electric mobility; and Almatech, in aerospace (satellites).

The project aims to develop innovative hybrid technology that combines storage technologies with high energy densities (lithium-ion batteries) and high specific power (supercapacitors).

The outcome of the research process has been satisfactory. After its completion, the hybrid storage system, together with the designed energy management system (EMS), is able to more efficiently cope with power demands. As a result, battery life is improved by 15% compared to operation without hybridisation.

The main advantage of hybridisation is the increased lifetime of the battery, which improves the efficiency of the storage system and its response to peak demand.

Specifically, our R&D&I Division has been in charge of the design, development and validation of the energy management system (EMS) of the integrated hybrid system, as well as the manufacturing and testing of the demonstrator for the Smart Grids use case in residential environments.

The initiative is part of the Eureka Eurostars Programme dependant of the Ministry of Science and Innovation and the European Union.

Given that the technical improvement of the proposed system has been demonstrated, Magtel is looking to move forward with the materialisation of the project as an integrated product that can be sold to residential customers. To this end, it is seeking new partnerships for the industrialisation and automation of the manufacturing processes of the various elements within the system.

The head of the company's photovoltaic energy and electrochemical storage area, José Manuel García, believes that "the system could be a real product, with an automated assembly line, after the completion of a future project in 2-3 years, giving time for the cost price of supercapacitors to fall".





## Life Green Sewer

Multidisciplinary consortium linked to the water, energy, ICT, environmental and biotechnology industrial sectors

The objective of this project is the validation of a new secondary wastewater treatment system based on the integration of direct-indirect osmosis with an anaerobic membrane bioreactor, allowing the recovery of energy and resources, while reducing costs, energy consumption and the presence of pollutants.

## Fiberclean

Solutions for microfibre reduction in the fabric and garment manufacturing and maintenance value chain

The project is developed from two different perspectives:

- > Research and development of new yarns, fabrics and finished products, with properties that prevent the release of microfibres during various stages of the product life cycle or allow them to be revalued.
- > Research and development of new technologies related to garment washing and waste water treatment for the removal or reduction of microfibres, which are compatible with conventional systems.

## Resiltrack

Preventive system for railway infrastructure in the face of the effects of climate change

The project aims to know the state of railway infrastructures and their impact on adverse phenomena in real time, through BIM-based solutions for the assessment of resilience to climate change.



## Servicechain

Business-oriented blockchain technology

The main cross-cutting application areas of this project are digital identity management, traceability of digital goods and digitisation of relationships through automation. The project proposes three demonstrators of future application of the technology in the energy, industry 4.0 and smart cities sectors, cases of application and potential future commercial exploitation oriented to the capabilities and knowledge of the Servicechain consortium.

The initiative is the result of the strategic objective set by the consortium's entities to position themselves in a technology that could be key to their development and international expansion in the coming years.

## TEC-MED

Development of a cross-cultural model of social-ethical care for the dependent population in the Mediterranean basin

The project aims to improve social care policies addressing the ageing population by designing a new organisational model to support cooperation and partnership between public institutions and social care actors for the improvement of the quality of social services.

Made up of companies and entities from Spain, Italy, Greece, Tunisia, Lebanon and Egypt, the R&D&I Division is tackling the construction of a software platform for the management of beneficiaries, caregivers, training agents and administrators.



# **Logistics Base:** *A unique opportunity for Cordoba to place itself at the **cutting-edge** of technology*

This is an exciting project for the future of innovation in our region

**T**he Army Logistics Base (BLET) project is fundamental for Cordoba and Andalusia, from all points of view, and especially for business. It thus represents a unique opportunity to place the city at the forefront of innovation, technological development and a logistics hub that will propel the city into the international arena.

The initiative will be of vital importance in the new era following the effects of the covid-19 crisis on the economy and employment. Likewise, the extremely important technological component of the Base and the weight of digitalisation in the field of Defence will lead to the expected revitalisation of the industrial sector.

In this context, cutting-edge technology will play an indispensable role. Concepts such as artificial intelligence, virtual reality, augmented reality and blockchain will be key.

At Magtel we have extensive experience in R&D&I and as part of this commitment we have created an area which we have called Business Development for Defence, headed by Juan Cifuentes Álvarez.

It addresses issues such as predictive logistics, big data, algorithms and efficiency, which are essential to promote change in production models, as well as the promotion of digitalisation to complement and improve traditional sectors.

In this context, it will be necessary for technology companies to establish alliances and develop synergies to strengthen and compete in order to transform the production model in Cordoba in the medium and long term, as will public-private collaboration.

Finally, academic institutions will have a fundamental role to play, encouraging the promotion of specific training adapted to the new demands.

**JUAN CIFUENTES ÁLVAREZ**

Director of Defence Business Development





# They trust us

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> INTERNATIONAL LOCATIONS

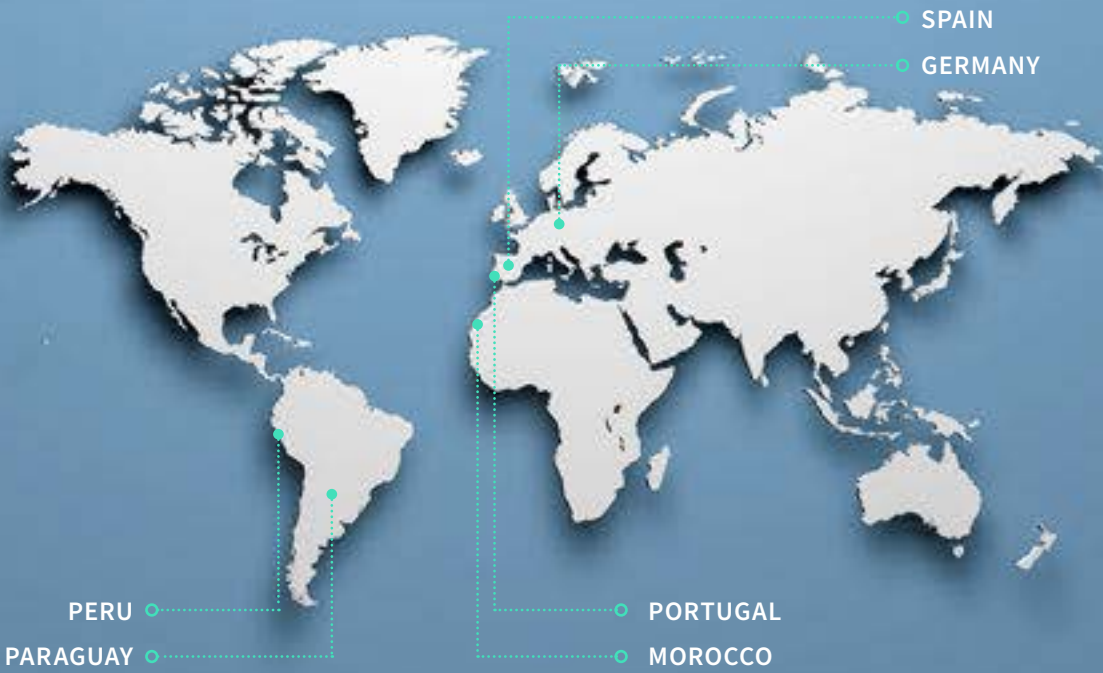
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# *Technology for sustainable development*







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