

THE RAILWAY

an innovative and attractive
sector for employment



IN DEPTH

The innovative capacity of SMEs in the railway industry.



MAFEX INFORMS

Mafex presents its new Strategic Plan 2021-2024 during its Annual General Meeting.



INTERVIEW

Hélène Valenzuela, General Manager OUIGO, Fabrizio Favara, Chief Executive Officer Ilsa and Julio Gómez-Pomar, Chairman Eco Rail.

Soluciones de transporte impulsadas por la pasión por la movilidad

El futuro de la movilidad en un mundo globalmente interconectado exige soluciones de movilidad fluidas, sostenibles, fiables y seguras. Aprovechamos los beneficios de la digitalización, la excelencia en ingeniería y nuestro espíritu emprendedor para dominar este desafío. Gracias a la confianza de nuestros socios, somos pioneros en el transporte, trasladando a las personas de forma sostenible y fluida desde la primera hasta la última milla. Y siempre hacemos una milla extra para ayudar a los servicios de transporte de todo el mundo a ir más allá de lo esperado.

siemens.es/mobility

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PLAN 2021-2024 DURING ITS ANNUAL
GENERAL MEETING**

The Spanish Railway Association presents to the General Members Meeting the Strategic Plan 2021 - 2024, incorporates new partners, and reviews the 2020 - 2021 activities.

INTERNATIONAL PROCUREMENT INSTRUMENT (IPI)

After nine years of negotiations, a mandate has been approved for the European Parliament to work on the proposal already agreed by the Member States to create the International Procurement Instrument (IPI).

THE SPANISH RAILWAY ASSOCIATION CONTINUES TO GROW WITH THE RECENT ADDITION OF 5 NEW PARTNERS

RAIL LIVE! ANNOUNCES ITS AGENDA

Rail Live! will be held in person from 30th November to 1st December 2021 under the banner "Technology, innovation and strategy for the entire railway supply chain".

MAFEX PROMOTES THE TRAIN OF THE FUTURE THROUGH A SERIES OF SEMINARS DURING 2021 WITHIN THE FRAMEWORK OF THE SPANISH OBSERVATORY FOR THE HYPERLOOP

The Spanish Observatory for the Hyperloop, an initiative launched by Mafex, the Spanish Railway Association in 2019, aims to address the uncertainties surrounding the Hyperloop system that still need further development by implementing the great experience in high speed that the sector has.

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THE RAILWAY, AN INNOVATIVE AND ATTRACTIVE SECTOR FOR EMPLOYMENT

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Multidisciplinary teams focused on safety, integration and the technological evolution of rail systems.

IDOM.com

The railway: The axis of change towards a sustainable and digital future



Mobility is moving towards a sustainable, digital, and connected model. On this new road, the central axis of change is the railway. Its many environmental, safety and structural advantages translates in the need for it to become the main beneficiary of investments in terms of green infrastructure, both nationally and internationally.

The European Commission has declared 2021 as the "European Year of Rail". This is a declaration of intent that highlights the importance given to this mode of transport to achieve the goal of being the first climate-neutral continent by 2050. On the occasion of such an important date, an extensive agenda of activities has been drawn up, among which is the organisation of the fair and congress Rail Live! next December in Madrid (IFEMA). This professional platform, organised by Terrapinn and Mafex, that will be carried out following an extensive safety protocol, will be the ideal scenario to analyse the changes and trends of the sector, as well as the topics of greatest relevance for the industry.

This commemoration coincides with the liberalisation of passenger transport in Spain. A process that is already a reality and whose evolution is analysed in these pages by some of its main players.

In this modal transformation, the role of SMEs, together with that of larger companies, will be essential to help

promote a competitive, technologically avant-garde, and emissions-free system, through the provision of their solutions and services. It is a crucial moment for an industry that faces great challenges and opportunities associated with key aspects such as digital transformation and sustainability.

We stand before an innovative sector, with great prospects of generating employment both in the public administrations and in the private sector, which also faces other challenges from the point of view of human capital such as attracting, incorporating, and retaining the best talent.

All these topics are analysed in issue 27 of Mafex magazine, which also includes 23 current news from our partners and 13 new developments and/or technological solutions on their latest innovations.

Likewise, in terms of innovation, more details will be shared to learn about the work in progress regarding the European project RailActivation, and whose consortium, led by Mafex, has as its main objective to support railway SMEs in their transformation through the creation and adoption of open innovation strategies within organisations.

Sustainability travels on tracks, with a promising future for a mobility model where there is full confidence in the railway.

MANAGEMENT: MAFEX.
MAFEX COMMUNICATION COMMITTEE: Alstom Transporte, ArcelorMittal, Bombardier España, Caf, Icon Multimedia, Grupo Trigo, Idom, Indra Sistemas, Ingeteam, La Farga Yourcoopersolutions, Patentes Talgo, Siemens Rail Automation, Stadler Rail Valencia, Thales España, TPF Getinsa Euroestudios y Zitron. **ADMINISTRATION:** comunicacion@alencor.es **ADVERTISING:** mafex@mafex.es **SUBSCRIPTIONS:** mafex@mafex.es. Mafex magazine is not responsible for the opinions, images, texts and works of authors and readers that will be legally responsible for their content. It is understood that the signing authors have given their consent to be included, for which he or she will be responsible. Also, the magazine is not responsible for typographical errors contained in the original documents submitted by the authors.



Mafex presents its new Strategic Plan 2021-2024 during its Annual General Meeting

Mafex, the Spanish Railway Association, held its seventeenth General Meeting on 16th April 2021, with a wide participation of more than 80 companies represented from a total of 95 current partners, and where 9 of the 13 new current member companies were introduced since the last meeting took place in November: Fastening Excellence Center, Flanker, ITSS, MainRail, ICF – Ingeniería y Control Ferroviario, Belgorail España, Forging Steel Products, Smart Motors, and Masa-Mecanizaciones Aeronáuticas.

As part of this meeting, the Strategic Plan 2021 – 2024 was presented, which incorporates the priorities of the sector and of the railway industry for the coming years. The presented report includes an assessment about the consequences in the sector of the current crisis caused by the pandemic and the roadmap to be followed to support companies in the recovery throughout the duration of the plan. To this end, the main drivers that will condition the activity of the coming years for the

THE SPANISH RAILWAY ASSOCIATION PRESENTS TO THE GENERAL MEETING OF MEMBERS THE STRATEGIC PLAN 2021- 2024, INCORPORATES NEW PARTNERS, AND REVIEWS THE 2020-2021 ACTIVITIES.

industry (regulatory, technological, and market) are analysed.

The presentation included the strategic guidelines, initiatives and actions that will be deployed in the coming years by Mafex focused on innovation, internationalisation, and sector representation.

During the general meeting, in addition to the presentation of the new plan, an overview of the more than 200 actions organised and/or coordinated by Mafex during the past year was made. This summary also highlighted the increase of 20% of the number of partners in the last four years and the important progress made in terms of innovation actions. Mafex is currently participating in four projects, three in Europe. Among them stands out the incorporation of Mafex into the Staffer pro-

ject, which brings together the key players in the railway industry to cooperate closely in the anticipation of training needs and the improvement of the dialogue between the education sector and the labour market. This is where Mafex collaborates with the main entities and manufacturers of the sector at European level.

On the other hand, the actions planned for the second semester of the year were presented, among which is the Rail Live! congress and fair, to take place from 30th November to 1st December at the IFEMA fairground in Madrid. This event is the national platform of reference within the railway transport that has broad support from the entire sector, and which will be included as one of the main contributions of the industry to the European Year of Rail to be held throughout this year. 🚂

Mandate approved to work on the proposal for the creation of the International Contracting Instrument (IPI)

The International Contracting Instrument (IPI) is an European regulation that will help address the lack of a level playing field in global procurement markets. From Mafex we have closely followed its negotiation in the Council, and we have been continuously in contact with the General Directorate of Trade Policy of the Secretary of State for Trade (in charge of the dossier) as well as with the Permanent Representation of Spain before the EU, UNIFE, CEOE, etc. to protect our sector interests.

Finally - after nine years of negotiations - the Council approved last week a mandate for the European Parliament to work on the proposal

already agreed by the Member States and to create such an International Contracting Instrument (IPI).

The European Parliament has yet to define its position on the case, and start interinstitutional negotiations (i.e., trialogues) after the summer.

It should be noted some of the key amendments introduced by the Portuguese Presidency to the legislative texts agreed by the Council which include:

- Shorter and more flexible deadlines for the investigation and consultation phases
- The procedure to define origin has been simplified with a focus on tenderers

- Two types of IPI measures can be implemented: adjustment measures and, in more extreme and therefore exceptional cases, exclusion

- Adjustment measures may include quality criteria in addition to pricing and may be applied within a certain percentage range
- IPI measures will only apply to new procurement procedures initiated after the entry into force of the regulation, which will be subject to further review. 🇪🇺



New Mafex partners

The number of companies joining Mafex continues to grow. These are the 5 new partners:

THE SPANISH RAILWAY ASSOCIATION CONTINUES TO GROW WITH THE RECENT ADDITION OF 5 NEW MEMBERS. MAFEX ADDS WITH THESE INCORPORATIONS A TOTAL OF 95 COMPANIES AND ENTITIES THAT REPRESENT ALL THE SUBSECTORS OF A LEADING INDUSTRY THAT IS MAKING ITS WAY AROUND THE WORLD.

URETEK SOLUCIONES INNOVADORAS, S.L.U

They are the inventors of foundation consolidation with Expansive Resins. Their patented technologies are the most widely used in the world, with more than 100,000 interventions performed. Its high technology, the quality of the interventions and more than 30 years of experience, have become the reference for the consolidation of land with injections of expansive resin to be able to provide multiple solutions to their problems. They are committed to repairing structures without interfering with life and activities. In particular, they use unique and patented innovative technologies that are fast and conservative.



DUAGON IBERIA, S.L.

Duagon Iberia, a subsidiary of the Swiss group Duagon. For the last 12 years they have been providing railway signalling engineering services for manufacturing companies of equipment and railway signalling solutions. They are 160 engineers with consolidated experience in the following areas: design and programming of electronic interlockings and track systems, control centres, systems engineering (CBTC, ERTMS) with an important software component, test & commissioning, and the implementation of on-board equipment on tracks and engineering. From Spain they collaborate in the R&D of some products of the group, especially software of network & control equipment and on-board computing.



MECANIZACIONES AERONÁUTICAS, S.A.

MASA is specialised in the manufacture of medium and large metallic parts of aluminum and hard metals. They are able to deliver to their customers finished parts (from the purchase of the raw material to the treatment and the equipment).



ARIÑO DUGLASS S.A.

50 years of experience in the sector is the guarantee that positions them as a company specialised in glass for Architecture and Railway. A long presence in the Spanish, European and world markets has allowed them to obtain the knowledge and know-how to offer the most technologically advanced and high quality products. The continuous research and technological development are in its DNA, which allow to incorporate day by day the latest manufacturing methods that lead them to business excellence and continuous improvement. Together with different entities and institutions, they collaborate, cooperate and conduct research projects.



VIRTUALMECHANICS, S. L. (VIRTUALMECH)

Virtualmech is composed of a highly specialised team with great experience in different areas of the industry such as the railway and the thermosolar sector. Its value proposition is to offer its customers actual results to complex problems, always adapted to their particular needs. They achieve this by obtaining and processing data, by means of simulation or experimental measurement that they present to their clients so that they can make effective decision-making based on objective criteria.



Rail Live! 2021 announces its agenda

Terrapinn, the organisation that has the support and collaboration of Mafex – Spanish Railway Association, works on an intense agenda of presentations and seminars where for two days the new trends in railway transport and the main challenges of the future will be addressed. Digitalisation or sustainable mobility are some of the topics that will be discussed by the more than 250 confirmed speakers. Attendees will also be able to learn more about the latest technological advances in the exhibition area.

Rail Live! will be held in person from 30th November to 1st December 2021. Under the title: "Technology, innovation and strategy for the entire railway supply chain", the event will host an agenda full of panels, presentations, and roundtables. The agenda covers all current issues for the future development of the industry, such as: integrated mobility, ticketing, energy and sustainability, IoT, BIM, digital and smart infrastructure among others.

Among the main international speakers there are already confirmed to date executives of DB Netze (Germany), HS2 (United Kingdom), SCNF Réseau (France), Texas Cen-



tral (United States) and Trafikverket (Sweden) among others.

The event will also be attended by the main national and international companies in the sector. The wide national participation stands out, as well as the attendance of company sponsors such as Grupo CAF, Talgo, Ingeteam, Ineco, ArcelorMittal, Indra, NGRT, Stadler, Amurrio, Idom,

Sener, Siemens, NRF, Zitron and X. It is expected that more than 115 companies will be participating and sharing their latest breakthroughs in innovation and technological developments.

Mafex, the Spanish Railway Association, has once again supported the organisation of the Rail Live! event. The Ministry of Transport, Mobility and Urban Agenda collaborate in the development of the event through Renfe and Adif. Other collaborators are Comunidad de Madrid, Madrid City Council, Metro de Madrid, the Spanish Railways Foundation, the Spanish Railways Technological Platform and ICEX. Other organisations such as UNIFE, EIM, Shift2Rail and Railgrup will participate in the event and have supported its promotion.

More details about the fair and congress, the speakers and the participating companies on the following website: <https://www.terrapinn.com/conference/rail-live/index.stm>



MAFEX promotes the **train of the future** through a series of seminars during 2021 within the framework of the Spanish Observatory for the Hyperloop

The Observatory aims, on the one hand, to boost the capacity of the Spanish railway sector, identify the lines of research and development to provide viable solutions to the different challenges, as well as to support in parallel the legal framework that regulates its possible implementation given this unique market opportunity. On the other hand, through the already proven experience of the Spanish railway sector, it is intended to analyse the technological developments in the field of safety throughout the system and to promote the interoperability of different Hyperloops at European level.

Evidence of this was the first of the virtual conferences planned for this year, organized on 29th April, called "The Spanish railway sector, main driver of the Hyperloop" in collaboration with Juan de Dios, Dr. Industrial Engineer of the Polytech-

THE SPANISH OBSERVATORY FOR THE HYPERLOOP, AN INITIATIVE LAUNCHED BY MAFEX, THE SPANISH RAILWAY ASSOCIATION IN 2019, AIMS TO ADDRESS THE UNCERTAINTIES SURROUNDING THE HYPERLOOP SYSTEM THAT STILL NEED FURTHER DEVELOPMENT BY IMPLEMENTING THE GREAT EXPERIENCE IN HIGH SPEED THAT THE RAILWAY SECTOR HAS.

nic University of Madrid, Juan Vicén Balaguer, Cofounder & CMO of Zeleros Hyperloop and David Álvarez, Research Engineer at ArcelorMittal. It also involved the General Manager of Mafex, Pedro Fortea, and Garazi Carranza Ruiz de Loizaga, responsible for the Competitiveness and Innovation area of Mafex, as moderator.

During the session it was highlighted that the Hyperloop system is a new mode of transport, complementary

to the railway. It is innovative, and it offers a great opportunity for the future, due to its ability to cover, in a sustainable and efficient way, long distances for the transport of passengers and goods. In addition, it should be noted that the vehicle of the system will be composed of capsules that levitate on steel tubes at low pressure at 1,200km/h, which will translate into the use of new materials and a revolution in mobility, since it will allow to connect cities in a few minutes. 🚀



Mafex will support european smes in international public procurement processes with **project S-ACCESS**

The S-ACCESS project is part of COSME, the EU programme that aims to promote the competitiveness of companies and SMEs. S-ACCESS aims to strategically strengthen European small and medium-sized enterprises to participate in public procurement tenders in markets outside the EU.

MAFEX will collaborate with other railway clusters in the definition and implementation of the internationalisation strategy for the U.S., Canada, and Norway. The duration of the project is 24 months, and a complete analysis of the target countries will be offered as well as training and advisory services to SMEs, business trips to the target countries, among other relevant actions to support SMEs in public procurement processes in these countries.

Access to third country markets is essential for European SMEs, especially as the size of the EU market is limited and growth is slower compared to some third country markets with larger railway networks. The S-ACCESS project will be developed in two phases: preparatory and implementation, during which the analysis of the SMEs joined up in the different partner groups - as well as the analysis of the markets and tendering procedures, and the public procurement processes in the target markets - will take place. These have been selected based on what was previously developed in the PERES project and will be the United States, Canada, and Norway.

Supporting a project centered on European railway technologies will help to strengthen the EU's effort

towards a greener and more digital economy, provided that through internationalisation we support the resilience of European SMEs and their opportunity to reinvest in Europe in greener production and solutions, as well as in digitalisation.

The S-ACCESS project fully complies with the spirit of the action. In addition, its ability to develop and offer a new approach of applicable internationalisation - with small changes (e.g., the dimension/complexity of the system integration, reference to standards, etc.) - to other European industrial sectors will be supported by the fact that many SMEs operating in the railway sector have also developed solutions for other public sectors, such as energy, water or defence. 🌱



The commitment of Mafex and the industry so that the recovery funds commit to the railway as the backbone of the mobility of the future

The year 2020 brought with it a global pandemic, the unprecedented effects of which have been palpable at all levels, forcing governments to act individually and collectively. As a Member State of the European Union, Spain opted from the outset for a supportive and coordinated response with all its Community partners which, after months of intense work, culminated in the design and approval of an extraordinary supplement to the Community budget called Next Generation EU.

Its fundamental pillar is the Recovery and Resilience Mechanism, which aims to become the main tool that allows countries to alleviate and repair the most imminent economic and social damages through important investments and reforms during the years 2021-2026, thanks to the National Recovery and Resilience Plans.

In this context and considering that of the 672,000 million euros planned, Spain aspires to receive in subsidies more than 69,000 (out of a total of almost 150,000), we proposed from Mafex to claim the active role of the railway industry (which represents more than 8% of the industrial GDP) in the economic recovery of the country, and the need to invest in sustainable and efficient public transport infrastructures.

And we have done so by actively participating in the elaboration of the 21 Strategic Initiatives that will govern the "PLAN ESPAÑA PUEDE" and reinforcing our dialogue with the ministries and agencies involved in its drafting.



As the National Plans of the various Member States are presented, 23 to date, we are optimistic that the railway sector will opt for around 9% of the total funds available: some 52 billion euros.

In Mafex we are committed to the railway as the backbone of sustainable and connected mobility of the future for the citizen's welfare that it generates at a social and environmental level. But our commitment as an industry goes further, and we are aware of the brand and country image we generate, since our companies are leaders when it comes to developing all kinds of technological solutions that have allowed us, in

recent decades, to be a world reference.

We therefore continue to encourage our administrations to invest in less polluting transport infrastructures. Let us take advantage of the momentum of the Recovery Funds and emerge stronger, more resilient and better prepared for the new challenges and demands that we will have to face in order to meet the objectives imposed by the European Union for 2030 and 2050. We therefore hope that investments in the sector will not be temporary but sustained over time, and that they will be combined with other Community instruments that will allow us to develop ambitious projects beyond 2023.

Adif-Mafex conference

In the morning of the 5th of May, the General Manager of Mafex, the Spanish Railway Association, Pedro Fortea, opened the event organized jointly by both organisations in order to share the vision of Adif in the current context and its strategic lines of action for the coming years (Strategic Plan 2030 and presentation of the innovation strategy). This had also the participation of Maria Luisa Domínguez, General Manager of Strategic Planning and Projects; Luis Fernando López, Director of Business Strategy and Carlos Juárez, Director of Functional Planning. Fortea also stressed during his speech "the importance of streamlining the processes and ongoing projects of Adif that, in addition to involving work and contributing to reduce the current situation of uncertainty among companies, serve

ON 5TH MAY THE SPANISH RAILWAY ASSOCIATION ORGANISED TOGETHER WITH ADIF, A VIRTUAL CONFERENCE WITH THE ATTENDANCE OF MORE THAN 100 REPRESENTATIVES OF THE RAILWAY INDUSTRY WITH THE AIM OF SHARING THE STRATEGIC LINES OF ACTION OF THE RAILWAYS INFRASTRUCTURE MANAGEMENT FOR THE COMING YEARS.

as an engine that promotes subsequent sales abroad".

This interest and commitment of the railway industry with the infrastructure management has been reflected in the participation of more than 100 representatives of companies in the sector. It is important to remember that last year Mafex and Adif signed a cooperation agreement. Although both organisations had been collaborating regularly in the search for and development of new

business opportunities for companies, the signing of this agreement strengthens the foundations of an even closer cooperation in the organisation of activities that support the internationalisation and the promotion of innovation initiatives. All this is carried out with the common objective of supporting and promoting the competitive improvement of the Spanish business railway sector, which in Spain generates more than 27,000 jobs, and up to 400,000 throughout Europe.





Ardanuy Ingeniería to supervise the renovation of Spain's conventional network Control Centers

Ardanuy Ingeniería

The Spanish Railway Administrator (ADIF) has recently awarded Ardanuy Ingeniería a new Technical Assistance contract. The Consultancy will be in charge of monitoring and supervising the new renovation works for the Centralized Traffic Control (CTC) centers belonging to Spain's conventional

network. The works will be carried out over a period of 36 months and tasks will not only include work supervision but will also involve document and pre-work execution management and control, apart from supply, installation and assembly. Likewise, the Company will also be responsible certain assignments for the post-installation period, such as the management of possible incidents that may arise. The goal of this modernization contract is to upgrade the technology

utilized for the operation systems currently being used by the different CTC facilities. Some of the most important of these CTC facilities can be found in Orense (Galicia), Miranda de Ebro (Burgos), Zaragoza, Valencia, Madrid, Manzanares (Ciudad Real), Granada, Córdoba, Ronda (Málaga), Málaga and Seville. The modernization works to be carried out will serve to optimize the CTCs functionality while also enhancing the reliability and quality of the equipment in question.

Cablescom, 50 years connecting the world

CABLESCOM

CablesCom turns 50 this year. Our company was founded in 1971, and from our beginnings, the rail sector has been one of our main markets.

In 1992, we supplied the signalling and communications cables for the first Spanish high-speed line between Madrid and Seville. Since then, we have been growing and expanding our client portfolio both in Spain and in export markets, having achieved presence and approvals not only in the main European countries such as France, UK, Belgium and Romania, but also in other countries farther afield like Chile and Egypt.

In 2020, despite the international crisis that we all endured, CablesCom

maintained its activity and supplied 2,660 km of signalling cables for different Spanish and European clients.

Today, our portfolio features a broad array of signalling and fibre-optic cables for railway infrastructures that

comply with different client specifications, most notably the cables with "Reduction Factors" that minimize interference from catenaries, and a complete range of cables that meet CPR requirements for fire performance.



COMSA Corporación will execute the new rail access to Barcelona-El Prat Airport's T1 terminal

COMSA

COMSA together with COMSA Industrial will be in charge of the second and last phase of the works for the new train access to terminal T1 at Barcelona-El Prat Airport, worth 64.6 million euros. The access will enable direct local train services to both terminals T1 and T2 and will be able to accommodate shuttle services between the airport and the high-speed line. The completion of the works will reduce connection times from the centre of Barcelona to 20 minutes.

The project includes the assembly of the tracks and superstructure that will enable the branch line to be put into service, with a total length of 4.5 kilometres on double track, of which 3.4 kilometres are underground. It also



includes the architecture of the two new stations and the connection with

the Iberian gauge line from Vilanova to El Prat, among other works.



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New urbos trams for the city of Lisbon

CAF

CAF has been selected to supply 15 Urbos trams to Companhia Carris de Ferro de Lisboa, E. M., S. A. (CARRIS), the company responsible for urban public land transport

in the city of Lisbon. This contract also includes tram maintenance servicing for a period of 5 years. The overall project amount is in excess of €43 million.

The new trams will operate on Carreira 15 (line 15) which runs parallel to the mouth

of the River Tajo, connecting the main tourist monument areas in the Portuguese capital, such as Commerce Square, Belém and the Jerónimos Monastery, as well as the city's main stations of the various means of transport such as metro, railway, ferries, etc.

CAF Signalling projects, Wales and Borders, Zidani Most-Sentilj and Baseline 3 Release 2 certification

CAF SIGNALLING

CAF Signalling successfully concludes the FATs ERTMS tests of the "Wales and Borders" project. The company is responsible for supplying and certifying the ERTMS Level 2 system for 21 Civity Class 197 trains, of the Cambrian line. During this phase the correct integration of the on-board ERTMS, as well as the interface with the signalling system in UK TPWS.

In addition, it has put in service Section 3 of the Zidani Most-Sentilj project in Slovenia, executed in consortium with ISKRA.



These works include the first two stations of Slovenska Bistrica and Poljane out of the 16 stations of the contract. Also, CAF Signalling receives ETCS Baseline

3 Release 2 certification of the latest set of European Train Control System (ETCS) specifications, Baseline 3 Release 2 according to the latest TSI 2019/776.

NRF obtains 15085 CL1 certification

NRF

NRF, the Dutch multinational leader in cooling systems for engines and traction systems, continues its European expansion. After the opening of a new production plant in Poland last February 2021, NRF obtained in April the 15085 CL1 certification, which enables the welding of components in the railway sector. Poland thus



joins the Dutch factory, which was already certified in 15085.

The next to join will be the NRF factory in Granada, with the firm objective of being a reference for Spanish customers, this plant will be audited and certified early July, so that NRF will have total flexibility, for the development and manufacture of refrigeration units for railways in Europe.

New facilities for Alstom Spain's 3D Printing Hub in Santa Perpètua

ALSTOM

Alstom Spain's 3D printing Hub in Santa Perpètua, Barcelona, is opening new facilities. The new Hub has a component scanner, ten industrial FDM wire machines, and three SLA-DLPs, which enable printing tools and tooling for industrial centers and prototypes to validate designs, molds, and serial parts.

In the past year, the Hub has designed more than 258 types of parts, with a total of 13,978 parts manufactured.

The new facility will allow for an increase in the number of components generated by 3D printing, including structural, functional, and safety elements, as well as the incorporation of new materials and techniques.

Created in 2016, within the framework of Alstom's "Industry of the Future" program, the Santa Perpètua 3D printing Hub was the pioneer in incorporating this type of

techniques within the Group, and currently, it is a world reference in R&D processes, as well as in the production of components.



PRECON

**INNOVACIÓN,
TECNOLOGÍA Y TALENTO**
desde 1958



Indra develops the ticketing technology for the Metro de Madrid project “Estación 4.0.”

INDRA

Indra has developed the innovative and attractive ticketing systems, designed in collaboration with Metro de Madrid, for Estación 4.0., testing ground for the new, digitized and innovative transportation environment.

The new automatic ticket vending machines and access control systems, based on Indra's Mova Collect line of solutions, will bring a new travel experience to users, who will be able to obtain information and interact with the machines thanks to their smartphone-like usability (with a 43" touch screen), validate their trip both with transport cards and through cellphone or credit card in the future and access the suburban metro in a simpler, more comfortable and dynamic way.



The largest electrification project in the world

IDOM

IDOM has been awarded the overall implementation project for the electrification (25 kV AC) of the 870-km-long double-track high-speed line (249 km/h) according to an agreement signed with the Rail Baltica joint venture RB Rail AS.

Together with partners DB Engineering & Consulting and Italferr S.p.A., IDOM has been appointed as the energy (ENE) engineer and will be providing the engineering, consulting and FIDIC engineer services for the overall management and execution of the ENE deployment process across the Baltic States.

The Rail Baltica Global Project is a rail transport project aimed at integrating the Baltic States into the European rail network. The ENE Engineering Service project, of which IDOM is part, is the largest single procured electrification project worldwide, connecting three different countries with a single piece of infrastructure.

Ingeteam will supply traction converters for new locomotives

INGETEAM

Ingeteam has obtained new orders to supply traction converters for 12 locomotives and 8 EMUs. The vehicles will be manufactured by PESA in Poland and will give service in this country.

The contract includes the supply of high powered traction converters, located on board for the locomotives and medium powered converters located on roof for the EMUs.

Up to date, INGETEAM has already supplied converters for more than 30 locomotives of its kind. INGETEAM order includes TCMS system for the locomotives.

The deliveries are to start on the next weeks. The manufacturing of converters will take place at the INGETEAM factory in Ortuella (Bizkaia).



The Interior Ministry's Secretary of State for Security and ICON Multimedia reach an agreement to spread alerts of people who has disappeared through the DENEVA

ICON MULTIMEDIA

The ICON Multimedia's Passenger Information System, DENEVA, has been recognized by de Interior Ministry as an authorized content management system for the spread of alerts of people who has disappeared. The aim of this initiative is to increase the number of messages displayed to reach a larger number of people who can provide clues. It will also sensitize awareness among



the population regarding the events surrounding the disappearance of a person. Thus, the Spanish Secretary of State for Security will be in charge of supplying the content related to the warning message, and determining the duration and area of diffu-

sion depending on each case. In this context, the first pilot testing has already begun at railway and metro stations, due to the relevance that these places acquire in the search for people because of their high mobility index within them.

JEZ Sistemas Ferroviarios is voestalpine Railway Systems JEZ

VOESTALPINE RAILWAY SYSTEMS JEZ
The company Talleres y Fundiciones JEZ, established in 1924, the historic “JEZ”, is today voestalpine Railway Systems JEZ. In 1948, the great development of the project drove the founders to acquire land in Llodio, where the facilities were relocated. In 1994, the company joined voestalpine group, becoming a part of it and

guaranteeing its projection and development.
The company is committed to the designing, manufacturing, supplying and maintenance on track of all types of manganese steel switches and railway track systems for railways and tramways. The technical department and R&D assures the design and production of turnouts and its components and the creation of registered patents. voestalpine Railway Systems

JEZ products are a part of the “Corredor del Mediterráneo”, high speed networks of Spain and Saudi Arabia and the main Spanish, European and American subway and tram networks. Currently focused on the development of new guided urban mobility systems with rubber tyre, the group provides solutions for railway infrastructure systems and offers products, logistics and exceptional services for rail, turnout, fixation and signalling and monitoring applications.



Metrotenerife receives an award from the UN for improving the mobility and the sustainability

METROTENERIFE
Metrotenerife has received the second prize from the United Nations Economic Commission for Europe (UNECE-UN) for its contributions to improve the mobility and sustainability. The 'Building Back Better' awards recog-

nize international infrastructures that contribute to the sustainable development goals.
31 Projects from twenty countries were evaluated, being Metrotenerife the only European initiative that reached the final. Among the assessed aspects, Metrotenerife stands out as a public transport system that has improved the mobility of the population,

reduced the use of private transport and therefore, the emission of polluting gases. Furthermore, it has created an important number of jobs. This project provides a sustainable and safe transport mode accessible for all citizens.
The jury's decision was announced during the V International Forum of Public-Private Associations, held in Switzerland last April.



Lantania to carry out the renovation work of Metrovalencia Line 1

LANTANIA
Ferrocarrils de la Generalitat Valenciana (FGV) has awarded the contract to the UTE (Temporary Joint Venture) formed by Lantania and COMSA to complete the renovation work of Line 1 of Metrovalencia.

The budget for this contract amounts to 18 million euros, including taxes, and the time period for the completion of the work is 30 months. The work will be carried out on the section between the Valencia Sud and Villanueva de Castellón stations on Line 1 of the Valencia metro.

It will mainly consist of the replacement of the existing turnouts and the activation and modification of



interlockings and centralised traffic control systems (CTC) due to changes in track configurations at some stations. Several branches will also have their tracks replaced, the most significant being the section between Paiporta- Torrent (3,600 m) and Espioca- Almaguer (1,880 m). In addition, the level crossings will be renovated, both for vehicles and pedestrians, which will involve

refurbishing the track in the affected area. A Strail type level crossing which is made from a mixture of recycled and new rubber will also be installed.

The main work that will be undertaken is the replacement of 45 turnouts, the supply and installation of 14,374 prestressed monoblock concrete sleepers and the supply and placement of 24,932 m3 of ballast.

The renovation work will affect the stations of Paiporta, Picanya, Torrent, Alcasser, Picassent (San Ramón), Benifaió, Alginet, Carlet, Alcuia, Massalaves, Alberic and Villanueva de Castellón. Metrovalencia Line 1 has a length of 95.2 kilometres and a total of 58 stations.



The experience of an operator at the disposal of your mobility projects

TECHNICAL ASSISTANCE AND ENGINEERING SERVICES
International and national projects

- Railway engineering services
- Technical assistance in Operation and Maintenance

• Clients' portfolio: operators and Transport Authorities in Europe, America, Africa and Middle East



An integral ticketing system on your customer's smartphone



SIMOVE
On-board Vehicle Speed Monitoring System

The solution to avoid accidents due to over speeding

SENER is an independent certifier at Brisbane Cross River Rail project in Brisbane (Australia)

SENER
SENER is participating in the Cross River Rail project, which will increase the capacity of the railway network in the city of Brisbane (Australia) to a frequency of 24 trains per hour, thanks to a second crossing under the Brisbane River.

SENER is involved in the Independent Project Certification Service (Independent Project Reviews) in the TSD (Tunnels and Stations, with specialists in in MEP (Electromechanical Systems), platform doors, elevators, escalators, etc.), RIS (Railway Integration and Systems) in Telecommunications systems, SCADA and MEP; and ETCS Level 2 (Railway Signaling) packages.



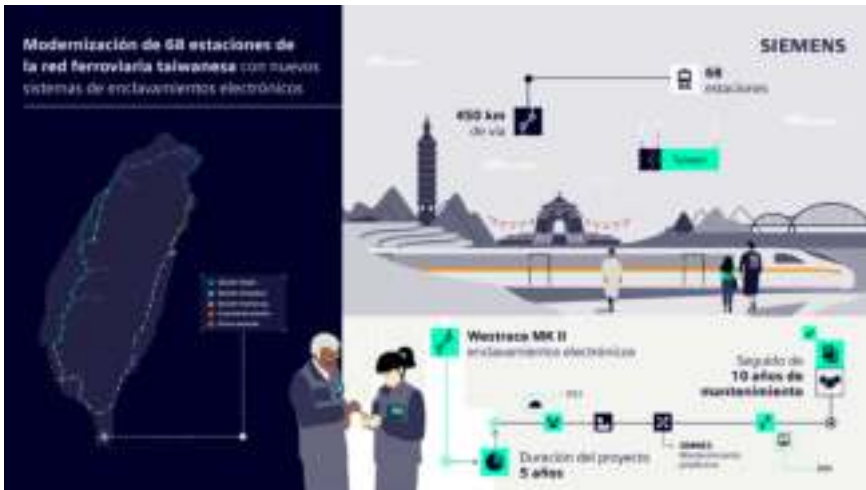
The project will be developed under the ETCS (European Train Control System), which will be deployed in several stages.

Work has started on the Shorncliffe Line, operational in 2022.

Siemens Mobility to upgrade and modernize 450 km of the Taiwan rail network

SIEMENS
Siemens Mobility has signed a €231 million contract with the Taiwan Railways Administration (TRA) to upgrade the smart electrical systems and signaling interlocking system. The company will replace the existing relay interlockings with new electronic interlocking systems at 68 stations that will cover 450 km of Taiwan Railway.

The company will provide 10 years of maintenance and for this purpose there will be used the OMNES predictive maintenance solution, an innovative digital services platform for railway signa-



ling that improves the overall efficiency of operations, with the aim of ensuring 100% service availability. The customer

also reserves the right to procure electronic interlocking systems for 10-additional stations.

We Continue to Work on Metro Line Extension Projects

TPF GETINSA EUROESTUDIOS
The Public Works Agency of Andalusia, via the Department of Development, Infrastructure and Spatial Planning, has awarded TPF GETINSA EUROESTUDIOS and EIS GUIA a contract to perform the detailed design of infrastructure and site development works for the underground extension of Line 2 of the Malaga Metro to the Civil Hospital. The project involves extending the line by about 3 km

and adding 2 or 3 stations along the route, including the preparation of the Preliminary Design required for the public information and environmental assessment activities, and the development of the Detailed Design. The main milestones of the project are:

- BIM Execution Plan.
- Modeling of existing conditions in the project area.
- Preliminary design of infrastructure and site development works for the extension of Line 2 to the Civil Hospital.
- Detailed design of infrastructure and

site development works for the extension of Line 2 to the Civil Hospital.



Stadler wins two new metro contracts

STADLER
The first contract won by the consortium of Stadler Valencia and Siemens Mobility will provide the Lisbon Metro with a state-of-the-art signaling system and a new fleet of modern trains. Stadler will supply 14 three-car metro trains, while Siemens Mobility will install its CBTC Trainguard MT system on the Blue, Yellow and Green lines, and will upgrade the existing equipment.

Stadler has also reached an 8-year framework agreement with Ente Autonomo Volturno (EAV) for the production, supply and maintenance of 40 electric trains for metropolitan and suburban services on the 950 mm narrow-gauge Vesuvian railway lines. With a first order for the supply of 23 3-car vehicles.



The acquisition of the new fleets will be increased the quality and range of public transport services of both operators, improving the travel experience of

passenger by usage of modern vehicles that meet the latest standards in terms of accessibility, comfort, reliability and safety.

Teltronic to supply TETRA radio system to new light rail in Parramatta, Australia

TELTRONIC
Teltronic will be responsible for the deployment of the TETRA radio system serving the new Parramatta Light Rail, a new line connecting the suburbs of Westmead and Carlingford, west of Greater Sydney.

For this project, whose telecommunications package was assigned to Thales, Teltronic will provide its NEBULA network infrastructure, consisting of Switching Control Node as well as the outdoor base stations required to provide coverage for the entire route. In addition, the company will also equip



the vehicles with an on-board radio from its RTP series that provides TETRA voice and data services and that is frequently used in trams and light rail systems around

the world, as well as the terminals, both portable and desktop units, which will be used by supervisors and maintenance staff.

Thales modernises rails between Tortosa and L'Aldea-Amposta stations for a greater safety and efficiency

THALES
New electronic interlocks have been brought into operation in Tortosa and Campredó stations, and L'Aldea station has been modified to better manage the movements of trains, communications and signalling.



The traffic control offices and the installation of the Local Operations Centres

have been improved on this particular section.

CEIT-BRTA Technology Center has been pre-selected as a Founding Member of ERJU (Europe's Rail Joint Undertaking), the European backbone of railway R&D

CEIT
CEIT Technology Center has been pre-selected as a founding member (CFM - Candidate Founding Member) of the Europe's Rail Joint Undertaking (ERJU), a continuation of the European Shift2Rail initiative, which will centralize European research and develop-



ment in the railway field during the next 8 years. ERJU will focus on accelerating research, development and demonstrations of innovative technologies and operational solutions

for their future deployment, in order to meet the policies of the European Union towards the objectives of sustainability, digitization and social integration, etc.

The participation in the platform will allow CEIT to develop new technologies in the areas of infrastructure maintenance, signalling and logistics, among others. These developments will materialize in demonstrators (TRL7) for future transfer to companies, contributing to the transformation of the railway sector.

ICF continues its international expansion in Egypt

ICF
ICF, the Spanish engineering solutions company for railway safety and control, consolidates its international presence with the signing of a new project in Egypt.

For Javier Juárez, Director of ICF, "after a complex year in which the pandemic has put our commercial operations to the test, it is very satisfying to carry out operations such as those in Egypt, which consolidate the quality of our level crossings and the extraordinary work of our teams".

The project was made possible thanks to the subcontracting of Elsewedy Electric, an Egyptian electrical multinational, which en-



trusted ICF with the supply of 50 full Automatic Level Crossings.

The first prototype successfully passed the validation test on 16th June last, when the

Automatic Level Crossing was put into service with the consulting firm Cairo University and ENR, who gave the green light for the continuation of the project, which will be completed by the end of this year.

One step closer to a whole new innovative experience: Certifer is the independent evaluator of the virgin Hyperloop one project

BELGORAIL
Certifer, the Group to which Belgorail belongs, is part of this innovative project whose main challenge is to reinvent transport: faster than any other train in history, thanks to a speed of 760 miles per hour, Hyperloop One aims to eliminate barriers of distance and time.

The development of this new means of transport is based on a new, reliable, efficient and fast technology, which is as comfortable and safe as any other means

of transport. For this, the Hyperloop One teams work with current international standards such as the CENELEC standards, a globally recognized reference in safety measures for guided transport systems. In fact, CENELEC standards have been developed to define a framework for the development and use of complex systems

and are used in urban and rail transport systems around the world.

The first phase of Certifer's collaboration with Hyperloop One is training, training carried out at Virgin Hyperloop One's Los Angeles Innovation Campus.



voestalpine Railway Systems JEZ SL

PERFORMANCE ON TRACK®

We change our name but continue building the turnouts that made us leaders.

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in

Innovative solutions for railway networks.

RAILWAY SYSTEMS

voestalpine

ONE STEP AHEAD.

SMEs: Challenges and opportunities in the era of a digital, connected, and sustainable railway

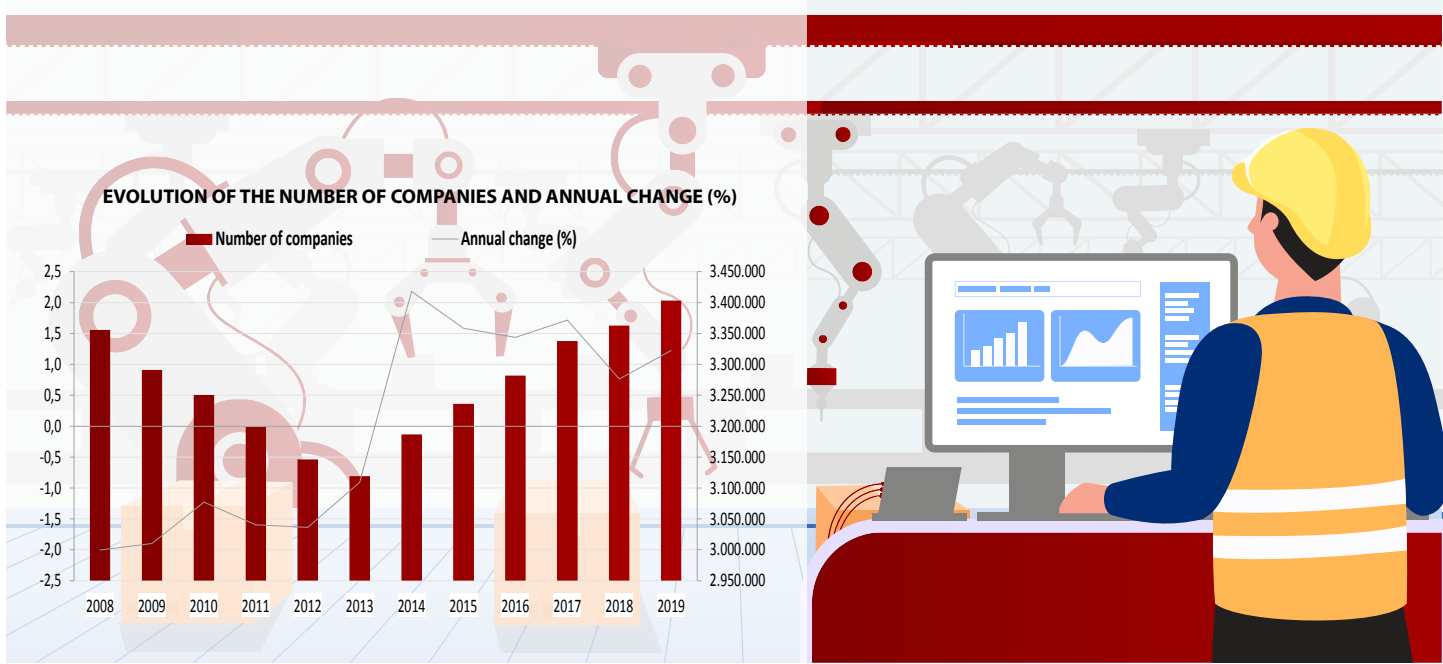
THE PARTICIPATION OF SMES IN THE VALUE CHAIN OF THE SPANISH RAILWAY SECTOR IS VERY REPRESENTATIVE. SUCH COMPANIES PROVIDE GREAT SUPPORT TO LARGE BUSINESSES TO SUCCESSFULLY DEVELOP TRANSPORT PROJECTS AROUND THE WORLD.

SUSTAINABLE AND DIGITAL TRANSFORMATION REPRESENTS A NEW CHALLENGE, BUT ALSO AN OPPORTUNITY FOR GROWTH AND IMPROVEMENT IN AREAS SUCH AS R&D, COMPETITIVENESS AND JOB CREATION. ITS GREAT ROLE IN THE PRODUCTIVE FABRIC MAKES THIS TYPE OF COMPANIES A STRATEGIC PLAYER TO PROMOTE THE DEVELOPMENT OF THE RAILWAY THROUGHOUT THE WORLD.

Small and medium-sized enterprises are highly represented in the production of goods and services and in the overall data on economic activity. In Europe, nine out of ten companies belong to this classification, according to the European Commission's "User Guide to the SME Definition". In turn, they generate two out of every three jobs. Three criteria are taken into account for its definition: number of employees, annual turnover and annual balance sheet. This category includes all those with fewer than 250 employees and an annual turnover of less than 50 million euros.

In Spain it also plays a big role. According to the Spanish Confederation of Small and Medium Enterprises (CEPYME), they represent 99.8% of the productive fabric and represent 65% of the GDP. In addition, as indicated by Eurostat, they account for approximately 72% of overall employment. This contrasts with the average for the entire

"99.8% of the Spanish productive fabric is made up of small and medium-sized enterprises, which represent, in turn, 65% of the Gross Domestic Product (GDP)."



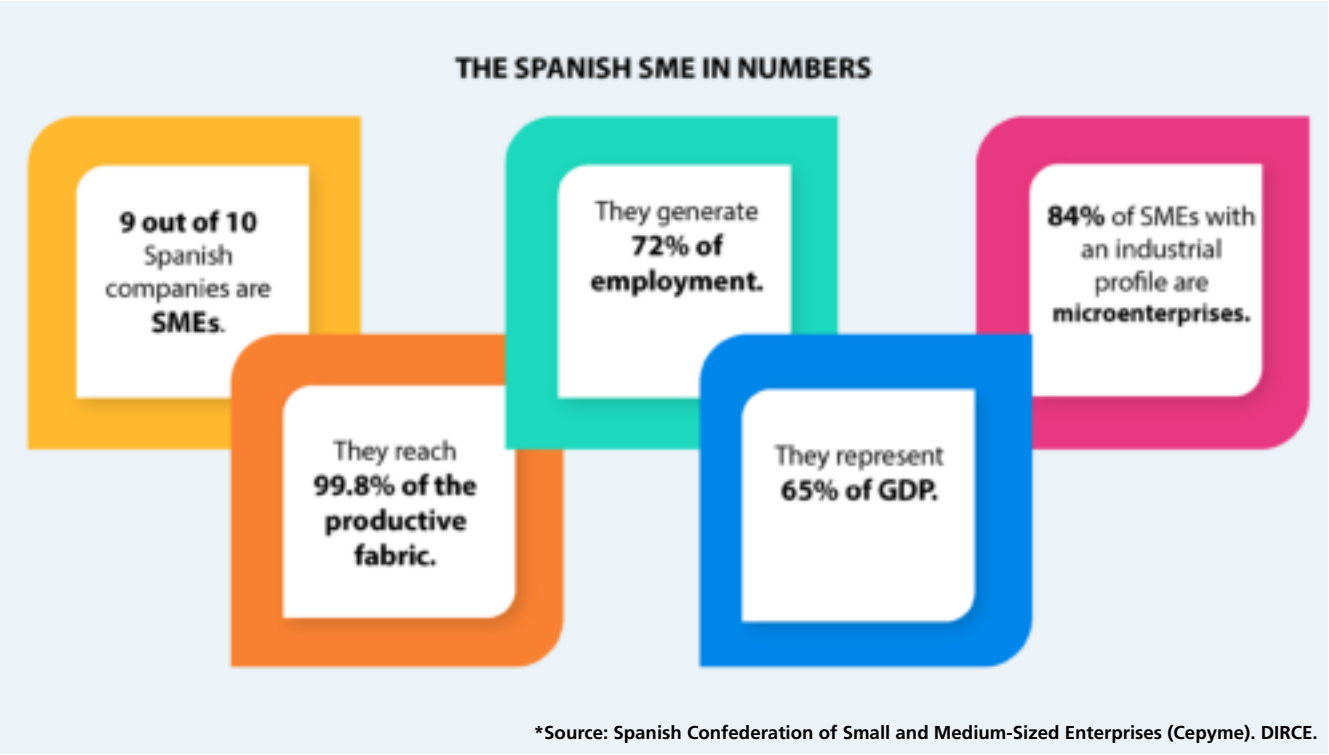
Source: INE, DIRCE 2009-2020 (data at 1 January 2009-2020)

European Union, which stands at 66%.

As for their number, the Central Companies Directory (CCD), as of 1st January 2020, indicated that there were 3,404,428 registered, of which 3,399,602 (99.9%) are SMEs (between 0 and 249 employees). This document also points out that 97.4% of them had a turnover of less than 2 million euros.

"84% of SMEs with an industrial profile are microenterprises. Of these, more than 48% have between 1 and 9 employees."

The report "Portrait of the SME", prepared by the Ministry of Industry, Trade and Tourism, indicates that, according to the sectoral distribution, the size varies depending on the economic sectors to which they belong. Thus, 84% of those with an industrial profile are microenterprises. Of these, more than 48% have between 1 and 9 employees.



SMES: innovative capacity

... LA SEGURIDAD ES EL FACTOR DECISIVO EN LA ELABORACIÓN Y EVALUACIÓN DE TODA IDEA DE DESARROLLO SOSTENIBLE
... SECURITY IS DECISIVE FACTOR IN THE ELABORATION AND EVALUATION OF ANY IDEA OF SUSTAINABLE DEVELOPMENT



DINÁMICAS DE SEGURIDAD. S.L.

DSAF APPLICATIONS ARE IMPLEMENTED IN THREE SPECIFIC AREAS: EMERGENCY LIGHTING IN WIND TOWERS, SAFETY SIGNAGE WITH EMERGENCY LIGHTING IN RAILWAY TUNNELS AND SAFETY SIGNAGE AND EMERGENCY LIGHTING IN ROAD TUNNELS

LAS APLICACIONES DSAF SE IMPLMENTAN EN TRES ÁREAS ESPECÍFICAS: ALUMBRADO DE EMERGENCIA EN TORRES EÓLICAS, SEÑALÉTICA DE SEGURIDAD Y ALUMBRADO CON KIT DE EMERGENCIA EN TÚNELES FERROVIARIOS Y SEÑALÉTICA DE SEGURIDAD Y ALUMBRADO CON KIT DE EMERGENCIA EN TÚNELES CARRETEROS.

túnel carretero

ROAD TUNNEL

APLICACIÓN: TÚNEL DE COVIANDES / COLOMBIA

www.dsaf.es



► OVERVIEW OF THE SME IN MAFEX

- Flexibility, adaptation to the new demands of the market.
- Personalised response to the functional needs of each client.
- Close international collaboration with large companies.
- Technological cooperation: Strategic alliances in R&D.
- High participation in innovation projects.
- High degree of specialisation in railway services and products.
- Consolidated presence throughout the value chain.
- International recognition with projects in more than 90 countries.
- Commitment to sustainability.
- Compliance with the highest safety standards.
- At the forefront of disruptive companies: Startup.

Source: Own elaboration. Mafex Magazine.

transport generates more options to enter the railway operation and lend its portfolio of solutions and products to respond to the new demands of this sector. Customer

service will be a priority and SMEs can contribute their know-how and aspects such as information, safety on board, comfort, etc.

To facilitate the change, additional resources are available such as the "2021-2025 SME Digitalisation

Plan" of the Ministry of Industry, Trade and Tourism.

This programme brings together aid worth 4.5 million euros, in order to promote a transformation that they consider "urgent", especially after the pandemic.

The Spanish railway SME

The SME has a wide presence in the railway sector, where it has a consolidated track record. In recent years it has accompanied, as the main supplier and strategic ally, large companies in the development of national and international projects of all types of systems (high speed, medium distances, commuter, urban mobility, goods, etc.).

This industry has a wide range of small and medium-sized enterprises highly specialised and present throughout the value chain. They start from an advantage position in the market, since the leading groups (large engineering companies, rolling stock manufacturers, etc.) they have acted as a business promoter and have counted on them for the successful achievement of each con-

tract in many countries around the world.

Growth opportunities

In a global and connected market, such as the current one, the improvement of internal processes, helped by the most cutting-edge technology, allows to advance towards an industry 4.0. This change represents for the SME of the sector an opportunity for growth, the ability to be disruptive and optimise its resources to offer a more innovative model. The current context, especially after

the events of the last year, has led to an acceleration in digital transformation.

The high level of technology that many of the companies in the railway sector already had allows them to face the new challenges in a better position than in other areas of activity: manufacture of smart products, promotion of R & D, implementation of new systems, IoT, artificial intelligence, etc.

In addition, aspects such as the recent liberalisation of passenger

"The SME in the railway sector has before it an opportunity for growth, the ability to be disruptive and optimise its resources to offer a more innovative model."



Como conectar puntos con líneas y trazados



Así es nuestro trabajo

Una tarea tan sencilla que hasta un niño podría llevarla a cabo... ¿o no?

En **Amurrio** diseñamos, producimos e instalamos material ferroviario desde 1880.

La **experiencia** nos ha enseñado a aplicar las **tecnologías** más avanzadas para conseguir que problemas muy complejos parezcan sencillos.

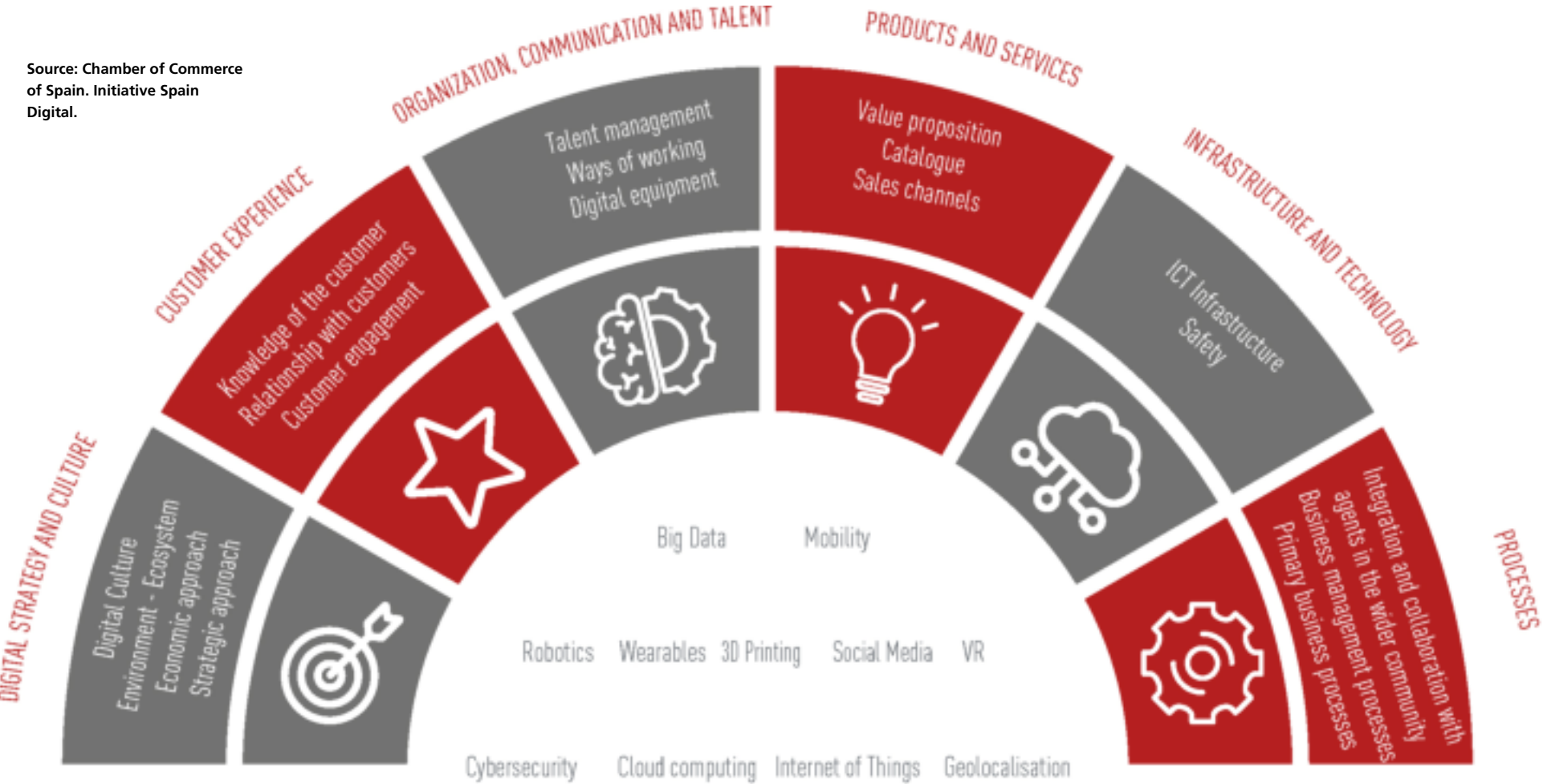
Y a crear **uniones**, enlaces y desvíos para todo tipo de trazados: convencional, alta velocidad, urban rail y heavy haul.

¿Le gustaría hacer que su proyecto ferroviario **avance** como si fuera un juego de niños?

Venga a Amurrio. Le ayudaremos a conectar todos los puntos.



Source: Chamber of Commerce of Spain. Initiative Spain Digital.



Main challenges

The Spanish railway sector has a group of well-established SMEs, with years of experience and a good collaboration with large companies and transport administrations around the world. However, in order to continue advancing and maintain its competitiveness in the market, it is necessary to continue with investments in R&D, training in new skills and digitalisation.

On these areas, due to their size and turnover, they may start at a disadvantage compared to large corporations. From an economic point of view, certain effects may be more damaging, as they have a lower capacity to react to external factors such as inflation or deflation. They must also strengthen aspects such as the ability to negotiate with suppliers and distributors. Limited access to credit or sources of financing can also slow down their growth.

Investment in the railway sector will be key in the coming years. In order to be part of the many projects, in which the technological factor and sustainability will be essential, the SME must have the capacity to maintain over time the investment in development, innovation, training and updating of the workforce. Ultimately, resilient in resources and strategies and with a continuous improvement of processes.

RAILWAY SME: MAIN CHALLENGES AND OPPORTUNITIES

Challenges	Opportunities
Staying competitive	Technology to optimise your resources
Digital transformation	Great market knowledge
Raising productivity levels	New needs of the sector
Strengthening negotiating capacity	Large investments in railway
Continuous improvement of skills	Globalisation benefits
Investment in R&D.	Highly specialised professionals

"The Spanish railway sector has a group of well-established SMEs, with years of experience and a good collaboration with large companies."

Source: Own elaboration. Mafex Magazine.

THE WORK OF ASSOCIATIONS

The work of institutions and associations is key in promoting the consolidation of SMEs. Mafex, aware of their relevance in the value chain, works to facilitate their activity as much as possible by defending their interests, boosting cooperation with other companies, opening new markets, etc. The association is also leading an innovative European R&D project: RailActivation. The objective is to support them in their transformation process through the creation and adoption of strategies from an open innovation approach that

will allow the development of new mechanisms and tools.

RailActivation will result in significant improvement changes to the business structure, human resource management, customer relations and the work environment.

Among the member companies participating in this project are: Aquafrisch, Ardanuy, Inse Rail, MGN - Transformaciones del Caucho, Talleres Agui, Talleres Zitron and Telice.

INTEGRAL SOLUTIONS FOR THE RAILWAY INDUSTRY

SERVICES

Comprehensive consultancy of railway projects.
Advice for the planning of new transport plans.
Technical assistance in building works.
Civil engineering.
Building work. Special foundations, piloting, construction.
Co-engineering projects.
Development of studies and reports on mobility.
Safety assessment and process certifications.
Technological partners for new developments.

MANUFACTURING

Welded assemblages.
Telecommunications cables, signaling and fiber optic.
Special machined parts for the sector.
Forging of safety parts with very specific characteristics.
Foundry. Steel parts and components.
Pre-stressed wire.
Transformation of copper and aluminum.
High precision machining and finishing operations.
Pre-assembly of floors, doors, dividers, fairings, etc.
Specialised parallel horizontal lathes.
Transformers and coils.
Railway track materials, rails and railway accessories.
Machinery for railway workshops and water treatment.
HVAC systems for all types of vehicles.
Monitoring equipment against hazards in the operation.
Solutions for handling welding machines.
Rubber and rubber-metal products.
Track and crossing devices.
Mobile silos and sand dispensers.
Metallic structures.
Fixed signaling for tracks.
Restoration of rolling stock and special vehicles.

SYSTEMS AND TECHNOLOGY

Identification and access control systems.
Level crossing protection.
Train detection.
LED light signals. Emergency lighting.
Railway signalling.
Predictive maintenance.
Information and communication technologies.
Electrification.
Comprehensive telecommunications solutions.
Power and safety electronic equipment.
Driving simulators.
Uninterrupted power supply equipment.
IT to optimise infrastructure maintenance.
Instant alarms in control centres.
New technologies for sustainable transport.
Hyperloop system.

SME PARTNERS OFFER US THEIR VIEW ON HOW TO FACE THEIR CHALLENGES AND OPPORTUNITIES



ENRIQUE HORNOS
CEO
ICON MULTIMEDIA

In 2021 ICON Multimedia celebrates 28 years at the service of the digital transformation in the railway industry. There has been a significant evolution from our first Passenger Information System implementation to the current deployment of DE-NEVA at stations, as a result of the maximum use of technology and internalization. This would not have been possible without the support of the operators, with whom we share know-how to jointly undertake leading international projects in digitization.

Our main challenge and at the same time the key to success is knowing how to adapt quickly and efficiently to the needs demanded by the industry. There are based on communication systems that support increasing volumes of data, in managing them and the interoperability of the solutions used. These three pillars are the basis of our solutions so that we can continue to look to the future with optimism, together with our partners, transmitting the same illusion (or more) during all these years, and of course that.... it's the only thing we want to spread!

IVÁN RIVERA
INNOVATION MANAGER
TELICE S.A.



According to the latest INE survey on innovation in companies, the innovative intensity of Spanish SMEs (the ratio of innovation investment to total turnover) barely exceeds a meagre 0.9 %. The railway sector, where a 2 % is not unusual, shows better numbers. But TELICE stands out from the pack with a 7.83 %.

However, this investment is not enough to ensure that innovation activities offer a tangible return for the company. A first step, the

UNE 166002 certification for R&D&I systems management, was essential.

This year we implemented a new strategy: "applied R&D&I". Focused on the contribution of value from all parts of the company, it has allowed us to surpass, in just the first five months of the year, the number of ideas evaluated compared to the best year on record. A promising start for TELICE's innovation projects in the future.

Leading together

Because we share the growth and internationalization of Spanish businesses, guaranteeing leading projects on a global level, today more than 300,000 businesses trust our surety insurance.

New opportunities are coming and we are ready to lead them together.

aserta.com.es



The Railway, an innovative and attractive sector for employment

PROGRESS ON GREEN MOBILITY WILL BE LINKED TO THE CREATION OF JOBS IN ALL SUBSECTORS, AS WELL AS THE INCORPORATION OF NEW SPECIALISED PROFILES. RAILWAY COMPANIES FACE A NEW CHALLENGE: ATTRACTING AND RETAINING TALENT.

Europe is firmly committed to an efficient, connected and emission-free transport model. The planned investments in infrastructure from the Recovery Funds will be largely aimed at boosting the railway, which aspires to be at the core of of

sustainable mobility. In Spain, the Ministry of Transport, Mobility and Urban Agenda will also use this year 2021 a budget of 6.2 billion euros to modernise, strengthen and expand both the passenger and goods network.

Economic growth in the coming years will be associated with a sustainable recovery and will be based on three strategic engines that will combine new technologies, digitalisation, and human capital. The goal is to be the first climate-neutral continent by 2050. Due to the high emissions currently generated by transport, this is one of the areas where most changes will take place.

Within this model shift and, due to its many environmental, efficiency and safety advantages, the railway will be the key. During this process it is very necessary to have professionals to help implement new developments, strengthen innovation, and move towards the digitalisation of the industry. The progress on green mobility will be linked to the creation of jobs in all subsectors, in addition to the incorporation of new pro-

files specialised in sustainability, environment, blockchain, telecommunications, cybersecurity, operators, auxiliary staff, new construction modelling technologies, etc. All such fields have great employment prospects, alongside with human resources management, corporate social responsibility, or digital marketing, among others.

The challenges are multiple, and it is necessary to have professional profiles that contribute their qualities, specialisation, and know-how to the development of the railway.

Attracting talent

One of the challenges facing the railway industry is the training, development, and career plans within the companies of the many professionals who will join in the coming years. To a large extent, the ability to have the best market profiles in companies will depend on the attraction and retention of talent so that they consider that working in a leading industry with a great future is the best option.

This is part of a holistic process in which various proposals

are combined so that employees want to develop their future in the company and feel involved with its evolution and progress: attractive conditions and identification with the corporate philosophy, etc.

To spark the interest of working in an industry with great growth prospects, it is key for prospective employees to feel that talent and effort are taken into account. Companies must combine not only remuneration, but a competitive "emotional salary", life-work balance initiatives, options to participate in innovation

projects, constant training, etc. In addition, candidates are increasingly considering environmentally responsible companies which operate and commit themselves to the Sustainable Development Goals (SDGs). In this regard, the human resources policy is valued for being inclusive and because equal opportunities, intergenerationality and the quality of employment prevail.

In order to achieve these goals, both, companies and transport administrations, will have to be able to retain employees and provide the entire human capital with a value

proposition. This value proposition should be one where each professional feels it is the place where they want to work and develop their career in a stable way: a quality job that provides numerous benefits and where they see a future to advance and grow.

In this regard, it is also key that the sector consolidates the image and projection it currently has as well as its world leading position. Likewise, it must continue to apply all the advances at their disposal in order to be more innovative, productive and have a consolidated organisational structure.

RESEARCH TALENT

R&D will be a priority in the transport sector to continue advancing in the new model of green, connected mobility. Getting to "attract" and "retain" researchers is another of the most important challenges.

Partnerships between research centres, the administration, universities, and companies in the sector are essential to incorporate new developments into railway systems and ensure that they have the latest technology.

"Research talent" is another priority for the coming years. Having professionals with a high level of training and expertise to develop their activity in the area of transport is a guarantee to continue at the forefront of innovation.

MAJOR PUBLIC EMPLOYMENT PLANS

Professionals who want to join a sector are within a very favorable context. Alongside the opportunities that will arise in the industry, there are growth plans already taking place. Within its 2030 Strategic Plan, the Railway Infrastructure Manager (Adif) and Adif High Speed has launched the largest public employment offer.

There will be almost 62,000 vacancies until 2025 in order to meet the demands of the railway service. This employment plan is the response to the new challenges such as generational change, railway liberalisation, and the extension and improvement of network services, among others.



TRAINING AND DEVELOPMENT

One of the aspects that is most valued by employees when being part of a company is the possibility of growing within the organization and having support to continue their professional development. The candidates value quality proposals and companies that have training plans in those areas that are most demanded to be up to date with the most relevant advances in the sector.

Investment in continuous training is essential to strengthen the workforce and have a highly qualified human capital, according to the demands of the market and with the ability to provide a differentiating value both, to customers, and to the infrastructure projects that are developed. From the workforce point of view, these plans promote employee

satisfaction, increase their integration, and allow them to move forward. In this way, its development is enhanced and the perceptions of stagnation that can lead to the search for other options in the market are avoided.

In the railway sector, the training provision is very wide. The companies have bonus schemes, as well as advanced courses in railway schools for driving, in auxiliary tasks, and specialized master's degrees in a wide range of segments. Corporate culture increasingly tends to be based on each employee's motivation to meet their career aspirations and address their needs.

Specialised Masters

Future professionals in the sector are loo-

king for a specialised training offer. Institutions, agencies, and universities work closely to provide specialisation plans according to market demands.

Mafex, for example, collaborates with the University of Cantabria, through LADI-CIM - Laboratory of the Division of Materials Science and Engineering - in the Master of Railway Engineering that has the participation and business experience of the industry of the sector, as well as various railway entities at a national level. This initiative was born to respond to one of the strategic challenges of the association: the attraction of talent to the sector, the incorporation of knowledge from other non-railway businesses or the specialisation of employees from Mafex member companies.

SUSTAINABLE DEVELOPMENT GOALS AND EMPLOYMENT

The field of Corporate Social Responsibility (CSR), is increasing everyday particularly having the Sustainable Development Goals (SDGs).

The commitment of companies in the railway sector to the 2030 Agenda and its 17 points is reflected, in the field of employment, in the adoption of measures in line with the different SDGs: 3 "Health and Well-being", 5 "Gender equality", 8 "decent work and economic growth", 9 "Industry, innovation and infrastructure", 11 "Sustainable cities and communities" and 13 "Climate action". Advances in these fields contribute not only to being a responsible company with its environment, but also to strengthening the brand image and consolidating the desire of professionals to work in a responsible company.

EMPLOYER BRANDING: THE WEIGHT OF CORPORATE VALUES

The image that the employer projects on people interested in joining a new project is becoming more and more important in the final decision of the candidate. It is a determining factor in attracting talent. The railway industry has an international reputation closely linked to its capacity for innovation, a great expertise of its professionals and its own know-how based on R&D and the development of transport projects of special importance around the world.

In addition to this cutting-edge image and the interest in being part of the companies in the sector, the "employer brand" factor is also taken into account. The factors that influence this corporate image are associated with values and bu-

siness philosophy. Among them, transparency, collaborative spirit, integrity, equality, commitment to society, safeguarding of the well-being of employees, relationships with suppliers and customers, etc. Employees need to identify with the "raison d'être" of the company and have a "sense of belonging" to a group with which they feel identified. This set of values will enable a greater affinity and it will also make the likelihood of that professional wanting to develop their career in the company much higher.

It will also make companies have the best "brand ambassadors", their own internal influencers who will expand the knowledge and reputation of the company.

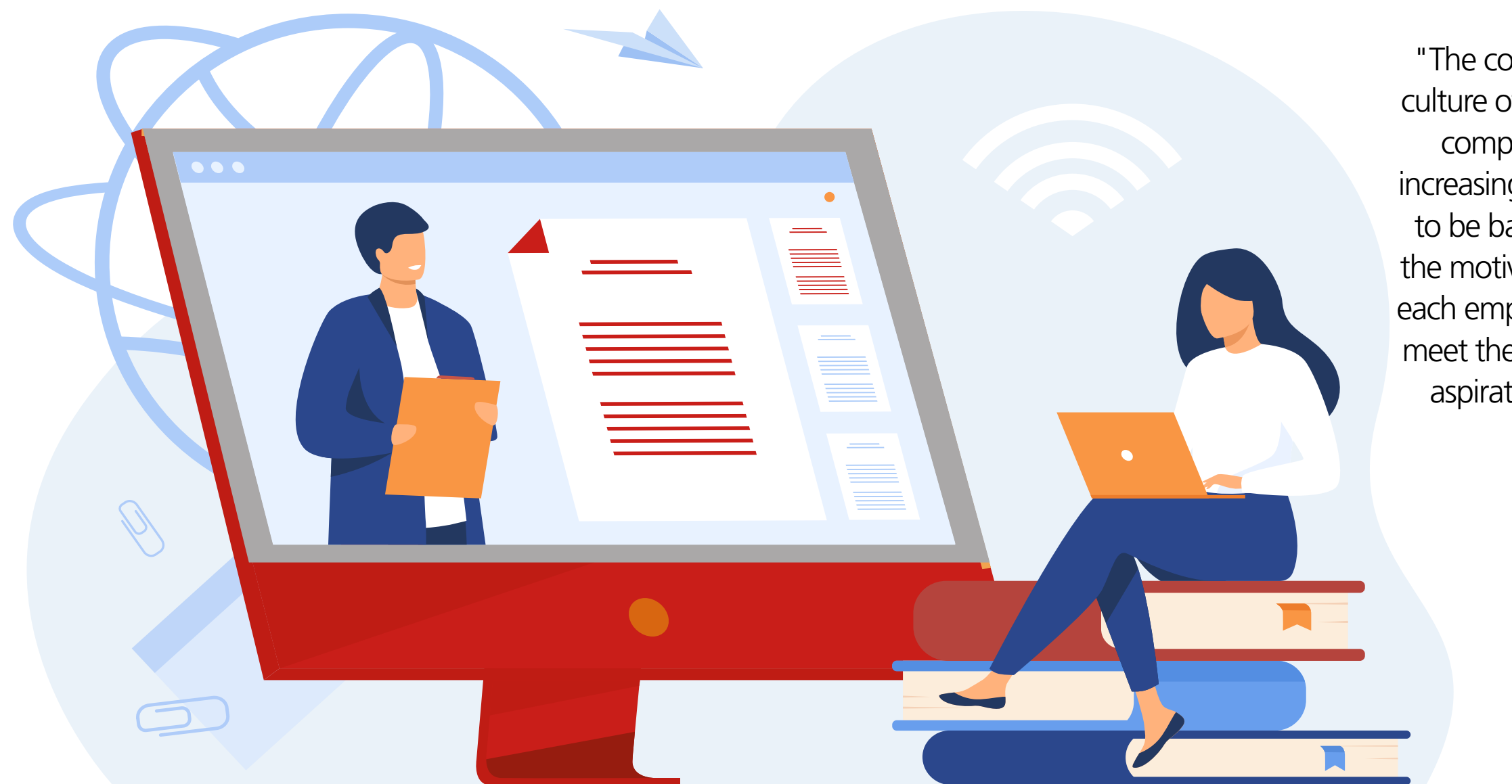
DIVERSITY AND EQUAL OPPORTUNITIES

In line with developments in employment the railway industry, is very committed to diversity and equal opportunities. A pluralistic staff, formed by multidisciplinary teams, helps to strengthen productivity and business results, since it brings the best talent towards the same direction.

One of the great challenges is to make progress in the incorporation of women into the railway sector, both in operational and auxiliary tasks, as well as in engineering and senior management positions. According to data from Adi, they currently represent 22% of the workforce in the field of transport. In order to be able to implement a change on these percentages, measures such as work-life balance or flexible working hours are being established. To attract the best talent, companies are aware that candidates are looking for inclusive organisations, where there is room for qualified professionals, regardless of gender, age, race, or sexual orientation.

Within the concept of "employer brand", the candidates value the coherence of the company with its human resources policy and real equality of opportunities

"The corporate culture of railway companies increasingly tends to be based on the motivation of each employee to meet their career aspirations."





Working at Adif and Adif AV, the companies that look towards the future

Adif and Adif AV play a leading role as the driving force of the railway sector. Our mission is to make railways the preferred means of transport for citizens and to facilitate access to the infrastructure for train operating companies under equal conditions. We build, maintain and manage infrastructures to achieve a safe, efficient, environmentally sustainable system with high quality standards. That is our commitment: to think about today, and anticipate what we want tomorrow to be like.

The SDGs guide our management.

Our work is aligned with the Agenda for Change that guides the action of the Government of Spain, which assumes the reforms contemplated in the 2030 Agenda for Sustainable

WORKING AT ADIF AND ADIF-AV IS MUCH MORE THAN WORKING AT ONE OF THE LEADING COMPANIES IN SPAIN, IT IS TO BE PART OF AN AMBITIOUS TRANSFORMATIONAL PROJECT THAT IS ALREADY CHANGING OUR COUNTRY.

Development of the United Nations. Structural reforms that we have assumed as our own in each one of our projects, activities, actions and objectives:

- ✓ Focus on training and human capital
- ✓ Promote the ecological transition
- ✓ Promote scientific and technological progress
- ✓ Move towards an efficient and fair labor market
- ✓ Reduce inequality and protect the welfare state.
- ✓ Progress towards a more effi-

cient administration at the service of citizens.

Time to join the Adif and Adif AV project.

Transferring these important challenges from paper to reality requires the best professionals.

Our response is undoubtedly the most ambitious initiative ever to be carried out by the entity throughout its entire history in the field of human resources: the Generational Relay Plan 2030. In the coming years, a new

generation of railway workers will rejuvenate Adif and Adif AV staff and will provide both entities with the necessary profiles to meet the strategy, objectives and important challenges we will have to face in the short and medium term. The Multi-annual Employment Plan 2021-2025, the first phase of this challenge, includes an offer of almost 6,200 job vacancies.

This is perhaps, a unique moment to join a company that has great potential for those who are looking for proven professional development; with the possibility of taking on more and more responsibilities and with real options for personal and professional growth.



and offers on hundreds of products and services offered by commercial companies of all kinds).

In short, we are working to make Adif and Adif Alta Velocidad the companies that the railway of the future needs and, in ultimately, that our citizens demand. We have set ourselves the challenge of turning them into inclusive organizations and a showcase for the diversity we find in our society, because the more we resemble it, the greater our chances of responding effectively and efficiently to their demands for mobility and public service.

Retaining Talent.

In Adif and Adif AV we are aware of the importance of attracting talent, but much more so, the challenge of retaining it. Therefore, we work intensively on the concept of "emotional salary", offering continuous opportunities for professional development within the company through training, assumption of greater responsibilities during performance in the company, taking part in cutting-edge projects at national and international level and incorporating incentive formulas that value the commitment and results of the work of its professionals. (measures that favor conciliation, with flexible schedules and the possibility of teleworking, a broad portfolio of social benefits, participation in preventive medical

campaigns, accident and life insurance, including a flexible compensation plan, as well as advantages





Educational and career development plans

Renfe is a benchmark in training in the operational safety and maintenance of rolling stock areas. This training is given by the Professional Technical Schools of Driving and Operations and the Maintenance School.

This school covers all the training needs in the Renfe Group driving area and responds to the requests and training needs of other railway companies and entities in the sector.

As a unique element, it has a wide network of driving simulators that

allows training and continuous improvement of students to be carried out, making it possible for them to successfully face their responsibilities, establishing the principle of safety as an essential value above any another objective.

Renfe has 9 training centers located throughout the national territory to carry out the license and diploma course, all of them are equipped with driving simulators, which are used by aspiring machinists, prior to carrying out the effective driving practices in the commercial trains of the Renfe Group.

The Professional Technical Maintenance School provides technical and specialized training. Through training itineraries for specialization, this School plays a strategic role in the transformation process of the maintenance area. The courses cover the most relevant subsystems of rail vehicles.

Creation of new areas associated with digitization

El Plan Estratégico de Renfe 2019-Renfe has signed with the unions SEMAF, CC.OO. and UGT in June 2021 the II Equality Plan for the

next four years, with the aim of detecting situations of inequality between men and women and promoting the presence of women in the company.

The company will create a Gender Equality Observatory to detect, analyze and propose improvements to possible situations of inequality, which will be made up of representatives of the workers and the group's management areas.

The Observatory will periodically monitor and analyze the measures implemented by the Equality Plan and will prepare reports with proposals for improvement and planning that can redirect the actions and objectives set out in the plan.



SDG

Renfe's objective is to transport travelers and goods under the principles of safety, focus on the clients, quality, efficiency, profitability and innovation, based on the commitment to society and the development of our employees. This commitment is part of our business management model, through a strategy that promotes social responsibility, care for the environment, equality, culture, ethics and transparency, permeating

all levels of the company and all our areas of performance.

We have integrated into our business strategy the 17 Sustainable Development Goals (SDGs) that mark the United Nations Agenda for this decade, in the very core of the business and in the relationships and dialogue that we maintain with all our stakeholders, the objective of maximizing the positive impact we achieve on society and development.



SOME MAFEX PARTNERS GIVE US THEIR VIEW ABOUT THE RAILWAY AS AN INNOVATIVE AND ATTRACTIVE SECTOR FOR EMPLOYMENT

ALSTOM

Alstom has launched a new positioning campaign highlighting its profile as an innovative, multinational and people-focused employer.

This initiative highlights how all Alstom people are part of the same community, united by a passion for innovation, a diverse and inclusive culture, concern for the environment, enthusiasm for teamwork, and accountability (to teams and customers) as a top priority.

The continuous development of professional growth opportunities, multicultural team building, and a focus on people are the company's strategic human resources priority.

As part of the campaign, videos, testimonials, and posters featuring employees of different nationalities and profiles have been developed. They are a sample of the more than 70,000 employees who, day by day, work to build a more sustainable and intelligent mobility around the world.

More information at: <https://www.alstom.com/careers>

IDOM

At IDOM, as part of the process, we develop web applications for most of our projects, something ever more requested by the client. An in-depth knowledge of their needs, added to our expertise in the fields of engineering and consulting, allows us to develop a customized, completely personalized digital tool.

We apply Machine Learning, virtual reality or web applications to engineering, resulting in developments that provide great added value to our work. The workflow can be visualized very closely, maintaining close collaboration between our teams and the client in an efficient and remote way. Digitization and automation mean that we can deal with any context and keep the pace of work.

UC UNIVERSIDAD DE CANTABRIA **MÁSTER EN INGENIERÍA FERROVIARIA** **MAFEX** ASOCIACIÓN FERROVIARIA ESPAÑOLA

La puerta de acceso al mundo ferroviario

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MÁSTER EN INGENIERÍA FERROVIARIA (65 ECTS)

1	2	3	4
INTRODUCCIÓN A LOS SISTEMAS FERROVIARIOS	PROYECTO, CONSTRUCCIÓN Y MANTENIMIENTO	MATERIAL RODANTE FERROVIARIO	PLANIFICACIÓN Y EXPLOTACIÓN FERROVIARIA
CURSO DE ESPECIALIZACIÓN	TÍTULO DE EXPERTO	CURSO DE ESPECIALIZACIÓN	CURSO DE ESPECIALIZACIÓN
12 ECTS	17 ECTS	12 ECTS	15 ECTS

■ PRÁCTICAS REMUNERADAS EN EMPRESAS FERROVIARIAS NO OBLIGATORIAS, MÁXIMO 6 MESES A LO LARGO DEL CURSO.
 ■ 1 AÑO DE DURACIÓN SEMIPRESENCIAL: CLASES PRESENCIALES Y ONLINE.
 ■ CLASES IMPARTIDAS POR PROFESIONALES DEL SECTOR PROFESORADO SELECCIONADO CON ALTA EXPERIENCIA.

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COLABORAN:

adif **AV ingenieros** **avanza** **PRECON** **WSP** **cise** **EIM** European Rail Infrastructure Managers
ineco **inse rail** **ALSTOM** **renfe** **SENER** **IDOM**

SOME MAFEX PARTNERS GIVE US THEIR VIEW ABOUT THE RAILWAY AS AN INNOVATIVE AND ATTRACTIVE SECTOR FOR EMPLOYMENT

SENER

SENER, a benchmark company in railway and urban transport, has for years been adding to its already outstanding technological contribution the development of digitalization projects and new technologies applied to the sector, such as the artificial intelligence system for ventilation RESPIRA or the ACROT tunnel boring machine operation risk control system.

To boost this line of activity, SENER has had an Innovation Technology Unit since 2020, in addition to the Mobility and Energy Units, which bring together data science profiles and advanced digital environments responsible for the development of these solutions. In parallel, the company is adapting its people management policies to the new ti-



mes, with measures such as the creation of a development program for young talents, the promotion of flexible work measures or the

adoption of a role map for an equitable and transparent management of professional careers.



SIEMENS

In terms of innovation and comprehensive digital transformation, Siemens Mobility carries out different initiatives to promote a digital mindset and an entrepreneurial spirit among its employees. It should be noted the Digital Academy that seeks to inspire, train and share knowledge among employees on issues related to digital technology and new ways of working or digital training from both internal and external sources that, from the company, is made available to employees. In addition, this year marks the third edition of its structured intrapre-

neurship program, focused on finding digital solutions to the needs of its clients or the market.

Siemens Mobility Spain invests 33 million euros annually in R&D demonstrating its commitment to innovation and has a team of more than 200 professionals dedicated to this work. Committed to the 2030 Agenda, the organization is in an ideal position to contribute to the fulfillment of the SDGs.

According to its roadmap, before 2030 it will become an emissions neutral company.

It also implements a powerful professional development program divided into two branches, one dedicated to training and the other focused on allowing employees to design their own career and make their profile known to access different opportunities within the company.

Likewise, it is firmly committed to equal opportunities for men and women. It also carries out initiatives such as FeMale Voice in Mobility to promote and empower female talent and leadership within the mobility sector.

Railway Traction

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SOME MAFEX PARTNERS GIVE US THEIR VIEW ABOUT THE RAILWAY AS AN INNOVATIVE AND ATTRACTIVE SECTOR FOR EMPLOYMENT

STADLER
Railway projects have the potential to be tractor projects for other industries and can serve the country's strategies of re-industrialization and technological drive. Stadler Valencia appreciates the configuration of a new mobility model that responds to the challenges of sustainability, digitization and safety, with the railways as the main axis.

At Stadler Valencia we are aware of our social responsibility for sustainable mobility, the generation of quality employment and with education and training. We are supported by our almost 125 years of history as the dean project of the metallurgical industry of the Valencian Community. In 2020, and despite the pandemic, nearly 400 new professionals joined. The company now has more than 1,400 employees and plans to generate 500 new direct jobs, and 4,000 indirect jobs in the auxiliary railway industry, following the award of the Renfe high-capacity train contract and other recent orders.

In addition to being an important production center, we are one of the best



engineering and development centers specializing in rail technology at European level, with more than 350 engineers dedicated to the design of trains.

Some come from the Universitat Politècnica de València through the Cátedra Stadler, which makes it easier for recent

graduates to transition between their university and work careers in one of the leading European companies in the rail sector. Qualified dual vocational training is other of the pillars for attracting and empowering talent where theoretical training in educational institutions is combined with practical training in the company.

WSP
Continuous in-house training is one of WSP's main investments in its efforts to maintain its leading position in the industry. WSP's Global Academy for Rail & Transit offers interactive training modules related to the rail industry that are delivered by company experts from around the world. The aim of this project is to enable junior engineers, experienced professionals and those in between to better understand the complexity of rail and mobility projects and to be able to take on new rail-related challenges.

This year, the WSP Global Academy for Rail & Transit will offer five courses, divided into webinars and digital labs. The courses will address topics of great interest for the sector: 'Track alignment', 'Overhead contact systems (OCS)', 'Rail operations and planning', 'RAMS & LCC' or 'ZEB & BRT'.



CAF SIGNALLING
CAF Signalling has launched the first edition of its 'Young Talents' program aimed at recently graduated engineers. The objective stems from the commitment to promote youth employment, as Spain has an unemployment rate of 37.7% among those under 25 years of age, more than double the Eurozone average, according to the latest Eurostat data.

In collaboration with Fundación Universidad-Empresa, the company has launched this initiative with the idea of attracting young talent with technical profiles through an attractive academic training plan and paid internships. Due to the very nature of CAF Signalling, it is mainly aimed at telecommunications, computer and industrial engineers (in the specialties of automation and electronics, electricity and industrial organization).

Over the course of a full year, the people selected will tour all of CAF Signalling's business areas so that they can gain in-depth knowledge of both the company and the railway sector. The company will design a

specific plan for each of those selected and they will be assigned a mentor with experience within the company, who will act as a reference person throughout the program and will help and accompany them in their integration.

The project, which is currently in the process of recruiting talent, will begin at the end of the summer. The registration period is open and you can apply through LinkedIn and Infojobs.



THALES SPAIN,
Thales in Spain, we therefore foster their professional development and training, as certified by our presence in the ranking Best Companies to Work For published by Actualidad Económica, which assesses talent management, remuneration, work environment, social policies and training in the best Spanish companies.

SOME MAFEX PARTNERS GIVE US THEIR VIEW ABOUT THE RAILWAY AS AN INNOVATIVE AND ATTRACTIVE SECTOR FOR EMPLOYMENT

ICON

With the aim of strengthening the attraction of global talent policy and promote de Employer Branding, ICON Multimedia has launched the ICON.Talent program.

This project brings together the corporate culture actions carry out so far by the company, that its focuses on the employees, who are now converted into "ambassadors".

They will be in charge of representing the company in different forums, social net-

works, events, presentations and training in universities or technical schools. They will be spokespersons, placing value on the strengths of the company and the ITC sector.

ICON.Talent aims to be a loudspeaker for the recruitment of talent. This, it will be solved the problems to find specialized profiles to tackle the digitization processes in the railway sector. In addition, special actions are carried out for the incorporation of women in the company, to fill the digital gender gap, in a predominantly masculinized industry.



INDRA

Indra has carried out a major cultural transformation to put professionals at the center of its strategy based on pillars such as innovation, diversity, training and talent development, flexibility, and a commitment

to young talent to boost digital transformation. It has made the contribution to sustainable development through technology the core of its business and its main purpose as a company.

Through Smart Start, specific training, development, assessment and career advancement programs are offered to young talents for their first two years in Indra. These include talent camps, in which young people receive six weeks of specialized training in technical and business knowledge, digital competencies and skills to develop their full potential from the moment they join the company. They also have access to more than 7,000 online courses through their corporate university.

Last March, Indra organized a unique virtual event, in which more than 700 Spanish engineers participated, with the aim of raising awareness of the technologies that are set to revolutionize Transportation and Defense in the coming decades and to encourage them to join the company.

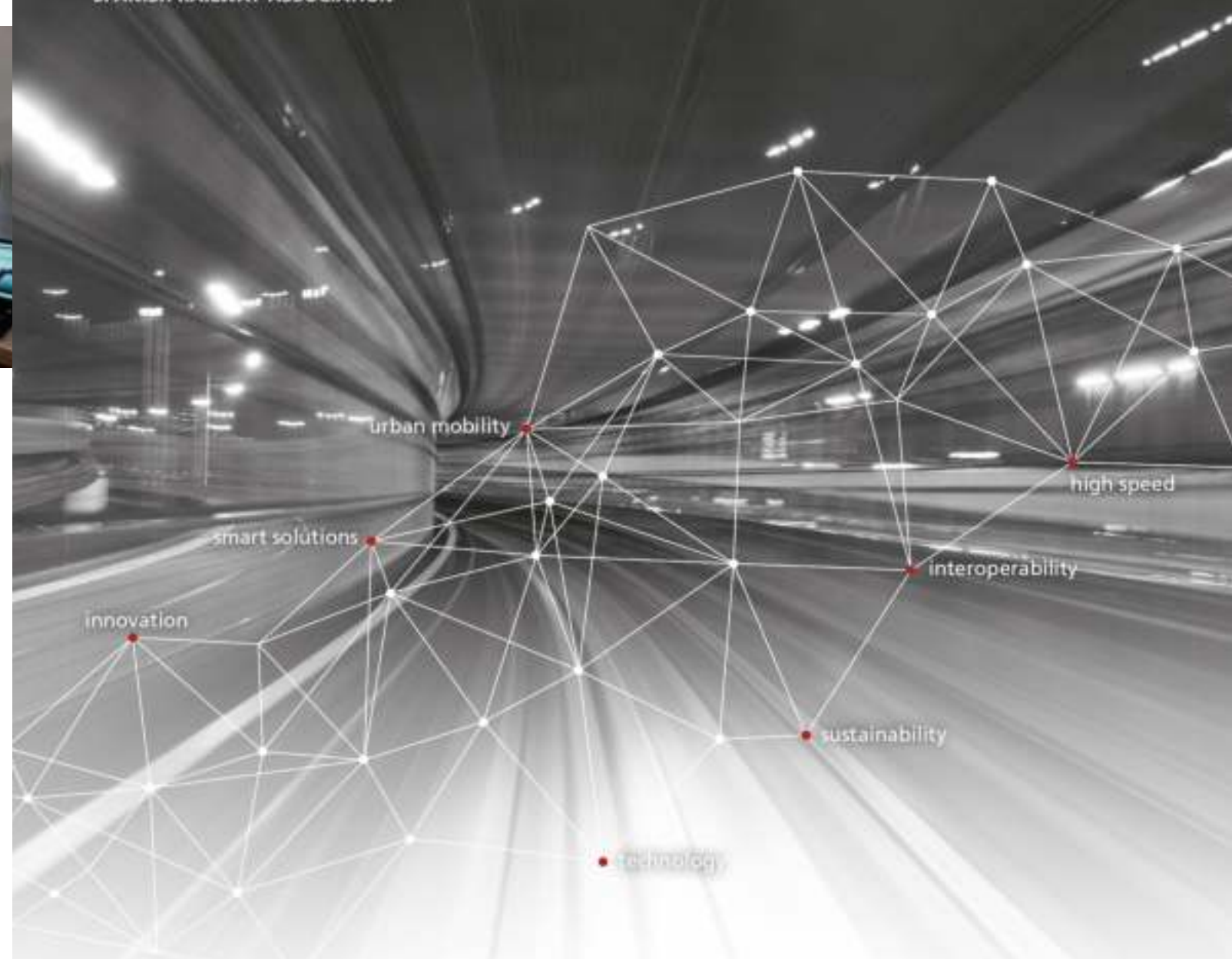
TELTRONIC

Teltronic has years of experience in the development of broadband solutions, which allows it to incorporate in its portfolio LTE network infrastructure and on-board radio equipment that have already demonstrated their reliability for voice and data transmission, including signalling.

Teltronic is committed to the evolution of its product portfolio towards the communication needs identified in the FRMCS standard, the rail transport of the future. This strategy has led its Engineering and

Development department to incorporate specialised personnel with skills in broadband technologies and railway environments.

In this line, Teltronic has agreements with the main university campuses in its area, as well as with Vocational Training centres to incorporate and attract talent, and participates in research projects in collaboration with other entities such as the School of Engineering of the University of Zaragoza or the Centre for the Development of Industrial Technology (CDTI).



Find out more about all the activities and services we have prepared for 2021 to promote Internationalization, Competitiveness and Innovation.

mafex@mafex.es | 00 34 944 706 504

European Year of Rail:

A key date for the future of sustainable transport

ON THE OCCASION OF THE SPECIAL DATE, AN EXTENSIVE AGENDA OF ACTIVITIES HAS BEEN DRAWN UP THAT WILL BE CARRIED OUT THROUGHOUT THE YEAR. THE OBJECTIVE IS TO RAISE AWARENESS OF THE NEED FOR A MODAL SHIFT WHERE THE MAIN CHARACTER IS THE RAILWAY, THE ULTIMATE RESPONSIBLE FOR THE SUSTAINABLE MOBILITY MODEL THAT EUROPE IS LOOKING FOR.

The year 2021 has been marked in the calendar of the European Union as the one destined to give a strong boost to one of the most sustainable means of transport such as the railway. That is why Brussels has declared it the 'European Year of Rail'.

This commemoration joins the steps that have been taken in recent years

to build an emission-free mobility model. These include the 2019 European Green Deal and the Sustainable and Smart Mobility Strategy, adopted in December 2020 by the European Commission.

Europe wants to be the first climate-neutral continent by 2050. On this date it is intended for transport, in all its forms, to have a reduction of at least 90% in emissions. And in this regard, the railway has much to say if, as pointed out by the European Commission, there is a greater demand and actions that lead to a better use of its resources are coordinated by the different governments. This way, the railway will be the main character of mobility: sustainable, digital, and connected.

This mode of transport accounts for less than 0.5% of total emissions in the European Union, compared with 72% on road and 13.4% on aircraft.

The declaration is also a way of drawing the attention of European citizens to the use of the railways for their mobility. A European debate is to be achieved that deals with, and is concerned about, showing the benefits that this transport brings and tackling some of the outstanding challenges.

The adoption of the 'fourth railway package' two years ago is now being endorsed by this initiative, which wants the railway to be seen as one of the key elements for successfully

implementing the Trans-European Transport Network (TEN-T) project and the future development of the nine European passenger and goods Communication Corridors.

Activities

To mark such an important date, an extensive agenda of activities has been drawn up, with an overall budget of eight million euros. Each Member State is responsible for organising on its territory the initiatives it deems appropriate for this commemoration. In the case of Spain, the Ministry of Transport, Mobility and Urban Agenda (MITMA) has appointed the Spanish Railways Foundation (FFE) to articulate the coordination and performance of activities in Spain related to this commemoration together

"With this iconic commemoration we want to achieve a debate that shows the great benefits that the railway brings and the challenges that remain."



"This declaration aims to make progress in the creation of an integrated, attractive and competitive European Railway Area."

with the entities of the sector, among which is Mafex.

All the scheduled activities can be checked in the national calendar on

the MITMA website:

https://www.mitma.gob.es/el-ministerio/campanas-de-publicidad/2021-anio-europeo-del-ferrocarril/calendario_eventos

Among the events planned the highlight is the celebration of the Rail Live! fair and congress organized by Terrapinn and Mafex, the launch of the "Connecting Euro-

pe Express" train, which will pass through Spain in September, or the study of the technological situation and the application of new formulas to this means of transport, by the Official College of Telecommunications Engineers.

All this under a slogan with which the development of this special year is presented on the MITMA website: "Let us show you the future: hop on the train".

Moreover, in the case of Spain, the Ministry points out that Europe is the world leader in the railway industry, and that the country has the longest length of European high-speed road infrastructure and the second in the world. In addition, it highlights the role that the train plays both, in culture and in heritage, as well as its importance for the connections of regions, people and companies, and its contribution to sustainable tourism.

This special year is not only a celebration, but also "a paradigm shift", because what this declaration is intended to achieve is to make progress in the creation of

an integrated, attractive, competitive, and emissions-free European Railway Area.

Rail Live!, a key event of the European Year of Rail

One of the main activities on the agenda of the European Year of Rail is the Rail Live! Fair and congress, organized by Terrapinn in collaboration with Mafex.

This professional platform will bring together representatives of the international railway sector in Madrid (IFEMA), from 30th November to 1st December. This edition will delve into three major themes: digitalisation, liberalisation and sustainability.

The exhibition will be represented by companies from all over the value chain to show their latest developments and railway solutions and services. In addition, the congress will have a large range of more than 250 speakers, representatives of infrastructure managers, passenger and goods operators, transport authorities, etc.

Rail Live! it is an opportunity to get back on track in a booming industry, with great opportunities for growth in the coming years, as well as for establishing new contacts with the key players in the shift towards sustainable mobility.

IFEMA, a safe space

The new edition of Rail Live! will be held at IFEMA, a 100% secure space that complies with all cleaning, disinfection, and safety protocols against COVID-19. Both in terms of access and within the facility, the allowed capacity and the minimum distances are guaranteed at all times and the use of face masks is mandatory.

This event joins those that have already been held recently with full safety measures such as Fitur 2021, the HIP-Hospitality Innovation Planet or the next ARCO Madrid 2021 in July.

In the following link you can check the complete guide of the Covid regulations that are applied by the venue::

<https://www.ifema.es/medidas-sanitarias-seguridad-para-eventos>



The liberalisation of passenger transport in Spain is already a reality

RAILWAY PASSENGER TRANSPORT BEGINS A NEW STAGE. THE INCORPORATION OF MORE OPERATORS EXPANDS THE OPTIONS FOR PASSENGERS, WHO WILL HAVE A WIDER CHOICE OF TIMETABLES, PRICES AND OPERATORS.

The liberalisation of the passenger railway service began its journey in Spain on 10th May 2021. This way, the new scenario that the railway will experience in this country becomes a reality, where the exclusivity of this service by the public company Renfe is left behind. That day the first convoy of Ouigo, a low-cost subsidiary of the French public company SNCF (French National Railway Company, also known as the French Railways Society since June 2017), began to operate in the Madrid - Barcelona corridor.

This segment of the transport market is already open to operators wishing to offer their high-speed

passenger services, a further step after the effective date of the European Directive of the "fourth railway package" on 14th December 2020. This regulation sought to promote the development of mobility by railway as one of the most sustainable means of transport and with a lower emission of CO2 into the atmosphere, to achieve the goal of becoming the first climate-neutral continent by 2050.

Fourth railway package

It should be borne in mind that the "fourth railway package" was approved by the European Parliament in April 2016. It prepared for the entry of operators other than those of each country into the Member States. The aim was to allow competition to increase the use of the railway, to make it the transport of choice for passengers and to improve the quality of its services. For EU members to bring themselves up to date with their parliamentary terms in line with the EU directive, the liberalisation process was lengthened over time, setting the 1st of January 2020 as the date for the possible entry of new operators, so that they

could offer services on 14th December 2020.

Along these lines, the Spanish Government approved in the Council of Ministers of 21st December 2018 a Royal Decree-Law that authorised new companies to operate in the national territory in long distance and high-speed services. This Decree marked out the timetable that had to be followed so that on that date of December 2020 any company that had the appropriate license for the transport of passengers and the safety certificate granted by the State Railway Safety Agency, could be eligible for the tender process of paths in the three main Spanish high-speed corridors: The Madrid Corridor with the French Border, through Barcelona, the most sought-after; the Levante Corridor; and the Southern Corridor (Andalusia).

Public services

This regulation also specified that the opening up to competition did not affect services considered to be Public Service Obligations (PSOs), that is, those which include Commuter trains, Mid-Distance trains and the Avant, since the European legal opinion allows the Member States for this type of transport, considered essential for communication, not to be compulsorily tendered until 2023.

The tender was automatically opened by the Railway Infrastructure Manager (ADIF-ADIF AV) for those companies that wanted to bid in the process to operate in the three high-speed corridors.

During the first months of 2019, more than 25 companies, individually or in partnership, showed their interest. Of those, at least eleven had the appropriate permits for the transport of passengers, and others had it for goods and were waiting for the second. These companies were: Renfe Operadora; SNCF; Continental Rail; Alsa Ferrocarril; Velay

Rail; Eco Rail; InterBus, Interurbana de Autobuses; Ferrovial Railway; AISA Tren S.A.U; Avanza Tren S.A.U; and Intermodalidad de Levante (Air Nostrum). Some interest was also shown by CAF, Talgo, Flixbus, which already operated in Germany, NTV and Virgin, among others.

Analysis phase

On 31st October, the deadline for bidders closed, and the manager admitted for processing the proposals presented by six of these companies, starting the process of analysing the capacity to comply with the required service, as well as evaluating the service that each one could offer. In this phase of analysis, the documentation received was assessed from four points of view: administrative compliance, financial capacity, technical capacity and compatibility between requests.

Six companies or partnerships were selected, Motion Rail –Trailantic, Globalvia, SCNF, Renfe Operadora, Ilsa (Air Nostrum -Trenitalia) and Eco Rail.

In addition, from Adif three packages were designed for the distribution of the railway paths: "Framework Capacity Offer". Package A, for a traffic of two trains per hour

"With liberalisation, services and offers are expanded in price and frequency for the passenger".

on the connection between Madrid and Barcelona; one per hour between Barcelona and Valencia and the same for the Levante corridor: one with Valencia and another one with Alicante. Although in the Andalusian corridor two trains per hour were offered from Madrid to Seville and one per hour on the journey between Madrid and Malaga. This package has about 104 daily trips, of which 32 correspond to the connection with the city of Barcelona, 32 with the Levante area and 40 with Andalusia. This package was practically reserved for Renfe because it is the only company with sufficient capacity to meet these requirements.

Packages B and C are the ones that Adif put out to tender for the entry of private companies in competition with Renfe Operadora. The first aimed at a traffic of 16 trains a day in each of the aforementioned corridors, while the second restricted operations to five trains per day on each of the three.

On 27th November, the award was made public and the Board of Directors of Adif decided to select Rielsfera, (Ouigo, low-cost subsidiary of SCNF), ILSA (partnership formed by Air Nostrum and the Italian public company Trenitalia), and Renfe Operadora as the first operators to be competitors of Renfe.

Package A was exclusively for Renfe Operadora; while package B was assigned to the Intermodalidad Levante (ILSA) partnership, and package C was for SCNF, which will operate it through its subsidiary Rielsfera (Ouigo). Eco Rail did not qualify despite having submitted a good offer, according to the company itself. However, these companies did not take on all the paths offered by Adif. In the case of package A, Renfe has chosen 86% of the paths, leaving 14%; while, in the package B, Intermodalidad Levante has chosen 70%, 30% of the offer remaining vacant; and in the case of package C, the 100% acceptance by Rielsfera (SCNF) has been fulfilled. It is hoped that in the medium-term other companies will be able to take part to occupy those available paths.

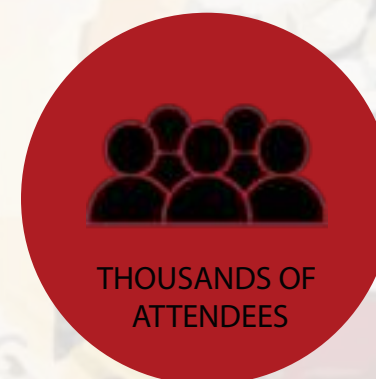
The low cost offered by Ouigos is already a reality in the northwest corridor, and the company has announced the intention to operate before the end of the year in the Levante corridor and by 2022 in Andalusia. In the meantime, Ilsa will start offering its services from March next year with connections in all three corridors. Faced with the competition of low-cost prices, the response of Renfe Operadora has been to prepare a new service of the same characteristics, the Avlo, which will start its operations from 23rd July between Madrid and Barcelona.



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Ouigo, the first low-cost train with launched the opening of the market

On 10th May, within minutes of each other, two trains departed from Madrid and Barcelona, respectively. This way, the liberalisation of passenger railway transport through high speed began in Spain. The two units are part of the Euroduplex fleet of the low-cost subsidiary of the French public company SNCF, called Ouigo.

This company offers its services in the Northwest high speed corridor with five daily frequencies between Madrid and Barcelona (ten in total), with stops, in each direction, in Zaragoza and Tarragona, it aims to make railway high speed "popular", since as its Managing Director for Spain, Helene Valenzuela points out, "we want everyone to be able to travel through this country via high speed trains".

The Ouigo brand, already operated in various corridors in France, offers a service similar to that which can be found in traditional high speed trains, through the double-decker model of the French manufacturer Alstom, with the only difference of the interior configuration that admits in this way more passengers, up to a total of 509 per convoy. It offers a choice of seats of different sizes, including the XXL for added comfort. Furthermore, unlike other low-cost trains, it has a café on board.

Likewise, the initial price is 9 euros each way, although the price of the ticket increases depending on the day of travel and the services required on the journey. It is similar to the offer that low-cost airlines have already established years ago. If travellers wish to carry more than one suitcase, they must pay a supplement for it, the same applies for entertainment and Wi-Fi. Children have a special price and there is no loyalty card or discount for large families.

To start with, and as announced by Valenzuela, the company will focus

on the corridor between Madrid and Barcelona, although it is studying the possibility of operating towards Levante before the end of this year and towards Andalusia in 2022.

Ilisa and Renfe: Long awaited debut

The next step has been the debut of Renfe Operadora. On 23rd June began the journeys of Avlo, the new low-cost high speed service. These are units of the Serie112, which has started its connection between Madrid and Barcelona with 4 frequencies in each direction. Its initial configuration is planned to carry up to 438 passengers, with prices starting at 7 euros each way.

This way, the company will offer 40 daily trains (20 each way) and 16,000 seats to travel between both cities either by either the traditional AVE or by Avlo.

Below, the model of the operator ILSA, also expected to engage in commercial operation in Spain.



In addition, this year it is expected the debut of ILSA, a consortium made up of Air Nostrum and the Italian public company Trenitalia. The start date is yet to be set, although it

is proposed to start operations from 2022 according to the company. In this case it plans to focus directly on the three high speed corridors: Northwest, Levante, and Andalusia.

Avlo is the low-cost proposal of Renfe Operadora for this new stage of liberalisation.



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Some of the new railway operators analyse the take off of passenger railway liberalisation in Spain

The recent deregulation of passenger railway transport opens a new stage in the sector. The main characters, the operators, offer their view in the Mafex magazine about the challenges and opportunities that arise

to promote the railway among the population.

Likewise, as experts in a sector of activity with good growth prospects, they explain in these lines the importance of collaboration in

the industry to promote a sustainable, efficient mobility with the best breakthroughs in the market.

All that, in order to achieve excellence in service and the highest quality standards.

Experts' opinion

The presence of more railway operators on the market increases passengers' travel options. In this new context, what direct benefits will it bring you from the point of view of services, quality, etc.?

Is this an opportunity to boost railway transport and compete with other modes such as the airplane?

What are the main challenges facing them?

As representatives of the Spanish railway industry, liberalisation is an issue that generates great expectation in companies for the cooperation opportunities offered. What ways do you envisage to promote collaboration with the industry?

HÉLÈNE VALENZUELA
GENERAL MANAGER
OUIGO

OUIGO stands for a new model of tourism: sustainable and digital



The arrival of OUIGO in Spain marks the opening of the train to all types of travelers. Before, the train was discarded in favor of other modes of transport that were more economical or better suited to each individual traveler. Now, with the entry of OUIGO, a stage begins in which everyone can have access to high-speed trains at an affordable price.

After three decades of high prices, in three months, we have contributed to lowering them and widening the offer, democratizing this means of transport, and giving the customer the chance to choose the best option for the environment without paying more for it.

OUIGO proposes a new model of tourism: green and digital. This is the model that Spain is looking for, based on the experience of travelling by train with a more pleasant, economic and sustainable approach.

We offer a means of transport at a very affordable price that will contribute to many more people opting to travel by train, instead of more polluting alternatives such as the car or the plane. OUIGO trains have a carbon footprint 80 times lower than a plane and 50 times lower than a car.

The whole sector faces many challenges, but we prefer to think about the opportunities ahead. After the pandemic, there are sectors such as tourism and hospitality, which have been severely affected and we want to be a lever of recovery for the Spanish economy with our work.

In OUIGO we aim to bring Barcelona, Tarragona, Zaragoza and Madrid, along with the cities of the upcoming routes, closer to companies and self-employed professionals who, until now, have had to invest a significant amount of money in travelling from one city to another and make it easier for them to generate business.

FABRIZIO FAVARA
CHIEF EXECUTIVE OFFICER
ILSA



ILSA's value proposition revolves around two basic pillars: innovation and sustainability

First and foremost, rail liberalisation represents an essential step forward for passengers: the possibility to choose. Until now, citizens have only had the offer of the one operator, but with the arrival of two new competitors, not only is supply expanding, but also the frequencies and with more competitive prices.

Of course, this new railway landscape also entails an upgrade in quality. We at ILSA are a customer-centric company that seeks differentiation through our services, offering the most comfortable travel experience, with extra space in the seats, enhancements in noise and vibration insulation, quality interiors and smart Wi-Fi, among other features. Accordingly, we want to position ourselves as the best private high-speed operator under the strictest quality and safety standards.

2021 is the European Year of Railways. This, coupled with liberalisation, reinforces the opportunity to promote the use of rail as the most sustainable mode of transport. A boost for which Spain has an ideal starting point: we have one of the largest and most modern rail infrastructure networks in the world, with more than 3,000 kilometres of track, and a radial configuration where distances to Madrid are less than 700 kilometres in most cases.

These two facts position the train as the best-suited means of transport in terms of sustainability, cost and speed, with the added opportunity to optimise our railway intelligence. In this context, the birth of ILSA will be a turning point

in the rail transport sector in Spain, allowing our country to position itself as a European leader in know-how not only in manufacturing but also in operation, with a new profile of integrated mobility companies based on the train and committed to sustainability.

Under this conception, ILSA's value proposition revolves around two basic pillars: innovation and sustainability, which are precisely our two great challenges and on which we work together, nurturing each other.

For us, innovation revolves around a 360-degree perspective of product, technology, operations, organisation and our conception of future mobility.

In terms of product, we are building an initial fleet of 20 new state-of-the-art trains, developed by Hitachi Rail in partnership with Bombardier Transportation (now part of the Alstom Group), in which we have invested 800 million euros to build the most sustainable, quietest and fastest fleet in Europe.

From the technological standpoint, we are a digital native company and we plan to invest 10 million euros in the development and implementation of our own IT to guarantee a 100% digital experience for the customer. Moreover, as an organisation we are an open company with multidisciplinary, diverse and cross-sectional work teams.

In terms of our conception, we boast an innovative vision of integrated mobility in which the train spearheads the value chain, fostering collaboration between companies

for passenger transport and laying the foundations for multimodal mobility with the high-speed connection to Madrid-Barajas airport.

From the sustainability angle, the in-depth awareness of the urgency of climate change has allowed us to think green from the very start of the project.

Our trains -the first high-speed trains in the world to obtain environmental impact certification (EDP) because they manage to contain CO2 emissions per passenger-kilometre to 28 grams- are built with 95% recyclable materials and have a regenerative braking system that converts the energy produced into alternating energy, returning it to the grid for reuse. Of course, we have a zero-waste policy in our offices, among other initiatives that reinforce the team's awareness and responsibility towards the environment.

Thus, innovation and sustainability both define us and stand us apart. That is why they represent our overriding challenge and each day we endeavour to reach the start of our operations in the second half of 2022 with the very highest standards of both.

We want to become the key partner for the two main Spanish industries: tourism and mobility. In this regard, ILSA was born with a clear vocation of cooperation with companies of these sectors, enabling us to contribute to the country's socioeconomic development.

We are committed to a model in which the train is the focal point of the transport value chain. To this end we plan to collaborate with other companies to take passengers wherever they wish, combining long-, medium- and short-distance and micro-mobility and connecting the main Spanish cities with Madrid-Barajas airport.

JULIO GÓMEZ - POMAR
CHAIRMAN
ECO RAIL



As new rail operators who want to compete in the market, we want there to be equal opportunities

It is clear that all the markets that have been opening up to competition have attracted new operators who have offered improvements in prices, quality, performance, services and facilities to customers, to generate additional demand and to attract the existing one. In this respect, the passenger rail market is no exception.

The demand for transport takes into account the total transfer times, the prices, the availability of supply and a complex preference in its nuances for each of the modes. Better prices, more supply and a more sustainable mode of transport are powerful arguments in favour of rail.

As new rail operators who want to compete in the market, we want there to be equal opportunities for all; certainties of the possibilities of operating certain lines and guarantees with sufficient time to undertake the important investments in capex and opex that this market requires.

This market requires an enormous entrepreneurial effort and, therefore, collaboration in its different forms between companies in the sector will be essential. It is not only about operating trains but about equipping them with the best innovations, maintaining them, repairing them, parking them, training personnel in all these areas, in short, only with a powerful cluster of companies in this industry is it possible to pose this type of challenges.

Spanish railway engineering in five continents

Ineco, the engineering company of the Ministry of Transport, Mobility and Urban Agenda group (MITMA), was founded more than 50 years ago as an overseas railway consultancy whose genes remain active both in its work in Spain, at the service of its shareholders Adif and Renfe, and abroad. Today, with more than 3,000 professionals it develops projects in all modes of transport, although the railway still generates the highest volume of activity.

America and Africa were the first international destinations for the company, but it now also operates in Europe, Asia and **Oceania**, where it was where it has a stable presence after being awarded its first contract in 2019, for the modernization of the Sydney suburban network in Australia, which has just been renewed for three and a half more years. As systems integrator, the company provides its expertise in system definition, monitoring, design and testing of the European rail traffic management system ERTMS

HIGH SPEED, SUBURBAN, METRO... INECO, THE MITMA GROUP'S TRANSPORT ENGINEERING AND CONSULTANCY COMPANY, HAS BEEN EXPORTING ITS RAILWAY EXPERIENCE ALL OVER THE WORLD FOR HALF A CENTURY.

THE FUTURE MAYAN TRAIN IN MEXICO IS THE MOST RECENT PROJECT, BUT THE SYDNEY SUBURBAN RAILWAY IN AUSTRALIA, THE "DESERT HIGH-SPEED TRAIN" IN ARABIA OR THE BRITISH HS2 ALSO BEAR THE SPANISH STAMP.

(European Rail Traffic Management System).

Commitment to the railway

The company has been and still is actively involved in the development of the Spanish high-speed rail network. It is present in all phases of the railway development life cycle: planning, conceptual and constructive design, supervision and project management, operation and maintenance. In addition to this, as a comprehensive engineering company, it covers all the structural facets of said development: infrastructure, energy, signalling, safety and rolling stock.

This is what sets Ineco apart. Its experience includes projects on sections, construction and environmental management, track assembly, stations, maintenance bases and workshops, electrification, traffic management, gauge changers, singular works, preparation of environmental impact studies, geotechnical engineering, etc

Ineco has also participated in the development and implementation of ERTMS, the European railway signaling system, in Spain and Europe; it has worked on the renovation and electrification of conventional lines, railway accesses to ports, metro and tramway projects, integration in urban areas, railway safety; supervision of the manufacture, modernisation and certification of all types of rolling stock; restoration of historic stations, renovation and construction of stops and suburban stations and works to improve accessibility.

In the field of consultancy, it has carried out all kinds of studies on passenger and freight demand, gauging, and technical and economic feasibility analyses. It has also and still is collaborating with management in the preparation of technical railway regulations, sectoral plans and strategies as well as railway legislation in general.

A wealth of knowledge and experience in railway matters is incorpora-



Geotechnical testing in Rail Baltica project.

ted in the company's projects in the five continents.

In **Europe**, these include major high-speed projects such as the High Speed Two line, HS2, in the United Kingdom, where Ineco was the first Spanish engineering company to start work, in 2012, and Rail Baltica, which will connect Estonia, Latvia and Lithuania (from 2019) with the rest of Europe. Turkey, where Ineco first worked in 1998, has also com-

mitted to renewing its railway network and adapting it to high speed, like the Ankara-Istanbul (2009-2013) and Samsun-Kalin lines, the latter 378 km long and pending completion. On the other hand, on the European continent, the company has contracts to support the European Commission in the implementation of ERTMS on the nine main European corridors (2014-2021).

In **America**, one of the most recent railway contracts is the "Shadow

Operation" of the Mayan Train in Mexico, a 1,500 kilometre conventional line for passengers and freight, which will cross five states -Chiapas, Tabasco, Campeche, Yucatan and Quintana Roo. This was aimed at boosting tourism, the agricultural sector and creating employment in the region by promoting social inclusion. Ineco and its subsidiary Inecomex, Renfe and DB E&C, will work together for the next three years on the development of the project, considered a "priority" by the Federal Government. Ineco arrived in Mexico in 2004 as a partner of CAF, with the Buenavista-Cuautitlán suburban line project in Mexico City. In the Mexican capital, it is also managing the work being carried out on the extension of Metro line 12.

Ineco also participates together with Adif and Renfe in the development of the Houston-Texas high-speed railway in the USA, where it has also carried out the commissioning and operational transition (ORAT) of new Moynihan Train Hall by converting the former listed building for its incorporation into Penn Station, which has just been inaugurated in New York.



Systems integrator for Sydney commuter trains.





Ineco experts in Haramain high speed rail project in Saudi Arabia

In the Southern Cone, the company has been operating from the beginning in practically all countries, including Bolivia, Argentina, Honduras, Guatemala and Chile, where it has just completed a project for new railway regulations for EFE, the National Railway Company (Empresa Nacional de Ferrocarriles). In Chile, the company is working on the modernisation of rolling stock for the Santiago metro, as well as on the supervision of new trains manufactured by CAF for the Quito suburban lines, which have also been operating since 2011 for Metro de Medellín, in Colombia.

In **Asia**, work has also been carried out on high-speed tracks in Saudi Arabia, where the so-called "High-Speed Train of the desert" has been operating since October 2018, connecting the 440-kilometre journey between the holy cities of Mecca and Medina, with trains specially designed by Talgo and adapted to the harsh desert conditions. Ineco, Adif and Renfe are part of the Al Shoula consortium, which was awarded the international 12-year contract in 2012 for the construction of the second phase, operation and maintenance of the Haramain High Spe-

ed Railway, the country's first high-speed line and the largest industrial contract for Spanish companies abroad to date.

Several Asian countries have high-speed railway projects in different stages of development, such as India, for which Ineco has carried out technical and financial feasibility studies for the future 1,500-km high-speed New Delhi-Calcutta line, the 772-km Bombay-Nagpur line, in 2016, and the 135-km Haldia -Howrah line, in 2012. All of them are included in the Diamond Quadrilateral, an 11,000-kilometer high-speed railway network that will connect India's

four major cities of Mumbai, Kolkata, Chennai and Delhi.

Recent work on the **African continent** includes the inspection and overhaul of a batch of trains from Mallorca in 2020, which have been redesigned to return to service on Nairobi's suburban network for at least 25 years. In 2019, the metropolitan transport authority of the Kenyan capital acquired 11 diesel railcars from SFM (Serveis Ferroviaris de Mallorca), which had decommissioned them after electrifying its network. Ineco was responsible for Renfe's inspection and pre-testing of the trains, which were sent to Kenya by sea.



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Innovation Way® workshops to promote the adoption of Workplace innovation in Rail Sector

By Giacomo Petrini, QUINN
www.consortioquinn.it

From needs to action for Innovation

The work of the RailActivation project, in close contact with companies from different sectors and sizes, has over time tested that innovation is at the top of the priority for small and medium-sized enterprises to resist the ever-changing market. In the same way, however, experiences in the field have shown that smaller companies suffer from the lack of an approach to innovation designed for their specific characteristics. Small businesses show difficulty to innovate at the same time, however, being less numerous, they benefit from the speed with which an innovation can spread within the company and quickly improve the approach to the market.

Another winning element for business innovation, in the operational support activities for companies, is the theme of "bottom-up innovation" that is the importance of in-

volving operators and company staff to generate ideas for improvement. This type of workplace innovation is substantiated in the co-creation of ideas for improvement that benefits multiple points of view within the company. The operational view is in fact very often an incessant engine of ideas for improving performance and value proposition in general and this is all the more true the more there is a collaborative and participatory approach to innovation in the company.

Starting from the analysis of the context of the SMEs and studying the potential causes that generate critical issues related to innovation in small and medium-sized companies, QUINN has created the suite of Innovation Way® workshops tested with hundreds of companies from different production sectors and improved through a specific adaptation for rail sector within RailActivation project. The suite consists of a path of four workshops in which, through the explanation and direct application of scaled and refocused tools to the company on the characteristics

of small and medium-sized enterprises, a "toolbox" is provided to the company that intends to innovate the way of doing business.

Through the workshops, the goal was to support the participating companies:

- In analysing their context (internal and external);
- In the innovation of the corporate strategy;
- In aligning the vision of innovation both from a technical and commercial point of view;
- In increasing the participants' personal ability to generate new and effective innovative ideas on an ongoing and sustainable basis.

The objectives of the workshops were pursued through practical applications of the tools directly in the classroom and on the participating companies (following the Experience-Based learning model). This occurred mainly thanks to the use of special templates which provided a complete picture of critical issues and opportunities that allowed participants to be able to take decisions



Figure 2- Innovation Way® path

immediately to improve their business.

Innovation Way® path

Innovation Way® promotes a type of sustainable innovation for medium-small business realities, attributable to the "Business Creativity" approach. This takes the form of workshops where the focus is on improving the business achieved through the recombination of the factors already available in the company, in Innovation Way® the goal is therefore to allow companies to:

- Define / redefine the business development strategy;
- Design / redesign the offer of goods and services;
- Create harmony between marketing and production functions;
- Increase the ability of participants to generate innovative ideas.

The entire structure of the workshops really has an impact only if the actors involved in generating improvement ideas are at the centre of the process. This is achieved by letting the participants in Innovation Way®, during the activities, be constantly put on the "front line" by overturning the concept of traditional training and letting the company staff present in the workshop get involved, generate ideas, have his say and test the toolbox using his

knowledge and experience to model each tool presented to his business needs. Each participant becomes an active part of the path and literally "learn by doing" by using the tools according to their objectives and personal background, generating innovative ideas "tailored" to their business.

However, Innovation Way® workshops add to the "individual" learning an additional element that generates value for the participants: the sharing and co-creation of ideas. This is done through teamwork sessions and through the shared presentation of results. In this way, several expertise simultaneously participates in the generation, questioning and refinement of ideas, obtaining a "finished product", the fruit of different points of view and often created with "multiple hands", providing

a brief internal first efficacy check. To achieve this effect, the moments of practical application of the contents, which occupy about three quarters of the activity, are carried out in teams made up of "similar" companies and then shared with the rest of the participants, this allows to obtain a first step of "creating participated in ideas", and a second "cross-check" step with the rest of the participants to obtain constructive feedback and refine the idea even better.

RailActivation project experience of Spanish companies

Within the RailActivation project - whose objective is to create and piloting a rail business and organisational mechanisms for the uptake of workplace innovation by SMEs from the railway sector as part of an Open Innovation ecosystem - a version of Innovation Way was proposed with the following adaptations:

- 1) delivered in 3 editions in order to facilitate the participation of companies in relation to their own agendas and to activate a fine-tuning process derived from comparison between one edition and another;
- 2) for the same reason indicated in the previous point, a format of the suite concentrated in two days was proposed;
- 3) the adaptation was carried out remotely via the Zoom platform, with the resulting revision of time and operational support for group work.



Figure 1 - Innovation WAY® Structure



Figure 3- Participants' Categories



Figure 4- Participants' functions

18 SMEs participated in the Innovation Way workshops including 9 from Spain, mainly manufacturing companies and solution providers for the railway network. The graphical representations aids comparative analysis of the data from the 3 editions as a function of the categories of participants: roles and company functions.

The proposed methodologies have been introduced to the participants so that they could be understood and applied regardless of the technical background: participants could thus feel and act as protagonists of the innovation process.

After the 3 editions of Innovation Way we have obtained the following confirmations about its features enabling workplace innovation:

- ▶ employees of **each function can participate** with a variable level of protagonism because it is related to the aims of the different workshops,
- ▶ **each participant can contribute** to the work of the groups regardless of their role, age particularly if the participant is part of a workgroup with colleagues,
- ▶ **the transferred methodologies can be reused** in their own work context independently,

- ▶ the methodologies **can be used in a recurring way** when a need arises,
- ▶ the various editions of the workshops show that the best results are obtained if **several business functions of the same organization** are involved,
- ▶ innovation goes beyond the boundaries of technical functions and becomes **shared heritage**.

The analysis of the preferences of the participants of the 3 editions summarized in the following figure highlights in general terms the particular interest on WS 02 (focused on Identification of new benefits

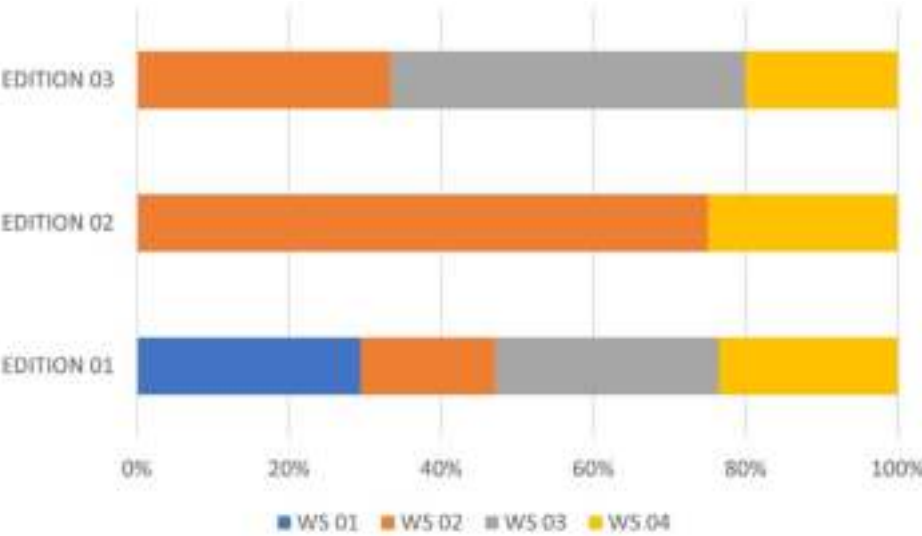
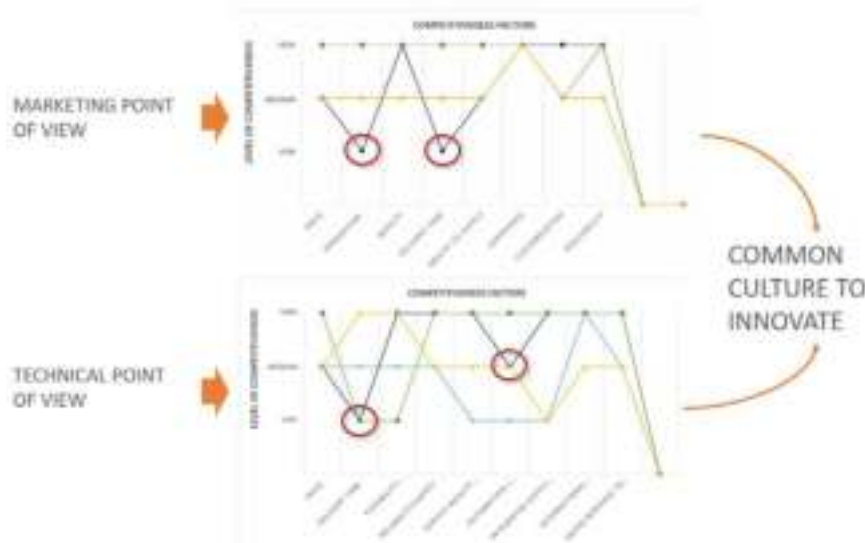


Figure 5- WS preferred by the participants of the 3 editions

sought by the customer that we could satisfy) and 03 (focused on New design for products / services). The second edition stands out for its concentration on WS 02 and 04 (Improving the customer listening process). The first edition, on the other hand, highlights the interest in WS 01 (New positioning on the market), consistent with the more significant involvement of executive roles, but at the same time proposes data distributed over all four WS, again a sign of a greater ability to have a holistic view of corporate interests.

For those who make a product or a service it is easier to think about its features, but it is necessary to be able to communicate to the customer what benefits they can obtain from the use of that product. One of the first and most appreciated approaches transferred also to the Spanish companies involved in the workshops was precisely to learn how to speak the language of the benefits that their solutions can bring to customers. Specific exercises have been conducted on this theme with moments of sharing and comparison among the participants.

Regarding more in deep the involvement of the nine Spanish companies in the following case studies, we



summarize the perceived value of their participants. The **first case study** focuses on the use of the value curve for defining

new strategic directions. The original approach of the Spanish company mentioned - manufacturer of vehicle components, auxiliary components





"Innovation Way® promotes a type of sustainable innovation for medium-small business realities".

and system - lies in having first approached the analysis from two distinct points of view, from the marketing function and from the technical function, to then initiate a comparison between the two points of view and thus arrive at a shared vision.

The **second case study** is representative of the interest registered by several of the participating Spanish companies (in particular manufacturing companies) in adopting approaches and methods to improve active listening to customer needs. This translates into the adoption of methods for matching explicit and implicit needs with the requirements of the products and services offered to check gap and strong assets.

We then move on to the mapping of points of contact and listening to the client and the identification of information sources that have been neglected or unused to date as sources of input for the continuous improvement of their offerings. The design process is therefore also fed by inputs that until now were the

OFFER	BENEFIT	TASK E: try to match needs and benefits list before	NEEDS	CUSTOMER
	BENEFITS THAT SATISFY THE CUSTOMER EXPLICIT NEEDS		EXPLICIT NEEDS: Needs / Wishes / Problems to be Solved	
	1. QUALITY		1. RESPECT SPECIFIC STANDARDS	
	2. RELIABILITY		2. DELIVERY TIMES	
	3. MANAGING SUPPLIERS		3. LOGISTICS SPECIFICATIONS	
	4. DESIGN COLLABORATION		4. COLLABORATION DESIGN	
	5. PROXIMITY		5. MANAGING SUPPLIERS	
	BENEFITS THAT SATISFY NEEDS THAT THE CUSTOMER DOES NOT SAY, BUT IMPORTANT TO HIM		HIDDEN NEEDS Needs that the customer does not expose but that make the difference in customer satisfaction	
	1. ENGINEERING KNOW HOW (PROCESS ENGINEERING)		1. SOLVING UNEXPECTED PROBLEMS	
	2.		2. CHEAPER COST OF PRODUCTION	
	3. COST REDUCTION PROPOSALS		3. MANAGING SUPPLIERS	
	4. DESIGN PROBLME SOLVING		4. DESIGN IMPROVEMNTS	

TECHNIQUES	SUGGESTION	IDEA-TRIGGER QUESTIONS	Apply the SCAMPER technique to your Products / Services / Facilities with the aim of identifying new solutions	SELECT PRODUCT or SERVICE or ASSET
 SUBSTITUTE	Think about substituting part of the product or service or asset with something else.	1) What other materials, processes, power, approaches, or forces might I substitute? 2) What could I substitute or swap to improve the product/service/asset? 3) What processes or rules could I substitute? 4) Can I use this product/service/asset elsewhere, or as a substitute for something else?	1) Materials: carbon fiber Swap laptop with Hmi Swap contact sensors for track gauge surveying with a contactless sensor Swap power supply by alternative sources (solar...) 3) Substitute measurement procedure (static) with a continuous method	
 COMBINE	Think about combining two or more parts of the product or service or asset to make something new or to enhance synergy.	1) What mix, assortment, alloy, or ensemble might I blend? What ideas, purposes, units, or appeals might I combine? 2) What part of the product/service/asset can I combine with something else? Is there another product or service or asset I could combine this with to create a new offering? 3) Are there any companies I could collaborate with? 4) How could I combine talent and resources to create a new version of this product/service/asset?	Add a nest for hand tools transportation Add pedals/engine Add topographic prism for total station Add remote control (drone-like) Add pantograph for contact measurement of the wires Add machine learning algorithms Add more accurate and precise geolocation system	
 ADAPT	Think about which parts of the product or service or asset could be adapted or how you might change the nature of the product or process	1) What else is like this? 2) What other idea does this suggest? 3) What might I adapt for use as a solution? 4) What might I copy? 5) Who might I emulate? 6) How could I adapt or readjust this product/service/asset to serve another purpose? 7) Is there a new trend I could embrace and adapt to? 8) What other context could I put your product/service/asset into?	Analysis of information gathered by the cameras (artificial vision) Tunnel without tracks Monitor assets within tunnels Adapt the trolley to be pushed by other track vehicles Adapt the sensors to uncreasing operation speeds Adapt the sensors to monitor viaducts/bridges Adapt BIM Adapt to act as a "exploresr train" (before the real exploresr train)	
 MODIFY	Think about changing part or all of the product or service or asset, or distorting it in an unusual way	1) What other meaning, color, motion, sound, form, or shape might I adopt? 2) What might I add? 3) What could I add to modify this product/service/asset? 4) Are there elements of the marketing message could I modify? 5) What element of this product/service/asset could I change to be able to modify the pricing?	Measurement system distance performance (e.g. fog) --> increase the distance of elements Modify lens/camera to take pictures at night	

prerogative of other functions, according to a classic sylos logic.

The last significant experience that we highlight as a **third case study** concerns the theme of product innovation.

In fact, during Workshop 03 the participants were asked to apply the SCAMPER methodology to one of their products. SCAMPER is a Divergent Thinking technique to generate a large number of ideas for new products starting from their current form or function.

Each letter of the acronym contains a set of "idea-trigger" questions with which you can change the characteristics of a product in order to trigger new ideas. The results, in various cases, was the production of a large number of innovation ideas developed in a few hours as additional inputs to the design process.

In the interviews conducted 4-5 months after the workshops were held, it was intended to monitor the outcomes. It became clear that there is a direct correlation between

"RailActivation project has over time tested that innovation is at the top of the priority for small and medium-sized enterprises".

the quality and richness of the works produced during the workshops and their capitalization as management know-how to be used in the business context. The companies that participated extemporaneously or with a reduced number of resources indicate the need for further consulting interventions to integrate the methodologies presented and tested.

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Declarations

Funding: This Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 861887



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Inclusive Passenger Information Systems: iPIS

As part of the company's global innovation strategy, an Alstom Security team in Madrid has developed an Inclusive Passenger Information System (iPIS) solution to improve the travel experience for all users.

The iPIS (Inclusive Passenger Information System) project has integrated Navilens, an application that allows users to be guided in public spaces and provides real-time traffic information by scanning its ddtags codes. These codes can be registered by a cell phone from a great distance and different angles, allowing users to walk through the station with the certainty that their device will capture the code and receive the available information.

Incorporated into Alstom's security system, the codes are digitally inte-

THE TECHNOLOGY IS NOW READY FOR COMMERCIALIZATION AND IMPLEMENTATION IN STATIONS WITH ALSTOM'S SECURITY AND INFORMATION SYSTEM.

grated into the display and are displayed only when the user enters the station and needs the codes.

The reading of the code triggers a protocol that makes it possible to articulate truly adapted security systems, where the passenger is at the center of all actions.

It can be established that, if a passenger registers the station entrance code, ddtags codes automatically ap-

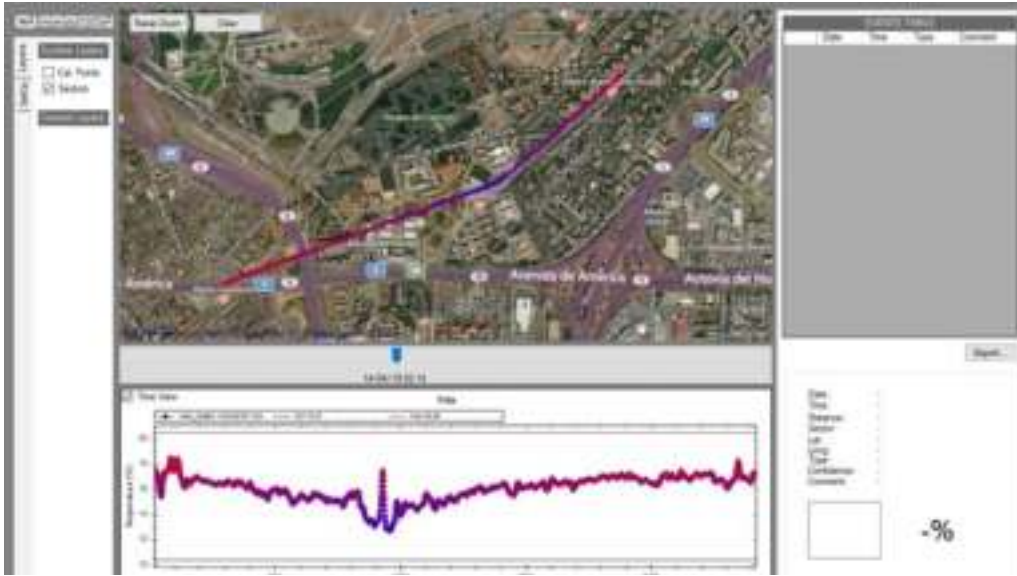
pear on all screens with the most up-to-date information; cameras near the code are displayed in the control center to track the transit, and the station and train team is informed to give any kind of assistance to the user.

The technology is now ready for commercialization and implementation in stations with Alstom's security and information system.

Communications infrastructure as a temperature sensor

Indra is carrying out an innovative pilot project to create a thermal map of the entire Madrid Metro network, in order to study the possible use of this energy, as well as to facilitate the detection of fires or overheating in high-risk areas, among other uses.

The project consists of reusing the existing optical fiber in the infrastructure with minimal intervention at the ends to install a distributed thermal sensor (DTS), which enables the temperature and its variations to be measured with an accuracy of less than 10 meters and 1 degree and a range of up to 60 kilometers to generate that thermal map.



This technology has been used for a decade in other sectors, but Indra is a

pioneer in its application to the rail sector, as well as on highways and roads.

Welcome to the 5G railway

5G is a revolutionary opportunity for rail. It will not only improve performance, but also transform the architecture of networks and telecommunications.

Thales provides an end-to-end modular architecture that allows you to migrate smoothly from legacy technologies to future networks. Our offer includes centralised network orchestration, adaptive onboard communication systems

and secure end-to-end IoT architecture. Everything is Cybersecured by Design, safeguarding your operations and boosting performance for years to come. Whitepaper: What does 5G mean for railways? To access the white paper



DENEVA adapts to facilitate the inclusion of people with **visual disability**



The ICON Multimedia's Passenger Information System, DENEVA, facilitates the inclusion of people with visual disability with the integration of technologies that allows to inform and guide across train, bus and airport stations. After the presence of the blind person is detected, digital screens allow the transcription of the information displayed in real time. As an example, the displays show the access to boarding or the departure or arrival timetable, without the need of additional physical support.

The development of this new iPIS (Inclusive Passenger Information System) is carried out through the integration of NaviLens system in DENEVA. A QR code is embedded on each screen, that is able to be read from a long distance (up to 30 meters) and from different angles, through a mobile application. After

DENEVA IS INTEGRATED INTO ALSTOM'S SECURITY PLATFORM, THAT COORDINATES MULTIPLE SUBSYSTEMS SUCH AS VIDEO SURVEILLANCE, PUBLIC ADDRESS OR TRAFFIC MANAGEMENT.

the first reading of these QR codes, the system activates these markers on all screens, where the information displayed is interpreted and transformed into audio, in the language of the receiver. The system offers immediately the location and orientation of the route that the person wants to follow.

In this way, DENEVA is able to transform the static information showed by NaviLens, into dynamic, by offering real-time data to passengers about changes in schedules or delays. It even warns train drivers that a person with visual disabilities is using this service, and thus, they are able

to consider it for the exit and entry times of the train coach. In addition, DENEVA also provides to visually impaired people the access to different services information such as the stores located in the stations, the products and promotions offered at each of them or its opening and closing hours.

This new development is also integrated into Alstom's security platform, that coordinates multiple subsystems such as video surveillance, public address or traffic management. Currently, the first pilot tests are already underway at different railway stations.

FRACTAL Project, **research project** related to Computer Vision (CV) and Artificial Intelligence (AI)

The EU-funded FRACTAL project is developing a computing node on which to base a cognitive fractal network capable of learning from and responding to its environment. It will support seamless, fast and reliable interaction between the physical world and the cloud. This node will have the capability of learning how to improve its performance against the uncertainty of the environment.

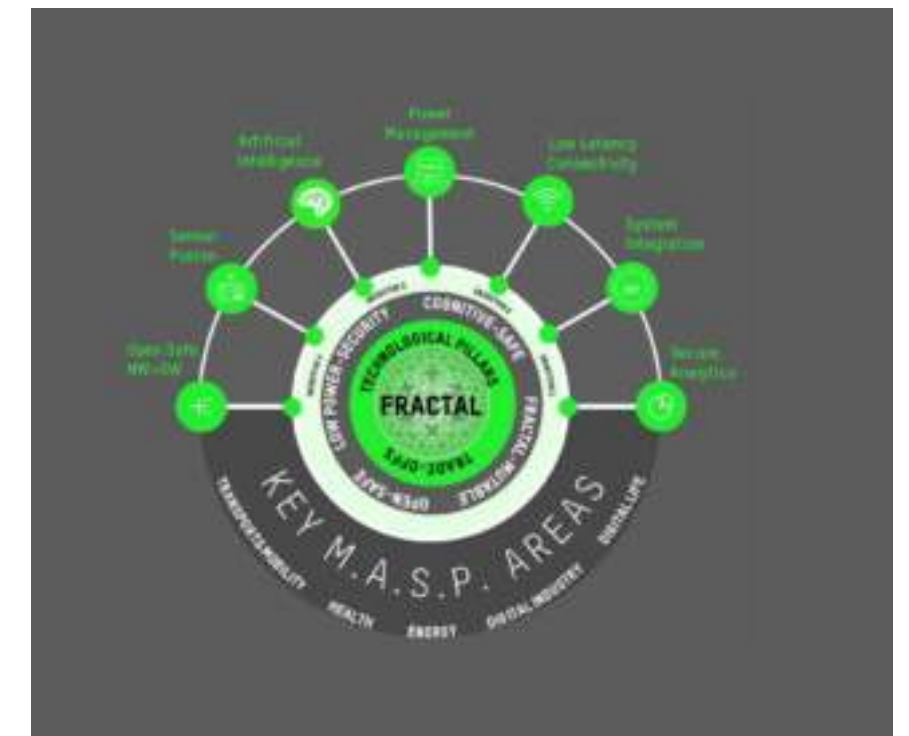
As a result of the integration of these cognitive systems into a fractal network, there will be another intrinsic crucial advantage, emergency and adaptability; new functions will flourish through the created space of possibilities of our cognitive Systems.

This complex network will transfer all those cognitive advantages to the Edge, a computing paradigm that lay down between the physical world and the cloud.

VERSAL nodes

The high node performance), which includes a multicore platform with HW support for safety and AI acceleration features, and that will be developed and prototyped in FRACTAL, seems a perfect hardware substrate to meet the challenging requirements of autonomous train operations.

CAF SIGNALLING IS INVOLVED IN DIFFERENT RESEARCH PROJECTS RELATED TO COMPUTER VISION (CV) AND ARTIFICIAL INTELLIGENCE (AI) ENHANCED SYSTEMS DEVELOP IN ORDER TO REACH A HIGHER AUTONOMY IN URBAN VEHICLES AND ALIGN THEM WITH RAILWAY EUROPEAN NORMATIVE.



CAF Signalling will use the FRACTAL approach on AI-enabled computing platforms to execute some functionalities developed in CV&AI field for autonomous train operation.

More precisely:

- Automatic platform detection,

- Automatic accurate stop at platforms and
- Safe passenger transfer.

FRACTAL project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 877056.

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Smart Mobility, la evolución de los Sistemas de Transporte Inteligentes



For several decades, transport authorities around the world have relied on Intelligent Transport Systems (ITS) to make more efficient use of existing transport infrastructure with the aim of reducing

traffic congestion, accidents, and air pollution. Despite advances in implementation capacity, cities in the developing world are not realizing the full potential of the new generation of ITS or smart mobility applications.

In this context, the World Bank is seeking to transition its portfolio to encompass the new generation of smart mobility applications.

IDOM has recently awarded in an innovative project where disruptive thinking in transportation will follow a methodology that ends in a guideline for smart mobility applications/solutions.

This guideline will help the World Bank to build the capacity of Bank staff supporting cities for a transition from ITS to smart mobility applications/solutions. The project will also develop implementation readiness assessments and implementation action plans in the context of Bank operations in order to encourage cities to undertake innovative smart mobility solutions in 13 cities.

Hardware in the Loop simulator

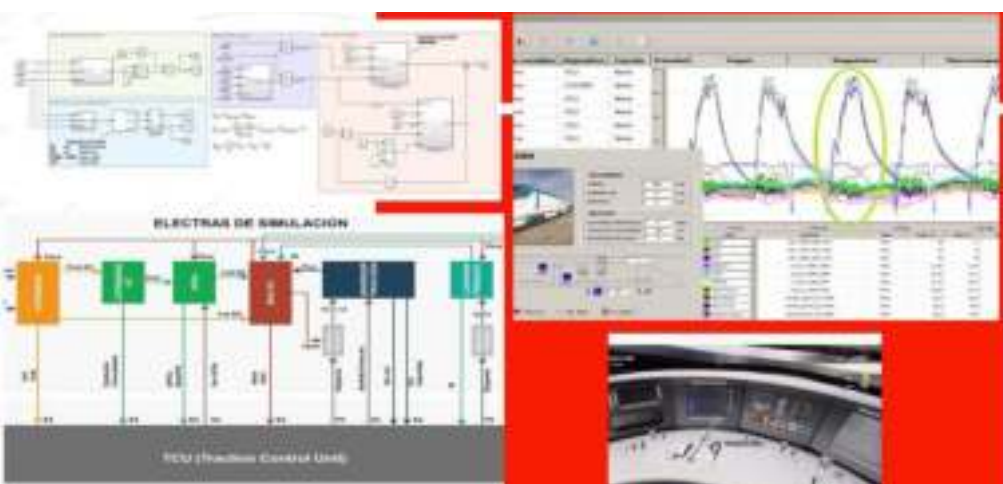
Hardware-in-the-loop (HIL) test bench developed by INGE-TEAM provides a time saving and safe environment for testing high-power electronic systems for High Speed railway applications. This tool allows to reach higher levels of software quality, a significant reduction in

cost and shorter commissioning times by the debugging of software errors in early phases of the project considering the software lifecycle.

HIL test bench consists of the same Traction Control Unit (TCU) to be used in the real application and a

real time simulator, where the traction converters, motors behavior and the train dynamics are simulated, generating all the needed signals and operation conditions. This way, it is possible to evaluate both the hardware and software performance of traction control unit as it would be on a train's real operation; allowing to force and simulate situations that would be very difficult to create in any other manner.

Hardware In The Loop will maximize software quality improvement, minimize defaults during commissioning of the traction system, will reduce time needed for system's validation and will be useful during commercial operation, to reproduce and analyze any situation on an effective way.



Predictive maintenance of railway infrastructures against climate change

In line with its commitment to innovation in the railway sector, COMSA leads the consortium of companies that has developed the RESILTRACK project to design a system that provides information on the state of railway infrastructure and how it is affected by adverse climatic phenomena.

It is a solution that provides real-time data and also forecasts the behaviour of the infrastructure in order to act where necessary, making it resilient to the effects of climate change.

The new maintenance techniques proposed by RESILTRACK take advantage

of the opportunities offered by new technologies, both in terms of real-time sensors and the collection, processing and integration of large amounts of data (Big Data and BIM), as well as advances in computational calculation that allow a wide range of simulations with predictive capabilities to be considered in decision-making.

The project, which started in 2017, has completed the industrial and experimental research stages, the development of the system for optimised maintenance of railway infrastructure and also several pilot tests. It is currently in its final phase and is one of the areas of innovation that COMSA Corporación intends to continue promoting.



Power & Automation

The Power of Adaptability

Train control systems

Traction systems

Train-land communication systems

Energy storage systems

LOCOMOTIVES

REGIONALS

SUBURBANS

TRAMS

METROS

HIGH SPEED



Vía en placa prefabricada sobre viaducto (foto y ejecución: ferroviaria).

VP slab track system

Throughout 2020, PRECON has carried out the manufacture of the precast concrete slabs of the VP SLAB TRACK system under the AFTRAV license. 1,212 slabs have been manufactured for the construction of 5,500 m of the Madrid-Galicia and Madrid-Asturias high-speed track.

The VP SLAB TRACK system is the first Spanish development of precast concrete slab track. Its design is based on the European slab track regulations and complies with the different technical specifications of ADIF. It can be adapted to be designed under different international regulations and a complete Risk Analysis of the system has been carried out. It allows the assembly of railway tracks in tunnels, embankments and viaducts, and is

PRECOM'S VP SLAB TRACK SYSTEM IS THE FIRST SPANISH DEVELOPMENT OF PRECAST CONCRETE SLAB TRACK.

available for UIC or 1668 gauge, as well as three rail dual gauge.

The slabs have been designed with prestressed reinforcement in both longitudinal and cross direction, allowing their installation where greater ground movements are expected and areas with high thermal gradients. An elastomer sheet is placed in the bottom surface to obtain the desired track rigidity, and the slabs are linked to the concrete base layer by injecting a high strength mortar on site. Repairment or replacement of the slabs in case of

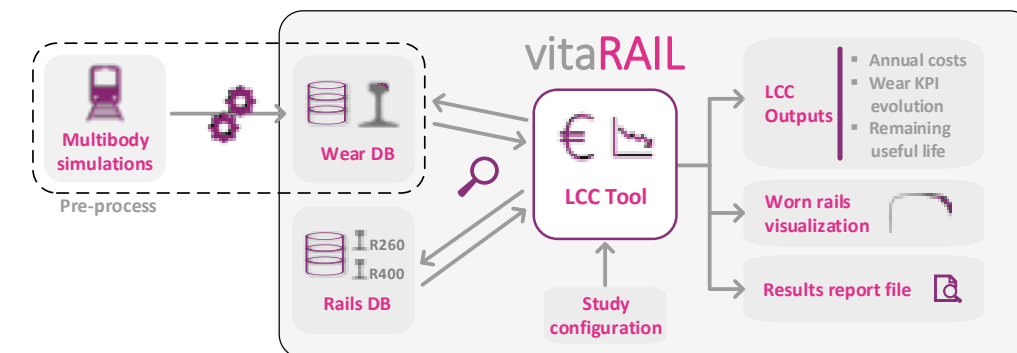
a platform failure is faster and easier than in other solutions using in situ concrete. The fastening system has a high capacity for regulation and, since it is an indirect baseplate fastening, can be adjusted without altering the clamping force of the clip.

This solution is compatible with other ballastless track developments and, combined with the transition to ballast track and the solution for cast-in-situ switches and crossings, allows to design a complete concrete slab track section.

vitaRAIL: life cycle optimisation of railway

The estimated costs at European level for the maintenance of rolling stock and railway infrastructure are around € 20,000M per year, of which those related to the rail correspond to approximately 10%-20% of that amount. Therefore, a correct management and optimization of the maintenance actions of the infrastructure, and more specifically of the rail, can suppose a huge amount of money. To achieve a correct predictive maintenance it is necessary to know how the components degrade over time to anticipate to failures.

vitaRAIL solution offers the railway infrastructure manager a tool to help predict rail wear and make decisions for the optimization of the life cycle cost (LCC) of one of the most critical components of the railway infras-



tructure, whilst maintaining the highest standards of safety and comfort.

vitaRAIL tool is capable, through a database of wear KPIs built using multibody simulations, of predicting the wear produced in a section of a line over time based on the characteristics of the layout and operation, such as the type and amount of traffic, straight or curved section, open-

rating speeds and tractive/braking efforts, presence of sand, different coefficients of adhesion, etc.

Finally, based on the costs and the configuration of the different inspection and maintenance actions, the tool provides the user with information on the annual costs, useful life of the rail and evolution of wear over time.



MAFEX Spanish Railway Association **2021**

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Banlight System

In evacuating people, safety begins with a continuous line of light



Focused on the field of emergency signaling and lighting in railway tunnels, road tunnels and wind towers, the business activity of Dinámicas de Seguridad S.L. prioritizes its commitment to new technologies in the execution of its projects and initiatives in pursuit of compliance with the highest safety standards regarding the evacuation of people in risk situations.

As a result of this commitment to new technologies applied to security, the Banlight System was born. This system consists of a handrail (or handrail) made of halogen-free fiberglass, illuminated with Led technology. Being designed to guide people to the tunnel evacuation galleries, it simultaneously performs the functions of railing and lighting the area.

Monitoring with triaxial inclinometer in the rail sector

This monitoring system is used especially in the railway sector because it allows extremely precise and real-time control of the deck during the injection of resin with limited expansion.

The Senceive triaxial inclinometers are installed on the extrados or in the middle of the cross beams using a special glue and without hindering regular railway traffic in any way. The inclinometers are interconnected with each other thanks to a wifi module and communicate the recorded data to a Flatmesh platform which the Uretex operator can access via computer or tablet. They are placed at regular intervals along the longitudinal profile of the tracks



and, by measuring the inclination of the three Cartesian axes, provide information about the longitudinal level, the transversal level, the trans-

versal level difference and the skew of the deck.

More info at www.uretek.es

Fibre-optic cables with a high performance against fire: CPR B2ca - s1a, d0, a1

Since 2017, all cables permanently installed on construction sites within the European Union have had to comply with the Construction Products Regulation (CPR, 305/2011). This regulation means that suppliers have to ensure the quality of their products in terms of performance against fire, and makes possible the CE marking on the cables. Furthermore, the technical specification for interoperability related to safety in railway tunnels requires minimum compliance with class B2ca - s1a, d2, a1 for all cables installed in tunnels in the European territory.

In our commitment to guaranteeing the highest quality of its products, CablesCom, a leading manufacturer of signalling and telecommuni-

CABLESCOM HAS ACHIEVED CERTIFICATION FOR FIBRE-OPTIC CABLES WITH EUROCLASS B2CA - S1A, D0, A1.

cations cables, has achieved certification for fibre-optic cables with Euroclass B2ca - s1a, d0, a1. These cables meet the requirements for installation in tunnels in the EU, with the maximum fire-safety guarantees.

This certification means that the fibre-optic cables have successfully passed the extreme tests that simulate fire situations, ensuring for example limited fire spreading, reduced heat emission and minimised

opaque and toxic fume emission. All this, under the supervision of Notified Bodies that monitor compliance with current regulations and CablesCom's production processes.

In order to serve the needs of all our customers, the B2ca - s1a, d0, a1 product range in CablesCom fibre-optic cables covers a wide range of fibre counts, from 4 to 288, with a design that facilitates cable installation via easy fibre-peeling.



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- ▶ Tectronic
- ▶ Tekniker
- ▶ Thales España Grp, S.A.U.
- ▶ TPF Getinsa Euroestudios, S.L.
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- ▶ Vicomtech
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studies

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- ▶ Talleres Zitrón
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- ▶ Inse Rail, S.L.
- ▶ Lantania
- ▶ Pretensados del Norte, S.L.
- ▶ Talleres Alegría, S.A.
- ▶ voestalpine Railway Systems JEZ SL

TRAFFIC CONTROL AND SIGNALLING
SYSTEMS, COMMUNICATION,
PASSENGER INFORMATION
AND TICKETING

Traffic control and signalling (safety)

- ▶ Alstom Transporte, S.A.
- ▶ Cables de Comunicaciones Zaragoza, S.L.
- ▶ Caf Signalling, S.L.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ CEIT
- ▶ Duagon Iberia, S.L.
- ▶ Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- ▶ Electrosistemas Bach, S.A.
- ▶ Ikusi S.L.U.
- ▶ Indra Sistemas, S.A.
- ▶ Inse Rail, S.L.
- ▶ Luznor Desarrollos Electrónicos, S.L.
- ▶ Revenga Ingenieros S.A:
- ▶ Segula Technologies España, S.A.U.
- ▶ Semi - Sociedad Española de Montajes Industriales, S.A.
- ▶ Sice Tecnología y Sistemas
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Tecnivial S.A.
- ▶ Tectronic, S.A.
- ▶ Telice, S.A.
- ▶ Thales España Grp, S.A.U.
- ▶ voestalpine Railway Systems JEZ S.L.

Protection (security) and infrastructure
monitoring

- ▶ Alstom Transporte, S.A.
- ▶ Azvi S.A.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Comsa Corporación
- ▶ Dsaf-Dinamicas De Seguridad, S.L.
- ▶ Indra Sistemas, S.A.
- ▶ Inse Rail, S.L.

- ▶ Mainrail S.L.
- ▶ Segula Technologies España, S.A.U.
- ▶ Semi- Sociedad Española de Montajes Industriales, S.A.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Telice, S.A.
- ▶ Thales España Grp, S.A.U.
- ▶ Vicomtech

Systems and equipment for collection,
ticketing and access control

- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Calmell, S.A.
- ▶ Comsa Corporación
- ▶ Gmv Sistemas, S.A.U.
- ▶ Ikusi S.L.U.
- ▶ Indra Sistemas, S.A.
- ▶ Inse Rail, S.L.
- ▶ Revenga Ingenieros S.A.
- ▶ Semi- Sociedad Española de Montajes Industriales, S.A.
- ▶ Sener Ingeniería y Sistemas, S.A.
- ▶ Sice Tecnología y Sistemas
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Telice, S.A.
- ▶ Vicomtech

Communications

- ▶ Azvi S.A.
- ▶ Cables de Comunicaciones Zaragoza, S.L.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ CEIT
- ▶ Comsa Corporación
- ▶ Duagon Iberia, S.L..
- ▶ Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- ▶ Gmv Sistemas, S.A.U.
- ▶ Ikusi S.L.U.
- ▶ Indra Sistemas, S.A.
- ▶ Inse Rail, S.L.
- ▶ Revenga Ingenieros S.A:
- ▶ Semi - Sociedad Española de Montajes Industriales, S.A.
- ▶ Sener Ingeniería y Sistemas, S.A.
- ▶ Sice Tecnología y Sistemas
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Tectronic, S.A.U.
- ▶ Telice, S.A.
- ▶ Thales España Grp, S.A.U.
- ▶ Vicomtech

Passenger information and on-board
entertainment systems

- ▶ Alstom Transporte, S.A.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Duagon Iberia, S.L..
- ▶ Gmv Sistemas, S.A.U.
- ▶ Icon Multimedia, S.L.
- ▶ Indra Sistemas, S.A.
- ▶ Inserail, S.L.
- ▶ Ikusi S.L.U.

- ▶ Revenga Ingenieros S.A.
- ▶ Sice Tecnología y Sistemas, S.A.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Tecnivial S.A.
- ▶ Telice, S.A.
- ▶ Vicomtech

ROLLING STOCK MANUFACTURERS

High Speed trains (over than 250km/H)
M.R para tráfico de pasajeros alta
velocidad (más de 250km/H)

- ▶ Alstom Transporte, S.A.
- ▶ Ariño Duglass, S.A.
- ▶ Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- ▶ Patentes Talgo, S.L.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Zeleros

Long distance and regional passengers
trains (up to 250km/H)

- ▶ Alstom Transporte, S.A.
- ▶ Ariño Duglass, S.A.
- ▶ Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- ▶ Patentes Talgo, S.L.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Stadler Rail Valencia, S.A.U.

Urban and suburban trains

- ▶ Alstom Transporte, S.A.
- ▶ Ariño Duglass, S.A.
- ▶ Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- ▶ Patentes Talgo, S.L.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Stadler Rail Valencia S.A.U.

Freight wagons and Locomotives

- ▶ Alstom Transporte, S.A.
- ▶ Ariño Duglass, S.A.
- ▶ Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- ▶ Patentes Talgo, S.L.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Stadler Rail Valencia, S.A.U.
- ▶ Talleres Alegría, S.A.
- ▶ Zeleros

Vehicles for infrastructure maintenance

- ▶ Alstom Transporte, S.A.
- ▶ Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- ▶ Patentes Talgo, S.L.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Talleres Alegría, S.A.

MANUFACTURERS OF VEHICLE
COMPONENTS, AUXILIARY
EQUIPMENT AND SYSTEMS

Traction and propulsion components

- ▶ Aimen Centro Tecnológico
- ▶ Alstom Transporte, S.A.
- ▶ Artech (Electrotécnica Artech Smart Grid, S.L.

- Caf Power & Automation, S.L.U.
- Flexix, S.A.
- Ingeniería Viesca S.L.
- Ingeteam Power Technology, S.A.
- Mgn Transformaciones del Caucho, S.A.
- Siemens Rail Automation, S.A.U.
- Zeleros

Control, auxiliary and diagnostic systems

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Artech (Electrotécnica Artech Smart Grid, S.L.)
- Caf Power & Automation, S.L.U.
- CEIT
- Duagon Iberia, S.L..
- Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- Gmv Sistemas, S.A.U.
- Hispacold S.A.
- Ibérica Tecnología en Sistemas de Seguridad Ferroviarios S.L. (ITSS)
- Indra Sistemas, S.A.
- Ingeniería Viesca S.L.
- Ingeteam Power Technology, S.A.
- Kimua Group
- NGRT S.L.
- NRF España, S.A.
- Stadler Rail Valencia, S.A.U.
- Zeleros

Assembly equipment

- Agui S.A.
- Aimen Centro Tecnológico
- Artech (Electrotécnica Artech Smart Grid, S.L.)
- Danobat, S. COOP.
- Fundiciones del Estanda, S.A.
- Funor, S.A.

Mechanical components

- Agui S.A.
- Alstom Transporte, S.A.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- FEX, Fastening Excellence Center
- Flexix, S.A.
- Funor, S.A.
- Fundiciones del Estanda, S.A.
- Hispacold S.A.
- Mecanizaciones aeronáuticas, S.A.
- Metalocauchó, S.L.
- Mgn Transformaciones del Caucho, S.A.
- Stadler Rail Valencia, S.A.U.
- Talleres Alegría, S.A.
- Zeleros

Interiors

- Agui S.A.
- Ariño Duglass, S.A.
- Colway Ferroviaria, S.L. (Nexus Management)
- Flexix, S.A.
- FEX, Fastening Excellence Center
- Flanker Tech Solutions
- Fundación Gaiker

- Satys Interiors Railway Spain, S.A.

Safety

- Agui S.A.
- Alstom Transporte, S.A.
- Artech (Electrotécnica Artech Smart Grid, S.L.)
- Dsaf - Dinamicas de Seguridad, S.L.
- Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- FEX, Fastening Excellence Center
- Fundación Gaiker
- Indra Sistemas, S.A.
- Luznor Desarrollos Electrónicos, S.L.

**MAINTENANCE: EQUIPMENT,
MAINTENANCE SERVICES AND
REFURBISHMENT**

**Infrastructure and superstructure
maintenance**

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Amurrio Ferrocarril y Equipos, S.A.
- Azvi S.A.
- Caf Turnkey & Engineering, S.L.
- CEIT
- Comsa Corporación
- Mainrail S.L.
- Mieres Rail, S.A.
- Gantrex Spain
- Inserail, S.L.
- Ladictim
- Semi - Sociedad Española de Montajes Industriales, S.A.
- Smart Motors
- Uretek Soluciones Innovadoras, S.L.U.

Rolling Stock maintenance

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Artech (Electrotécnica Artech Smart Grid, S.L.)
- Azvi S.A.
- Caf - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Caf Turnkey & Engineering, S.L.
- Comsa Corporación
- Grupo Trigo
- Hispacold S.A.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.
- Talleres Alegría, S.A.
- Talleres Zitón

**Maintenance of traffic control and
signalling, communications, passenger
information and ticketing systems**

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Artech (Electrotécnica Artech Smart Grid, S.L.)
- Azvi S.A.

- Caf Signalling, S.L.
- Caf Turnkey & Engineering, S.L.
- Dsaf-Dinamicas de Seguridad, S.L.
- Electrosistemas Bach, S.A.
- Gmv Sistemas, S.A.U.
- Ibérica Tecnología en Sistemas de Seguridad Ferroviarios S.L. (ITSS)
- Ikusi SLU
- Indra Sistemas, S.A.
- Inserail, S.L.
- Luznor Desarrollos Electrónicos, S.L.
- Patentes Talgo, S.L.
- Semi - Sociedad Española de Montajes Industriales, S.A.
- Sice Tecnología y Sistemas, S.A.
- Siemens Rail Automation, S.A.U.
- Smart Motors
- Telice S.A.
- voestalpine Railway Systems JEZ S.L.

**Maintenance of traffic control and
signalling, communications, passenger
information and ticketing systems**

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Artech (Electrotécnica Artech Smart Grid, S.L.)
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Caf Power & Automation, S.L.U.
- Caf Turnkey & Engineering, S.L.
- Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- Gmv Sistemas, S.A.U.
- Géminis Lathes
- Grupo Trigo
- Hispacold S.A.
- Indra Sistemas, S.A.
- Ingeteam Power Technology, S.A.
- Kimua Group
- Mgn Transformaciones del Caucho, S.A.
- NGRT S.L.
- NRF España, S.A.
- Patentes Talgo, S.L.
- Satys Interiors Railway Spain SA
- Sice Tecnología y Sistemas
- Smart Motors
- Stadler Rail Valencia, S.A.U.

**Maintenance of systems, equipment and
vehicles components**

- Aimen Centro Tecnológico
- Alstom Transporte, S.A.
- Aquafrisch, S.L.
- Danobat, S. COOP.
- Electrosistemas Bach, S.A.
- Kimua Group
- Ingeniería Viesca S.L.
- Newtek Solidos S.L.
- Patentes Talgo, S.L.
- Tecnivial S.A.



AGUI S.A.

AGUI is a B2B subcontractor and manufacturer of complex integrated assemblies for OEMs. In recent years we have evolved from being a reactive subcontracting firm, adaptable to clients' needs, to become a subcontracting services partner, anticipating to market needs; innovation and continuous adaptation. AGUI currently provides services in more than 10 different sectors including lifts and railway, exporting production to more than 25 countries. Within the Railway sector, AGUI is certified in ISO-3438 and EN-15085, which positions us as a reference supplier for complex welded assemblies.

- Pol. Ind. Lintzirin-Gaina. Parcela B-1. 20180 Oiartzun - (GUIPÚZCOA)
- +34 943 335 811 / 663 775 753
- +34 943 552 066
- lm.gil@agui.com
- www.agui.com



**AMURRIO FERROCARRIL Y
EQUIPOS, S.A.**

Design, production, installation of turnouts, track devices, crossings. For all type of purpose. Metro, tram, regional, conventional, high speed, heavy haul, ports and industrial.

- Maskuribai, 10 01470 Amurrio (ÁLAVA)
- +34 945 891 600
- +34 945 892 480
- comercial@amufer.es
- www.amufer.es



AIMEN TECHNOLOGY CENTRE

We are an innovation & technology Centre specialized in materials and in advanced manufacturing technologies, especially joining technologies and laser technologies applied to materials processing and robotics. We develop R&D&I in collaboration with companies in the field of the technologies for industry 4.0, and we offer technological services to industry in the field of welding and corrosion engineering, manufacturing engineering, design and simulation and mechatronics; developing customized and integral technological solutions which respond to the needs of our clients and associated companies. Our accredited laboratories provide analysis and testing services, especially failure analysis and in-service behavior of industrial components.

- C/ Relva 27 A - Torneiros | 36410 O Porriño (PONTEVEDRA)
- +34 662 489 181
- aimen@aimen.es
- www.aimen.es



AQUAFRISCH, S.L.

More than 20 years of experience in the railway sector guarantee Aquafrisch as a manufacturer of train washing tunnels, bogies, WC extraction systems and other equipment for the maintenance of rolling stock in railway workshops. Our equipment is installed in more than 30 countries on 5 continents. Aquafrisch is also a reference in industrial water treatment, potabilization and purification. In Aquafrisch we take care of the design, manufacture, installation, commissioning, training and maintenance of the machines according to the customer's needs. Aquafrisch is certified in ISO9001:2015, ISO14001:2015 and OHSAS2007.

- Ignacio Zuloaga, 10 28522 Rivas Vaciamadrid (MADRID)
- +34 91 380 03 33
- jmartin@aquafrisch.com
- www.aquafrisch.com



ALSTOM SPAIN

As a promoter of sustainable mobility, Alstom offers a complete range of solutions (from high-speed trains to metros, tramways and e-buses), passenger solutions, customized services (maintenance, modernization), infrastructure, signalling and digital mobility solutions. The company recorded sales of €8,2 billion in the 2017/18 fiscal year. Alstom is present in over 60 countries and employs 38,900 people. In Spain Alstom employs around 2,000 people on 18 sites, including a rolling stock manufacturing site and 4 innovation centres where it runs R&D programmes for rolling stock and railway signalling, safety, security, digital mobility and services.

- Martínez Villergas, 49 - Edificio V - 28027 (MADRID)
- +34 91 334 58 00
- +34 91 334 58 01
- www.alstom.com



ARCELORMITTAL

ArcelorMittal, as the steel industry leader in product and process innovation, is fully geared to meet the future requirements of the rail industry. With rail production facilities in Spain, Poland, Luxembourg and USA offers a wide portfolio of rails for subways, trains, trams, light rails, crane rails, crossings and rail accessories. We are a specialist in rail for high-speed net, with over 1 million tons produced, and presence in infrastructure of over 30 countries, the high technologic quality allows participating in the more demanding tenders all over the world. ArcelorMittal has its own R&D Rail Excellence Centre for developing new products and processes.

- ArcelorMittal Asturias. Edif. de Energías, 2 pl. 33691 Gijón (ASTURIAS)
- +34 985 187 750
- rails.specialsections@arcelormittal.com
- https://rails.arcelormittal.com/

Ardanuy

ARDANUY INGENIERÍA, S.A.

Ardanuy Ingeniería, S.A. is an engineering consulting firm specialized in studies, projects, works management, safety engineering (ISA), operation / maintenance studies; and technical guidance for railways (high-speed, conventional, freights, metros, trams, cable cars), electrical engineering (sub-stations and high-voltage lines), roads (highways, freeways, BRT's, streets, etc.), buildings (architecture and facilities) and telecommunications.

The company was established in 1992 and is comprised of a permanent team of more than 200 professionals.

Ardanuy Ingeniería develops activities worldwide, in more than 60 countries in all 5 continents.

🚩 Avda. Europa, 34 28023 (MADRID)

☎ +34 91 799 45 00

☎ +34 91 799 45 01

✉ madrid@ardanuy.com

🌐 www.ardanuy.com



ARIÑO DUGLASS, S.A.

50 years' experience behind us as a company specialised in glass for architecture and railway. An extensive presence in the Spanish, European and world markets has enabled us to obtain the knowledge and know-how in order to offer the most technologically advanced products of high quality.

It is in our DNA to continuously research and develop technology that allows us to adopt the very latest manufacturing methods, resulting in business excellence and ongoing innovations. In partnership with a number of organisations and institutions, we collaborate, cooperate and lead different research projects.

🚩 Polígono Industrial Royales Bajos, S/N, La Puebla de Alfindén 50171, Zaragoza

☎ +34 634 860 681

☎ +34 976 455 085

✉ felix.fernandez@duglass.com

🌐 www.duglass.com



ARTECHE

The Artech Group is focused on offering equipment and solutions for the electricity and railway business worldwide. The expertise of more than 70 years manufacturing instrument transformers and electromechanical relays gives the client the assurance of a technological leader. With projects over more than 40 countries, our dedicated range of railway relays are designed to meet the highest standard requirements of the sector and its reliability and durability allow them to be used not only as general purpose relays, but also in all kind of safety functions, both for on-board and signalling applications making them suitable to be used in circuits requiring up to SIL-4 safety integrity level.

🚩 Derio Bidea, 28 48100 Mungia (VIZCAYA)

☎ +34 946 011 200

☎ +34 946 155 628

✉ marketing@arteche.com

🌐 www.arteche.com



CAF - CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, S.A.

CAF is one of the world leaders in the design and implementation of comprehensive transit systems. CAF provides comprehensive project and engineering management throughout all stages of the project including feasibility analysis and investigations, system design, civil work, signalling, electrification and other electromechanical systems, rolling stock supply and system operation and maintenance. In terms of rolling stock, CAF supplies and maintains high speed trains, regional and commuter trains, locomotives, metro units, trams and buses.

🚩 J.M. Iturrioz, 26 20200 Beasain (GUIPÚZCOA)

☎ +34 943 880 100

☎ +34 943 881 420

✉ caf@caf.net

🌐 www.caf.net



CAF POWER & AUTOMATION

CAF Power & Automation designs and develops electric traction systems, energy storage systems and control & communication, which guarantee adaptable reliable and committed solutions with transport. Our systems are modular and flexible and can be integrated both in new vehicles and in those in service or that need refurbishment. Traction systems; Energy Storage (GREENTECH) and Control & Communication (COSMOS). Railway systems modernisation and refurbishment: Equipment and components, system integration, installation, maintenance and guarantee. Railway system maintenance: Technical support, spare parts, training courses, test benches.

🚩 Mikeletegi, 58 - 2, Parque Tecnológico de San Sebastián (GUIPÚZCOA)

☎ +34 943 309 251

✉ info@cafpower.com

🌐 www.cafpower.com



CAF SIGNALLING, S.L

CAF Signalling, the technological subsidiary of the CAF Group, designs and provides Integral Signalling Solutions, both in Spain and abroad. The company has its own advanced technology products, both for onboard and wayside applications that make up the core of its integral solutions. As a result of a significant and growing effort in R&D&I, particularly in the area of critical safety systems, CAF Signalling promotes continuous innovation and customer focus.

CAF Signalling, boasts the Company's own in house engineering and expertise to take on "turn-key" railway signalling projects.

🚩 Avda. de la Industria, 51 28108 Alcobendas (MADRID)

☎ +34 91 789 27 50

☎ +34 91 661 37 51

✉ cabsignalling@cabsignalling.com

🌐 www.cabsignalling.com



AZVI

Azvi is the company which undertakes construction within Grupo Azvi. For over 100 years, Azvi has carried out a significant number of large scale civil engineering and building projects. Azvi has extended its activity to all construction areas in Europe, America and the Middle East, without losing sight of its origins and railway background. By applying principles of responsibility to the whole business sphere, seeking the creation of value, maintaining a strong commitment to all its stakeholders in all countries where it is present and investing in R&D Azvi continues constructing a company capable of facing the new challenges of an increasingly globalised market.

🚩 Almendralejo, 5. 41019 (SEVILLA) / Maudes, 51, 2º. 28003 (MADRID)

☎ +34 954 999 320 / +34 91 553 28 00

☎ +34 926 88 47 06

✉ azvicentro@azvi.es

🌐 www.azvi.es



BELGORAIL S.A.

Belgorail SA is a certification, inspection and safety evaluation entity for the guided transport sector, both conventional railways and subways and trams. We are an accredited body for the certification of interoperability (NoBo), national regulations (DeBo), safety evaluations under CENELEC standards (ISA) and under CE Regulations (AsBo). We are part of the Certifer Group, with a presence, in addition to Spain, in Belgium, France, the Netherlands, Germany, Austria, Italy, Sweden, Turkey, Algeria, Brazil, Australia, Vietnam, the United Arab Emirates and China.

🚩 Pº de la Castellana, 127 M 2º A 28046 (MADRID)

☎ +34 91 764 72 21 / 626 683 435

☎ +34 91 770 88 67

✉ info@belgorail.be

🌐 www.belgorail.es



CABLES DE COMUNICACIONES ZARAGOZA, S.L.

Cables de Comunicaciones is one of the main European companies dedicated to the design, manufacturing and commercialisation of telecommunication, signalling and optic fibre cables. Ever since its foundation in 1971, it has contributed to the development and extent of the telecommunications infrastructures. Railway companies from the main European countries entrust us with the manufacture of their cables. Among them, they stand out: Adif, SNCF, NetworkRail, Infrabel etc. Cablescom undertakes its activity in Zaragoza, in the Malpica industrial park, over a surface of 77,000 m2, which includes a production plant, offices and warehouses.

🚩 Polígono de Malpica, C/D, 83 50016 (ZARAGOZA)

☎ +34 976 729 900



✉ j.alzorriz@cablescom.com

🌐 www.cablescom.com



CAF TURNEY & ENGINEERING

CAF Turnkey & Engineering was created in 2007 with its head office in the Technological and Scientific Park of Biscay (Zamudio). It began its business in Integrated Engineering of Transport Services and in 2015, after merging with the company CMFS (Mexico), it increased its portfolio of services with the inclusion of EPC projects for both civil works and subsystems. Following solid and constant growth, the company currently has a workforce of 200 with offices in Zamudio, Madrid and Mexico, providing service to both companies within the CAF Group and national and international private and public customers.

🚩 Parque Científico y Tecnológico de Bizkaia, Laida Bidea, Ed. 205. 48170 Zamudio (VIZCAYA)

☎ +34 946 819 550

☎ +34 94 623 29 29

✉ comercial@cafte.com

🌐 www.cafte.com



CALMELL, S.A.

The Calmell Group is the leader in access control and identification, through its companies Calmell S.A., Affix S.L., Idoneum S.A., which are respectively engaged in producing the supports (tickets, cards, ...), developing specific software and hardware, personalization and security.

In the public transport sector it works for integrators and operators supplying any kind of support for ticketing and reader/writer systems.

With a strong international presence through its network of representatives and distributors, the Calmell Group is able to satisfy your needs on a global level.

🚩 Pol. Ind. Pla d'en Coll C/ Fresser, 12 C 08110 Montcada i Reixac (BARCELONA)

☎ +34 93 564 14 00



✉ dsala@calmell.net

🌐 www.calmell.net



CEIT

We are a Basque Technology Center founded by the University of Navarra, whose main objective is to develop applied R+D+i projects with companies to improve their competitiveness. We are part of BRTA (Basque Research & Technology Alliance), which includes 16 agents that constitute the Basque Network of Science, Technology and Innovation (RVCTI). We also participate in Shift2Rail Joint Undertaking as associated members.

We focus our R+D+i activity within the railway sector in the following topics: energy efficiency, maintenance, railway dynamics, component design and characterisation, embedded systems (SIL4), positioning, data intelligence.

🚩 Paseo Manuel Lardizábal 15, 200018 Donostia-San Sebastián (GUIPÚZCOA)

☎ +34 943 212 800

☎ +34 943 213 076

✉ ualvarado@ceit.es

🌐 www.ceit.es

**CETEST, S.L. Centro de Ensayos y Análisis**

Fully accredited ISO17025, CETEST is an experienced laboratory in railway vehicles and components testing. Its offering covers a wide variety of component test benches at their facilities as well as portable ones. CETEST provides a global on-track measurement deployment capacity. From validation and verification test in the development phase to product homologation and failure detection / root cause analysis in the after-sales operation, CETEST can assist you during the full lifecycle of your product. Their customers include passenger, freight and special track maintenance vehicle manufacturers, component suppliers, as well as Notified Bodies, engineering firms and authorities.

🚩 Lazkaibar, s/n Edif. CETEST 20200 Beasain (GUIPÚZCOA)
☎ +34 943 028 690

✉ emartinez@cetestgroup.com
🌐 www.cetestgroup.com

**CITEF**

CITEF (Railway Technology Research Centre) was created in 1997 as part of F2I2 (the Foundation for the Development of Industrial Innovation) for research, innovation, experimentation, study and teaching purposes within the railway knowledge area.

It is a non-profit organisation pursuing aims of general interest within any rail transport technology sector.

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**COLWAY FERROVIARIA, S.L.**

COLWAY FERROVIARIA S.L., a company belonging to the COLWAY Group, is specialized in the design, engineering, manufacture, installation and commissioning of turnkey railway interiors and toilet modules projects. Revamping of seats and floors for a significant improvement of the coaches, with a controlled investment, is included among its capabilities. Through the integrated management of modular supplies & systems, based on experience, research and innovation, satisfaction and expectations of railway constructors and Public Administrations are achieved. Its work is based on the application of strong values: commitment, professionalism, ethics and agility.

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🌐 http://colway-08.com/site/es

**DINÁMICAS DE SEGURIDAD, S.L.**

DSAF is a entrepreneurial society focused on the safety of the movement of people at risk. Committed to the new technologies applied to the design of signaling systems, prevention and emergency in safety, DSAF promotes the development of products that guarantee the highest grade of security according to the standards of type approval current in generalized risk societies such as global ones. The activity of DSAF focuses on these two major sectors: road / rail tunnels and wind towers.

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**DUAGON**

Duagon Iberia, a subsidiary of the Swiss group Duagon. We have been providing railway signalling engineering services for railway signalling companies such as railway signalling equipment and solutions for 12 years. We are 160 engineers with consolidated experience in the following areas: design and programming of electronic interlockings and track systems, control centers, systems engineering (CBTC, ERTMS) with an important software component, test & commissioning and commissioning on track and on-board equipment engineering. From Spain we collaborate in the R&D of duagon's products especially network & control, embedded software and computing on-board.

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**ENCLAVAMIENTOS Y SEÑALIZACIÓN FERROVIARIA ENYSE S.A.U.**

Enyse is a Signalling company belonging to the Industrial Services division of the ACS group. For Enyse, the success of their projects is based on a high level of adaptation to functional and operational needs of the various railways - flexibility is the key word. In an industry increasingly integrating technology standards, the required Reliability, Availability, Maintainability and Safety standards not only apply to system design level, but are the actual premises to properly implementing and commissioning turn-key Signalling projects.

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**COMSA**

COMSA is the company of COMSA Corporación specialised in railway infrastructures. Founded in 1891, the company provides a comprehensive service in the field of construction, maintenance, electrification and control and communication systems for high-speed and conventional lines, metros and tramways. In this business activity, it is leader in Spain, where has been involved in the carrying out of all high-speed lines, and has permanent operations in Argentina, Brazil, Croatia, Denmark, Mexico, Poland, Portugal and Uruguay. It has also taken part in a large number of projects in other markets such as Italy, the Philippines, Taiwan, Malaysia, India, etc.

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**CUNEXT COPPER INDUSTRIES**

Cunext in the way to continuous development has created the entire cable product range for overhead line electrification adapting at any speed from local transport to high speed line. Our modern technology together with a wide experience at cable and alloy manufacturing makes us the best partner for railway companies offering best product quality and service. Cunext Group locate production plants at strategic places such as Cordoba for copper products, Vitoria and Brescia for aluminium products.

🚩 Av. de la Fábrica, s/n 14005 (CÓRDOBA)
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**DANOBAT S.COOP.**

Specialised Machine Tools and production systems for railway industry offering technologically advanced solutions and services, including among others engineering, consultancy, which are fully adapted to clients' needs. DANOBAT focuses its activity in the supply of turnkey solutions for the manufacturing and maintenance of railways rolling stock, incorporating own leading technology products, together with those manufactured by specialised companies.

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**ELECTROSISTEMAS BACH, S.A.**

Electrans, established in Barcelona in 1977, has had a successful career path that turn it in an international relevant supplier in signalling, particularly in the field of level crossing protection solutions, railway and tramway signalling, detection systems and LED lighting, obtaining its products and solutions worldwide recognition.

Electrans' constant progress is motivated by the commitment to innovation, at the service of the adaptability of systems and products for the current needs of railway projects.

🚩 Calle de la Mar Mediterrània, 9 Pol. Ind. La Torre del Rector 08130 Santa Perpètua de Mogoda (BARCELONA)
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**FEX, FASTENING EXCELLENCE CENTER**

The creation of the Fastening Excellence Center association responds to the concern of several companies to promote the transformation and competitiveness of the bolted joint sector, going from being companies more focused on the day-to-day and manufacturing process, to companies that also direct their attention to the finished product and the market. Currently, we have 17 companies in the association, which intends to develop two lines of activity, one focused on internal activities for members, and the other open to the market offering services on demand. Many of the partner companies work the railway market and we have a table to deal with this sector specifically.

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**FLANKER TECH SOLUTIONS**

Flanker produces components in the field of wood and its derivatives (tablex, HPL, OSB, plywood), as well as in fibreglass, plastic or composites. We integrate CNC technology, stamping, assembly and painting, for roof, floor, boot, carpeting or side cladding applications, among others. We are present in the Railway, Automotive, Packaging and Laboratory Furniture sectors.

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✉ croma@flankertech.com
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**FLEXIX, S.A.**

FLEXIX, develops, manufactures worldwide since 1950 INJECTION and EXTRUSION RUBBER PARTS, rubber-metal, rubber-plastic, special elastomers and assemblies. We are part of the KÄCHEL-FLEXIX Group, with 2 plants in Germany, 1 in Spain and a warehouse in USA. For the RAILWAY SECTOR we produce mainly for infrastructures, absorption of vibrations under track, tie pads for sleepers, different range of stiffness (14-152 kN/mm). We provide development in geometries (FEM), materials, (conductivity, non-harmful gases...)

TYPE OF PARTS: Pads, Ducts, bellows, tubes, silent-blocks, joints, bumpers, axles, links, valves, bearings.

MIXTURES: NR, SBR, EPDM, CR, H/NBR, ECO, AEM, ACM, Silicone, FPM.

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**FORGING STEEL PRODUCTS, S.L.**

Manufacturing of machined and if needed painted forged components ready for assembly destined to the railway rolling stock manufacturers for chassis, brakes, clutches, hooks etc.

Barrio Arregui s/n 48340 Amorebieta-Etxano (VIZCAYA)

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**FUNDICIONES DEL ESTANDA, S.A.**

Since 1957 Estanda has been providing various sectors with steel castings. The half of all its activity is focused on the high-speed train brake discs manufacturing, being one of the first worldwide manufacturers, the other half is focused on a wide range of sectors such as the cement and mining industry, defence, off-shore, automotive industry, and bogie components for the railway equipment. Mostly low alloy steels, wear resistant steels, refractory steels, stainless steels and white irons are casted. With its 14.000 tonnes per year production capacity, Estanda manufactures from 10 to 2000 kgr. parts in all kinds of batch sizes, with 2.400 mm as its maximum part dimension.

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**GANTREX SPAIN, S.A.**

Gantrex is the global market leader in production, distribution installation and maintenance of high quality crane rail solutions. Gantrex products are used in many different applications and end-markets including ports, shipyards, steel mills, aluminium smelters, railway depots and heavy industries.

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**GEMINIS LATHES, S.A.**

Leaders in the development of horizontal and multiprocess lathes, and specialized in railway sector, where we are proud to support the manufacturers of trains and maintenance lines, among other agents in the value chain. We offer customized solutions with highly reliable machines for the maintenance of rolling stock. Our lathes are specialized in the machining of axles, axle-wheel set and wheels.

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**GLOBAL QUALITY ENGINEERING SER. UNA COMPAÑÍA DE TRIGO GROUP**

TRIGO Spain is a supplier of quality services and support in the supply chain in industrial sectors. Founded in 2001, it offers quality assurance services in products, maintenance, industrial means management and metrology with more than 600 quality professionals in Spain. TRIGO GROUP is present in 25 countries with a team of more than 10,000 professionals.

TRIGO Spain exports to the railway sector good practices of high added value developed in sectors such as aerospace and automotive.

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**FUNORSA**

Funorsa is a Steel casting foundry with more than 20 years in the railway sector. We are specialized in pieces of high responsibility as couplers, Pivots, connection rods and different parts of the bogies. We are able to cast low alloy, alloy and inox castings up to 1.300 kg with a capacity of 2.000 Tons per year.

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**GAIKER CENTRO TECNOLÓGICOS**

GAIKER Technology Centre, located in the Technological Park of Bizkaia, is devoted to the development of new technologies to be transferred to the industry. Since 1985, the Centre has carried more than 2,000 R&D Projects in the areas of Plastics and Composites, Environment and Recycling and Biotechnology. Besides, GAIKER offers to its customers Advanced Technological Services, Analysis and Tests and Technological Dissemination Services. GAIKER counts on 87 employees and was awarded in 2008 by the European Foundation for Quality Management (EFQM) with the "Prize Winner" for the best European organisation in "Management for Process and Facts".

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**GMV SISTEMAS S.A.U.**

GMV is a leading firm in the design, development, implementation and rollout of Intelligent Transportation Systems (ITS) guaranteeing compliance with the railway sector standards. Main products and services: On board units for location and communications, Fleet Management Systems, Fare Collection Systems, Passenger information systems, CCTV systems, PA & Intercom system, Systems for security reinforcement, Eco-driving systems, Software for planning and scheduling of services. Conceived for all railway modes (tram, metro, commuter train, long distance, high speed trains...)

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www.gmv.com

**HIERROS Y CARBONES, S.A.**

Since 1997 Hicasa is specialised in transformation, tailored cut, storage and distribution of railway tracks materials, all kinds of rails and railways accessories with a permanent stock of more than 3.500 MT.

In 2006 we have incorporated to our Group of companies a factory specialised in manufacturing light rails from 7 kg/m to 48 kg/m, manufacture according European and American Standard, Australian or South African together with other types of Standard (AREMA).

Our own experience allows us the optimal management of the supply chain, exporting to more than 30 countries all over the world.

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**ICON MULTIMEDIA, S.L.**

With over 25 years of experience, we have a extensive experience in the Digital Signage sector.

Our DENEVA Digital Signage platform is specially designed for high availability environments such as Smart Cities or as a powerful and comprehensive marketing tool for 'Smart Stations', guaranteeing a reliable and safe travelers and users experience.

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INGENIERÍA Y CONTROL FERROVIARIO, SAU

ICF offers technical and sustainable solutions for railway signalling. In this area, our vocation is betting heavily on the development and innovation, constantly releasing new products that can be used to improve and optimize existing technology solutions. All the level crossings since June 2001 have been protected by ICF with its level crossing protection system SPN-900. We are working worldwide with more than 1000 international references. For us it's very important to be sustainable so we have worked hard to design systems that reduces dramatically its power consumption which allows it to work taking its energy only from sun, getting a zero CO2 emissions and zero external power supply.

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IDOM CONSULTING, ENGINEERING AND ARCHITECTURE S.A.U

IDOM is one of the leading companies in the field of professional services in Engineering, Architecture and Consultancy. An independent company established in 1957 and it has participated in over 30.000 projects in five continents. In 25 countries with 42 offices. More than 3.500 staff possesses the expertise and experience to cover all the phases of a railway project (high speed, conventional, freight, metro, light rail, tramway, depot and workshops). From conception to commissioning and beyond and facing the challenges of an innovative, efficient and resilience Transport System. IDOM accompany the client by providing the correct technical assistance required for the decision making process.

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IKUSI, S.L.

Soluciones integrales a bordo y en tierra. En Ikusi desarrollamos soluciones integrales de movilidad inteligente que hacen posible la gestión y operación centralizada del material rodante desde tierra, al mismo tiempo que se aporta seguridad y confort a los pasajeros. Todo ello permite que planificadores, operadores y autoridades de transporte puedan visualizar la información de forma ordenada y sencilla y tomar las mejores decisiones para reducir los costes operativos en los servicios, coordinar de forma óptima los recursos y anticiparse a los problemas y tendencias futuras.

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INGETEAM POWER TECHNOLOGY, S.A.

Ingeteam es un grupo especializado en electrónica de potencia y de control, (inversores, convertidores de frecuencia, controladores y protecciones). Operamos en todo el mundo, empleando a 3.900 personas. Nuestra actividad está estructurada sobre la base del I+D. En el sector ferroviario, los convertidores de tracción INGETRAC se basan en la integración de módulos de potencia (BPM) ampliamente probados, e incluyen todos los elementos necesarios para cada aplicación.

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INSE RAIL S.L.

Inse Rail es una ingeniería altamente especializada en el sector ferroviario y en particular en sus instalaciones y sistemas. Fundada en 1994, está plenamente dedicada a la ingeniería, consultoría y project management en los sectores ferroviario, industrial, de energía y edificación, desarrollando su actividad en las diferentes etapas de planificación, diseño, construcción y explotación de las inversiones. Inse Rail participa en el desarrollo internacional de Alta Velocidad ferroviaria y transportes metropolitanos, con una profunda especialización en los sistemas de electrificación, señalización y seguridad, comunicaciones y demás instalaciones del transporte ferroviario.

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INTERNACIONAL HISPACOLD, S.A.

Hispacold, una empresa con más de 40 años de experiencia, líder a nivel mundial en sistemas de climatización y especializada en el confort de las personas. Hispacold diseña y fabrica soluciones HVAC para todo tipo de vehículos ferroviarios: tranvías, metros, EMUs, DMUs, LRV (trenes ligeros)... con soluciones tecnológicas probadas y fiables. Hispacold cuenta con los más reconocidos certificados internacionales de calidad, medio ambiente y seguridad: ISO 9001, ISO 14001, OSHAS 18001, EN 15805-2 y el prestigioso certificado IRIS ISO / TS 22163.

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INDRA

Indra es una de las principales compañías globales de tecnología y consultoría y el socio tecnológico para las operaciones clave de los negocios de sus clientes en todo el mundo. Es un proveedor líder mundial de soluciones propias en segmentos específicos de los mercados de Transporte y Defensa, y una empresa líder en consultoría de transformación digital y Tecnologías de la Información en España y Latinoamérica a través de su filial Minsait. Su modelo de negocio está basado en una oferta integral de productos propios, con un enfoque end-to-end, de alto valor y con un elevado componente de innovación. En el ejercicio 2018, Indra tuvo unos ingresos de 3.104 millones de euros, 43.000 empleados, presencia local en 46 países y operaciones comerciales en más de 140 países.

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INECO

Ingeniería y consultoría global referente en transporte que contribuye, desde hace más de 50 años, al desarrollo de infraestructuras de transporte en más de 50 países. Su alto grado de especialización técnica le ha permitido diversificar su actividad hacia nuevos mercados y afianzar aquellos en los que está presente. Su participación en toda la red ferroviaria española le ha servido para desarrollar importantes proyectos internacionales como la Alta Velocidad Meca-Medina, en Arabia Saudí, el proyecto HS2, en Reino Unido o el despliegue de ERTMS en Europa.

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INGENIERÍA VIESCA S.L.

En Ingeniería Viesca somos especialistas en diseño y fabricación de equipos electrónicos de potencia. Nuestros equipos operan satisfactoriamente en todos los continentes con alta fiabilidad y disponibilidad haciendo un uso eficiente de la energía disponible. Adaptamos nuestros productos a las necesidades y requisitos de cliente aplicando los estándares de calidad y normativas específicas que correspondan. Disponemos de medios de pruebas que permitan efectuar los protocolos que garanticen la funcionalidad esperada. Nuestra innovación está presente en nuestras soluciones: convertidores auxiliares de potencia, cargadores de baterías, arrancadores, ...

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IBÉRICA TECNOLOGIA EN SISTEMAS DE SEGURIDAD FERROVIARIOS SL (ITSS)

IBERICA TECNOLOGIA EN SISTEMAS DE SEGURIDAD FERROVIARIOS SL (ITSS), fundada en 2005, es una empresa con sedes en Sagunto (Valencia) y en Madrid. Se centra principalmente en detectores de cajas calientes / frenos agarrados y detectores de impacto vertical. Los sistemas de ITSS utilizan tecnología de infrarrojos y fibra óptica de última generación. El sistema PEGASUS DCC/DFA monitorea las temperaturas de las cajas de grasa y de los frenos de los vagones. El sistema AGUILA DIV utiliza sensores de fibra óptica para detectar ruedas descentradas y planos, y puede informar el peso del tren. Los productos ITSS son un modelo de combinación perfecta de experiencia e innovación.

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KIMUA ENGINEERING, S.L.

Kimua designs and produces different types of auxiliary tools for lifting, transporting, assembling and doing maintenance of rolling stock and its components during any stage of the Railway value chain. Additionally, Kimua has added 2 new business units to its portfolio; one for providing renting services of standard solutions and a second one for providing its clients with specific training courses in areas like handling and lashing of big and large loads.

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LA FARGA YOUR-COPPERSOLUTIONS, S.A.

La Farga is able to produce all the range of railway products in an integrated process. Our railway range includes all alloys used, the different measures of grooved contact wire and all supporting and electricity supply elements, feeders, hangers and cables. Furthermore, we offer technical visits and assessment to our clients and we constantly develop new railway products with the aim of introducing the best copper solutions into the market. La Farga is a family-run metallurgical company, with more than 210 years of history. We produce semi-finished copper products and their alloys for several technological sectors.

🚩 Colònia Lacambra, s/n, 08508, Les Masies de Voltregà (BARCELONA)

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**LADICIM - UNIVERSIDAD DE CANTABRIA**

LADICIM participates in R&D projects focused on the innovation of the railway superstructure, carrying out studies on the development of its elements, acc to national (Adif), European (EN) and American (AREMA) reference standards. The results are reflected in more than 500 reports, 25 research papers with a high impact index and 7 Doctoral Theses. The projects include collaborations in countries such as the USA, Canada, Saudi Arabia, Turkey, Germany, Senegal, Tanzania, Morocco or Ethiopia. LADICIM has implemented a quality system according to the UNE-EN ISO/IEC 17025 standard, being accredited by ENAC (Spanish Accreditation Board) for the testing of fastenings, sleepers and rail welds.

🚩 E.T.S. Ing de Caminos, Canales y Puertos
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**LANDER SIMULATION & TRAINING SOLUTIONS**

Lander Simulation & Training Solutions, S.A. specialises in designing, developing and implementing cutting-edge commercial simulation devices for training purposes.

On the basic premise of preventing accidents and loss of human life, Lander works with each customer to build training simulators which meet the specific needs of each operation. Lander was incorporated in 2002, and now operates in more than 20 countries across all 5 continents. Its solutions cover the entire range of railway operations - suburban trains, long-distance units, high-speed trains, freight, monorail systems, metros or light rail..

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**LANTANIA**

Lantania specializes in the construction of heavy civil works (roads, highways, dams, water treatment plants, maritime works, railways and airports), building construction and energy projects. The company began its activity in 2018 with the acquisition of the construction, energy and services business units of the Isolux Corsán Group and the subsequent purchase of the Velasco Group in 2019. One of the differential characteristics of Lantania is its ability to execute any kind of rail project in an integral way. The company has built more than 150 km of infrastructure, tunnels and railway viaducts, as well as more than 50 traction power substations and more than 1,500 km of overhead line..

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**METALOCAUCHO, S.L. (MTC)**

MTC, being part of Wabtec Corporation, designs and manufacture rubber-metal components for suspension and vibration control systems used on railway, automotive and industrial applications. With headquarters in Spain, MTC has 4 production facilities in 1) Spain, 2) China, 3) India and 4) USA, which offers to customers the possibility to localize production in any of these countries. Thanks to a wide commercial presence in any country of the world, MTC gives local support to develop projects for both OE and Aftermarket business.

Our main products are related to Primary Suspensions, Secondary Air Springs, Bushings, Buffers, Layer Springs, Subassemblies, Elastic Wheels, etc.

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**MGN TRANSFORMACIONES DEL CAUCHO, S.A.**

MGN was established in 1957 and since then it has been developing its activity both designing and manufacturing rubber-metal components, mainly for the railway industry. MGN invests in research and innovation as a basis for the development of elements to be adapted in the new understanding of passenger and freight trains, taking the latest technological advances of the rubber world, vibration control and damping systems. - Primary and secondary suspensions. - Conical springs - Bushes and spherical bearings - Rods, Bogie subsystems - Pivot Bushes - Elastic Supports - Compression buffer and Draw Gear springs - Bellows, Gangway protections - Profiles, o-rings and seals.

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🌐 www.mgncaucho.com

**MIERES RAIL S.A.**

Design, manufacturing and supply of turnout systems, and their components, for Metro, classic or conventional lines, industrial and heavy haul or High Speed up to 350 km/h.

Design, manufacturing and supply of casted manganese steel crossings. Trimetallic flash butt welding.

Insulated glued joints, transition rails, fastening systems, locking systems, wear measuring devices.

🚩 Polígono Industrial Fábrica de Mieres, s/n 33600 Mieres (ASTURIAS)
☎ +34 985 456 331
☎ +34 985 456 164
✉ mieresrail@mieresrail.com
🌐 www.mieresrail.com

**LUZNOR DESARROLLOS ELECTRONICOS, S.L.**

LUZNOR is a company specialized in the design and manufacture of professional torches, emergency lighting and other electronic security devices. LUZNOR puts at your disposal highly qualified technicians, a high quality standard, efficient development, manufacturing and control systems and, above all, a philosophy of commitment to clients that allows LUZNOR to offer innovative products with advanced technology and recognised prestige.

🚩 Paduleta 47 - Pol. Ind. Jundiz Vitoria (ÁLAVA)
☎ +34 945 200 961
☎ +34 945 200 971
✉ iarbeloa@luznor.com
🌐 www.luznor.com

**MAINRAIL S.L.**

MainRail is a high-tech startup devoted to providing IT-based solutions to help you digitizing and optimizing the railway infrastructure maintenance operations.

We combine our expertise in a wide range of technologies (e.g. big data analysis and visualization, digital twins, IoT, machine learning, etc.) with a solid knowledge in railway maintenance and operations. Our solutions are based in a customizable IT platform (MainRailMT) for the management of all maintenance-related operations and a family of IoT devices (MainRailID) for a continuous and cost-effective inspection of your infrastructure.

🚩 Paseo Manuel Lardizabal, 15, Donostia/san Sebastian, 20018, (GUIPÚZCOA)
☎ +34 662 574 768
✉ jorge.rodriguez@mainrailsolutions.com
🌐 www.mainrailsolutions.com/

**MECANIZACIONES AERONÁUTICAS, S.A.**

MASA is specialised in manufacturing medium and large structural parts in aluminum and hard metal alloys.

We are able to provide a complete finished part to our customers (from the raw material purchasing to the treated and equipped part).

🚩 Avenida del Ebro, 33 Pol. Ind. El Sequero - 26150 Agoncillo (LA RIOJA)
☎ +34 669 540 962
☎ 1
✉ christelle@masatpa.aero
🌐 www.masa.aero

**NEXT GENERATION RAIL TECHNOLOGIES, S.L. (NGRT)**

NGRT S.L. is a company focusing on railway safety, working with railway regulators and helping infrastructure managers and train operators secure their infrastructure and operations. NGRT's products are designed to detect any anomalies that occur in the railway infrastructure.

The NGRT applications will detect rolling stock, independent of speed, direction and track conditions at any location, in all weather conditions, as well as anomalies impacting on the railway infrastructure.

🚩 C/ Severo Ochoa, 9 29590 Campanillas (MÁLAGA)
☎ +34 650 100 801
✉ info@ngrt.com
🌐 www.ngrt.com

**NEWTEK SOLIDOS, S.L.**

NEWTEK is mainly active in the manufacture of systems for filling sand in trams, trains and locomotives. NEWTEK supplies installations composed of storage silos, fixed sand feeders, sand feeding mobile units, aspiration systems and dust collection devices. The company also designs, manufactures and maintains custom installations according to the needs of each client.

🚩 Pol. J Mª Korta, Parcela A1 - 20750 Zumaia (GUIPÚZCOA)
☎ +34 943 835 942
✉ anajera@newteksolidos.com
🌐 www.newteksolidos.com

**NRF**

Since 1927 NRF is a leading manufacturer and supplier of cooling products for the automotive market, industrial, railway and marine sector. NRF is known for the production of high quality radiators, but also produces and supplies a large range of other engine cooling and air conditioning products. NRF has global engineering, testing and development facilities. Railway and ship manufacturers, large retailers of vehicle parts, radiator shops and specialists in more than 80 countries worldwide daily rely on NRF's high quality products.

🚩 Av. Asegra, 22, 18210 Peligros (GRANADA)
☎ +34 958 405 030
✉ a.lara@nrf.eu
🌐 www.nrf.eu

**PARRÓS OBRAS, S.L.**

Family business with over 25 years experience in civil construction and iron and steel industry for the railway sector. Parros Group which is specialized in pile driving and catenary foundations, has implemented the 80% of the foundations of the entire Spanish High Speed Network. Whether conventional railway network or Highspeed Railway (AVE), PARROS GROUP is distinguished by the versatility of our machines adapted "Ad hoc" for auxiliary civil works from the railway, with automatic switching to the three Spanish gauges. Also innovative is our implementing system of noise barriers from the railway track and its foundations. Generic activities of building and general construction.

🚩 Ctra. Virgen del Monte, 1 13260
Bolaños de Calatrava (CIUDAD REAL)
☎ +34 926 88 47 05
☎ +34 926 88 47 06
✉ rocio@parros.es
🌐 www.parros.es

**PATENTES TALGO, S.L.U.**

Talgo is a Spanish company with more than 70 years of experience, specialized in designing and manufacturing trains, maintenance equipment as well as providing maintenance services to railway operators worldwide. Today, Talgo is the leading global reference for Spanish High Speed Technology and the number one player in Spain's railway market. Due to Talgo's successful expansion strategy and its globally acclaimed products, the company has become truly international. Its key success factors are innovation, unique technology, sustainability, safety, competitiveness and tailor-made projects with clear focus on customer. Talgo trains are internationally recognized as the best in their category.

🚩 Pº del tren Talgo, 2 28209 Las Matas
(MADRID)
☎ +34 91 631 38 00
✉ marketing@talgo.com
🌐 talgo.com

**PREFABRICACIONES Y CONTRATAS, S.A.U. (PRECON)**

PRECON is the Spanish leader in design and supply of precast concrete products for railway tracks, either ballast and ballastless tracks. It has supplied monoblock, twinblock, block slabs and sleeper for switches and crossings, Either for high speed, conventional lines, haul, subways and tramways.

🚩 Espronceda, 38 (Local 3) 28003
(MADRID)
☎ +34 91 343 03 48
☎ +34 91 359 12 46
✉ fsanchez@precon.cemolins.es
🌐 www.preconsa.es

**SEGULA TECHNOLOGIES**

SEGULA Technologies is an engineering group with a global presence, helping boost competitiveness within all of the major industrial sectors: automotive, aerospace, energy, rail, naval and defense, pharmaceutical and oil & gas. Present in 30 countries and with 140 offices worldwide, the Group fosters a close relationship with its customers thanks to the expertise of its 12,000 employees. A leading engineering specialist placing innovation at the heart of its strategy, Segula Technologies conducts large-scale projects, ranging from studies to industrialisation and production.

🚩 Av. Bruselas 8 Oficina 8
01003 Vitoria-Gasteiz (ÁLAVA)
☎ +34 678 771 259
✉ jmartin@segula.es
🌐 www.segula.es

**SOCIEDAD ESPAÑOLA DE MONTAJES INDUSTRIALES, S.A.**

Activities in 2018/2019: *Execution of Works and maintenance SS/EE traction and autotransformer centers associated with, for the section: Plasencia-Badajoz in the High Speed railway Madrid-Extremadura. *Electrification, safety installations and telecommunications of Medina del Campo – Salamanca – Fuentes de Oñoro Line, in section Salamanca – Fuentes de Oñoro.
*New SS/EE traction in Parets del Vallès at the p.k. 20/285 of Barcelona-French border line.
Innovations in 2018: Design and development of a new overhead contact line C-200, powered to 25 kV and versatile in their different sections.

🚩 Av. de Manoteras, 6 2º Pl.
28050 (MADRID)
☎ +34 91 308 93 35
☎ +34 91 701 77 71
✉ ferrocarril@semi.es
🌐 www.gruposemi.com

**SENER INGENIERÍA Y SISTEMAS, S.A.**

SENER is one of the leading engineering and technology groups in Europe with over one billion euros of annual turnover, more than 2,000 professionals and a continuously growing international presence with offices in over 15 countries. In the field of railway engineering, Sener counts on an extensive experience in metros, light rail trains systems and tramways, conventional railway line, freight transport and High Speed Lines. SENER's activities range from preliminary, conceptual and feasibility studies, basic and detailed engineering to project management services, supervision of works, value engineering and ICE services.

🚩 Av. de Zugazarte, 56 48930 Getxo
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🌐 www.ingenieriaconstruccion.sener

**PRETENSADOS DEL NORTE, S.L.**

PRETENSADOS DEL NORTE, is one of the most important producers of pre-stresses steel in the word. Our products are recognised for having the best quality on the market. Our high standards of quality mean that we are talking about the best pre-stresses steel you can find. Our company has more than 30 years' experience in manufacturing and investment that have led to what we are today: PRETENORTE. Technologically, we have equipped our company in Vitoria-Gasteiz with the best state-of-the-art machinery. We continue to incorporate the latest novelties for your complete satisfaction. Pretenorte is highly specialised in pre-stressed steel and its many applications.

🚩 Miravalles, 4 Zona Indus. de Betoño
01013 (VITORIA)
☎ +34 945 258 431
☎ +34 945 261 400
✉ pretenorte@pretenorte.com
🌐 www.pretenorte.com

**REVENGA SMART SOLUTIONS**

Revenge Smart Solutions offers comprehensive solutions for the transport sector: railways and metros, roads, ports & airports. In railways & metros we focus on passenger experience solutions, ranging from intercomms, public address and information panels, to systems related with revenue/cost issues, like ticketing, tolling and access control, and also with operator oriented solutions like railway telephony, signalling (level crossings, point heaters and inspection systems) and station control. More than 45 years of experience. Projects deployed in 24 countries.

🚩 Fragua, 6
28760 Tres Cantos (MADRID)
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☎ +34 91 804 19 55
✉ marketing@revenga.com
🌐 www.revenga.com

**SATYS INTERIORS RAILWAY SPAIN**

Satys is a Spanish company specializing in the design and manufacture of galley systems for railway rolling stock.

A galley system is broken down into 3 main families of equipment:

- Refrigerated cabinets
- Functional systems. Cooling, electricity, water, lighting, etc.
- Interiors. Countertops, lining, etc.

Satys offers a wide range of products specifically for each one. Thanks to the unique and highly efficient Satys technology, our products are internationally recognized as the best in their class in terms of quality, safety, availability, reliability, accessibility and environmental friendliness.

🚩 Isla de Jamaica, 8 28034 (MADRID)
☎ +34 91 334 15 90
☎ +34 91 358 05 64
✉ mvega@satys.com
🌐 www.satys.com

**SGS GROUP SPAIN**

SGS is the world's leading inspection, verification, testing and certification company. We are recognized as the global benchmark for quality and integrity. With more than 97,000 employees, we operate a network of more than 2,600 offices and laboratories around the world.

Our core services can be divided into four categories: Certification, Inspection, Testing and Verification.

We are constantly looking beyond customers' and society's expectations in order to deliver market leading services wherever they are needed. Our independent services add significant value to our customers' operations and ensure business sustainability.

🚩 C/ Trespaderna, 29, 3º Edificio
Barajas I, 28042 - MADRID
☎ +34 913 138 000 / +34 607 845 281
✉ maha.salemsoliman@sgs.com
🌐 www.sgs.com

**SICE TECNOLOGÍA Y SISTEMAS, S.A. (SICE TYS)**

SICE Tecnología y Sistemas, (SICE TYS) is a group of companies that provides solutions and systems for Transport and Traffic, Environment and Energy efficiency, Smartcities and Telecommunications. SICE TYS, as systems integrator, offers technological solutions adapted to the railways sector, conceiving a centralized management with functionalities oriented to the operation of public and private transport, integrating: - Security Systems - Telecommunications Systems - Signaling (Interlockings, Level Crossings, CTC) (ENYSE) - Automatic Fare Collection - Traffic Prioritization of Public Transport - Engineering (OFITECO): railway lines; Tunnel monitoring; Load test (railways bridges).

🚩 La Granja, 72-Pol. Ind. Alcobendas
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☎ +34 91 623 22 00
☎ +34 91 623 22 01
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🌐 www.sice.com

**SIEMENS MOBILITY, SLU**

Siemens Mobility is a separately managed company of Siemens AG. As a leader in transport solutions for more than 160 years, Siemens Mobility is constantly innovating its portfolio in its core areas of rolling stock, rail automation and electrification, turnkey systems, intelligent traffic systems as well as related services. With digitalization, Siemens Mobility is enabling mobility operators worldwide to make infrastructure intelligent, increase value sustainably over the entire lifecycle, enhance passenger experience and guarantee availability.

🚩 Ronda de Europa, 5
28760 Tres Cantos (MADRID)
☎ +34 91 514 88 87
✉
🌐 www.siemens.es/siemens-mobility

**SMART MOTORS**

Smart Motors(R) applies new technologies to generate added value from the monitoring of critical railway assets that believe that Digitalization and the uses of advanced analytics are the way to service excellence. The priority is to generate new knowledge about the operation of railway assets that satisfies the requirements of the most demanding environments and with a real day to day contribution.

smart motors(r) has its own Digitalization Platform to help maintenance and operation that brings together signaling monitoring systems, infrastructure and rolling stock, as well as IoT sensors adapted to the railway sector.

🚩 **Torroella de Montgrí 17-19, 08027 (BARCELONA)**

☎ +34 675 220 603



✉ info@smartmotors.org

🌐 smartmotors.org

**STADLER RAIL VALENCIA, S.A.U.**

International rail vehicle construction company, Stadler, is headquartered in Bussnang in Eastern Switzerland. Founded in 1942, it has a workforce of over 8,500 based in various production and over 40 service locations. Stadler provides a comprehensive range of products in the heavy and urban transport segments: High-speed trains, intercity trains, regional and commuter heavy rail trains, underground trains, tram trains and trams. Stadler also manufactures main-line locomotives, shunting locomotives and passenger carriages, including the most powerful diesel-electric locomotive in Europe. It is the world's leading manufacturer in the rack-and-pinion rail vehicle industry.

🚩 **Pol. Ind. del Mediterráneo Mitjera, 6 46550 Albuixech (VALENCIA)**

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☎ +34 961 415 002

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🌐 www.stadlerail.com



Talleres Alegría, s.a.

TALLERES ALEGRÍA, S.A.

Talleres Alegría, s.a. is a family owned company devoted since 1900 to design, manufacturing and after sales assistance of all kind of fixed track material, its accessories and spare parts. Developing of Designing and Commissioning Integral projects of turnouts to be installed at Depots and Industrial Ports and Factories. Design, manufacturing, repair and maintenance of self propelled vehicles to carry out works at the infrastructure. Design, manufacturing, retrofitting, repair and maintenance of freight wagons.

🚩 **Peña Santa, 7 - Pol. Ind. Silvota 33192, Llanera (ASTURIAS)**

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☎ +34 985 266 011

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🌐 www.talegria.com

**TELTRONIC**

Backed by over 40 years of experience in the design, manufacturing, and deployment of Professional mobile radio projects on a turnkey basis, Teltronic presents a broad portfolio of critical communication solutions for transport sector, providing complete solutions: network infrastructure, control centre, and end-user equipment, including specialized onboard systems specifically designed for train, metro, tram and LTR. Besides voice and data transmission solutions, the company offers integration services with other subsystems: PA and intercom, applications to manage and control fleets and for operating aid, real time CCTV or communications support for signalling systems ETCS, CBTC, PTC...

🚩 **Pol. Malpica, C/F Oeste 50016 (ZARAGOZA)**

☎ +34 976 465 656

☎ +34 976 465 720

✉ fsanjuan@teltronic.es

🌐 www.teltronic.es

**THALES ESPAÑA GRP S.A.U.**

Thales is a World leader in Mission Critical Solutions for Land Transportation. Thales Spain, with more than 60 years of experience, has been pioneer and leader in the technological development of the Spanish railways, being one of the main suppliers of safety and telecommunication systems for the Spanish Railways Administrations and present in countries as Turkey, Mexico, Algeria, Malaysia and Morocco. Its activity goes from the development, manufacturing installation, commissioning to the maintenance of equipments and systems for railway signalling, train control, Telecommunication, Supervision ticketing and critical infrastructures security.

🚩 **Serrano Galvache, 56 Edif Álamo 28033 (MADRID)**

☎ +34 91 273 7200



✉ jose.villalpando@thalesgroup.com

🌐 www.thalesgroup.com

**TPF GETINSA EUROESTUDIOS, S.L.**

Passion for excellence

Our priority : developing solutions that meet our client needs. This approach is based on three pillars: expertise, efficiency and continuous innovation.

Today, TPF is ranked among the most important multidisciplinary companies active in the following sectors: building, transport infrastructure, water and energy.

Over the years, the group successively expanded in Europe, Asia, Africa and America through a series of acquisitions and became a key player, internationally recognized in its field.

🚩 **Ramón de Aguinaga, 8 28028 (MADRID)**

☎ +34 91 418 21 10

☎ +34 91 418 21 12

✉ internacional@tpfingenieria.com

🌐 www.tpfingenieria.com

**TECNIVIAL, S.A.**

In TECNIVIAL we specialize in all types of fixed signalling for track (Marker Boards), conventional lines and High Speed lines. We are one of the companies approved by the Spanish Railway Infrastructure Administrator (Adif) and the others. The last product boosted to the market have been the NANOTEC SIGNS (R+D). The incorporation of cutting-edge materials (carbon nanoparticles) to the signs manufacturing , allows the improvement of its behavior and mechanical features: light, corrosion-free, low residual value and maintenance, eco-friendly, resistant to loads (snow/ wind). Besides, we develop Corporate Image projects according to the needs of the customer; design & installation.

🚩 **Livorno, 19004 (GUADALAJARA)**

☎ +34 639 101 699

☎ +34 949 252 080

✉ export@tecnivial.es

🌐 www.tecnivial.es

**TEKNIKER**

R&D center oriented to technology transfer through research projects.

Specialization areas:

- Advanced manufacturing: laser processes, LMD coating and repair, cutting processes

- Surface engineering: friction and wear studies, physical-chemical coatings seeking to improve anti-corrosion, wear, easy cleaning, anti-adherence, optical and aesthetic characteristics

- ICTs: solutions for inspection and measurement based on vision and AI techniques, O&M, condition monitoring, data management, Smart components, sensor development

- Product engineering: new product development, tribological testing, fault diagnosis.

🚩 **Iñaki Goenaga, 5, 20600 Eibar (GIPUZKOA)**

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🌐 www.tekniker.es

**TELICE, S.A**

Telice is an international company, with more than 45 years of experience in different markets related to cutting-edge technology and standing out in the railway market. Its activity covers the design, installation and maintenance of railway electrification systems, safety and railway signalling, electrical substations, civil engineering projects, industrial electricity, fibre optic installation, industrial automation and safety systems in tunnels, underground and mining projects. Due to its wide expertise, Telice has become preference collaborator for the main railway administrations. Telice has international presence in Norway, United Kingdom, Portugal, Peru, Chile and Brazil.

🚩 **Anabel Segura 11, Edif. A, 3ª Pl. Oficina B 28108 Alcobendas (MADRID)**

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**TYPESA**

Founded in 1966, TYPESA is a leading consulting engineering group in the fields of transport, buildings, water, environment, energy and rural development. We have a long-standing relationship with public, private and institutional clients in the Americas, Europe, Africa, Asia and the Middle East, assisting them in the development of infrastructure, energy and city projects from concept to completion. In addition to providing world-class engineering services, TYPESA has extensive experience in building the capacity of local firms and in strengthening institutions to guarantee the sustainability of the infrastructure.

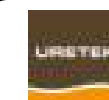
🚩 **Gomera 9, San Sebastián de los Reyes 28703 (MADRID)**

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**URETEK SOLUCIONES INNOVADORAS, S.L.U**

We are the inventors of consolidation with Expansive Resins. Our patented technologies are the most used in the world, with more than 100,000 interventions carried out. Our high technology, the quality of the interventions and more than 30 years of experience, we have become the reference for the consolidation of land with injections of expansive resin to be able to provide multiple solutions to your problems. We are committed to repairing structures without interfering with life and activities, in particular we use unique and patented innovative technologies that are fast and conservative.

🚩 **Príncipe de Vergara, 1261º F - (28002) -MADRID**

☎ +34 900 809 933



✉ uretek@uretek.es

🌐 www.uretek.es

**VALDEPINTO, S.L.**

Valdepinto, S.L. was established in 1986 and focuses its activities in the Railway sector.

We have four main product lines:

- All types of machining (specialists in electrical insulation).

- Screen printing, Signs and Engraving low-relief.

- Metal transformation and welding.

- Design and fabrication of transformers and coils of high/low voltage. Our philosophy is to always offer all our clients an unbeatable value for Money, combined with an excellent service.

🚩 **C/ Águilas, 9 - Nave 11 28320 Valdepinto (MADRID)**

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**VICOMTECH**

Vicomtech is an applied research centre specialising in Artificial Intelligence, working on technological solutions based on Computer Vision, Data Analytics, Computer Graphics, Advanced Media Technologies and Language Technologies. It aims at meeting the innovation requirements of the local companies and institutions to face new economic and social challenges, and improving their competitiveness in a global market. The transfer mechanism for this research is the creation of R+D+i projects geared to companies' needs. Furthermore, the centre works intensively on cooperation projects, through cooperative technology development promotion schemes at local, national and international level.

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 🌐 www.vicomtech.org

**VIRTUALMECH**

Virtualmech comprises a highly specialized technical team that has extensive knowledge on the different sectors of the industry, such as railway and solar thermal energy industries. The unique Selling Proposition is offering our clients real results to difficult problems, always adapted to their specific issues. We achieve these results thanks to data gathering through simulation or experimental measurements that we offer to our clients so they can make effective decision based on objective criteria.

📍 C/ Arquitectura, 1 PL10, Mod.13-14, 41015 (SEVILLA)
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 ✉ info@virtualmech.com
 🌐 www.virtualmech.com

**voestalpine Railway Systems JEZ SL**

We are committed to the designing, manufacturing, supplying and maintenance of all types of manganese steel switches and railway track systems for railways and tramways, in addition to moulded cast steel parts for the general industry. Our Technical Department (Department R&D) ensures we have the capability of designing and producing points and crossings (turnouts, crossovers, scissor crossovers and diamond crossings) or parts for them, such as hard steel manganese crossings, spare tongues... as well as the generation of patents.

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 🌐 www.jez.es

**WSP SPAIN**

As one of the world's leading professional services firms, WSP provides engineering and design services to clients in the Transportation & Infrastructure, Property & Buildings, Environment, Power & Energy, Resources and Industry sectors, as well as offering strategic advisory services. Our experts include engineers, advisors, technicians, scientists, architects, planners, surveyors and environmental specialists, as well as other design, program and construction management professionals. With approximately 49,000 talented people globally, we are uniquely positioned to deliver successful and sustainable projects, wherever our clients need us.

📍 Albert Einstein 6, 39011 Santander, (CANTABRIA)
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 ☎ +34 942 274 613
 ✉ Mario.Perez@wsp.com
 🌐 www.wsp.com/es-ES

**ZELEROS**

Zeleros is the Spanish company developing a hyperloop transport system, already considered as "the fifth means of transport". Its focus on the vehicle optimization allows to reduce infrastructure costs and to operate at safer pressures for the passengers. Zeleros has already raised substantial private and public support, and collaborates with companies such as Renfe (Trenlab) and Altran, research centers (Universitat Politècnica de València, CIEMAT, UPM) and is supported by investors such as Plug and Play, Angels or ClimateKIC. Currently Zeleros is preparing the construction of its own 2-kilometer test-track in Sagunto to demonstrate the system at high speed.

📍 Muelle de la Aduana s/n, Edificio Lanzadera 46024 (VALENCIA)
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 ✉ info@zeleros.com
 🌐 www.zeleros.com

**ZITRON, S.A.**

ZITRON is a world-wide leading company in designing, manufacturing, commissioning and maintenance complete ventilation systems for metro and tunnels. ZITRON has the world's biggest aerodynamic test bench, certified by AMCA, for testing fans at full load and 100 % speed. ZITRON's extensive reference list includes more than 500 metro and tunnel projects. The latest and more significant ones are Crossrail in London and Doha Metro. Experience and know-how, providing innovative and tailor-made solutions, are our most appreciated values. The global growing market of ZITRON's fans, along with the high level of satisfaction of the Clients is the best mark of its equipment and services quality.

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 ☎ +34 985 168 047
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 🌐 www.zitron.com



TRANS
BUSES
SIGNALLING
COMPONENTS
SERVICES
TRANSPORT SYSTEMS

We're prepared, with an acute vision... This is our way of looking at global transport. This is our way of designing, developing, manufacturing, installing and integrating all the parts that make up an inter-connected mobility system. We do it your way, adapting to your needs and preferences, making it sustainable, safe and comfortable for the people and cities of the future all around the world.

Your Way
TO FUTURE MOBILITY

Photo: Kaohsiung Tramway System - CAF Tramway Project



ArcelorMittal

XCarbTM

Towards carbon neutral steel

At the forefront of Rails Solutions

ArcelorMittal Rails & Special Sections has rail production facilities in Poland, Luxembourg and Spain that offer a wide portfolio of products, covering rails for subways, trams, trains, light rails, crane rails, crossings and rail accessories. The company is a specialist in rails for high-speed rail networks, with over one million tonnes produced and is present in infrastructure projects in over 30 countries. Its high technologic quality allows ArcelorMittal to participate in the more demanding tenders all over the world.

ArcelorMittal's main trending topics for railway:

- **RailCor®** a new range of Corrosion Resistant Rails: a completely new range of corrosion resistant rails available in 4 specific solutions to meet the most demanding customer requirements.
- **Climate Action: XCarbTM** will bring ArcelorMittal's reduced, low and zero-carbon products, steelmaking activities, wider initiatives and green innovation projects, into a single effort focused on achieving carbon neutral steelmaking.
- **R&D:** ArcelorMittal operates a dedicated rail research and development unit which includes pilot plants and prototyping facilities. Its Rail Excellence Centre also includes a dedicated welding unit which can provide advice and support for current and future grades for its customers.
- **Digitalisation:** ArcelorMittal Rails & Special Sections is extending its 4.0 transformation with the launch of several digital tools. New Rail Tool available.
- **Increasing the length of rails:** in order to provide further track safety, welding, track laying and maintenance cost savings.
- **Increasing the service life of rails:** with the most appropriate solution related to different applications; LCV (Low Carbon Vanadium) for tramway or new hardness grades for heavy haul rails.

rails.arcelormittal.com



New ArcelorMittal rails calculation tool
Available now for download
in your app store