

RAIL DE- REGULATION

Europe is moving towards a new model
in its supply of railway services



MAFEX REPORTS

Adif and Mafex sign a collaboration agreement to boost the internationalisation and innovation of the Spanish railway industry



MAFEX REPORTS

The association publishes a positioning note about "The impact of Coronavirus on the Spanish Rail Industry"



INNOVATION

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MAFEX

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THE ASSOCIATION PUBLISHES A POSITIONING NOTE ABOUT "THE IMPACT OF CORONAVIRUS ON THE SPANISH RAIL INDUSTRY"

Mafex requests the implementation of policies which allow, in a sustained and planned manner over time, to favor business activity, and therefore employment, through support for innovation, internationalization and skills generation, which can only be accomplished through either the maintenance or the increase in investment in rail transport and mobility.

NEW MAFEX MEMBERS

Mafex continues to grow with the recent incorporation of twelve new members. The Association adds with these memberships a total of 92 companies that represent all the sub-sectors of a solid industry and that forges its path around the world.

DEUTSCHE BAHN (DB) CHALLENGE SESSION ORGANIZED BY MAFEX TO BOOST R&D COLLABORATION IN THE RAILWAY SECTOR

An initiative launched by Mafex competitiveness committee that seeks to raise awareness about the innovative activity of partner companies.

RENEWAL OF THE MAFEX INTERNATIONAL AND COMMUNICATION COMMITTEES

Last January Mafex constituted the new intake of member companies of the committees of international and communication for the next two years.

SPANISH RAILWAY COMPANIES SEEK TO EXPAND THEIR INTERNATIONAL PORTFOLIO IN THE MIDDLE EAST

Mafex organized the Spanish group participation, for the fifth consecutive year, in the "Middle East Rail" fair and congress that took place on 25th and 26th February in Dubai, which is the largest event in the railway sector in the Middle East, North Africa, South and Central Asia.

THE SPANISH RAILWAY INDUSTRY WAS PRESENT AT THE XIX EDITION OF THE EXPORAIL CONGRESS

Mafex coordinated the participation of the Spanish railway industry in the XIX edition of the Exporail Congress, which took place from 11th to 13th February 2020 in Cancun.

MAFEX STEERING COMMITTEE HOLDS ROUND OF STRATEGIC MEETINGS IN BRUSSELS

The objective was to gain an in-depth understanding of the progress that the European Commission and other stakeholders and public entities are making in areas such as sustainability, investment in infrastructure, innovation and trade, in order to convey their vision and concerns about them.

USER PROTOTYPING EXPERIENCE WORKSHOP ORGANIZED BY MAFEX

The purpose of the session was to learn, through a practical approach, about the importance of the user experience when designing a product.

ADIF AND MAFEX SIGN A COLLABORATION AGREEMENT TO BOOST THE INTERNATIONALISATION AND INNOVATION OF THE SPANISH RAILWAY INDUSTRY

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BOOSTING WORKPLACE INNOVATION IN THE RAILWAY SECTOR WITH THE SUPPORT OF THE H2020 RAILACTIVATION PROJECT

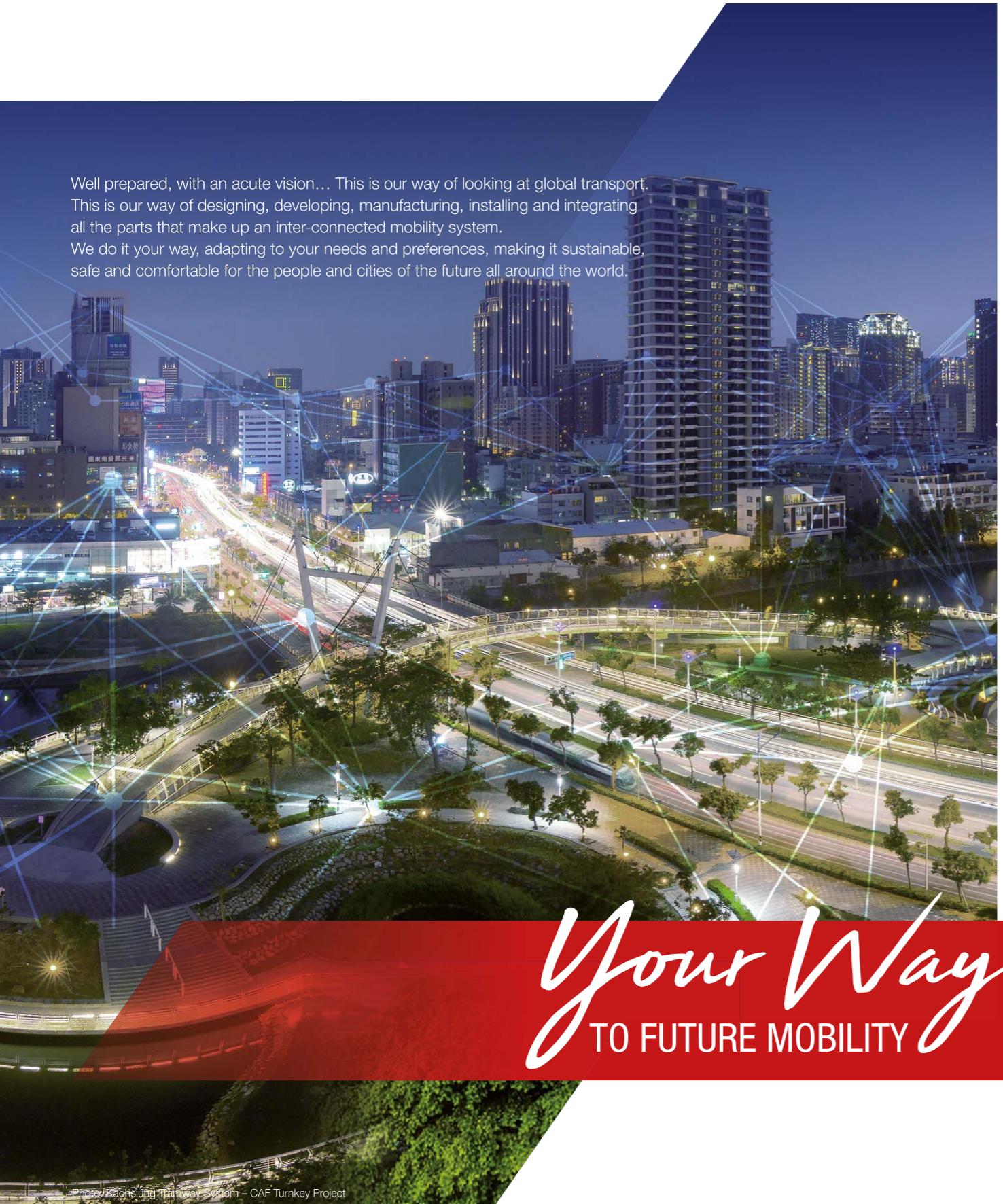
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MAFEX MEMBERS PRESENT THEIR LATEST ADVANCES

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Well 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 Turnkey Project

Dear Friends,

We are going through a moment of exceptional circumstances in the world. In this unprecedented situation, society, and therefore the railway sector as well, has seen the normal functioning of global economic and industrial activity interrupted to cope with COVID-19.

Given the scale of this pandemic, all partner companies have responded decisively and quickly to protect their professionals and to help cover requests for protective and diverse equipment for health workers. The firmness of your attitude is a feature of a sector very committed to the environment in which it works and with a great ability to respond. On behalf of Mafex we express our deep gratitude for the role played and the solidarity of your collaboration.

Once the current health care context has been overcome, it will be very important to respond to the challenges of the new economic situation. In the face of a change of scenery such as the current one, joining and working together become more necessary than ever. Within Mafex, aware of the importance of our representative role and protecting shared interests, we began from the outset to work on a note of concrete measures for the Spanish railway industry.

We believe that specific support is needed for a sector with a strong presence abroad. The re-establishment of economic activity and employment should be encouraged as well as to continue with the boost of R&D. In addition, it is essential to redesign the internationalization strategy, with the creation of financial instruments to support and promote the competitiveness of our companies. This objective requires close collaboration of all public bodies involved (Ministries of Economy, Finance, Foreign Affairs, OCI, etc.) and the industry, which is why at Mafex we have put ourselves at your disposal.

For this reason, we have called for immediate adoption of initiatives that alleviate the paralysis of business and industrial activity. We also encourage the implementation of policies that allow, in a sustained and planned way over time, to promote the operation of companies in the sector, and therefore employment. All this based on a policy of conservation or increase in investment in transport and railway mobility.

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 Mobility, Stadler Rail Valencia, Thales España, TPF Getinsa Euroestudios y Zitron. **ADMINISTRATION:** comunicacion@mafex.es. **ADVERTISING:** comunicacion@mafex.es

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Position Paper. The impact of Coronavirus on the Spanish Rail Industry

On March 14th, the Government of Spain declared, in a Cabinet meeting and for the second time in the history of democracy in the country, the State of Alarm. This decision was a direct consequence of the health emergency situation triggered by the spread of the COVID-19 virus.

Spain is not the only country in the world in this situation. After China, affected since December 2019, and the declaration of a global pandemic by the WHO (World Health Organization), many of our European neighbors have adopted the same measure. The US, Latin America, Asia, the Near East and the Middle East, Australia and New Zealand are also being hit by the virus.

The confinement of the population, imposed to try to stop the expansion of COVID-19, has led to the de facto paralysis of almost all economic and industrial activity. This circumstance has been aggravated since March 28 by the tightening of mobility restrictions by limiting activity to essential sectors (primary, health, food distribution, etc.) until, in principle, April 10th.

Our members had acted accordingly and, to guarantee the health of their employees, they had already taken measures such as teleworking, applied to 80% of their workforce, and implementing the corresponding hygiene and safety protocols in their production units, closed since March 30th.

At the same time, Public Administrations have adopted other measures which are proving to be very detrimental to our business sector, such as the halt of contracting procedures

THE ASSOCIATION PUBLISHES A POSITIONING NOTE ABOUT "THE IMPACT OF CORONAVIRUS ON THE SPANISH RAIL INDUSTRY" MAFEX REQUESTS THE IMPLEMENTATION OF POLICIES WHICH ALLOW, IN A SUSTAINED AND PLANNED MANNER OVER TIME, TO FAVOR BUSINESS ACTIVITY, AND THEREFORE EMPLOYMENT, THROUGH SUPPORT FOR INNOVATION, INTERNATIONALIZATION AND SKILLS GENERATION, WHICH CAN ONLY BE ACCOMPLISHED THROUGH EITHER THE MAINTENANCE OR THE INCREASE IN INVESTMENT IN RAIL TRANSPORT AND MOBILITY.

and the execution of projects, which is generating greater uncertainty, as it is also impossible to clearly measure the duration of this global pandemic.

Proposed measures

In a sector like Rail, so strategic and at the same time dependent on public investment, if appropriate measures are not taken this crisis can have very serious consequences. Therefore, we propose as necessary:

- Firstly, to generate a direct and coordinated dialogue at all levels - Government, Unions, Sector and Business Associations must work hand in hand.

- Request European institutions to promote investment in rail infrastructure and R&D. Considering that the European Commission has proposed 2021 to be the "European Year of Rail", this consideration makes even more sense.

- No paralyzing public tenders, ongoing contracting procedures or projects under execution - once these weeks of minimum activity are over, and following the example of other countries, both ongoing and upcoming procedures and contracts should be not only accelerated, but also investments planned for the coming years advanced to 2020 with the idea of returning to normality as soon as possible, and causing

the least economic damage to our companies, allowing them to recover from this debacle as soon as possible.

- Advance of collections and deferment of payments - it is essential for the survival of rail industry, and especially for SMEs (60% of our Association), the deferment (not waiver) of payment of the corresponding obligations / debts with the Social Security Administration, different Tax Agencies, etc. This measure will be more effective if it is accompanied by the mobilization of Public Administrations to expedite pending payments of the same nature, as well as those derived from any contractual relationship with the industry. In these critical moments, maintaining financial liquidity is a key aspect.

- Non-application of penalty clauses in case of non-compliance with delivery deadlines and possibility of renegotiating contracts. This condition mainly applies to clients from third countries. From Mafex we want to convey to the Government the need to issue an official certificate which comes to enforce the exceptional situation of force majeure that we are undergoing, and which will allow companies to allege this circumstance to justify any delay derived from production limitations.
- Early adoption of measures to stop the increase in unemployment and the loss of talent.

We, the Spanish rail industry, would also like to show our concern about:

- Restrictions to exports and investment, the total or partial closure of borders and the negative effects of these protectionist measures on the normal functioning of global and regional supply chains.
- The new economic situation resulting from the current blockade.

Conclusion

Mafex fully respects the economic support measures in which the Spanish Government is working and which reinforce the Economic Shock Plan launched on March 10. However, we ask for major political effort in preparing and coordinating actions that protect the economy and the industry, preventing us from suffering a much-feared setback.

Thus, once this health crisis is overcome, special attention must be paid to the restoration of employment and the adoption of measures aimed at mitigating the upcoming economic damage. This can only be achieved through the early implementation of specific set of ambitious actions aimed at the restoration of the country's economic activity and workforce.

This consideration is set to be framed within the current context of urgency in speeding up administrative procedures and reducing bureaucracy to achieve the necessary agility and avoid delays which worsen the financial environment of our companies.

In this sense, we must highlight that the Spanish railway sector owes its success and global leadership to last decades' investment in the national market. We therefore insist on the need to resume, as quickly as possible, the existing investment plans in railway infrastructures to help our industry return to the path of development and employment, and try to minimize the impact of the current crisis.

At the same time, we believe it is essential to redesign the Government's internationalization strategy, mainly by creating effective and flexible financial instruments (preferably non-refundable) to help

us promote the competitiveness of our companies. Such ambitious goal can only be achieved through a very close collaboration between all the public agencies involved (Ministries of Economy, Finance, Foreign Affairs, ICO, etc.) and industry. It is also fundamental to insist on the fact that international promotion is totally paralyzed, which is creating even more uncertainty on whether these strategic activities will be resumed in the medium term, since they are an indispensable tool for any company.

To sum up, we also want to share our concern that the current crisis must not at any time serve as an excuse to reduce the Government and sector commitment to innovation.

Today more than ever, and once the emergency situation is overcome, we would like to request the immediate adoption of measures that alleviate the paralysis of our industrial activity. We also urge the implementation of policies which allow, in a sustained and planned manner over time, to favor business activity, and therefore employment, through support for innovation, internationalization and skills generation, which can only be accomplished through either the maintenance or the increase in investment in rail transport and mobility. ↗

www.mafex.es



New Mafex members

Mafex continues to grow with the recent incorporation of twelve new partners. This is the new members:



AGUI

We are a family business based in the Basque Country, north of Spain, with more than 40 years of experience and we are specialized in the manufacture of welded assemblies for OEMs. We support our clients through all the stages of the product life cycle: From product design, contributing our knowledge in process engineering and welding, taking ISO-3834 and EN-15085 standards as a reference, up to the industrialization of the product and its serial manufacturing.

Among our strengths, we could highlight the following



- Development and management of the entire supply chain.
- Application of LEAN methodologies focusing on customer needs.
- Parameterizable product.



COLIN BUCHANAN CONSULTORES

Buchanan is an international Transport Planning consultancy established in Spain in 2007, but which origins date back to the innovative study "Traffic in Towns", conducted in the UK by a team of researchers led by Sir Colin Buchanan in 1963, on urban mobility in the society of the future.



In railways, Buchanan provides expert advice on pedestrian and crowd simulation studies at metro & rail stations, modal interchanges, rolling stock (boarding & alighting studies), using the leading pedestrian simulation soft-

ware, LEGION (Bentley Systems Ltd.) of which Buchanan is the only global accredited distributor. Our main clients are rail operators, public and private administrations, railway engineering firms and rolling stock manufacturers.



CEIT

CEIT is a Basque technology center, founded in 1982 by the University of Navarra, and member of BRTA network (Basque Research and Technology Alliance). Its main mission consists on developing industrial projects by using applied research in order to improve the competitiveness of companies, as well as transferring both technology and young researchers into the industry.

CEIT has a 30 plus years of experience in the railway sector, focusing its activities in the following fields:

- Energy efficiency



- Railway Dynamics
- Predictive maintenance and CBM
- Big data analysis and AI
- Component and elastic elements characterization
- Signaling and embedded systems
- Positioning and navigation



DOMINION

Dominion is a global provider of multi-technical services and specialized engineering projects. It combines know-how, technology and innovation to make its customers' processes more efficient.

Dominion provides railway transportation organizations with end to end solutions in networks, telephony, intercom, video surveillance, public address systems, passenger information systems, technical control rooms, DPCs and telecontrol solutions; integrated in control centers. Our deep knowledge of the key technologies for Digitalization like IOT, Cloud Computing, Big Data Analytics,



Computer Vision or Artificial Intelligence makes Dominion the perfect partner for the railway systems of the future.



ENYSE

Enyse is a Signalling company belonging to the Industrial Services division of the ACS group.

ACS Industrial Services is making a determined push in the railway sector, where Spain is an active international player. To this effect, it has taken Enyse under its direct realm, making strong investments in both human resources and technical developments. Within this context, Enyse has moved its headquarters and factory to a new venue in Alcobendas, Madrid.

Enyse's human capital, track record and relationship with the ACS railway companies make it capable of offering



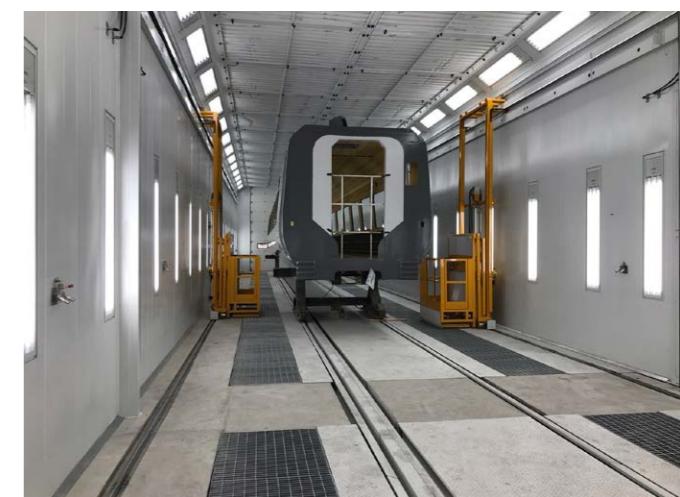
a wide range of systems and services including Signalling but also power, telecoms or the maintenance of all electromechanical systems along any type of railway line.



EQUIPOS LAGOS

Equipos Lagos is a Spanish company expert in the design of processes and products for surface treatment (sanding, metallic coating, painting, drying, polishing, etc.). It conceive turnkey solution, tailored to the reality of the plant and process requirements of the client.

Founded in 1982 it is now a leading company with its own know-how capable of developing large projects in any industrial sector. More than 14.000 installations and 26 distributors around the world supports the company expansion. On the railway sector Equipos Lagos works side by side



with renown international companies such as Alstom, SNCF, Bombardier, Samsung, Renfe, etc.

lantania_®

GRUPO LANTANIA

The Lantania Group focuses its activity on the construction of roads, railway infrastructure, building projects, water and energy. One of the differential characteristics of the company is its capacity to execute any type of railway project in an integral way.

The company has built more than 150 km of railway infrastructure, tunnels and viaducts, as well as more than 50 traction substations and more than 1,500 km of catenary. Lantania has a team of professionals with an average experience of more than 22 years in the sector and with the technical means of a machinery park with more than 1.200 references.



NRF

The new strategic vision of NRF has positioned its Granada plant as a new center for development and manufacturing of refrigeration units for the railway sector. This office works daily with the technology center in the Netherlands, supporting international projects and becoming a benchmark within the Spanish market. NRF manufacturing technology and expertise are at the forefront of the industry.

Our mission as NRF Spain is to spread, throughout the peninsula, the quality and service that our colleagues already provide in the Netherlands and central Europe.



Furthermore, offering a maintenance and replacement service for those installed units that require it.



ROSNI

ROSNI S.L., has the necessary capabilities to manufacture, repair and provide design on railway elements of significant dimensions, considered basic in structures and equipment.

In addition, ROSNI SL, is considered autonomous, as an important base in the manufacturing, both in the configuration of mechanical welding, as well as in machining, shot blasting, priming and painting, in addition to having the capacity to provide the corresponding quality documentation, both in intermediate phases. productive as a



finished part through three-dimensional control certificates, welding, painting, in addition to others that may be required.



SCHNEIDER

As experts in energy efficiency and automation solutions, we help railway segment to maximize energy and resources.

From the control center to the overhead line, we provide end to end smart urban and inter-urban rail mobility solutions, connecting field to enterprise.

Ensure safety, sustainability, reliability and uptime with the most complete energy management solutions for Traction Power, Distribution Power, Signaling Power and overhead equipment. Avoid unplanned outages, or recover quickly if they occur, with the widest range of connected power distribution equipment, power control,



secure power, and related analytics for enhanced decision-making by ensuring efficiency from the design up to the systems end of life cycle.



TEKNIKER

Tekniker is a private nonprofit Research Center, whose corporate purpose is focused on the development of applied research activities aimed at improving the competitiveness of companies through technology transfer.

With extensive experience in the development of applied research projects in various sectors such as machinery and capital goods, infrastructure, renewable energy, aeronautics, automotive, agri-food, health ... for which there are different solutions related to the development of mechatronic systems, industrial maintenance, automation and industrial robotics, functional surfaces, inspection and measurement, sensor development.



INGENIERÍA VIESCA

Ingeniería Viesca was born with the purpose of expanding the options available in the railways Power Electronics market in Spain. Since 2005 when we started our activity we have been facing, step by step, new technical challenges and innovations that have been reflected in the evolution of our solutions.

Today we customize our proposals to the specific requirements of the project, adapting voltages, powers, frames, ... and we offer on board and workshop equipment (auxiliary power converters, battery chargers, power supplies, reactive or inductive loads, ...) with high performance and high reliability.



Deutsche Bahn (DB) challenge session organized by Mafex to boost R&D collaboration in the railway sector



AN INITIATIVE LAUNCHED BY MAFEX COMPETITIVENESS COMMITTEE THAT SEEKS TO RAISE AWARENESS ABOUT THE INNOVATIVE ACTIVITY OF PARTNER COMPANIES.

The head office of the Spanish Railway Association (Mafex) hosted a delegation of 9 people from Deutsche Bahn's innovation area on 27th January. Pedro Fortea, Managing Director of Mafex, officially opened the session, accompanied by Dr. Tobias Fischer – Head of Technology TecLab.

Through such initiatives launched by its Competitiveness Committee, Mafex seeks to raise awareness about the innovative activity of partner companies, offering solutions to the challenges posed by Deutsche Bahn (DB) which in January signed a contract with the German Government for the modernization and renewal of the country's rail network with an investment of 86 billion euros.

Its main objective was to raise awareness about the activity that DB carries out in the field of innovation. Dr. Tobias Fischer highlighted that progress in the railway sector is based on our efforts. To this end, DB defined the strategic areas in which they are working.

The session focused mainly on the area that innovation aims to speed up. Progress in this area means that DB will increase the frequency

of the service and make your products more attractive by using digital technology to ensure seamless connections between modes of transport.

The participating companies had the opportunity to present technological solutions to the previously identified challenges, generating a forum where innovation is considered to be a key element for the competitive improvement of companies.

The combination of these challenges on the one hand and the vision of the initiatives underway on the other resulted in the identification of a unique set of opportunities for the sector thus responding to the different shared challenges.

This commitment of the sector to RD&I was reflected in the participation of representatives of 18 companies.

The Association is supporting all those initiatives in this strategic area, understanding it as a key factor in the competitive improvement of companies in the sector and considering innovation as an essential pillar to achieve the necessary evolution of the railway sector and its industry. ☺



Renewal of the Mafex International and Communication Committees

The International Committee is composed of 20 companies and the Communication Committee is formed by 16 companies that are outlined below:

Amongst its aims set for this period are defending and fostering the image of the Spanish railway sector especially on an international level, through the definition of content and monitoring of the scope and dissemination of Mafex Magazine. The main endeavours to be performed by the International Committee will focus on the accompanying and monitoring of

► INTERNATIONAL COMMITTEE MEMBER COMPANIES

ArcelorMittal
Ardanuy Ingeniería
CAF Signalling
Comsa

LAST JANUARY MAFEX CONSTITUTED THE NEW INTAKE OF MEMBER COMPANIES OF THE COMMITTEES OF INTERNATIONAL AND COMMUNICATION FOR THE NEXT TWO YEARS.

the development of matters involving internationalisation carried out by the Association. Within the scope of the aforesaid actions, exterior promotion,

market intelligence, efforts aimed at institutional representation in international matters, as well as tasks relating to trading policy, will be tackled.

► COMMUNICATION COMMITTEE MEMBER COMPANIES

Alstom España
ArcelorMittal
Bombardier
CAF
Grupo Trigo
Icon Multimedia
Ingeteam Power Technology
Idom
Indra Sistemas
La Farga Yourcoopersolutions
Patentes Talgo
Prefabricados y Contratas (Precon)
Satys Interiors Railway Spain
Segula Tecnologías España
Sice
Stadler Rail Valencia
Talleres Zitron
Tecnival
Thales España
Tpf Getinsa Eurostudios
WSP Spain

cafpower.com

Power & Automation

The Power of Adaptability

Train control systems

Traction systems

Train-land communication systems

Energy storage systems

LOCOMOTIVES REGIONALS SUBURBANS METROS HIGH SPEED

Spanish railway companies seek to expand their international portfolio in the Middle East



The Spanish Railway Association organized the Spanish group participation, for the fifth consecutive year, in the "Middle East Rail" fair and congress that took place on 25th and 26th February in Dubai, which is the largest event in the railway sector in the Middle East, North Africa, South and Central Asia.

In this year's edition, a wide range of businesses was present in the Spanish pavilion, from engineering and consulting firms to manufacturers of rolling stock and ancillary industry such as Aquafrisch, CAF, Danobat, Patentes Talgo, Teltronic and Tysfa. Mafex's commitment to annually

attend this professional platform responds to the objective of maintaining the position of relevance that its members have as strategic partners in the mobility plans that have been carried out over the last few years.

Companies in search of new horizons

The technology, experience and specialization of Spanish companies have been requested to carry out mega projects such as the Medina-La Mecca high-speed line (Saudi Arabia), the metro lines of Antalya (Turkey), Algiers (Algeria), Riyadh (Saudi Arabia), Doha (Qatar) and Dubai (United Arab Emirates) or the light rails and trams

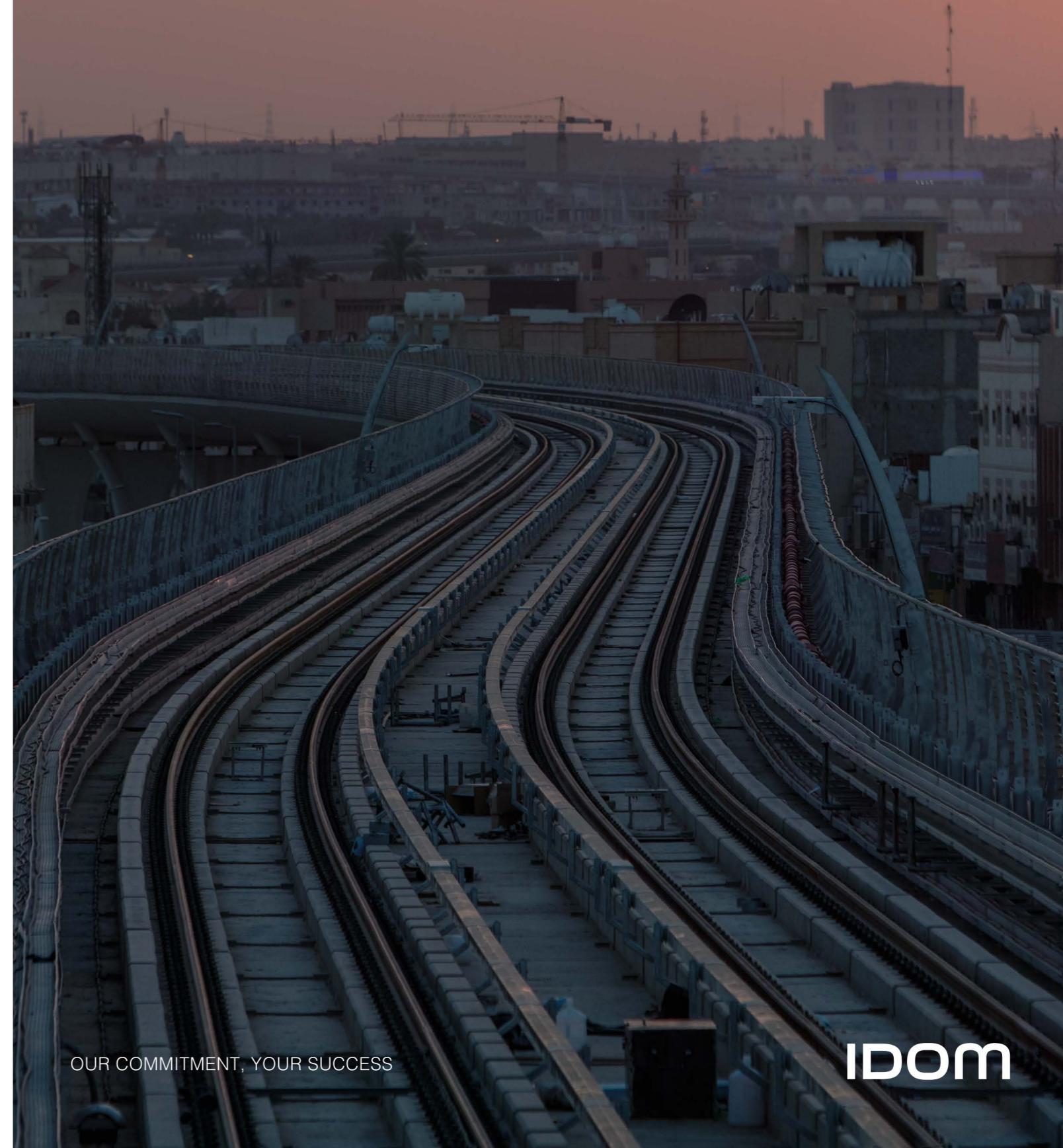
of Abu Dhabi, Astana (Kazakhstan), Ouargla (Algeria), Lusail (Qatar) and Cairo (Egypt), among others.

The authorities in the area have relied on the high expertise of this industry to also undertake very large-scale programmes such as the master plan for the metro of the city of Kuwait (Kuwait) and the master plan for public transport in Muscat (Oman). They are also responsible for the construction and design of the two most emblematic stations and interchanges (Major Stations Project) of the Qatari network: MSheireb, in the historic centre, and Education City, in Doha. ☀

Sustainable infrastructures in a changing environment

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

IDOM.com



The Spanish railway industry was present at the XIX edition of the Exporail Congress



Mafex coordinated the participation of the Spanish railway industry in the XIX edition of the Exporail Congress, which took place from 11th to 13th February 2020 in Cancun.

During this convention, which is a reference for the sector in Mexico, 500 specialists from 14 countries took part in more than 40 technical sessions where the trends, actions and challenges, both in the freight and passenger rail sector, were analysed.

With a full agenda with key issues such as the precise railway operation as well as the relevant aspects of freight railway, the presentation that

stood out was that on the investment plans by Lorenzo Reyes Retana, Managing Director of Planning and Projects of Grupo México Transportes (GMXT); Lázaro Rodríguez, Managing Director of Ferrocarril Línea Coahuila Durango; Corrado Muciño, Chief Operating Officer of Ferrovalle and Roberto Romandía, Managing Director of BajaRailroad.

On the other hand, there were also several of panels in which the participant Spanish companies Amurrio, GMV, Ineco and Patentes Talgo together with Mafex as moderator, presented a panel focused on the international success of the Spanish railway industry. Thanks to the participation of the four partner com-

panies, also representatives of four different subsectors: engineering, infrastructure, systems and rolling stock, it was possible to raise awareness about the extensive experience of our sector in the design, structuring and execution of large railway projects from their earliest planning phases to commissioning and operation.

This edition served to strengthen commercial and business ties in the field of transport, as well as to raise awareness about the progress of new projects such as the construction of the Maya Train, the Transistmico or the Mexico-Queretaro in addition to the possibilities offered by the freight railway sector. ↗

Mafex Steering Committee holds round of strategic meetings in Brussels

In parallel to other strategic actions that Mafex usually carries out in Brussels, between February 19th and 20th, the Association's Steering Committee held one of its meetings for the first time in this same city. The members of the Committee also held several institutional meetings during such days. The objective was to gain an in-depth understanding of the progress that the European Commission and other stakeholders and public entities are making in areas such as sustainability, investment in infrastructure, innovation and trade, to convey their vision and concerns about them.

Thus, in close collaboration with CEOE Brussels, Mafex could meet with entities such as Business Europe, the Permanent Representation of Spain to the EU and senior officials from different Directorates-General (DG) of the European Commission:



DG Move (develops and implements policies on Transport), DG Trade (develops and implements European trade and investment policies), DG Devco (establishes the European policy for international cooperation and development) and DG Research (is in charge of policies for research, science and innovation). A special was also arranged with Spanish MEP Ms Izaskun Bilbao, who has been in charge of important dossiers related to the railway sector. Likewise, messages and concerns were also shared with the representatives of UNIFE (the association that brings together the European railway industry and of which Mafex is active part since 2008) and Shift2Rail, an indispensable initiative for the advancement and international positioning of the sector. ↗

User Prototyping Experience workshop organized by Mafex

On 26th February, Mafex organised a workshop on User Prototyping Experience in collaboration with Altran, in which 6 partner companies took part. The purpose of the session was to learn, through a practical approach, about the importance of the user experience when designing a product. To this end, it is necessary to understand what the principles are to develop a good experience, to make it attractive and functional, as it is from the creation of different types of prototyping.

The session explained the means required to identify the customer focus segments, the value proposition, as well as the extraction and validation of hypotheses through feedback as



they guarantee the success of the result during the phases of creation and launch of a product. Mafex organises such initiatives to promote an innovative culture in companies, as a key factor to improve competitiveness and considering innovation as an essential pillar in the evolution of the railway sector and its industry. ↗

Adif and Mafex sign a collaboration agreement to boost the internationalisation and innovation of the Spanish railway industry

The Spanish Railway Association (Mafex) and Adif have signed a collaboration agreement to promote, support and encourage internationalization and innovation within the Spanish railway sector.

Mafex, which has been active since 2004, is a non-profit organization whose main objective is the defence of the general interests of the sector and those of its partners. Its mission is to promote the competitiveness of companies through activities in the area of internationalization and innovation. Currently, it represents 92 companies in the industry, which make up 80% of the country's railway exports and invoices 16 billion euros annually.

On the other hand, Adif has been supporting for many years the internationalization of the Spanish railway sector and improving the competitiveness of Spanish companies, through the participation of its experts in projects and visits organized by companies in the industry with organizations from third countries, among others. Adif's collaboration in activities that promote and activate the internationalization of Spanish

WITH THIS NEW ALLIANCE, BOTH PARTIES SEEK TO STRENGTHEN COOPERATION BETWEEN BOTH ENTITIES AND BOOST CONFIDENCE IN RAIL TRANSPORT AND THE SPANISH RAILWAY INDUSTRY.

industry is one of the objectives reflected in its International Strategy.

Although Mafex and Adif have been regularly collaborating in the search for and development of new business opportunities for companies, the signing of this agreement seeks to strengthen the foundations for an even closer cooperation in the organization of activities that support the internationalization and promotion of innovation initiatives. All of this with the common objective of supporting and promoting the competitive improvement of the Spanish railway business sector, which in Spain generates more than 25,000 jobs, and up to 400,000 across Europe.

The President of Mafex, Victor Ruiz, values very positively the agreement reached "especially at an exceptional time such as the current one". In order to "seek maximum support and coordination in the future, a greater promotion of the public-private part-

nership, which especially incorporates SMEs" will be essential. But, moreover, the Association also reinforces the idea of collaboration to "shift confidence to the general public in favour of the use of public railway transport, which is playing and must indeed play a key role in the future in facilitating the sustainable and safe mobility of people and goods in our country".

In turn, the President of Adif, Isabel Pardo de Vera, has pointed out that this agreement must serve to "improve the quality of the railway service provided to the citizens through public boost to the sector", especially "at a time when it is vital to generate maximum trust in the safety and reliability of the railway by the public".

That is why both presidents agree that "we must all contribute to achieve maximum support for our railway transport, which is undoubtedly a global benchmark." ↩

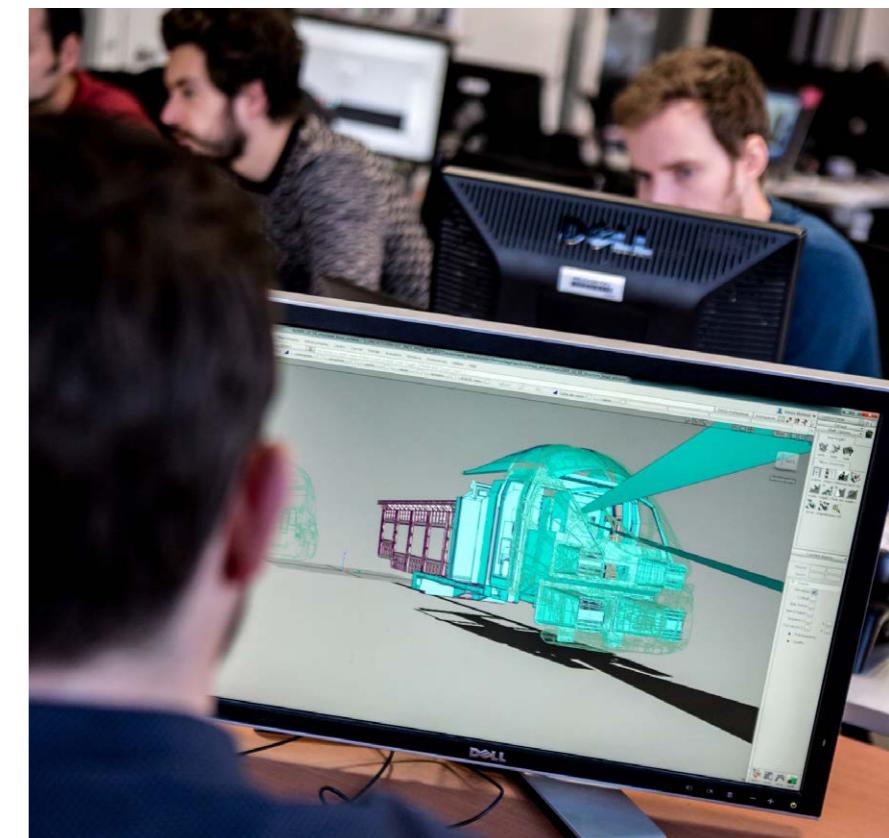
Innovations from Madrid and Barcelona awarded as the most innovative within the Alstom Group in 2019

ALSTOM SPAIN

The worldwide Alstom Group's Innovation Awards (I Nove You Awards) selected projects developed by the R&D centres of Alstom Spain among the most innovative initiatives of 2019: of the 19 projects that were granted awards worldwide, two were developed by Alstom Spain teams.

The internal I Nove You contest is open to all the employees throughout all the centres and business units. This year marks its 12th edition, with a record number of participants, 620 projects submitted from 23 countries and 60 different sites. The 19 winning projects were selected from among all of these and classified into 6 categories.

The railway services and maintenance teams of Alstom based in Getafe (Madrid) received the award in the "Innovation to Market" category for a project to improve hydraulic brake maintenance in trams. The design and development of an in-house test bench has allowed maintenance cost



savings and improvements in delivery times. In the "Small but Smart" category, the award was granted to a project presented by the Passenger Comfort and R&D teams in the Santa Perpètua plant (Barcelona).

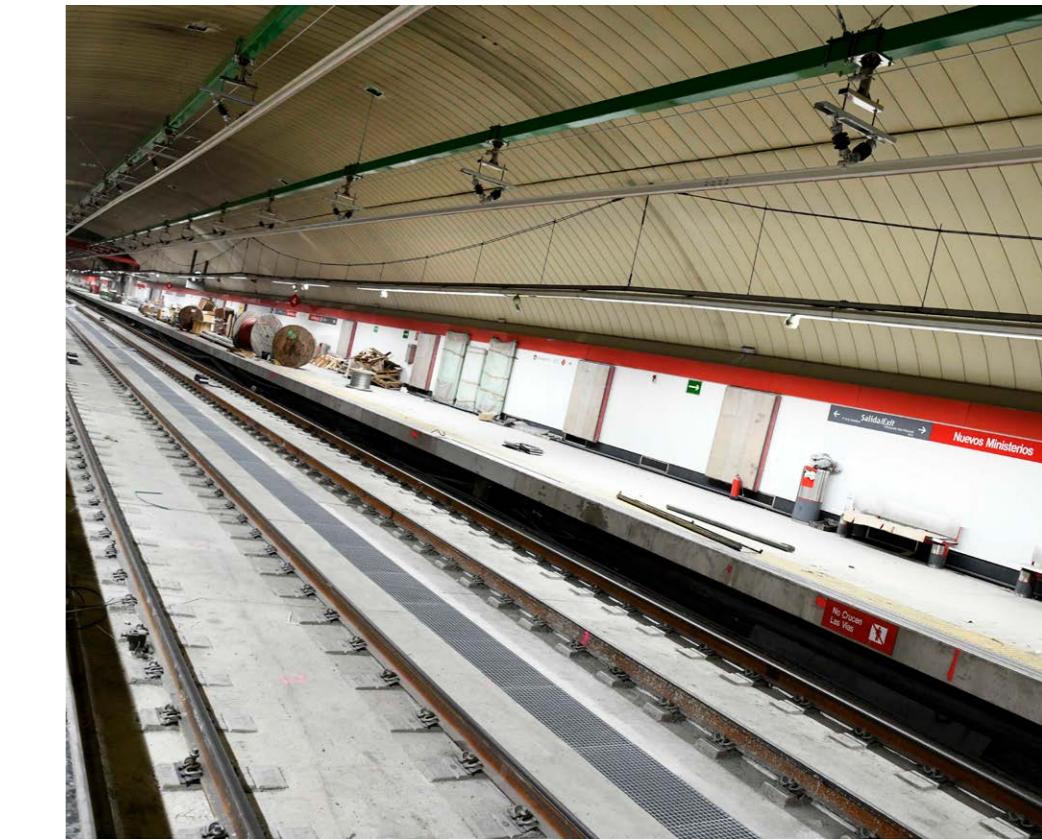
In addition to these projects, two other initiatives developed in Spain and focused on the implementation of digital manufacturing processes and multi-modal system management were among the finalists.

Alstom completes Recoletos Tunnel Project in a record time

ALSTOM SPAIN

Alstom has completed, the record time of five months, the project to modernize the signalling of the Recoletos Tunnel, in the section of the tunnel between Atocha and Chamartín, in Madrid, Spain. The project has included the complete renovation of the signalling and protection systems (ASFA Digital), the installation of new fixed communications systems, as well as the coordination and synchronization with the other works being carried out in the infrastructure at the same time (roads and catenary).

Over seven kilometres in length, the Recoletos Tunnel is a key infrastructure for the Spanish railway network. This is the tunnel that supports more traffic in the entire network, with about 3,290 weekly circulations (98% are suburban trains).



Ardanuy Ingeniería closes the year with an increased National and International Annual Revenue

ARDANUY INGENIERÍA

Ardanuy Ingeniería has increased its Order Portfolio in both the National and International markets finishing the fiscal year.

Ardanuy Ingeniería has increased its Order Portfolio in both the National and International markets finishing the fiscal year with a sales volume of 16 million euros. This growth has been in great part due to an uptick in the Iberian Market with the latest awarding from ADIF of the Technical Assistance Contract for the Development and Modernization of Conventional and High-Speed Railway Lines. In Spain, the Consulting Company has been selected to coordinate the new Railway Command Center for the Port of Barcelona as well as for the Technical Assistance of Safety Works for the security installations of



the stations of La Sagrera and Sant Andreu and for the renovation of lines L1 and L2 of Metrovalencia. For this fiscal year in the international arena, the Company has consolidated three new delegations in Colombia, Peru and India, with major and new offices and also opening another office in the case of Colombia, in Medellín in addition to the one in Bogotá. Ardanuy has also been in charge of strategic projects worldwide. Some of the most important projects on the international stage have been the new Technical Supervision Contract for the Me-

tro de Medellín (Colombia), Design of the new Power Supply, third rail 750Vcc traction and the SCADA system for two new lines belonging to the Bangalore Metro (India), Supervision of the RegioTram Project (Colombia), Commuter Rail Studies in Dodoma (Tanzania) and the Power Subsystem for the future Rail Baltica Network. Ardanuy's R+D Department has also continued to broaden its participation on the European Level with Pioneer Projects such as Shift2Rail and two of its new programs: 4SECURail and OPTIMA.



Antioquia Railways awards Ardanuy the Feasibility Study for a New Railway Line to connect Medellín with the Region of Urabá

ARDANUY INGENIERÍA

Antioquia Railways (Promotora Ferrocarril de Antioquia S.A.S.) has awarded the Consortium made up of Ardanuy Ingeniería, Cali y Mayor and CIP the Feasibility Study for the construction and commissioning of a railway line between Medellín and the Region of Urabá. The new net-

work will connect the city of Medellín with the Departments of Antioquia, Córdoba, Chocó and el Tapón del Darién, which borders Panama. Ardanuy Ingeniería will carry out work on a section which makes up part of the country's strategic infrastructure projects, that being the relaunching of the "Antioquia Railway". The connection will total 305 kilometers and will be equipped for both freight and passenger travel. Overall project planning has been divided

into three different key sections: La Pintada-Caldas (99.7 kilometers), Caldas-Barbosa (76.9 kilometers) and Barbosa-Puerto Berrio (128.4 kilometers). 52% of the existing alignment belonging to this line will remain intact while the rest of the line will be newly constructed. This project is yet another step forward for Ardanuy in Colombia, a country in which the Company already has a Subsidiary Office and plans on continuing to grow in the future.

New version ArcelorMittal Rail Tool App



Available for download in your app store

ArcelorMittal Rails launches the improved Rail Tool App with new functionalities

ARCELORMITTAL

ArcelorMittal Rails & Special Sections will release a new version of the successful Rail Tool App. The Rail Tool App allows rail key players to obtain interactive information regarding standards and

profiles for different rail product typologies, calculate rail length or tonnage for different types of railway projects (rail calculator available online and offline) and download the dimensional profile drawing.

ArcelorMittal, following the permanent evolution of the rail sector and wanting to provide better ser-

vice to railway players, has included new features that will allow, in addition to category, search by profile name, profile dimensions, and the possibility to compare several profiles.

The Tool will be more intuitive and allow the visualization of the different dimensions over the required profile.

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CAF wins tender to supply additional trams for Birmingham

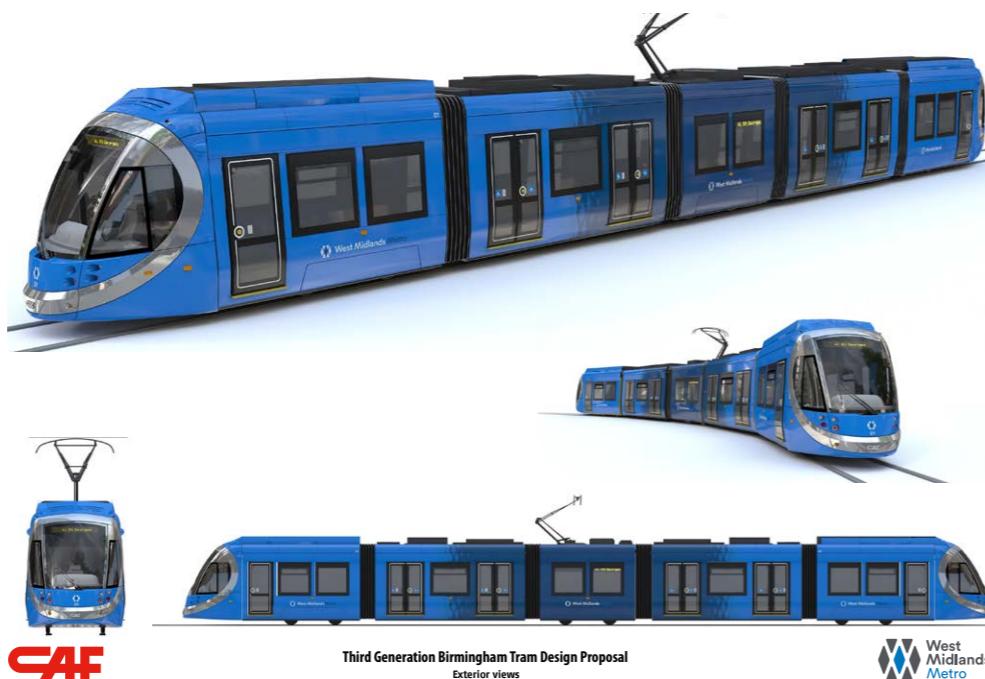
CAF

CAF has been selected to supply 21 Urbos catenary-free trams for Birmingham by West Midlands Combined Authority (WMCA), the organisation that manages transport and economic development in the region. The first Urbos units are scheduled for delivery in late 2021.

In addition, the contract includes technical support services and the supply of spares for a 30-year term. The total contract value is in excess of €90 million.

The new Urbos units will be equipped with Greentech On-board Energy Storage solution which eliminates the need for catenary.

The new trams will join the existing



Urbos fleet on the Midland Metro line linking Birmingham and Wolver-

hampton and the extension to Centenary Square.



SNCF awards CAF the supply of 28 regional trains

CAF

SNCF has selected CAF as the manufacturer of its new Intercités train fleet. The project covers the supply of 28 regional trains to operate on the Paris - Clermont-Ferrand and Paris - Limoges - Toulouse lines and

it includes options for up to 75 additional trains.

Designed to reach a maximum speed of 200 km/h, the new units will offer a high level of comfort and equipment thanks to their ergonomic seats, autonomous access for people with reduced mobility and WiFi, plugs and USB ports inside

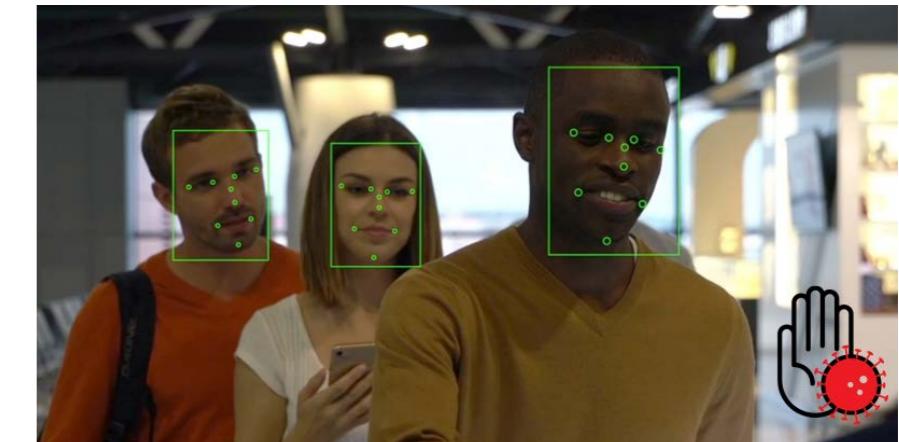
the train. This new project will also involve a strong investment by CAF in its Bagnères-de-Bigorre factory in southern France, as well as a significant growth in its number of employees in France. The units are expected to enter commercial operation as of 2023.

Return to mobility with IKUSI

IKUSI

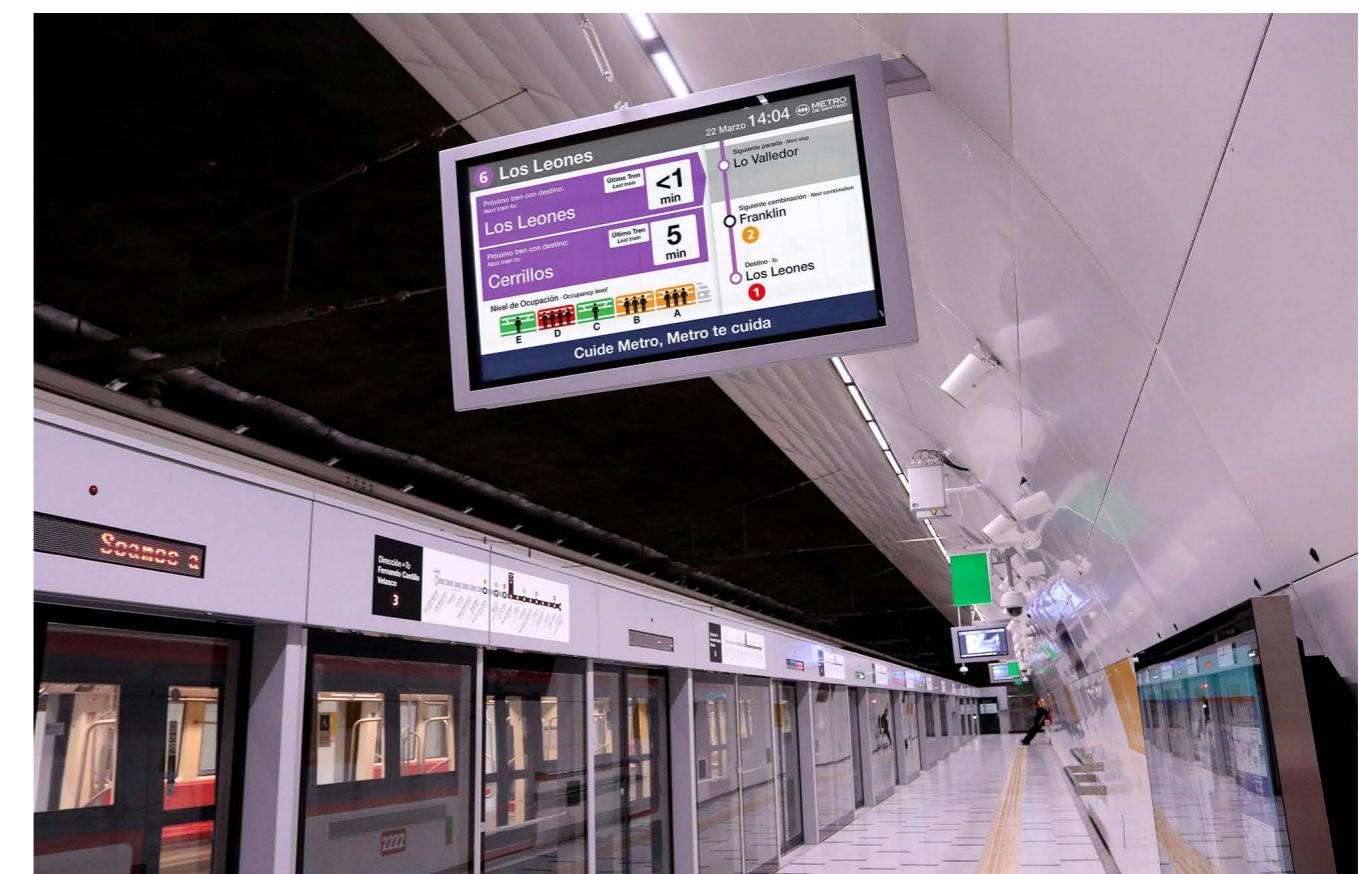
IKUSI has added the experience and knowledge in digital transformation, integration and engineering to design a proposal for technological solutions and security services to prevent COVID-19 specially in those places that involve a flow of people, where public transport, given its importance and implications in everyday life deserves special attention.

IKUSI's proposal is based on the use of thermal control technologies, crowd analysis and facial recognition, among others; carrying out a



detailed analysis that allows continuous and automated accurate detection of individuals with high temperature, control of crowds and interpersonal distance; as well as the

use of metrics (waiting times, occupation, etc.), which help to identify the actions that guarantee compliance with all measures, such as increasing frequencies, messages, etc.



Icon Multimedia minimises the risk of covid-19 contagion through its PIS DENEVA

ICON MULTIMEDIA

With the aim of ensuring the safety measures compliance, in terms of distance, physical temperature and flow of people in the transport industry, ICON Multimedia offers the pos-

sibility to integrate its 'Safe & Tech' solutions with its Passenger Information System, DENEVA

The use of Big Data technology and the integration of people's counting systems or facial recognition systems with their PIS will facilitate the capacity control at stations to avoid crowding, determine the busiest lines, as well as to limit the access, reporting

via PA and the screens located at trains, platforms or bus stops.

DENEVA will also make possible the report in real time of the wagons' occupation, allowing passengers to distribute themselves along the train and raise the frequency of passage, mainly at peak times, to reduce waiting times and ensure the social distancing compliance.

**Bombardier Spain presented its digital railway control solutions at SmartMetro 2019****BOMBARDIER SPAIN**

Bombardier Transportation Spain participated in the SmartMetro 2019 congress, which took place in Madrid and gathers the main urban mobility agents on a global scale.

José-Miguel Soler (Sales Director for Bombardier Spain and Portugal), David Torres (Sales responsible for Rail Control Solutions at Bombardier Spain) and Marco-Antonio Camargo (CBTC Manager), lead the workshop "BOMBARDIER CITYFLO 650 CBTC: allowing the continuous upgrade of GOA4". The interactive panel showcases the most optimize methology to produce the transition to more efficient and totally automated control solutions. Bombardier has successfully implemented CBTC systems worldwide, especially highlighting the most innovative model, CITYFLO 650, which, in addition to lines 1 and 6 of Metro de Madrid operates on the M5 line of the Istanbul Metro or on line 9 of the Delhi Metro.

Bombardier factory at Trápaga will develop engineering solutions for seven new trains that will operate in Italy**BOMBARDIER SPAIN**

Bombardier will be responsible for the supply of seven regional TALENT 3 trains, as part of the agreement signed in 2019 with Strutture Trasporto Alto Adige (STA) for the delivery of 32 new trains and 30 years of maintenance service.

The rolling stock will operate in South Tirol and will give international service between Italy and Austria, which constitutes a great advance into the closest cooperation in the la Euroregión Tirol - South Tirol -Trentino. Bombardier's Center of Excellence in Trápaga (Vizcaya), works continuously on the engineering process of the TALENT trains family and, for this project, it will participate in developing the TALENT 3 traction converter. To be more precise, the Trápaga team will be

responsible for the gestión, design, acquisition, and fabrication of two models of multisystem converters (TC 3423 V01 and TC 3423 V02), two models of power transformer chest (TCB 4W and TCB 2W), as well as other equipment and materials from the TALENT 3 trains that Bombardier will deliver to STA.

The new TALENT 3 vehicles will have 300 seats per car, among mo-



dern passenger information systems and temperature control. The trains are also noticed for their e a s y a c - cess,

Control System (ETCS).

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COMSA will execute the modernization project on the Vinkovci – Vukovar line in Croatia

COMSA

On December 20, HŽ Infrastruktura and COMSA Corporación signed the contract for the improvement and electrification work of a section of 18.7 km of the railway line



COMSA and its subsidiary FERGRUPO participate in the construction of a new section of the South International Corridor in Portugal

COMSA

COMSA Corporación continues to gain weight in the Portuguese market. Through the Consortium constituted by COMSA, FERGRUPO -its subsidiary in Portugal- and SANJOSE Constructora, the company will carry out the construction of the new railway section between Évora Norte and Freixo, integrated into the future South International Corridor.

The construction of this new section, awarded by Infraestruturas de Portugal (IP), is part of the modernization program of the National

between Vinkovci and Vukovar in eastern Croatia. The main goal of the project is to increase the volume of rail freight transport and improve the passenger connection of Vukovar-Srijem County by reducing travel time. The works, which have a duration of 2 years, include the reconstruction of the existing Vinkovci-Vuko-

var track with the improvement and electrification of the different sections, as well as the renovation of the Vukovar-Borovo, Nuštar and Bršadin stations including control subsystems, safety signage, railroad crossings solutions, construction of pedestrian walkways and improved accessibility for people with reduced mobility, among other elements.



CAF Signalling, success in the ATO test on ETCS in NS of Netherlands

CAF SIGNALLING

CAF Signalling has successfully tested its own ATO over ETCS (GoA2) in SNG trains from CAF, together with the Dutch operator NS. It is a very important milestone as it is the first time ATO over ETCS is tested in passenger trains running on high density lines.

Due to the high occupancy of Dutch rail lines and as part of the analysis that NS is doing to optimize their operation, NS asked CAF Signalling to experiment with this new technology and understand the benefits they can obtain. A pilot test was carried out (without passengers) during the night of 10th December where an SNG train drove automatically from Swifterbant

to Kampen Zuid, in Hanzelijn, stopping automatically and at scheduled time in Dronten station, where some people of the NS management board, CAF Signalling and Dutch media was present.

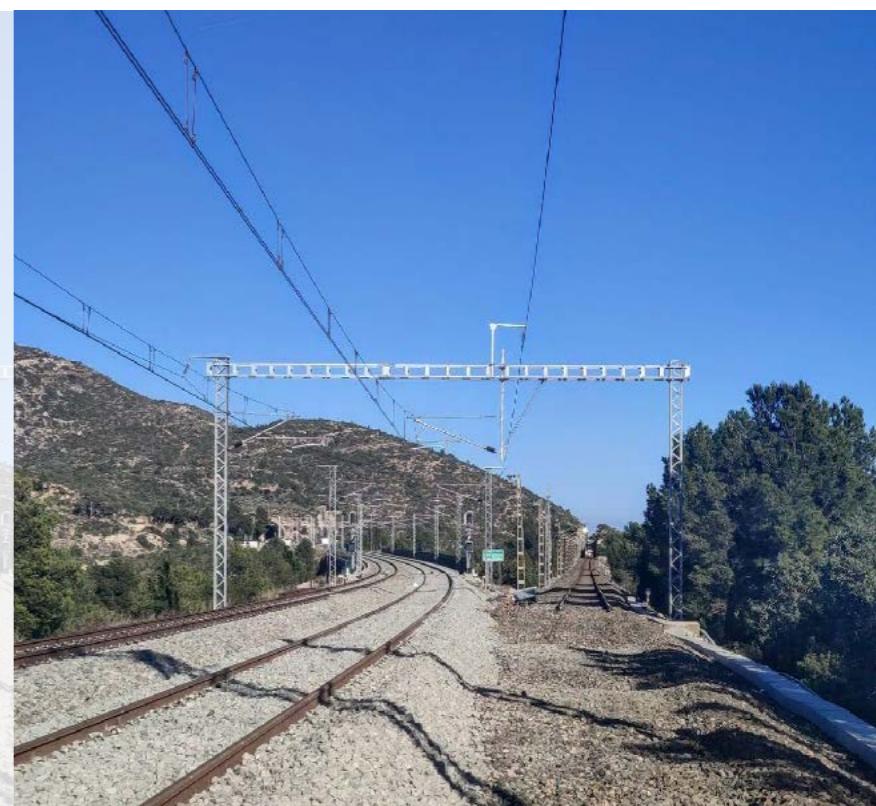
These tests (defined also in the frame of Shift2Rail) are part of a test campaign that will allow NS to test different functionalities of the ATO over ETCS during the next months.

CAF Signalling installs and commissioning signalling systems in Vandellós-Tarragona section

CAF SIGNALLING

Vandellós-Tarragona section has entered in commercial service in January. This section connects Mediterranean Corridor with High Speed Line Madrid-Barcelona-Francia and with Conventional Line Reus-Tarragona, resulting in a 40 minutes time reduction in trains between Barcelona and Valencia.

CAF Signalling was the responsible for installing and commissioning signalling systems in this section, including European Railways Traffic Management System, ERTMS. This commissioning is one of the main milestones in the Mediterranean Corridor in the short term.



New test accreditations for CETEST

CETEST

The process of obtaining new accreditations within CETEST's technical scope has culminated. ENAC has approved the extension of the CETEST LE/1385 file, including in the Schedule of Accreditation the following tests: Head pressure pulse test (ae-

rodynamics), Dynamic interaction test between pantograph and contact wire by measurement or arcing (non-intrusive method) and Axlebox water tightness test in test bench for axle-boxes. With these new accreditations, CETEST, ISO 17025 accredited laboratory, expands its technical scope and offers a wide portfolio of testing services. From structural tests (carbody strength test, static and fatigue bogie test,...) to on-track tests, such as dynamic behaviour test, simplified or normal method by means of own instrumented axes (also including stationary tests using portable platforms), EMC tests, aerodynamics, current collection quality, brake and traction performance, noise tests, among others.



CETEST High Speed EMC testing.

Recent testing campaigns in Spain

CETEST

CETEST has carried out the homologation campaigns of two new vehi-

cles in national territory, for which it is in charge of both the execution of the required tests, as well as the management and coordination of the test operation.



Evaluación Comportamiento dinámico por CETEST.

The approval campaign for the GRE-ENBRIER car carrier wagon L07A for TRANSFESA was completed during 2019. In addition to the operation management, CETEST has carried out safety verification against derailment at its facilities in Beasain, where wheel unloading tests and measurement of the guiding forces on a 150m flat curve have been carried out. Also, CETEST assessed the dynamic behaviour of the car using an instrumented axis.

In 2020, CETEST performed the homologation campaign for SOCOFER's catenary maintenance vehicle TMC02 for RATP, also in Spain. The safety verification against derailment in Beasain, Brake performance, noise tests, as well as vibrations and comfort assessment of the vehicle have taken place.

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Ingeteam in the railways sector: record of order backlog

INGETEAM

2019 has been key for INGETEAM Traction business. Regarding investments, the start of the production activities in the new factory, allowed an improvement in terms of quality and production capacity. The workforce has been strengthened, with a 10% increase during 2019. The relevant contracts signed in 2019 have been:

- The supply of traction systems for 12 electric locomotives for the Polish manufacturer PESA. The supply will include 2 INGETRAC High Power converters with auxiliary integrated, located on board and liquid cooled. The solution will follow most strict standards (TSI).
- The supply of traction systems to TALGO for 4 new power heads for Uzbekistan High Speed.



Inse Rail introduces Hamertec technology at Mass-Transit Innovation Japan 2019

INSERAIL

Inse Rail participated last November in Tokyo in the Mass-Transit Innovation Japan 2019 after having been selected in the framework of the EU-JAPAN economic partnership agreement (EPA) to participate in the EU Gateway Business Avenues program-

me, which integrates the mission of promoting European railway equipment in Japan.

The event, held under the title "RAILWAY TECHNOLOGIES AND SERVICES", allowed representatives from Inse Rail to introduce the HAMERTEC technology for advanced maintenance of railway bridges that they have developed in partnership with Telice, the Caminos de Hierro Foundation and the American company

Anco Engineers. For a week, several meetings were held with companies interested in commercializing this technology in Japan.

EU Gateway Business Avenues is an initiative funded by the European Union helping European companies to establish long-lasting business collaborations in Asia, after an exhaustive selection process at European level of railway innovation projects with a high market access potential.



La Farga was awarded the CECOT Safety Awards

LA FARGA

Last October in the celebration of the 25th Night of the Entrepreneur organized by the employee association CECOT, La Farga was recognized in the category "Innovation and investment for the

improvement of company health". The award was sponsored by the occupational risk prevention company, Prevint. It is true that the metallurgical industry has its complexity in terms of safety but precisely for this reason more demand and attention is required. Accordingly, for La Farga,

security is an unquestionable value that must be taken into account in each and every one of the actions carried out in the day-to-day life of the company. La Farga works strongly to improve its security policies and processes, investing in infrastructure, training and awareness of the entire team.

Haramain Amurrio in the Mecca-Medina High Speed Railway



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Wiener Linien takes tram simulation to a new dimension

LANDER

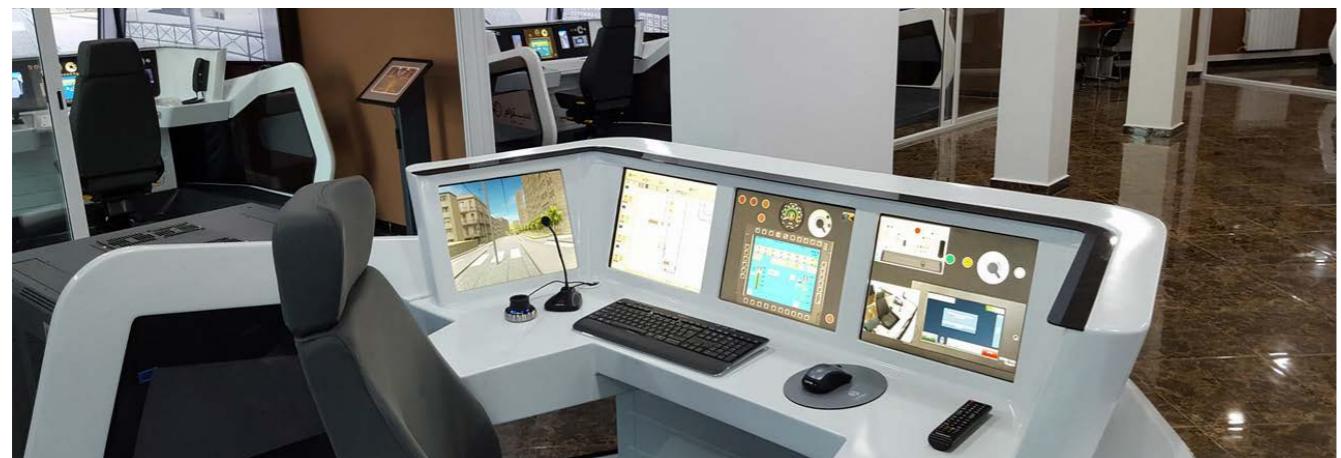
Since December, Vienna transport operator Wiener Linien has had access to a new tram simulation system for its Siemens ULF vehicles and the

new Bombardier Flexity units.

The simulation system's hardware is composed of two training stations with a replica of the driving console, one for the Siemens vehicle and another for the Bombardier vehicle. The training stations have an impressive new display system with 5 vertical

screens and virtually invisible frames. Each of them also features the three degrees of freedom movement system designed by LANDER. The units also have three instructor stations and two observation stations.

The main feature of this project, however, was not the actual hardware, but the ultra-clear vision of all Wiener Linien's tram staff concerning the training tool they chose to add to their training centre in Vienna's Simmering district. The software has innumerable minor functions to give the tram simulator a hitherto unknown level of training reliability. The functions include the possibility of adding questionnaires for trainees, dynamic visual information on the lateral distances between trams and a range of objects around them, the possibility of simulating an endless number of hazardous situations and training events for Wiener Linien's tram operations, an eye-tracking system, and many others.



LANDER moves into the African continent alongside SETRAM

LANDER

Most of Algeria, the largest country on the African continent, is taken up by the Sahara desert, and it is divided from east to west by a double barrier of mountains. It has a population of over 40 million and a surface area of 2.3 million kilometres (almost 5 times the size of Spain).

The country has many peculiarities such as, for example, the fact that modern Algeria is one of the few

countries with a tram system operating in 7 different cities (Algiers, Oran, Constantine, Sidi Bel Abbes, Ouargla, Mostaganem and Sétif). The main entity responsible for this major contribution to the improvement of infrastructures is SETRAM, a body which was created from an agreement between the Algiers Metro Company (EMA) and French group RATP Dev.

Now, 8 years on after implementation of its first tram system, SETRAM has opened its innovative simulation unit for the training of tram drivers.

This was developed alongside LANDER, and one of its peculiarities is that it includes software to support all 7 networks and their respective signalling systems and tram cars.

The purchase is part of the effort that RATP Dev has been making in recent years to make a contribution to local development, hiring and capacitating over 2,000 people, transferring its technical knowledge and, in 2017, opening the Rail Capacitation Institute in Algiers, now also home to the simulator capacitration centre.

LUZNOR works together with ANM in Naples

LUZNOR

The public transport company from the city of Naples in Italy, ANM – Azienda Napoletana Mobilità SpA, has incorporated in its subway vehicles a rechargeable LED signalling torch, specially designed by LUZNOR. The model LRFT-3BRYV-B-R contains a single high-efficiency high-power RGBW LED as the main light source with the possibility to light up in four different colours being white, red, yellow and green. Besides, the torch includes a frontal white signalling crown with 12x white LEDs and a rear red signalling beacon light with 12x red LEDs. Moreover, the torch has three levels



of constant lighting and three types of intermittency on the front part. LUZNOR used the most modern technology in its design and cons-

truction in order to achieve both a pleasant ergonomics and aesthetics as well as great resistance and reliability.

The CAF's Zaragoza depot opens up to digitalization

CAF DIGITAL SERVICES

CAF has selected the depot in Zaragoza for the "Digital Depot" project, a pioneer technological and cultural transformation that involves new tools and services that ease the train fleet Operation and Maintenance efficiently.

The Zaragoza depot maintains the Urbos' trams fleet that operates in

the city and has 30 million passengers yearly. Among the new solutions, LeadMind (www.leadmind.io), the platform operated by CAF Digital Services is being implemented. This platform offers many benefits such as condition-based maintenance, improved diagnosis and real-time decision-making all these contributing to avoid repetitive breakdowns.

The 'Digital Depot' project also includes other digital services such

as the implementation of tablets in order to eliminate the use of paper on daily activity, tool calibration controlled by NFC and a mobile APP to control the warehouses, among others.

The goal by the end of 2020 is to reduce the maintenance costs in 10% by reducing the maintenance tasks, component and equipment life extension as well as the asset management improvement.



TPF GETINSA EUROESTUDIOS reaffirms its presence in Tunisia: Upgrading of the Tunis Light Rail Central Loop and of the Intermodal Station at Barcelone Square

TPF GETINSA EUROESTUDIOS

This project involves upgrading the central loop of the Tunis Light Rail System and building a new transport hub for buses and tramway in Barcelone Square, located in the vicinity of the city's central railway station, which will improve mobility on the transport network. For that purpose, infrastructure upgrades will be carried out along the whole section (2 km). Particular attention will also be paid to the ar-



chitectural, commercial and urban regeneration of Barcelone Square

and its nearby areas, in the heart of the city.

TPF GETINSA EUROESTUDIOS to Implement Noise Abatement Measures on Railway Stretches in Spain

TPF GETINSA EUROESTUDIOS

ADIF has awarded TPF GETINSA EU-ROESTUDIOS a contract to prepare



the detailed design of noise barriers pertaining to noise abatement plans for Zone No. 2: Basque Country, Asturias, Aragón and Castile-León, and for Zone No. 5: the narrow-gauge railway network in Asturias and Cantabria.

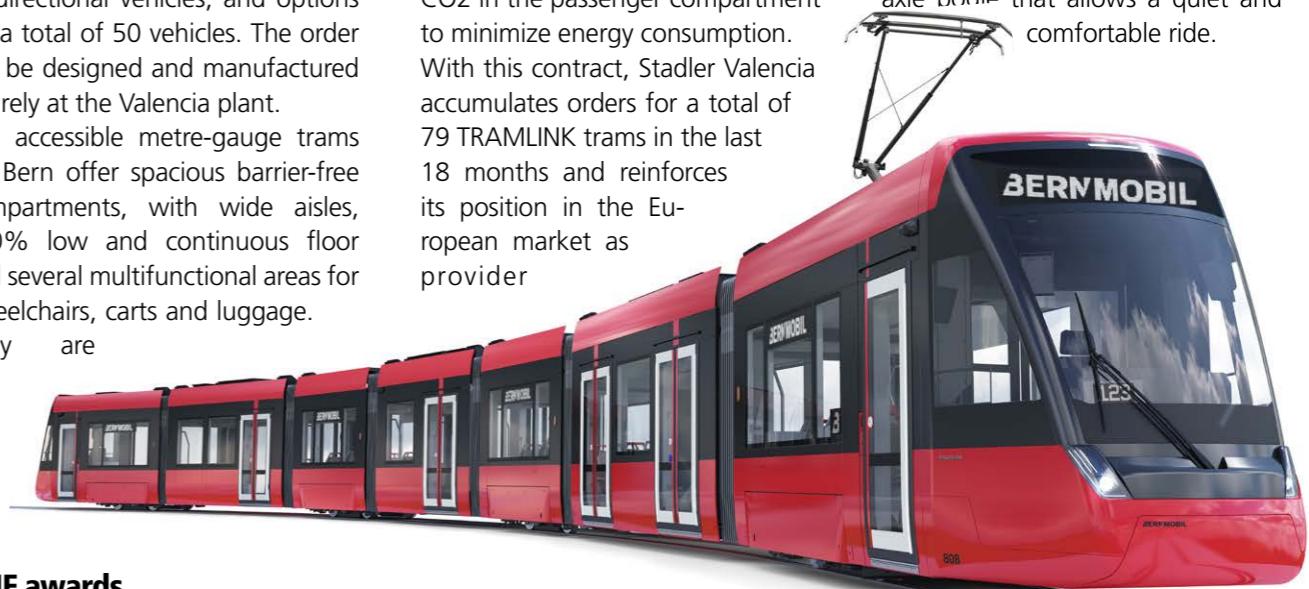
According to these action plans, 25 different priority zones have been taken into account for the design of the installation of 88 noise barriers of different sizes at several locations, along a total length of over 13 km.

Stadler signs a contract for 27 TRAMLINK trams for the Swiss capital

STADLER

The contract signed between Stadler and the local operator, Bernmobil, includes the supply of 27 TRAMLINK tramways, 20 bidirectional and 7 unidirectional vehicles, and options for a total of 50 vehicles. The order will be designed and manufactured entirely at the Valencia plant. The accessible metre-gauge trams for Bern offer spacious barrier-free compartments, with wide aisles, 100% low and continuous floor and several multifunctional areas for wheelchairs, carts and luggage.

They are



ADIF awards Stadler the supply of three infrastructure monitoring trains

STADLER

The trains, two for use on Iberian gauge lines (1,668 mm) and one for use on standard gauge lines (1,435 mm), will be manufactured by the consortium formed by Stadler Valencia and Mer Mec. The contract also includes

AGUI consolidates its presence in the railway sector

TPF GETINSA EUROESTUDIOS

AGUI, the basque company which is dedicated to the manufacture of welded assemblies for OEMs, accentuates its commitment to the railway sector and has strengthened its position with strong investments in differential aspects such as logistics and welding.

On the one hand, a digitalization project has been carried out in the company by installing RFiD technology in the production plants and warehouses. With this project AGUI manages to automate and digitize in real time all the information regar-

ding material consumption. On the other hand, Agui has been certified in ISO 3834 and EN 15085. Since its inception, welding has been a key production process for Agui. In addition, Agui has taken another step and made significant investments in order to improve the processes in a

of urban mobility solutions. Specifically, the plant will supply trams to two German cities - Erfurt and Augsburg - and four Swiss local operators - FLP, BLT, AVA and Bernmobil. TRAMLINK is a modern and modular multi-articulated light rail vehicle characterized by an innovative rear-axle bogie that allows a quiet and comfortable ride.

the supply and installation of safety and communications systems for the trains, the instrumentation and onboard diagnostic systems, the maintenance of the vehicles for five years and a stock of spare parts.

The bi-mode trains will be able to run at a maximum speed of 160 km/h in diesel mode and up to 200 km/h using electric traction. They will be fitted with

Asfa Digital, ETCS, GSM-R and wi-fi and they will be used to monitor both track and overhead line. Stadler Valencia has also recently been selected by Ferrocarrils de la Generalitat de Catalunya for the supply of five bi-mode metre-gauge locomotives.

way that adjusts and guarantees the new certification obtained. With these latest investments in resources, as well as with the beginning of the collaboration with the MAFEX association, Agui confirms its commitment to the railway sector.



**Siemens Mobility will modernize the security installations on the Xàtiva - Alcoi line**

SIEMENS

Adif has awarded Siemens Rail Automation, for an amount of more than 7 million Euros (VAT included), the contract for the drafting of the project and execution of the works for the new safety installations of the conventional width line Xàtiva - Alcoi, 64 kilometers long. This action, includ-

ded in the Community of Valencia's Commuter Plan, will be executed in ten months.

The project, included in Adif's Telephonic blocking system Suppression Plan, includes the implementation of the Automatic Blocking system in Single Track (BLAU) system, which will increase the installations reliability, as well as increase the capacity and regularity of traffic, rationalizing and optimizing railway operations.

Among the main works to be ca-

rried out is the installation of new electronic interlocking systems in the Ontinyent and Alcoi stations, which will have videographic systems that will be integrated into the Valencia CTC and adapted to the existing equipment in Xàtiva. Among other actions, digital ASFA trackside system and point machines equipment will be implemented and the modification of Fuente San Luis Siemens technology OCC (Operation Control Center).

WSP Spain, present in the Etihad Rail mega-project in the United Arab Emirates

WSP SPAIN

WSP Spain is participating in one of the most important rail projects that is being developed currently, the Etihad Rail network, which will link the 7 Emirates that are part of the United Arab Emirates through 1200 km with an investment of around 12,500 MUSD.

WSP's operation in Spain, is part of the global team that, led by the group's affiliate in the UAE, is carrying out the design for the consortium awarded with the 2B and 2C packages.

The consortium, formed by CRCC and the local firm Ghantoot, appointed WSP as its Design Engineer last summer. The specific task of the Spanish team is the design of a



significant number of the bridges in the project.

This contract adds to the long list of large railway projects developed by WSP Spain under the D&B method,

such as the California HSR or the Dallas-Houston HSR, reinforcing its position as one of the leading companies in this type of projects in the international market.



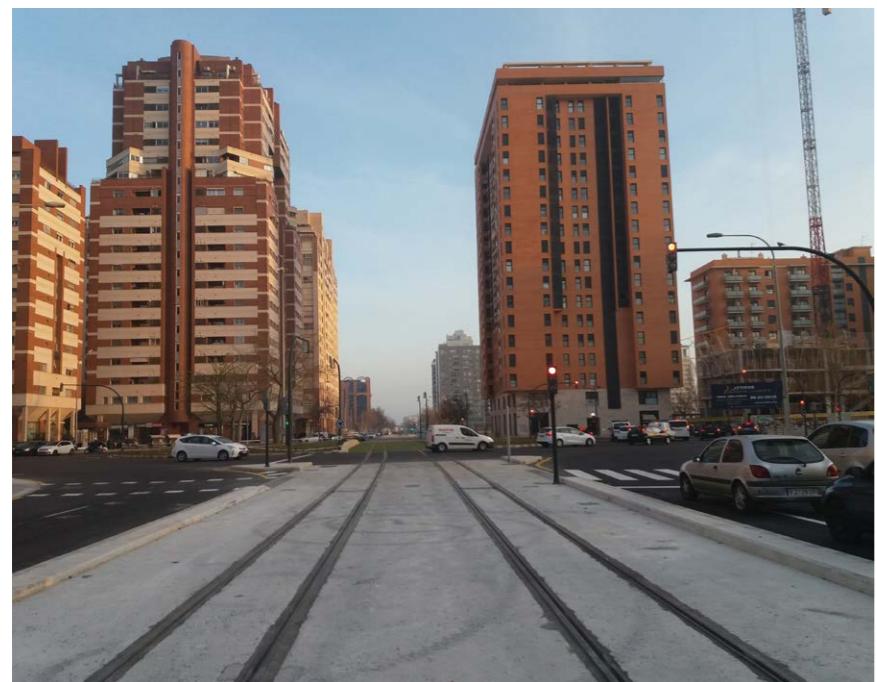
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FGV progresses in the construction of Line 10 in Valencia and the modernization of Line 9 in Alicante

Ferrocarrils de la Generalitat Valenciana (FGV) maintains as the main objectives for this year to continue with the expansion and fine-tuning of the operations of Metrovalencia and TRAM d'Alacant.



The planned investments concentrate on the launch of Line 10 of Metrovalencia, in the midst of the construction process, and the completion of the modernization of the connection between Benidorm and Denia, as

well as the execution of the project that will allow it to link the station of Luceros with that of Adif in Alicante. Once completed, Line 10 will link the centre of Valencia with the City of Arts and Sciences and the neighbourhood of Natzaret, greatly expanding the transport offer of the Metrovalencia network. It combines underground and above ground sections, with a route of 5.3 kilometres and 8 stations and stops (3 underground and 5 above ground).

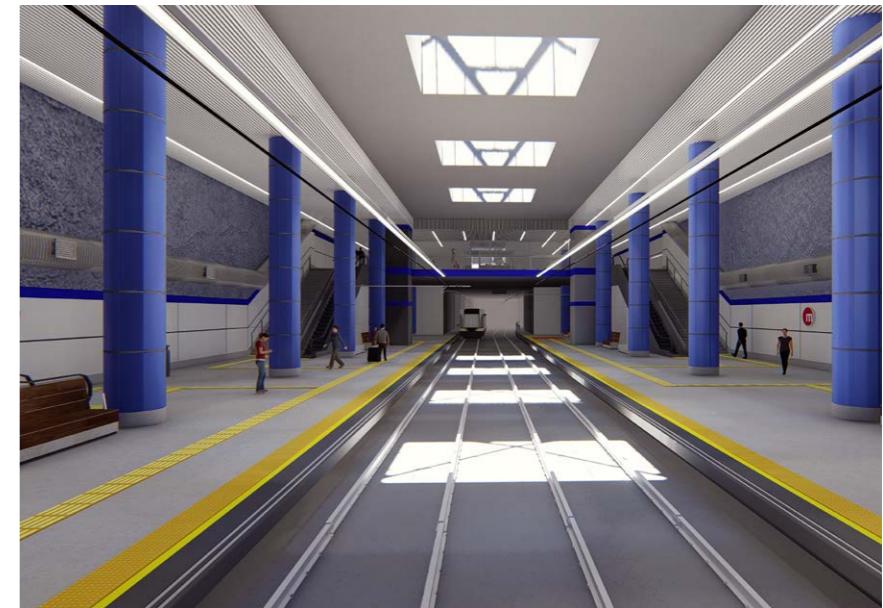
The construction project for the totality of this line is co-financed by the European Union, through the operational programme of the European Regional Development Fund (FEDER) of the Valencian Community 2014-2020, which contributes 50%.

Application of the BIM methodology

The planning and execution of the works on Line 10 has represented for FGV the starting point for the appli-

cation of the BIM methodology. FGV, taking the role of engine for the implementation of the BIM in the railway public works sector, has developed its own implementation plan, based on the integration of the methodology into the internal processes of infrastructure and asset management from the design and project phase to the operation and maintenance phase through the management of the works so that:

- BIM demands and requirements are established in the invitations to tender for new projects and works.
- Demanding objectives are set in terms of training and the use of methodology at internal level.
- "Pilot" projects and works are carried out to gain the necessary experience through lessons learnt in terms of objectives and uses.
- A BIM manual has been drafted



for the management of associated internal processes.

FGV is at the forefront of public administrations of its kind in terms of the implementation of the BIM methodology in the integral ma-

gement of the life cycle of its assets, as enacted by the Directive 2014/24/EU, and mandatory from 2019, as laid down by the inter-ministerial commission, for the invitations to tender for new public infrastructures.



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Europe moves towards a modern, competitive railway

THE EUROPEAN UNION WANTS TO IMPROVE PASSENGER TRANSPORT IN GENERAL, BOTH WITHIN THE MEMBER STATES THEMSELVES AND THEIR INTERNATIONAL CONNECTIONS, AND IN PARTICULAR IN THE SERVICE OFFERED BY THE RAILWAY, CONSIDERED TO BE THE MOST SUSTAINABLE AND EFFECTIVE MEANS OF TRANSPORT, AS WELL AS LESS HARMFUL TO THE ENVIRONMENT, IN THE SHORT AND MEDIUM TERM. TO THIS END, IT HAS LAID DOWN SEVERAL MEASURES RANGING FROM THE DEREGULATION OF RAILWAY COMPETITION TO THE DEVELOPMENT OF THE SO-CALLED PRIORITY CORRIDORS, WHICH ARE PART OF THE CONNECTING EUROPE PROJECT.

As part of this project, next December 2020 the directive set by the EU within the so-called Fourth Railway Package which "forces" all member States to open commercial passenger transport up to the competition at national level becomes a reality. But that is not the only concern, as the aim is to go further and get the industry in the sector to advance in innovation by applying the new technologies, the digitization of services, essential for the improvement of the service that trains must offer as well as the search and promotion of propulsion through non-

polluting energy, running away from diesel and improving the electrification of the infrastructures, given that there are still thousands of kilometres of non-electrified track in Europe.

Openness to the competition is a first step, and although it already existed in some EU member countries, and in the United Kingdom, nowadays outside the Union, it was not approved for general deregulation, which is what will be taking place this year, and which is based on the so-called Fourth Railway Package, which is part of the Trans European Transport Network (TEN-T) project.

The Fourth Railway Package,

the cornerstone on which this process of deregulation of passenger transport is based at the commercial level, approved by the European Parliament in April 2016, has six legislative proposals. This document is divided into two pillars: the technical pillar and the market pillar. The first one aims at completing a process of gradual opening of the market that began with the First Railway Package. This pillar also includes several rules to ensure impartiality in the management of railway infrastructures to eliminate any discriminatory behaviour. Also as of 2023, the compulsory bidding for Public Service Obligations (PSO) contracts will become effective. On the other hand, the con-



Openness to competition in all the countries of the European Union is based on the improvement that is to be given.

tent of the market pillar is aimed at increasing the users' choice of company to travel with and improving the quality of these services.

All these objectives require the alignment of the legislation of each country to make the train more attractive to passengers and goods traffic. The aim is to make European railways much more competitive as a means of transport.

Another aspect highlighted by the entry into force of the new deregulatory guideline is the emergence on the horizon, according to the Commission, of more investment opportunities for manufacturers, as demand for more mobile material is expected. Added to this is the boost that increased rail traffic will mean for sustainable transport, as it is one of the most environmentally friendly systems.

This is highlighted in the latest EU study on railways: "Sixth report to monitor the evolution of the railway market" (2019), which addresses the situation and the importance to be given to this means of transport. Along these lines, it bears in mind that it moves an average of 1.6 billion tons of goods per year; and that it has average annual traffic in the region of 9 billion passengers. It is also highlighted that "the railway con-

Openness to competition in Europe opens up new options for the railway market.

tributes significantly to the Union's means of transport, offering clean mobility and a high level of efficiency".

The TEN-T programme plans an investment of around 315 billion euros in terms of public funding by 2030, to reach 700 billion euros in public-private collaboration; state-run and co-financing of European funds. With this and with the projection Connect Europe the aim is to join by rail 94 main ports; 34 airports; and carry out the creation or improvements in 35 border crossings points, as well as taking part in nine priority corridors.

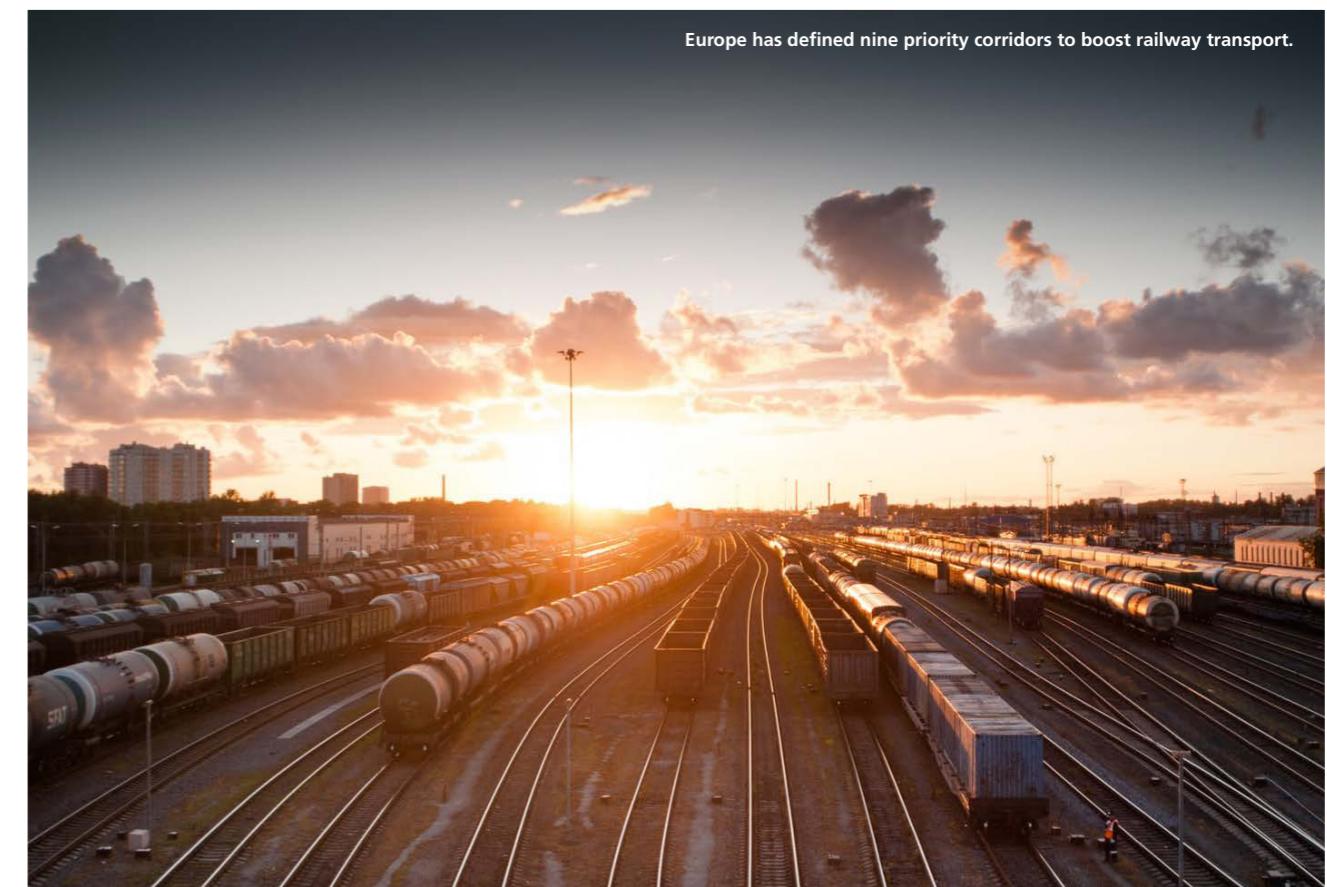
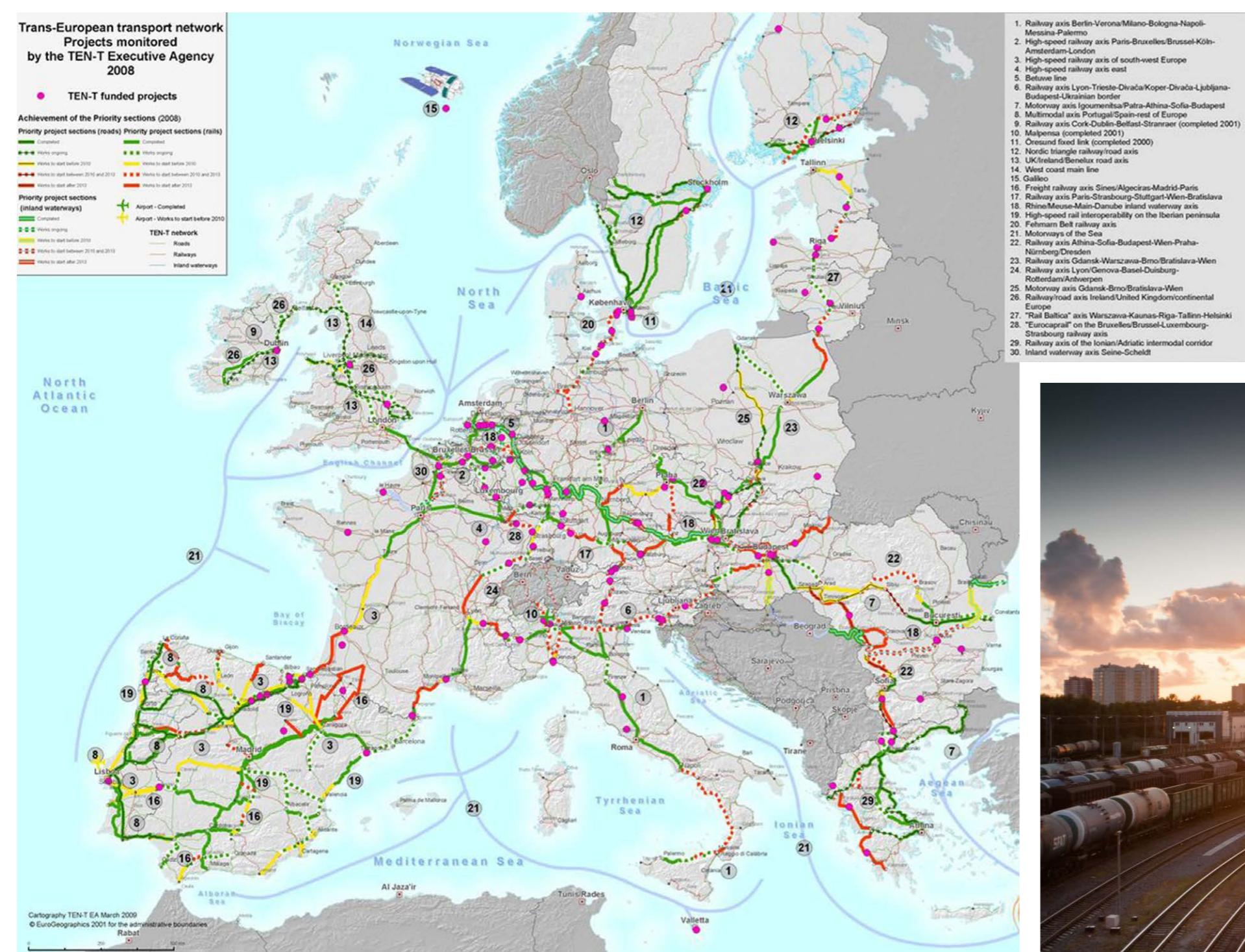
Priority corridors

The nine priority corridors, among which are, on a Spanish level, the Mediterranean and the Atlantic, are those with which it is expected to achieve that mobility that Europe wants to have in the future, with which it is planned to gain traffic efficiency, both of goods and people. Most of the planned investments are aimed at the railway sector.

The first one is the Scandinavian-Mediterranean, an axis between the North and the South that has been classified as "crucial" for the European economy. It departs from Scandinavia and crosses the Baltic Sea, it goes through Germany, Austria, Italy and it reaches the Mediterranean, incorporating Sicily and Malta.

The second is the one that extends from the Baltic Sea to the North Sea, which allows the connection of ports from one coast to the other. Finland communicates with Estonia via ferry, and from there modern railway system infrastructure connects the three Baltic States, on the one hand; and Poland, Germany, the Netherlands and Belgium, on the other.

A third corridor is the one that departs from the North to connect with the Mediterranean. It stretches out from Ireland and the north of the United Kingdom through the Netherlands, Belgium and Luxembourg, towards the Mediterranean via France. This connection depends on the evolution of "Brexit".



The Baltic connection to the Atlantic is another one of these routes designed by the Connect Europe programme. And it is one of those considered to be a priority by the European Union, as it traverses all central Europe.

They are joined by the one related to the Eastern Mediterranean region, which connects the maritime areas of the North, Baltic and Black with the Mediterranean.

The sixth is the so-called Alpine-Rhine, with which it is planned to keep a more direct and balanced connection, by rail, between the main ports with most European traffic. The seventh of them aims at linking the two most important river basins on the continent. It is about having the connection between the Rhine and the Danube as a central axis, connec-

In 2020 passenger rail traffic will be opened to competition in EU member states.

ting the main central areas that can take advantage of intermodality.

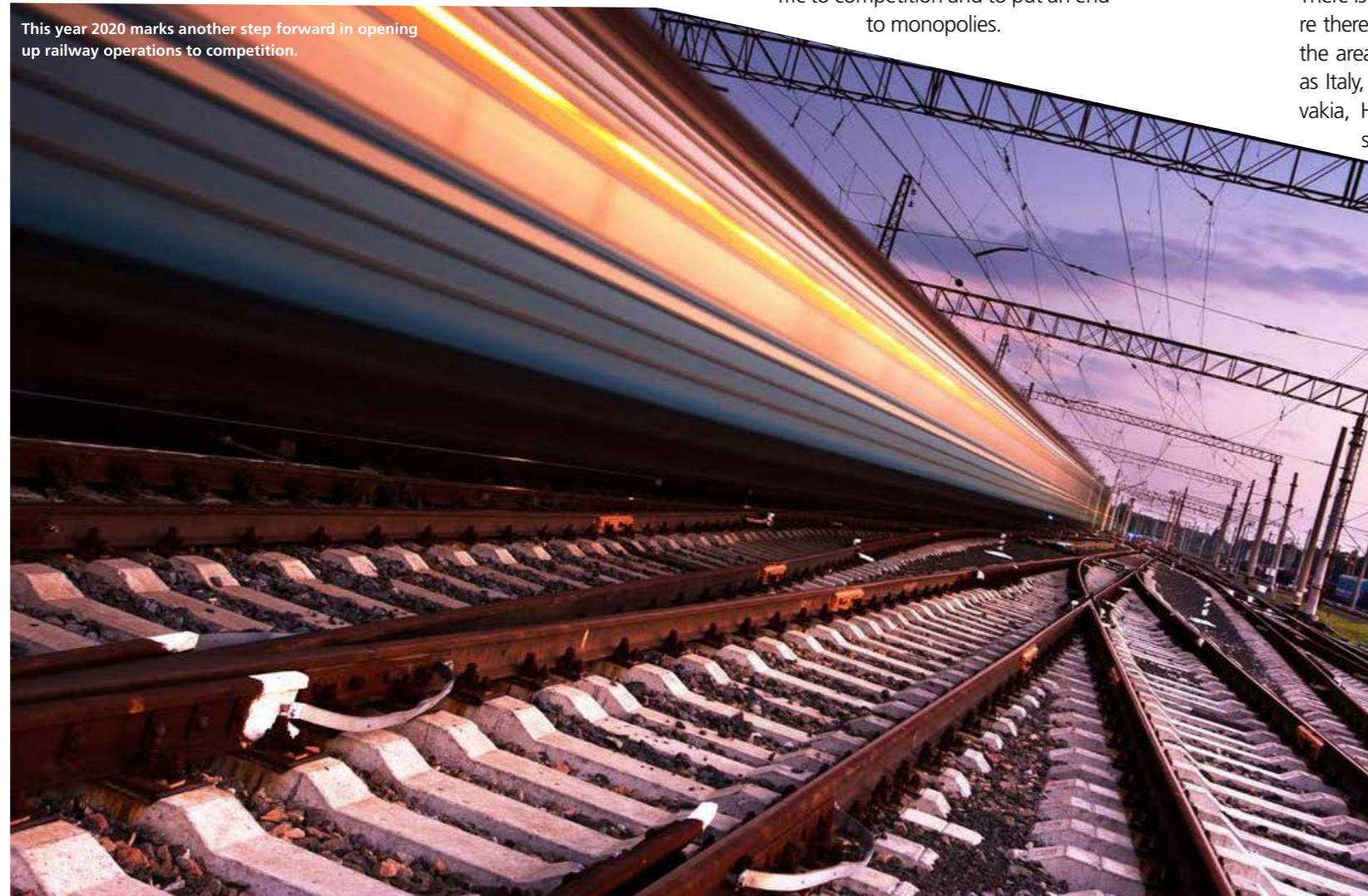
Finally, there are two important connections left for Spain. The first one, that of the Mediterranean, which is born in Algeciras and which reaches Hungary through France. The second

one is the Atlantic corridor, where it was agreed two years ago to extend it to Galicia and to allow the Cantabrian coast to participate in it, with connections to the plateau and with a communication with the main Portuguese routes.

The development of this magnificent project, which is meeting deadlines in the construction of the required infrastructures, would not be entirely feasible if there was not a new regulation for rail transport, both at goods and people level. This is where the European Parliament's decision to approve the "mandatory" process of opening up the rail transport markets comes from.

The transport of goods by train both nationally and internationally was already deregulated in 2007. And passengers transport was deregulated internationally in 2010. But in 2020 the aim is to open up all national traffic to competition and to put an end to monopolies.

This year 2020 marks another step forward in opening up railway operations to competition.



European deregulation: how does it work, when does it take place?

The opening up to the competition of the national passenger services of the member states of the European Union is not mandatory until this year 2020. Although some countries have come ahead of this date and began the deregulation process in advance.

There are currently five countries that have deregulated the operation including both commercial and public service obligation (PSO) routes. These are Germany, Denmark, Poland, Sweden and the United Kingdom - which has ceased to be a member of the EU.

There is another group of States where there is already real competition in the area of commercial services such as Italy, Czech Republic, Austria, Slovakia, Hungary and Latvia. Another significant number of countries have not yet complied with the guideli-

DEGREE OF DEREGULATION OF PASSENGER SERVICE IN EUROPEAN COUNTRIES

Type of service	Authorized by law (De jure)	Deregulated	Non Deregulated
Services PSO	Italy, Sweden Bulgaria, Estonia and Netherlands Portugal and Sweden	Germany United Kingdom (No UE), Denmark Norway, Poland, Austria, Belgium, Croatia, Slovakia,	Slovenia, Latvia, Lithuania, Spain Finland, France Greece, Hungria, Luxembourg Macedonia and Romania
Commercial services	Luxembourg, Bulgaria, Estonia, Lithuania and Romania	Germany Austria, United Kingdom (No UE), Denmark, Slovakia, Hungary Italy, Letonia, Poland Czech Republic and Sweden	Belgium, Croatia, Slovenia, Spain, Macedonia, Finland, France, Greece, Netherlands Norway Portugal and Sweden

Source: IRG-RAIL 6th Market Monitoring Report (March 2018). CNMC

nes and are in the deregulation phase such as Spain, Finland or France.

This development, at a different speed, has enabled to arrive at some conclusions about the advantages and challenges posed by Europe's new model of rail services. On the one hand, it is worth noting that this deregulation has many benefits for travellers who can see an increase in the number of frequencies in

the corridors and an improvement in areas such as the price of tickets or the quality of services provided. At the same time, potential obstacles may also be encountered such as the difficulty of entry that new operators may come across due to network capacity constraints, high amounts in rail tariffs or risks such as the interruption of services that may result non-profitable.

DEREGULATION OF PASSENGER TRANSPORT IN EUROPE

ADVANTAGES

- ✓ Increased demand.
- ✓ Increased network activity.
- ✓ Increased frequencies in corridors.
- ✓ Substantial reduction in prices for the end user.
- ✓ Lower public financing costs for services subject to PSO.
- ✓ Improved quality of services.



RISKS AND OBSTACLES

- ✓ Difficulty of entry of new operators because of lack of capacity.
- ✓ Possible lack of neutrality on the part of the relevant administrator.
- ✓ High amounts in rail tariffs.
- ✓ Real access to railway facilities.
- ✓ Disruption of unprofitable services
- ✓ Advantages of historical operators over the competition.



UNITED KINGDOM: PIONEER IN EUROPE

In the case of the United Kingdom, which is no longer part of the European Union following the approval of Brexit, we must go back to the year 1992, but the privatization of the sector was completed under the Railways Act enacted in the country in the year 1993.

The functions carried out by the British Railway Board, which managed the public company British Railways were split up, and several regulatory powers were transferred to the new Rail Regulator. Thus, the control of the infrastructures went to the company Railtrack and both the maintenance of the tracks and cargo operations were awarded to different private companies, as was the contest for the operation of passenger trains. Although, in 2001 Railtrack went bankrupt and the State re-nationalized its operations that were taken on by Network Rail.

In these 22 years of deregulation in the United Kingdom, passenger rail operators have been appearing and disappearing. Currently, there are at least 16 franchises. The presence of operators and owners particularly stand out, such as Arriva Rail UK; Abellio; Serco; Govia; First Group, or Virgin, in addition to Trenitalia operated by the C2C company, formerly owned by the National Express transport consortium, owner, among others of the Spanish company ALSA of road passenger transport, and which has been one of the strongest companies in the British rail market. The services offered by Caledonian Sleeper and Night Riviera are the only ones that take advantage of the night paths to connect London with Scotland and London with Cornwall.

The privatization process in Great Britain continues. The last call has been that of the competition for the Inter City between the locations of London and Birmingham, the concession of which has been awarded to the consortium comprising First Group and Trenitalia.

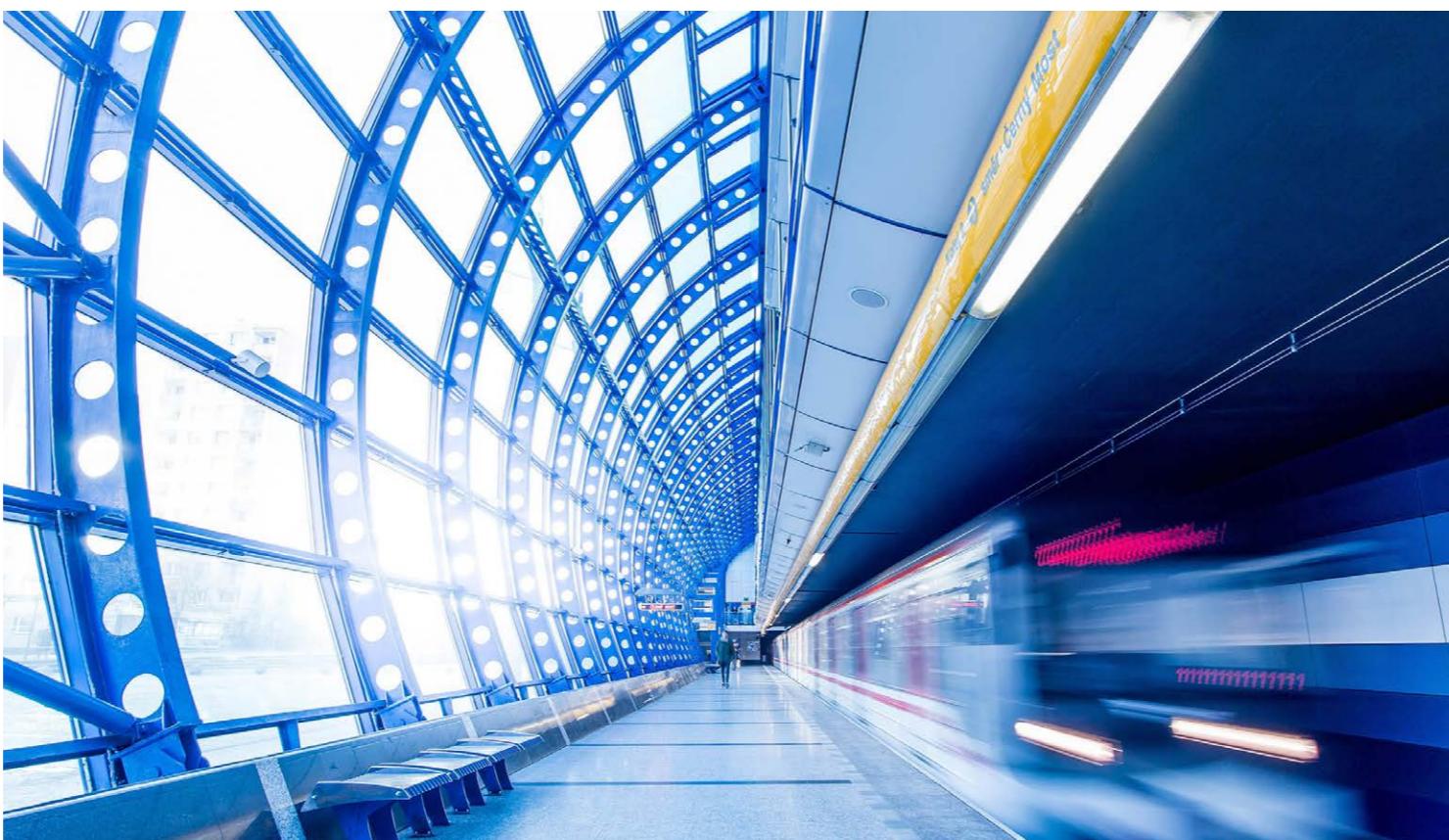
Despite the wide openness to the competition, ticket prices are high for the passenger, an aspect that can slow down the option of travelling in this means of transport in the country.

British deregulation model has managed to increase the demand for passenger rail transport that doubled from the beginning of deregulation until 2015.

► MAIN RAILWAY COMPANIES OPERATING IN GREAT BRITAIN

COMPANY	OPERATOR/OWNER
Virgin Trains	Virgin
Chiltern Railways	Arrival Rail UK
London North Eastern Railways	Departamento de Transporte
Northern Rail	Arrival Rail UK
ScotRail	Abellio
Greater Anglia	Abellio y Nederlandse Spoorwegen
Calcedonia Sleeper	Serco
Thamslink	Govia
Great Western Railways (GWR)	First Group/GWR
TransPennine Express	First Group
South Western Railway	First Group
Southern Railway	Govia
Heathrow Express	GWR
Stansted Express	Network Rail
Gatwick Express	Govia
Transpor of Wales	Arriva Rail UK
West Midlands Railways	Abellio
C2C	Trenitalia
CrossCountry	Arriva
Hull Trains	First Group
East Midlands Trains	Stagecoach Group
Southeastern	Govia
Gran Central Railway	Arriva Rail UK
London Northwestern Railway	Abellio

Source: British Railways. Own preparation



FRANCE: RENEWABLE CONCESSIONS WITH REGIONAL PRIVATE COMPANIES

The French state-owned company, Société Nationale Des Chemins de Fer François (SNCF) is the one that virtually has the monopoly, although a situation of renewable concessions is maintained with some companies covering regional itineraries, such as Veolia, Transport, Keolis, Transdev, Rtm or Tisseo.

There is an international route operation in cooperation with operators from other countries, such for example with Renfe,

with Ellipsos trains; with Belgium's SNCB, with Thalys and Eurostar; with the Dutch NS; with DB, through Aleo; or with the Swiss CFF, through the Lyria company. And

it has opened a strong competition with Trenitalia since 2010, thanks to the services of the company Thello, on the international lines between Italy and France.

AUSTRIA: PASSENGER AND GOODS SUBSIDIARIES

The process of opening the national rail passenger market began on 9th January 2008. That year WESTBahn was the first company to register for the provision of commercial services.

However, its activity in the Vienna-Linz-Salzburg corridor was delayed until 2011, the only one exempt from PSO in the country. It currently holds between 20 and 25% of the market share of this route where it also competes with OBB.

The great benefit experienced by the user is that after the purchase of new rolling stock by the private operator, the frequency of services has increased substantially and

new high-speed trains are available. In the country, the public company OBB, of 100 per cent state capital, is also maintained, and it is structured based on subsidiaries according to the routes between the different cities of the country, for

both, passenger and goods service. Also, the OBB is present in the Principality of Liechtenstein, as well as in an agreement with the Czech railways, CD, for the high-speed operations of the Railjet linking Vienna with Prague.

SWEDEN

The opening of rail services to different operators has occurred gradually and in two different stages. In the first one, as of 1990, public tenders for concessions were granted on an exclusive basis. In the second one, which began in 2010, together with this modality started the full competition.

Currently, only one route is not open to the free market. This is the line that joins Arlanda Airport with Stockholm Central Station. The private operator (A-Train) is in charge

of this stretch until the year 2040. In this country, infrastructure management is in the hands of a public company and is separate from the state passenger transport service operator, SJ AB, created in 2000.

There is a private MTR operator from Hong Kong, competing on the Stockholm-Gothenburg line, one of the country's main corridors, with a market share of between 25% and 30%.

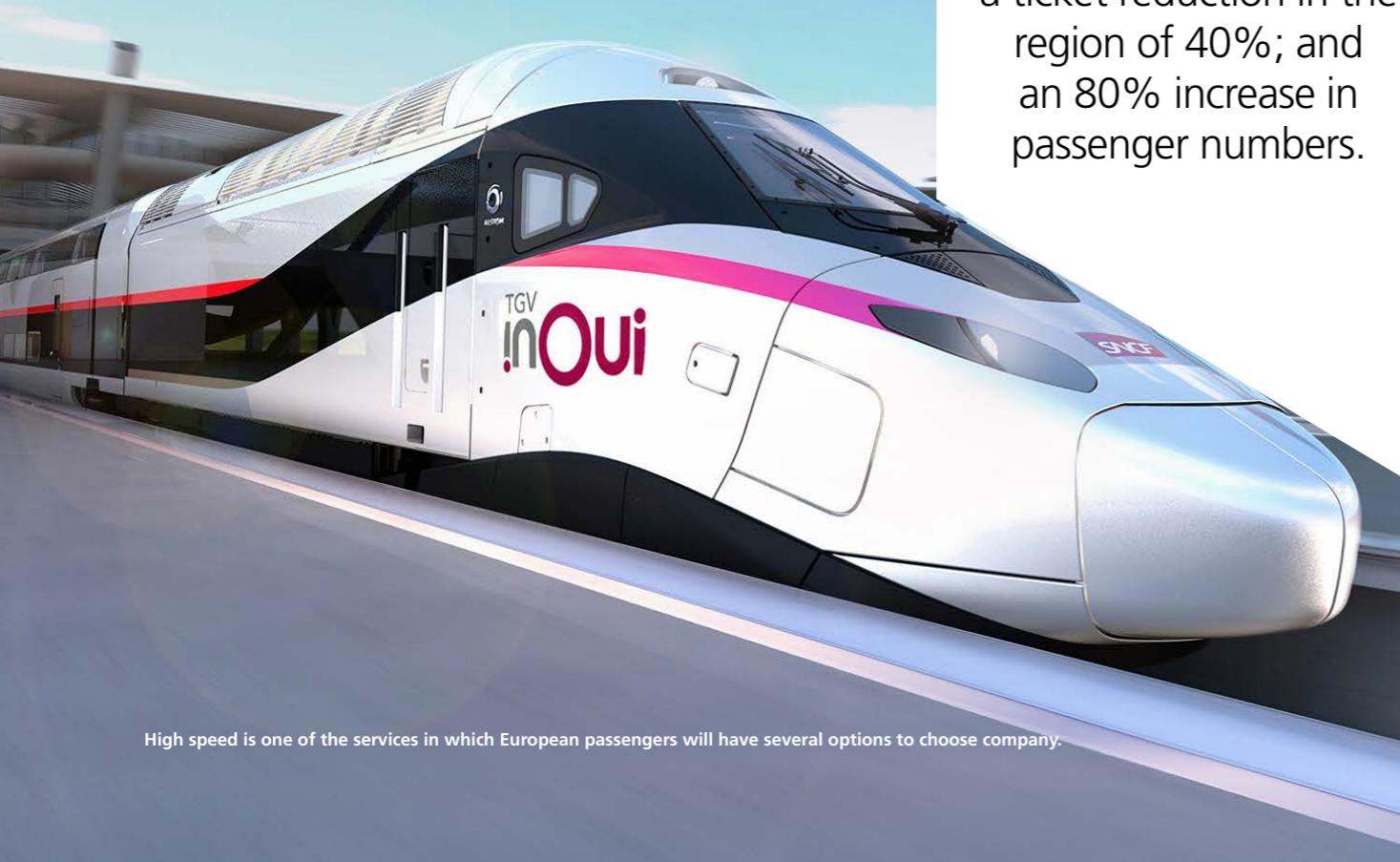
Competition has gradually occurred, gaining advantages for passengers who have been able to choose from market alternatives on routes such as the Stockholm-Gothenburg line.

GERMANY: MORE THAN A HUNDRED OPERATING COMPANIES

In Germany there are more than a hundred companies at a global railway level that offer different passenger transport services by train; this figure includes urban, suburban, local, provincial, regional and long distance services.

Despite the deregulation of the service that took place in 1994, 80% of the commuter market, goods and part of the long-distance operator is in the hands of the state-owned Deutsche Bahn (DB), so the effects of market opening have been very limited to date. As reflected in the German regulator's study (BNetzA) of 2018, in this process of deregulation companies that want to enter find some limitations such as the large investments

Free competition has led to an increase in alternatives in cases where Public Service Obligations (PSO) are provided.



ITALY: A DEREGULATED MARKET SINCE 2012

Italy has been one of the first countries to adopt community directives and not to wait until 2020 to open up the domestic market to other competitors besides the state-owned competitor. Thus, this market was deregulated in 2012 with the emergence of the company Nuovo TransportoViaggiatori (NTV) and its high-speed Italo trains on the routes between Turin and Salerno; and Venice and Salerno, joining 10 of the country's major cities and serving in fourteen stations.

The transalpine country created in 2000 the public company Ferrovie dello Stato, which is responsible for managing and maintaining railway infrastructure through the subsidiary Rete Ferroviaria Italiana (RFI), and the commercial passenger service with Trenitalia.

Although its opening to competition has been subsequent to that of the United Kingdom, for example, it is considered of greater importance, given that NTV competes directly with Trenitalia operating in parallel and offering similar journeys in some cases.

Italian deregulation has achieved, according to reports of train behaviour in the country, a ticket reduction in the region of 40%; and an 80% increase in passenger numbers.

NORWAY: PRIVATIZATION BEGAN IN THE YEAR 2000

The Scandinavian country carried out a reform in its railway services, deregulating all goods and passenger operation in the year 2000, but the same did not apply to infrastructure.

The initial NBS, now called VY, is state-owned, but the railway operation has been adjusted to a number of private operators which offer their services on both regional and Swedish connections. These include Cargo Net and Ofoten Line, dedicated to the transport of goods; Germany's Hec-

tor Rail; Sweden's Tagakeriet; Sporveien T-banen AS; LKAB Malmtrafik; Go Ahead Nordic, British; and, Flytoget AS. VY has recently signed an agreement with

the Spanish infrastructure administrator ADIF for the exchange of experiences and use by Norway of the knowledge of the Spanish public corporation.

SWITZERLAND: SPECIAL STATUS OF COLLABORATION WITH COMPANIES IN OTHER COUNTRIES

Although it is not a member of the European Union, its geographical location is key to railway development throughout the continent. The Swiss railways, SBB-CFF-FFS, the designation they receive in German, French and Italian, are public, although in the year 2009 they changed their structure to distribute their services in four divisions: the cargo transit, the passengers' transit, the infrastructures and real estate. At present there is a "de iure" deregulation of the railway market, as the legislation does allow new operators to freely enter at the national level, although it has not yet come into effect. At the moment, the country has a fully electrified railway infrastructure and its trains have high occupancy, so users enjoy high qua-

lity service despite still being in the hands of a single company.

The SBB-CFF-FFS is part of or owns the following subsidiaries operating either in the national territory or with Italian and French locations. In this respect, Alp Transit Gotthard, construction company of the base tunnel of San Gotardo; Thur-

bo; SBB Cargo Deutschland; SBB Cargo Italy; SBB Gmbh (Germany); Cisalpino-AG (high speed between Switzerland and Italy) where 50% is SBB's and the other 50% Trenitalia's; Tilo, with regional trains between Switzerland and Italy, also 50% with Trenitalia; and TGV Lyria, with routes between Switzerland and France, operated at 74% by SNCF and 26% by SBB.

In Switzerland, although services remain public, the train has gained market share and there is a special status of collaboration with companies in other countries.

CZECH REPUBLIC

This market was deregulated in 2003, but the first competitor, (RegioJet), began trading in September 2011 on the Prague-Ostrava corridor. In 2013 LeoExpress company also entered the market with the acquisition of five new trains. At present, however, the vast majority of passenger services (both long-distance and regional) are run by the public company České Dráhy, (CD) which has the monopoly of these services.

The arrival of these operators has provided a substantial boost to railway traffic

as a mode of transport, as the frequencies in this stretch have increased significantly. Private companies, despite the difficulties with the historical operator, have taken over between 40 and 50% of the market share in the Prague-Ostrava corridor.

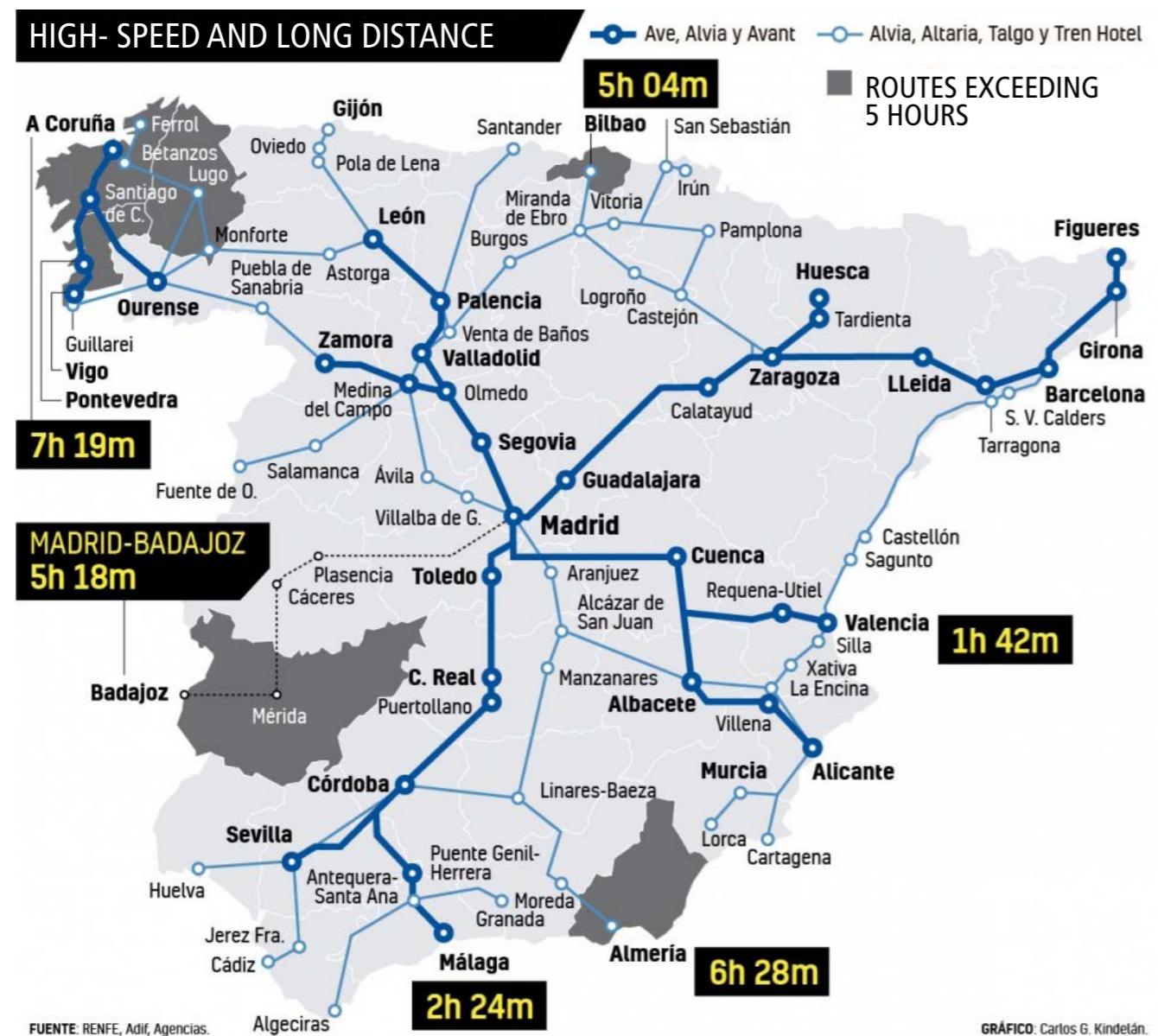
The new operators have brought a substantial increase in the frequency of railway services.

Spain opens the door to private railway operators

The entry of private operators in competition with the state-owned company Renfe Operadora will be definitive on December 14th. Two stakeholders, SCNF and ILSA, have already been selected.

To reach this point, it has been necessary to approve several rules complementary to the directive of the European Parliament, as well as the definitive acceptance of this liberalisation, to be in line with the Fourth Railway Package.

HIGH-SPEED AND LONG DISTANCE



tender competition in Spain's three main high-speed railway corridors: The Madrid Corridor with the French Border, through Barcelona, the most demanded; the Levante Corridor; and the Southern Corridor (Andalusia).

On December 14th 2020, a new phase opens up in the Spanish railway.

The distribution of paths into three packages

At the end of 2019, the Railway Infrastructure Administrator (Adif) approved the distribution of train paths from the three main high-speed railway corridors into three packages.

Furthermore, a possible extension of that period is under consideration, depending on the contractual situation in each country.

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 were offered per hour from Madrid to Seville and one per hour on the route between Madrid and Málaga.

This package has railway traffic of about 104 trains per day, of which 32 correspond to the connection with the Catalan capital; 32 with the Levante area and 40 with Andalucía. This package was practically reserved for Renfe for being the only company with sufficient capacity to meet those requirements.

Packages B and C are those which Adif put up for bid for the entry of private companies in competition with Renfe Operadora. The first aimed at railway traffic of 16 trains

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per day in each of the railway corridors mentioned; whereas the latter restricted operations to up to five trains per day on each of the three railway corridors.

On November 27th Adif's decision to grant the operation of Package A exclusively to Renfe Operadora was made public; whereas Package B was assigned to the Levante Intermodality Consortium (ILSA), formed by Air Nostrum and Trenitalia; and Package C was for SNCF that will operate it through its subsidiary Rielsfera.

As Adif's President, Isabel Pardo, pointed out when announcing this decision, there will thus be three competitors in the high-speed services, an aspect that represents a qualitative leap from the last paradigm of the Italian liberalisation, which resulted in a duopoly. For Pardo, this new stage will be "an opportunity for the economic development of the country". It should be noted

that with the entry of the two competing undertakings and the division of the paths between the three packages, the offer will be increased by 65% and ticket prices may also be reduced as there is increased competition in the market.

New Scenario

This new scenario is an opportunity to further boost the passenger railway as a means of transport in the country and to increase the latest passenger numbers. In this respect, it should be noted that in 2018, Spanish high-speed railway moved around 21.3 million passengers, up 1.1% from the previous year. In the corridor between Madrid and Barcelona 7.87 million travellers were transported; in the Southern one, about 6 million; whereas the figure in the Levante corridor exceeded 4 million.

The allocation has not reached 100% of what is offered. In the case of package A, Renfe has opted for 86%

of the paths, leaving 14% available; whereas in package B, Levante Intermodality (Air Nostrum plus Trenitalia) have done it for 70%, leaving 30% of the offer vacant; and in the case of package C, 100% acceptance by Rielsfera (SNCF) has been fulfilled.

Framework Agreement

Finally, on 12th May 2020, the framework agreement was signed with the three companies that will begin to compete in Spain. Renfe proposed extending the contract to 10 years, on the grounds that there is a need to pay off the large investment in the purchase of new rolling stock and the refurbishment of the current one, which has finally been accepted by the Commission.

As for the proposals made, ILSA has already announced that they will offer 16 services between Madrid and Barcelona; 8 between Madrid and Valencia; 7 between Madrid and Malaga and Seville; and 3 with Alicante. The company will operate with Bombardier Zefiro trains provided by Trenitalia.

Meanwhile, although Rielsfera (SNCF) has not indicated how it will occupy its paths, it has been pointed out that it wants to operate with its low cost offer that in the market of the French country is provided through Ouigo- TGV high-speed low cost services - and that it could use the new Euroduplex of Alstom which are in the approval stage.

On December 14th, a new phase of existence opens up in the Spanish railway with the entry of Renfe's competitors into the three most important high-speed railway corridors in the country. Thus, the objectives set by the Ministry of Development through liberalisation begin to emerge in the future, such as making the most of the network, in which some 51 billion euros have been invested, increasing the number of travellers and reducing the price of tickets, but always providing a perfect service based on quality, safety, efficiency and punctuality.

Boosting Workplace Innovation in the railway sector with the support of the H2020 RailActivation Project

Why do we need Workplace innovation in the Railway sector?

Railway transport already plays a vital role in supporting Europe's society, developing its economy, and protecting its environment. It has the potential to contribute much more, being the major driver in developing the strategic objective of smart green and sustainable growth.

At the same time the digital revolution is happening, thus transforming the way we move and produce. The railway manufacturers work now with "Industry 4.0" concept, which has drastically influenced the way of doing business. Mobile applications, e-ticketing, digital train control, signalling and traffic management, digital platforms for predictive maintenance are the key areas of digitalisation in the rail sector.

Railway sector requires permanent development of innovations to improve its competitiveness, and specifically the SMEs.

Innovation does not fail because of a technological failure or because the idea is bad. It fails because people make it difficult or avoid it, since they feel threatened by it or do not have an innovative mindset.

The idea may be good and perfect, but if the Innovation Process does not work, it will die. However, the idea could not be very good, but if it is implemented and marketed with the utmost commitment and passion, it can become a great innovation.

The lack of a corporate and innovation strategy as a basis for decision making is one of the most important barriers in Workplace Innovation.

The key to success in the railway sector is the full involvement of its employees through the implementation of the all-encompassing workplace innovation.

This is usually accompanied by the fact that the information is insufficient or insufficient as the basis for the decision. Another barrier for Workplace Innovation is that the Innovation Tasks does not always appear in job descriptions, therefore, they are perceived as additional work for some employees. Unrealized commitment and lack of support for innovation are undoubtedly one of the main reasons for the failure of innovations

At the same time an inadequate investment in people could be the biggest risk in workplace innovation. When employers perceive that the company is not giving them the compensation, career development, and other benefit, they are less committed to the innovation culture.

The fullest possible extent, simultaneously enhancing business perfor-

mance, engagement and well-being companies is possible only with the implementation of the evidence-based organisational practices which allow employees at every level to use and develop their skills, knowledge, experience and creativity. These organisational practices form the core of workplace innovation.

H2020 RailActivation aims to solve some common problems of all railway companies

Of course, smooth transitioning from the traditional way of work to the new model and implementation of all the best practices is not an easy task, especially for SMEs. Toward this end idea of RailActivation was born, and after being supported by EU Horizon2020, in the second half of the 2019 it began embark upon business and organizational scheme for



the adoption of innovation strategies in the workplace of SMEs, using the Open Innovation approach. The main objective of RailActivation project is to create and piloting a business and organisational scheme for the uptake of Workplace Innovation by SMEs from the railway sector using open innovation approaches. To this end, the RailActivation project is working on the development of new mechanisms and tools based on proven principles for open innovation process that will support the transformation for the railway industry from the inside out by actively reimagining the entire business around the customer, enabling employees to be the catalyst for change.

sists of the highly skilled specialists from 5 companies which represent 3 countries:

- TECNALIA- Foundation Tecnalia Research & Innovation (Spain);
- BTS Rail Saxony – The Rail Industry Cluster (Germany);
- DITECFER - District for Rail Technologies, High Speed, Safety & Security S.c.ar.l. (Italy);
- QUINN - University Consortium in Engineering for Quality and Innovation (Italy).

Before anything else, the consortium began looking at existing tools, and defining the best practices suitable for European railway SMEs. This information will be the basis for the development of a targeted Workplace Innovation Pilot Scheme for rail sector and the definition of RailActivation mechanisms and tools which aim to help companies to anticipate and adapt faster and better to changing economic environment, strengthening the pillars of responsibility in a digital age.

Solutions of a complex problems requires multifaceted cooperation within a strong team.



Who works on RailActivation?

From the very beginning it was clear that RailActivation project is aimed at a comprehensive solution to a number of existing problems in the European railway sector, and with this end it is imperative to cooperate with companies that can provide a high level of expertise and a vision of the work features in different countries. Therefore, project consortium con-

The whole group is led by MAFEX - Spanish Railway Association.

What the project consists of?

This project consists of a series of actions, each of which is an integral part aimed at providing a synergistic effect. Besides work packages focused on the innovative actions, there is a huge work of administration and dissemination of project's results.

RailActivation systematic approach will be developed fostering innovation capacities and allowing business to remain innovative and adapt to changes more quickly and smoothly. This type of flexibility is even more important in the context of a new industrial revolution and quickly changing technologies and business model.

At the same time it has been performed a benchmark at European



level analysing the SMEs behaviour, their culture of innovation, the level of employee engagement and the organisational and individual resilience among entities from Germany, Spain and Italy. This in-depth qualitative investigation into the SMEs identifies pathways towards for uptake Workplace Innovation.

The RailActivation will therefore aimed at helping SMEs reorganize around human condition. RailActivation project holistic approach starts with system theory, build upon with

applied data, wrapped in behavioural psychology, brought to life with design thinking principles. The involvement of the clusters from European Rail Cluster Initiative—ERCI as external actor from the consortium is essential to ensure the alignment of Rail Activation project with SMEs needs.

One should be aware that transformative changes in performance and working life can be achieved when boards, senior teams, line managers and employee representatives share a common understanding of Workplace Innovation and a commitment to making it happen.

RailActivation will work to build the internal capabilities and process required to deliver exceptional experiences for years to come. To drive change across SMEs. Thus, the support the development of open, collaborative and multidisciplinary interregional networks around the open



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

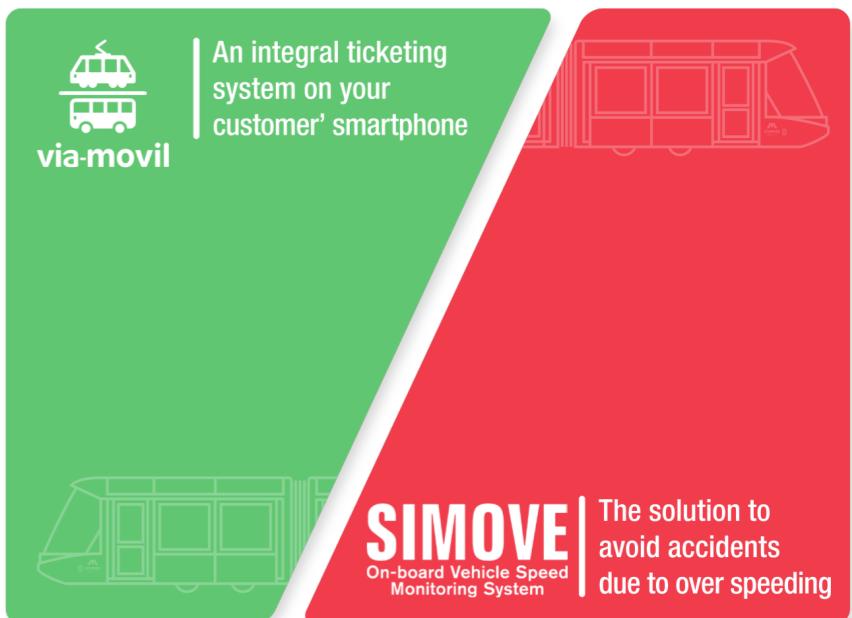
TECHNICAL ASSISTANCE AND ENGINEERING SERVICES

International and national projects

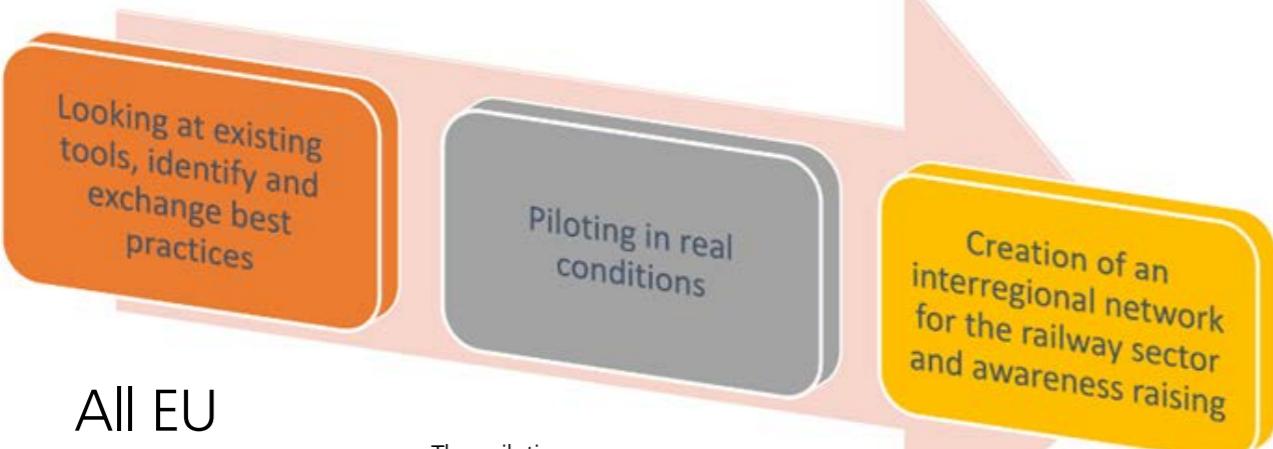
Railway engineering services

Technical assistance in Operation and Maintenance

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



contact@metrotenerife.com (Services and Consultancy section)



All EU railway SME can apply for RailActivation Open Call!

design and manufacturing model, as means to boost knowledge co-creation and skills development in this emerging field.

The RailActivation project will organise interregional Communities of Practice (ICoP) to co-create 20 pilot actions and develop guidelines of best practices and policy recommendations based on the experience from these pilots. In general, the pilot scheme in 3 different scenarios will be tested (See image n°1).

RailActivation will boost development of European Railway SMEs by implementation of workplace innovation concept, and taking into account particularities of the railway sector.

The piloting use cases conclusions will become recommendations from different perspectives to guide future researches, policymakers and organisations interested in Workplace Innovation. With this end an Interregional network for the railway sector will be created and awareness will be raising.

From a methodological point of view a combination of surveys and robust case studies will be taken as based in order to understand the barriers organisations face when considering Workplace Innovation and whether there are effective combinations of interventions.

Besides that, RailActivation provides an EU policy framework for boosting innovation uptake, industrial modernisation, scaling-up of SMEs and economic growth in the EU through the lessons drawn and new approaches tested at interregional level.

How can your SME implement it?

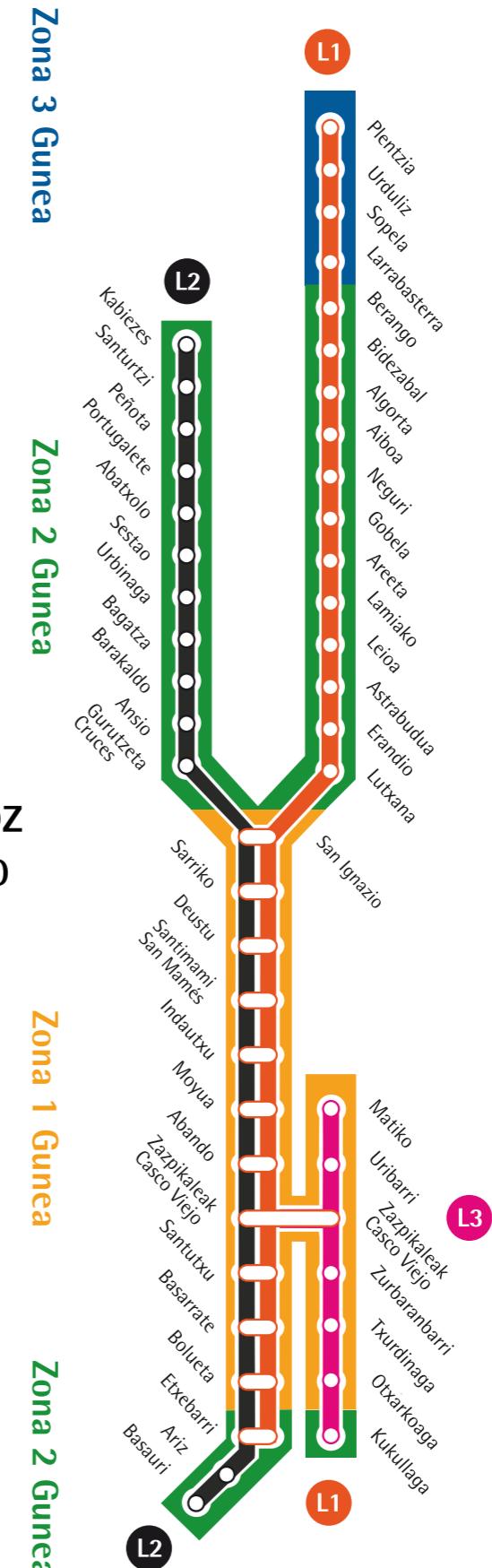
Here we have even more good news. In terms of RailActivation an Open Call (total financial support of €225.000) for European railway SMEs will be announced soon. The only conditions to participate in it is to be SME and to work in the railway sector. 20 selected SMEs will participate in 4 practical and independent workshops, suitable for Railway SMEs, and will achieve coaching and mentoring support regarding both technical and commercial aspects which involved in generating new value for the company and for the market.

How to follow RailActivation progress?

RailActivation wants to keep in touch with you! With this end the most relevant information about the project can be found on its website: <http://railactivation.eu/>

The recent news is available on its LinkedIn page (RailActivation) or on its Twitter @ActivationRail.

Image 1.



**Move the tube
Ici, en metro**

Mugitu metroz Muévete en metro

Zona 3 Gunea
Zona 2 Gunea
Zona 1 Gunea



New Operations Control Center Simulator and Co-Simulation Technology

As part of LANDER's ambitious project alongside SMRT in Singapore to train Circle Line staff, for the first time the company has developed an Operations Control Center Simulator which replicates to a large extent the functions of the customer's real OCC station.

The new simulator will enable trainees to practise situations relating to "Traffic Management", with signalling of the operation and its lines. Since the inputs that will be received by the OCC simulator operator are identical to those received daily at the work station, maximum immersion has been achieved in a secure

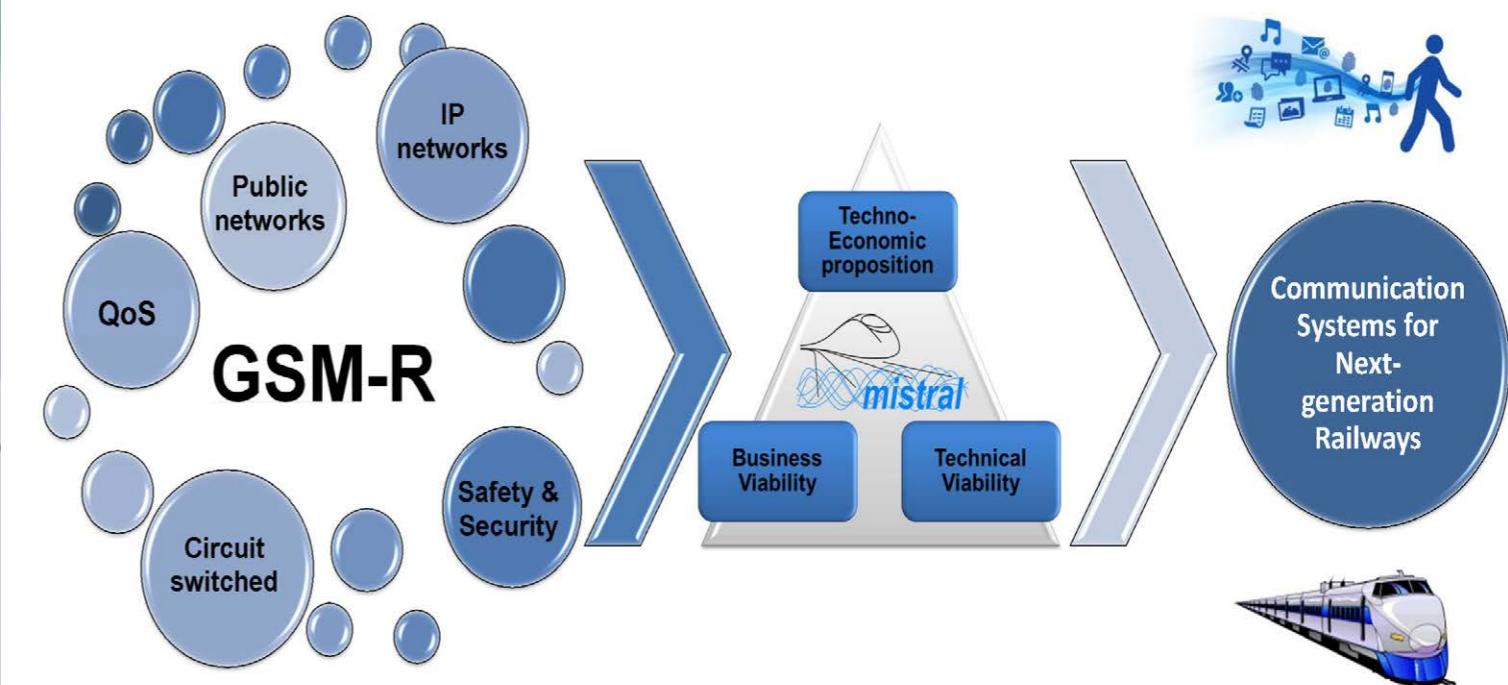
LANDER HAS DEVELOPED AN OPERATIONS CONTROL CENTER SIMULATOR WHICH REPLICATES TO A LARGE EXTENT THE FUNCTIONS OF THE CUSTOMER'S REAL OCC STATION.

controlled environment in which trainees can practise.

Also, since a major portion of the work of traffic managers and drivers involves interaction between them to ensure safe timely operation, LANDER has also developed Co-Simulation technology as part of this project. So, if there is at least one OCC station and one train driving station, both trainees can carry out joint training in situations pertaining to the operation, which affords them a large number of possibilities.

For example, breakdown training during which drivers will have to establish communication with the OCC for joint resolution of the breakdown. Or situations in which both of them interact collaboratively, such as: obstacles on the track, flooding, failure to establish the route etc.

Next generation system for railways



The number of passengers using railways is constantly growing so more capacity is needed. Railways need to provide new and competitive services to their passengers. Railways need to maintain and improve quality of service of their radio communication networks.

For that reason, the European project "MISTRAL" has been carried out during two years. Ardanuy Ingeniería has been part of the consortium in charge of this innovative project, which also includes the Istituto Superiore Mario Boella (Italy), SIRI S.p.A. (Italy) and Technische Universität Dresden (Germany).

The objective has been the elaboration of the Technical Specification of the future communication system for all railways in light of the migration from the current obsolete GSM-R. The new radio system will leverage the broadband capacity of IP-based wireless communication to enhance signaling but also to make possible

ARDANUY INGENIERÍA HAS PARTICIPATED IN THE "MISTRAL" PROJECT, WHICH IS PART OF THE SHIFT2RAIL PROGRAM. THE OBJECTIVE HAS BEEN THE ELABORATION OF THE TECHNICAL SPECIFICATION OF THE FUTURE COMMUNICATION SYSTEM FOR ALL RAILWAYS, AS WELL AS ITS BUSINESS VIABILITY.

innovative services for both users and train automation/ control.

To achieve the objective, MISTRAL has generated a Techno-Economic proposition, which relies on an optimized life-cycle cost and on a sound portfolio of innovative services. The Validated Techno-Economic proposition is the main publicly available output of MISTRAL.

Its design and validation has been supported by an External Stakeholder Committee, involving selected

key players in the Railway domain. This project received funding from the Shift2Rail Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 730840.

In terms of far-reaching impact, MISTRAL will lay the foundations for the next-generation train-to-wayside communication systems, paving the way for a more competitive, attractive and sustainable European railway ecosystem.

Asset identification standard a virtual miracle of the infrastructure

One of the main advantages of using BIM is the monitoring that it achieves along the whole lifecycle of the infrastructure project, being this critically important during the operation & maintenance phase.

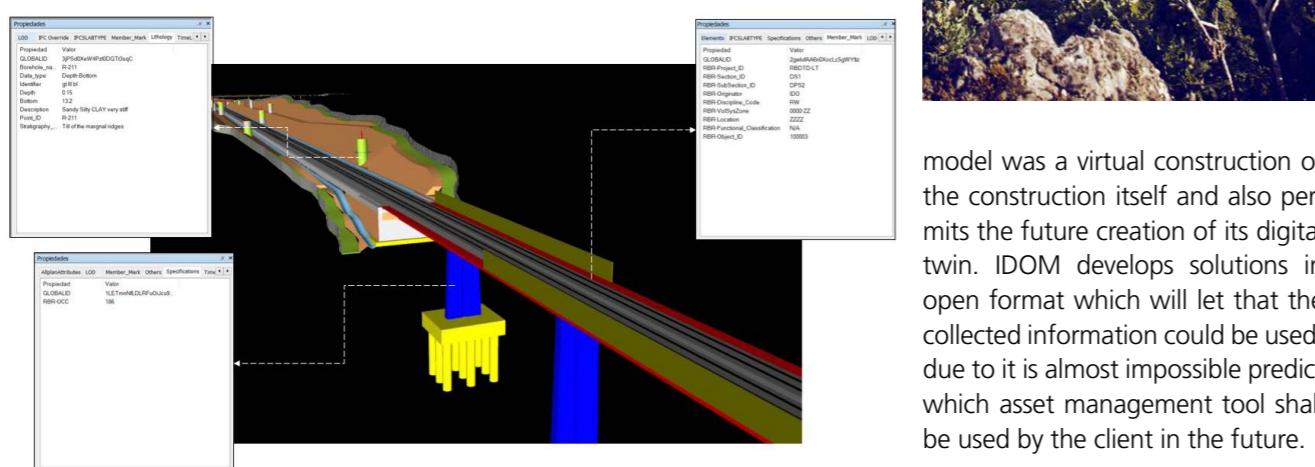
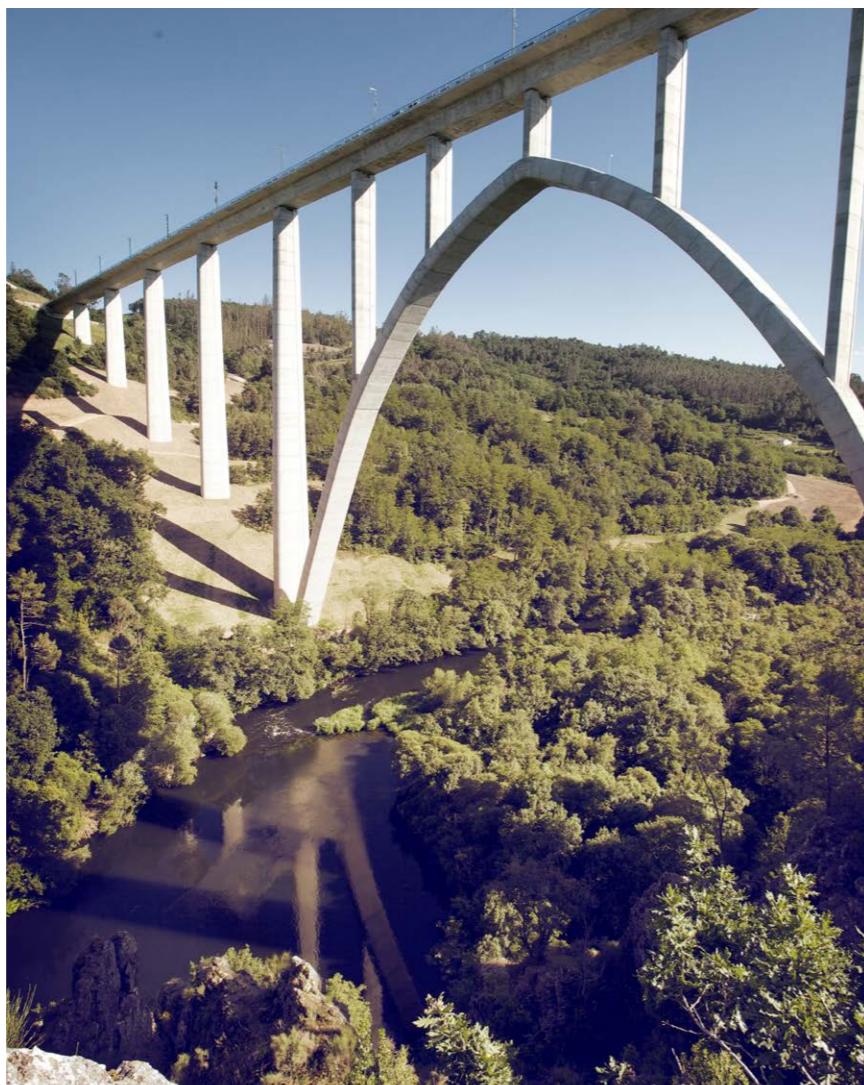
For that reason, IDOM assists all its clients including asset management as one of the BIM Use Cases in all of its projects. In order to achieve that, it is necessary creating a smart system which shall ensure that the BIM model developed during the preliminary design would be also useful in all of each following stages (detailed design, construction phase and finally operation & maintenance).

It is worth indicating that the meaning of asset might be either a big entity as the metro or railway station building, or smaller products as lighting fixture or even the sleepers from the railway line.

IDOM develops a variety of documents which helps to manage adequately and correctly the asset management, being the key one the following: Asset Identification Standard (AIS). The AIS consists in a system created by IDOM which allows ensure that any asset included within the infrastructure has its unique tag. This standard it is agreed and adapted to the client's needs.

This system also achieve that the BIM

IDOM ASSISTS ALL ITS CLIENTS INCLUDING ASSET MANAGEMENT AS ONE OF THE BIM USE CASES IN ALL OF ITS PROJECTS.



model was a virtual construction of the construction itself and also permits the future creation of its digital twin. IDOM develops solutions in open format which will let that the collected information could be used, due to it is almost impossible predict which asset management tool shall be used by the client in the future.

Inauguration of the new washing plant for Russian railways



Last January the operations of the new washing equipment installed in Moscow officially began.

The special climatic conditions as well as the characteristics of the rolling stock (1 and 2-storey trains, 625 m long Trans-Siberian) have been a design challenge achieved by Aquafirsch.

The washing room is of enormous proportions, including heating system, hot water arches, 16 washing

THE SPECIAL CLIMATIC CONDITIONS AS WELL AS THE CHARACTERISTICS OF THE ROLLING STOCK HAVE BEEN A DESIGN CHALLENGE ACHIEVED BY AQUAFRISCH.

brushes, dual detergent system, as well as special fans for drying, 3 complementary recycling systems for water reuse.

The new high-pressure roof arch with oscillating anti-ice nozzles has been tested with great success in this new washing plant. Its efficiency in

cleaning and removing the ice embedded in the roof of the trains has been amply demonstrated.

Aquafirsch's commitment to continuous improvement of its equipment and its investment in R&D has resulted in new systems adapted to the special needs of customers and respectful of the environment.

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3D sand mould printing technology for castings

FUNORSA, steel casting foundry in Spain since 1991, specialized in railway and high responsible casting components, following its Research and Development plan in quality orientation, has recently develop the castings with a 3D printed Sand Moulds and cores.

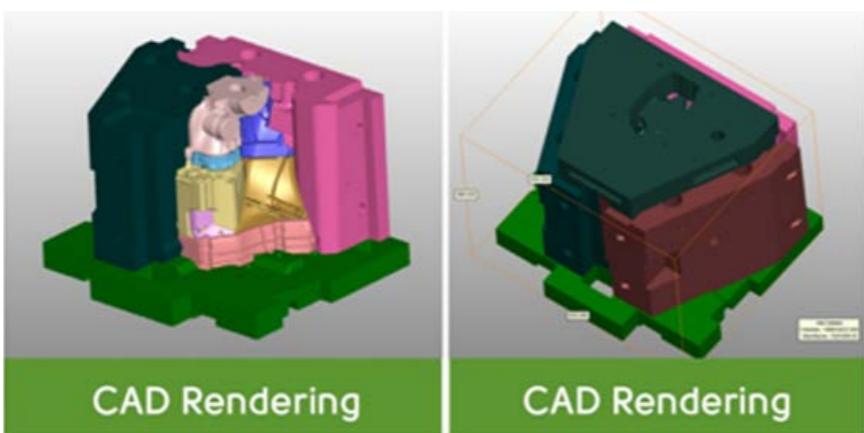
This innovative system allows the mould manufacture by 3D printing without pattern or hand operator manipulation, a complete automatic moulding, being the most suitable for the production of prototypes, high complexity pieces, spare parts and short series in which the investment in tooling is high and delivery time is long.

The advantages of this new sand printing method are the following:

- Reduction of the delivery time and the costs of the project because it is not necessary the pattern investment
- Greater geometrical precision of the pieces, decreasing the machining costs and weight of the piece
- Easy to make design modifications
- Reduction of indirect costs such as costs for pattern storage and maintenance.
- Possibility of manufacturing parts of high complexity.

With this new investment, FUNORSA faces 2020 following the continuous innovation strategy and a growth forecast in sales as those of the last three years that have allowed it to consolidate as one of the leading steel casting foundries (carbon steel, alloy steel and stainless steel) in its sectors.

THE FUNORSA SYSTEM ALLOWS THE MOULD MANUFACTURE BY 3D PRINTING WITHOUT PATTERN OR HAND OPERATOR MANIPULATION, A COMPLETE AUTOMATIC MOULDING.



WE ARE TALENT

Great infrastructure is the product of the vision and effort of exceptional people.



A talent that enables us to improve the mobility and the quality of life of millions of people, every day.

New traction chain development and validation

INGETEAM has developed and validated a new traction chain for high power, based on 3-level topology that has been proved at the Group's facilities, including a simulation of real operation on a high speed multi-voltage (25 kV /3 kV /1.5 kV) system.

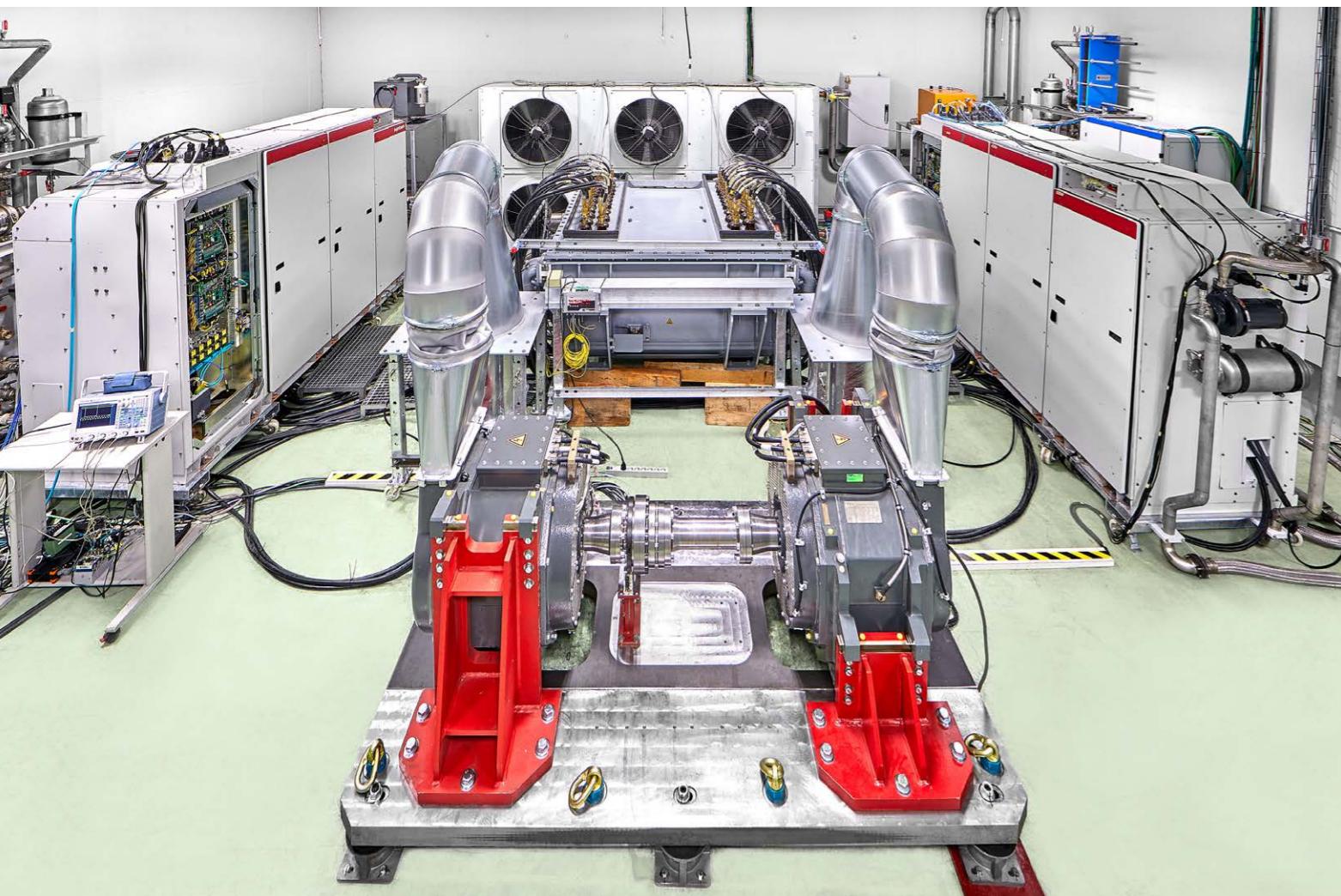
The results of tests showed that this traction system will deliver a higher energy efficiency; comparing to the classic systems based on bi-level technology, the efficiency will be around 30% higher.

The combined tests have allowed an optimization of all the elements,

INGETEAM HAS DEVELOPED AND VALIDATED A NEW TRACTION CHAIN FOR HIGH POWER, BASED ON 3-LEVEL TOPOLOGY THAT HAS BEEN PROVED AT THE GROUP'S FACILITIES, INCLUDING A SIMULATION OF REAL OPERATION ON A HIGH SPEED MULTI-VOLTAGE (25 KV /3 KV /1.5 KV) SYSTEM.

including the control system. Validation includes the accomplishment of all requirements, including noise levels, thermic characterization and the route simulation. All this process will help to reduce the mounting period and the vehicle testing.

The investment done by INGETEAM on those facilities amounted 3 Mio Euro. Furthermore, validation of traction system has been going through several months, involving a multi-disciplinary team.



Automatic measurement equipment: efficient and reliable data management

In the digital transformation context, the key leverage are: people, data and technology. By automating the asset measurement and the condition monitoring, the usual way to maintain can be transformed and the operational efficiency can be increased.

By integrating automatic measurement systems, advanced data analysis and computer-aided maintenance management, a critical base is built to improve the data quality, to make the maintenance service offered efficient to an operator and to improve the reliability and availability of the maintained train fleet.

With the aim of obtaining and consolidating all the data that is being generated by trains and infrastructure, CAF Digital Services have defined 4 measurement systems areas:

- Train monitors Infrastructure,
- Train monitors Train,

THE MEASUREMENT SYSTEMS ARE IMPLEMENTED BY CAF DIGITAL SERVICES AND THE DATA IS AUTOMATICALLY INTEGRATED INTO THEIR DIFFERENT PLATFORM FOR ANALYSIS.

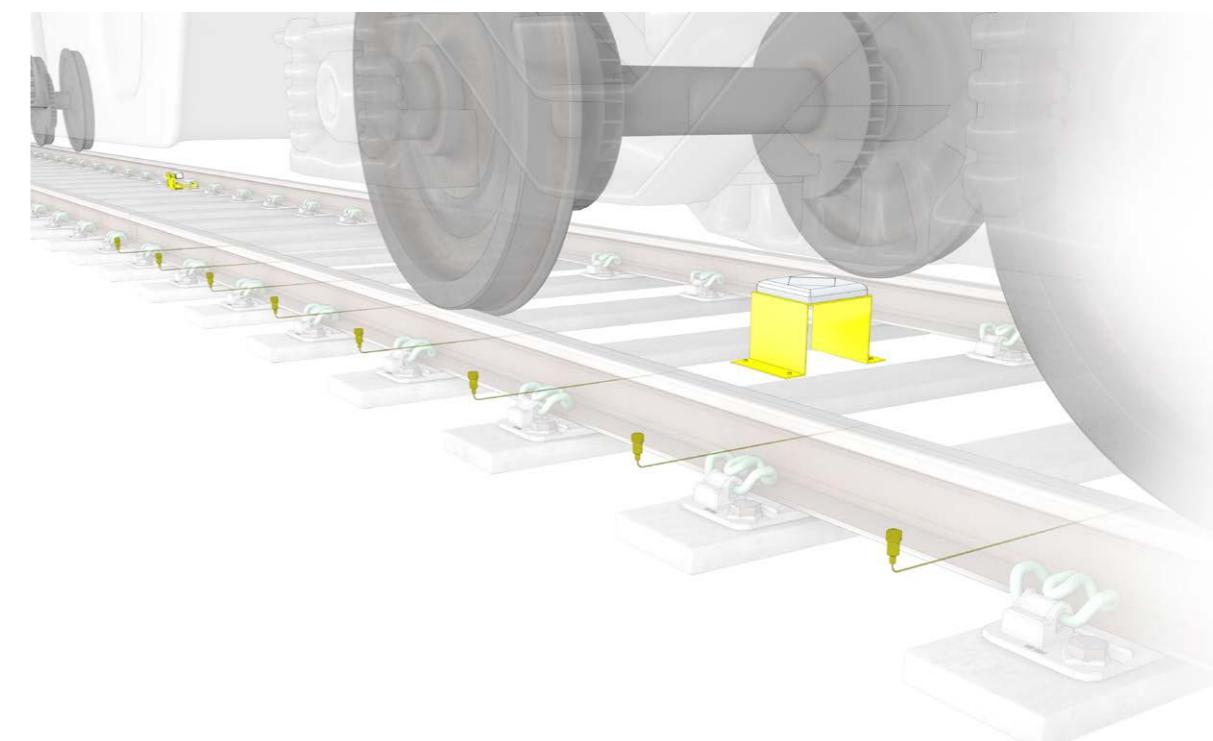
- Infrastructure monitors Infrastructure and
- Infrastructure monitors Train (what this article elaborates)

Infrastructure monitors train: Measurement equipment within this area represents rolling stock assets.

- Wheel Profile Measurement System: This system measures by using laser the wheel profile, the height and width of the flange and the back to back distance. This system can be installed indoors or outdoors.
- Brakes: Two types of brake systems can be offered; one for measuring the brake disc wear and another for measuring the brake shoes on the disc or the wheel.

- Wheel defect detection: Based on vibration analysis technology, it can be diagnosed based on the impact between the wheel and the track, defects located in the tread such as flats on wheels, spalling, shedding or polygonalization.
- Wheel Defect and Imbalance: This system accurately recognizes and identifies the out of roundness wheel. It classifies the typology (flat, number of lobules) and calculates the wheel load and the wheelset and bogie imbalance.

These measurement systems are implemented by CAF Digital Services and the data is automatically integrated into their different platforms for analysis.



An application enabling users to travel by public transport which improves the

The railway operator, Metrotenerife, has taken a significant technological leap for the public transport sector with the development and commercial operation of a system of wholly electronic ticketing which is at present unique, known as Via-Movil (<https://via-movil.es/>), which makes it possible to do without both the equipment for cancelling the ticket in the vehicles or at the stops and the physical ticket of the user.

This innovative system of ticketing is much cheaper and more sustainable than any traditional method for purchasing and paying for tickets, since it only needs stickers to be put in place with the QR code to valida-

THE VIA-MOVIL APPLICATION OF METROTENERIFE UNIFIES, IN THE MOBILE OF THE USER, THE PROCESSES OF SALE, VALIDATION AND INSPECTION OF THE TICKETS.

te the journey, thus significantly reducing the costs of issue of tickets, the maintenance of the ticketing infrastructure and investment in equipment. Moreover, Via-Movil is an interoperable tool which facilitates tariff integration between different transport operators.

The management and regulation of Via-Movil is located in a central server which guarantees the immediacy of any operation, records all the operator-customer interactions and makes it possible to perfectly seg-

ment the use made by each passenger of the service. Via-Movil enables users to buy any ticket on the internet and it is compatible with any other existing ticketing system.

After more than six years operating in the transport network on the island of Tenerife (trams + buses), the application has over 50,000 registered users, a daily demand of 25,000 validations and over 32 million journeys made using Via-Movil since it entered service.



The new RTP-800 revolutionizes train-to-ground communications

Teltronic presents the new RTP-800, a new generation on-board unit that integrates TETRA, LTE and WiFi voice and data communications in a single rack.

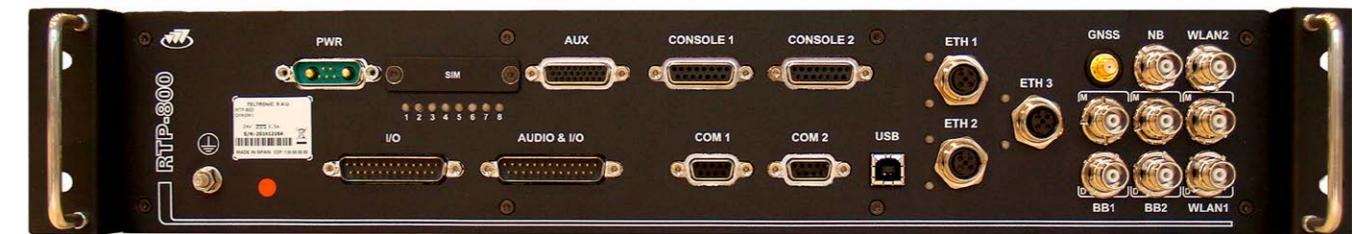
The new easy-to-install compact device, which complies with the EN50155 and EN45545 railway standards, and EN62443 industrial cybersecurity standard, is configured as a single hardware platform that supports multiple configurations: TETRA (for voice and data services), TETRA (voice) + LTE (data), or LTE (MCPTT and VoIP services for voice and broadband data services).

Within this multi-configuration scheme, the main novelty that makes it unique in the market, is that there is a part dedicated to broadband com-

munications, a completely independent and transparent interface that allows data transmission without interfering in mission critical functions, without the need to add more elements to the rack.

In addition, the new equipment offers wide connectivity possibilities, with Ethernet, serial ports and Wi-Fi, as well as a digital audio switching matrix that facilitates integration with the train's audio subsystems, such as intercom and PA system.

It also has interfaces for connection with other subsystems, such as the Train Control Management System (TCMS) or the Automatic Train Supervision (ATS), and its TETRA and LTE technology has been validated to support rail signaling data ETCS, CBTC and PTC. In its development, the guidelines of the International Railways Union for the definition of FRMCS have been followed, so it will also be prepared for compliance with this standard.



Resilience to Climate Change as a variable in infrastructure planning and financing



The long period of useful life intrinsically associated with infrastructure, as well as its evident exposure to meteorological phenomena, means that the effects of climate change must now be considered as another variable in the planning and investment processes. WSP Spain in collaboration with the Institute of Environmental Hydraulics of Cantabria, has developed for the International Finance Corporation the application "Climate Risk Management Screening Tool", which allows to introduce variables related to climate change in the process of planning and investment of an infrastructure. In particular, specific modules for roads and airports have already been developed, and the one corresponding to railway infrastructures is under development, including specific analyzes of the subsystems of

WSP SPAIN IN COLLABORATION WITH THE INSTITUTE OF ENVIRONMENTAL HYDRAULICS, HAS DEVELOPED FOR THE INTERNATIONAL FINANCE CORPORATION THE APPLICATION "CLIMATE RISK MANAGEMENT SCREENING TOOL".

track superstructure, electrification, control, or inspection of rolling stock, among others.

The aforementioned application thus becomes a support tool for management and decision-making in early stages of infrastructure development, based on input data typical of these phases and evaluating the financial impact of actions associated with climate change. during the period of useful life of the infrastructure.

The impacts considered by the application are derived from climatic fac-

tors such as precipitation, wind intensity, tropical cyclones, temperature, waves, swells and sea level rise. The selection of these variables is based on several factors: existence of reliable climate information, existence of a well-founded relationship between them and climate change, and cause of significant effects on the analyzed infrastructure.

This new application of WSP Spain complements its broad spectrum of tools and methodologies for evaluation and planning of investments in transport infrastructure.

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- WSP Spain-Apia S.A.

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- Fundación Gaiker
- Idom-Engineering, Consulting, Artchitecture
- Ineco-Ingeniería y Economía del Transporte, S.A.
- Rosni S.L.
- Sener Ingeniería y Sistemas, S.A.
- SGS Group Spain
- Trigo Group
- WSP Spain-Apia S.A.

Product and process certifications

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- Rosni S.L.
- Sener Ingeniería y Sistemas, S.A.
- SGS Group Spain
- Trigo Group
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- Lander
- Rosni S.L.
- WSP Spain-Apia S.A.

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- Lantania
- Luznor Desarrollos Electrónicos, S.L.
- Parrós Obras, S.L.
- Rosni S.L.
- Sener Ingeniería y Sistemas, S.A.

Electrification

- Alstom Transporte, S.A.
- Azvi S.A
- Caf Turnkey & Engineering, S.L.
- Comsa Corporacion
- Cunext
- Dominion
- Ingeniería Viesca S.L.
- Ingeteam Power Technology, S.A.
- Inserail, S.L.
- La Farga Yourcoppersolutions, S.A.
- Lantania
- Semi- Sociedad Española de Montajes Industriales, S.A.
- Schneider Electric
- Telice, S.A.
- Valdepinto, S.L.

Infrastructure and superstructure equipment and components

- Alstom Transporte, S.A.
- Amurrio Ferrocarril y Equipos, S.A.
- Arcelormittal España, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Azvi S.A.
- Cables de Comunicaciones Zaragoza, S.L.
- Caf Turnkey & Engineering, S.L.
- CEIT
- Comsa Corporacion
- Cunext
- Dominion
- Dsaf-Dinamicas De Seguridad, S.L.
- Segula Technologies España, S.A.U.
- SGS Group Spain
- Tpf Getinsa Euroestudios, S.L.
- Tekniker
- Teknorail Group
- Typsa - Técnica y Proyectos, S.A.
- Flexix, S.A.
- Funor, S.A.
- Hicasa-Hierros y Carbones, S.A.
- Iker SLU
- Inserail, S.L.
- Jez Sistemas Ferroviarios, 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.
- Schneider Electric
- Teknorail - Grupo Eurofinsa
- Tecnival S.A
- Tectronic, S.A.
- Telice, S.A.
- Thales España Grp, S.A.U.

Training and simulations tools

- Next Generation Technologies
- Precon - Prefabricaciones y Contratas, S.A.U.
- Pretensados del Norte, S.L.
- Rosni S.L.
- Semi- Sociedad Española de Montajes Industriales, S.A.
- Schneider Electric

MEMBERS DIRECTORY

- Talleres Alegria, S.A.
- Talleres Zitron
- Tecnival S.A
- Telice, S.A.

Track assembly

- Alstom Transporte, S.A.
- Amurrio Ferrocarril y Equipos, S.A.
- Azvi S.A.
- Caf Turnkey & Engineering, S.L.
- Comsa Corporacion
- Dominion
- Gantrex Spain, S.A.
- Inserail, S.L.
- Lantania
- Pretensados del Norte, S.L.
- Talleres Alegria, S.A.

TRAFFIC CONTROL AND SIGNALLING SYSTEMS, COMMUNICATION, PASSENGER INFORMATION AND TICKETING**Traffic control and signalling (safety)**

- Albatros, S.A.U.
- Alstom Transporte, S.A.
- Bombardier España
- Cables de Comunicaciones Zaragoza, S.L.
- Caf Signalling, S.L.
- Caf Turnkey & Engineering, S.L.
- CEIT
- Dominion
- Endavamientos y Señalización Ferroviaria ENYSE S.A.U.
- Ikusi SLU
- Implaser 99, S.L.L.
- Indra Sistemas, S.A.
- Inserail, S.L.
- Jez Sistemas Ferroviarios, 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.
- Schneider Electric
- Teknorail - Grupo Eurofinsa
- Tecnival S.A
- Tectronic, S.A.
- Telice, S.A.
- Thales España Grp, S.A.U.

Protection (security) and infrastructure monitoring

- Albatros, S.A.U.
- Alstom Transporte, S.A.
- Bombardier España
- Azvi S.A
- Bombardier European Holdings, S.L.U.
- Caf Turnkey & Engineering, S.L.
- Comsa Corporacion
- Dominion
- Endavamientos y Señalización Ferroviaria ENYSE S.A.U.
- Gmv Sistemas, S.A.U.
- Indra Sistemas, S.A.
- Inserail, 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.
- Schneider Electric
- Telice, S.A.
- Thales España Grp, S.A.U.
- Vicomtech

Passenger information and on-board entertainment systems

- Albatros, S.A.U.
- Alstom Transporte, S.A.
- Bombardier España
- Azvi S.A
- Bombardier European Holdings, S.L.U.
- Caf Turnkey & Engineering, S.L.
- Comsa Corporacion
- Dominion
- Endavamientos y Señalización Ferroviaria ENYSE S.A.U.
- Gmv Sistemas, S.A.U.
- Indra Sistemas, S.A.
- Inserail, 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.
- Schneider Electric
- Telice, S.A.
- Thales España Grp, S.A.U.
- Vicomtech

Revenga Ingenieros S.A.**Sice Tecnología y Sistemas, S.A.****Siemens Rail Automation, S.A.U.****Tecnival 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.
- Bombardier España
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Rosni S.L.
- Zeleros

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

- Alstom Transporte, S.A.
- Bombardier European Holdings, S.L.U.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Rosni S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.

Urban and suburban trains

- Alstom Transporte, S.A.
- Bombardier European Holdings, S.L.U.
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Rosni S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia S.A.U.

Freight wagons and Locomotives

- Alstom Transporte, S.A.
- Bombardier España
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Rosni S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.
- Taller Alegria, S.A.
- Zeleros

Vehicles for infrastructure maintenance

- Alstom Transporte, S.A.
- Bombardier España
- Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- Patentes Talgo, S.L.
- Rosni S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.
- Taller Alegria, S.A.
- Zeleros

MANUFACTURERS OF VEHICLE COMPONENTS, AUXILIARY EQUIPMENT AND SYSTEMS

Traction and propulsion components
Alstom Transporte, S.A.

- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Bombardier España
- Caf Power & Automation, S.L.U.
- Flexit, S.A.
- Ingeniería Viesca S.L.
- Ingeteam Power Technology, S.A.
- Mgn Transformaciones del Caucho, S.A.
- Rosni S.L.
- Siemens Rail Automation, S.A.U.
- Zeleros

Control, auxiliary and diagnostic systems

- Albatros, S.A.U.
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Bombardier España
- Caf Power & Automation, S.L.U.
- CEIT
- Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- Gmv Sistemas, S.A.U.
- Hispacold S.A
- Indra Sistemas, S.A.
- Ingeniería Viesca S.L.
- Ingeteam Power Technology, S.A.
- Kimua Group
- Nem Solutions
- NGRT S.L.
- Schneider Electric
- Stadler Rail Valencia, S.A.U.
- Zeleros

Assembly equipment

- Agui S.A.
 - Arteche (Electrotécnica Arteche Smart Grid, S.L.)
 - Danobat, S. COOP.
 - Funor, S.A.
- Mechanical components**
- Agui S.A.
 - Alstom Transporte, S.A.
 - Bombardier España
 - Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
 - Flexit, S.A.
 - Funor, S.A.
 - Gamarra, S.A.
 - Hispacold S.A.
 - Metalocaucho, S.L.
 - Mgn Transformaciones del Caucho, S.A.
 - Rosni S.L.
 - Stadler Rail Valencia, S.A.U.
 - Talleres Alegria, S.A.
 - Zeleros

Interiors

- Agui S.A.
- Bombardier España
- Colway Ferroviaria, S.L. (Nexus Management)
- Flexit, S.A.
- Fundación Gaiker
- Satys Interiors Railway Spain, S.A.
- Technology & Security Developments

Safety

- Agui S.A.
- Albatros, S.A.U.
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Bombardier España
- Dsaf - Dinamicas de Seguridad, S.L.
- Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- Fundación Gaiker
- Indra Sistemas, S.A.
- Luznor Desarrollos Electrónicos, S.L.

**MAINTENANCE: EQUIPMENT,
MAINTENANCE SERVICES AND
REFURBISHMENT****Infrastructure and superstructure maintenance**

- Alstom Transporte, S.A.
- Amurrio Ferrocarril y Equipos, S.A.
- Azvi S.A.
- Caf Turnkey & Engineering, S.L.
- CEIT
- Comsa Corporacion
- Duro Felguera Rail, S.A.U.
- Gantrex Spain
- Inserail, S.L.
- Ladicim
- Rosni S.L.
- Semi- Sociedad Española de Montajes Industriales, S.A.

Rolling Stock maintenance

- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smart Grid, S.L.)
- Azvi S.A.
- Bombardier España
- Caf - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Caf Turnkey & Engineering, S.L.
- Comsa Corporacion
- Goratu Lathes
- Grupo Trigo
- Hispacold S.A.
- Nem Solutions
- NGRT S.L.
- Next Generation Technologies
- Patentes Talgo, S.L.
- Rosni S.L.
- Siemens Rail Automation, S.A.U.
- Stadler Rail Valencia, S.A.U.
- Talleres Alegria, S.A.
- Talleres Zitrón
- Technology & Security Developments

Supply of maintenance equipment

- Albatros, S.A.U.
- Alstom Transporte, S.A.
- Aquafrisch, S.L.
- Bombardier España
- Danobat, S. COOP.
- Kimua Group
- Ingeniería Viesca S.L.
- Nem Solutions
- Newtek Solidos S.L.
- Next Generation Technologies
- Patentes Talgo, S.L.
- Rosni S.L.
- Tecnival 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

**ALBATROS, S.L.U.**

Technology company specialized in the design and manufacture equipment for trains, metros and trams. Divisions: Power Electronics (static power converters and battery chargers) and On-Board Systems (PACIS, control systems and other embedded systems). Leader in providing auxiliary components for trains and is among the leading world companies in such competitive markets like Europe, USA and Latin America. Headquarters located in Spain and factories in USA and Brazil. SEPSA products stand for high quality, high reliability and a long design life. The QM system is certified in accordance with IRIS, ISO 9001, CMMI3 and its eco-management system in accordance with ISO 14001.

- Albatros, 7 Pol.Ind. Pinto Estación
28202 Pinto (MADRID)
► +34 91 495 70 00
► +34 91 334 58 01
► sepsacomercial@sepsa.es
► www.sepsa.es

**ALSTOM ESPAÑA**

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 €7,3 billion in the 2017/18 fiscal year. Alstom is present in over 60 countries and employs 34,500 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 -
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► +34 91 334 58 00
► +34 91 334 58 01
► www.alstom.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

**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
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► +34 91 380 03 33
► jmartin@aquafrisch.com
► rails.specialsections@arcelormittal.com
► https://rails.arcelormittal.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 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)
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► +34 985 187 750
► jmartin@aquafrisch.com
► 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.

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+34 91 799 45 01

madrid@ardanuy.com

www.ardanuy.com

artechē

ARTECHE

The Arteche 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

Azvi //

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)

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+34 926 88 47 06

azvicentro@azvi.es

www.azvi.es

Power & Automation

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

Signalling

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

cafsignalling@cafsignalling.com

www.cafsignalling.com

Turnkey & Engineering

CAF TURNKEY & ENGINEERING

CAF Turnkey & Engineering was created in 2007 with its head office is 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

BOMBARDIER

BOMBARDIER TRANSPORTATION

Bombardier is today a key company of the Spanish railway industry, with around 1,000 employees between direct and indirect job positions, in its offices, workshops and factories located in Trápaga (Centre of excellence in propulsion equipment), San Sebastián de los Reyes (Centre of excellence in signaling systems), Alcobendas and Pinto (fleet maintenance). The company's activity ranges from the design, manufacture and sale of railway vehicles, propulsion and traction control systems (diesel and electric) and signaling systems, to the delivery of railway maintenance services for fleets, repair and modernization of railway material.

Miniparc 3 – Edificio K C/Caléndula, 93 28109 Alcobendas (MADRID)

+34 91 658 55 00

+34 91 650 75 18

javier.hinojal@rail.bombardier.com

www.bombardier.com/en/worldwide-presence/country.spain.html

CABLES COM SPAIN

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.alzorri@cablescom.com

www.cablescom.com

CAF

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.

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www.caf.net

Calmell Group

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)

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dsala@calmell.net

www.calmell.net

ceit

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)

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www.ceit.es

cetest

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.

- José Gutierrez Abascal, 2, 28006 (MADRID)
- +34 91 336 32 12
- citef@etsii.upm.es
- www.citef.es

**COLIN BUCHANAN CONSULTORES, S.A.**

Buchanan is a Transport Planning consultancy established in Spain in 2007, which originates date back to the innovative study "Traffic in Towns", conducted by a team of researchers led by Sir Colin Buchanan in 1963, on urban mobility in the society of the future.

In railways, Buchanan provides expert advice on pedestrian and crowd simulation studies at metro & rail stations, modal interchanges, rolling stock (boarding & alighting studies), using the leading pedestrian simulation software, LEGION (Bentley Systems Ltd.) of which Buchanan is the only global accredited distributor.

- Infanta Mercedes 73, bajo D 28020 (MADRID)
- +34 910 133 808
- info@c-buchanan.com
- www.c-buchanan.com

**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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- jiperalta@colway-08.com
- 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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**DOMINION**

Dominion, founded in 1999, is a global provider of multitechnology services and specialised engineering solutions. It combines knowhow, technology and innovation to help its customers make their productive processes more efficient, either by fully outsourcing them ("Services") or by implementing solutions underpinned by specialised technology and platforms ("Solutions"). Application of know-how, technology and innovation to improve customers' productive processes. Focus on selective digitalisation as a tool for driving efficiency gains. Stable presence in 35 countries with the ability to execute projects anywhere. Services and Solutions in three lines of activity: T&T, Industry and Energy.

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- www.dominion-global.com

**DURO FELGUERA RAIL, S.A.**

DF Rail is a company specialized in the design and manufacture of turnout systems for metro, conventional, heavy haul and even high speed lines up to 350 kph.. DF Rail has its own designs and patents thanks to an intense effort in research and development, and its technologically advanced facilities, with more than 56,000 m² for the design, manufacturing and assembling of turnout systems as well as machining and flash-butt welding of Mn steel crossings, machining of switches and stock rails. Besides, it designs and manufactures locking systems, fastening systems, wear devices, insulated glued joints and transition rails. Our products are installed in more than 21 countries.

- Pol. Ind.Fábrica de Mieres 33600 Mieres (ASTURIAS)
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- +34 985 456 164
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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 us Cordoba for copper products, Vitoria and Brescia for aluminium products.

- Av. de la Fábrica, s/n 14005 (CÓRDOBA)
- +34 957 499 300
- josep_anfruns@cunext.com
- www.cunext.com

**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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- www.railways.danobatgroup.com

**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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- +34 916 619 296
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- www.enyse.com

**EQUIPOS LAGOS, S.A.**

In Cabinas Lagos we are experts in the design of processes and products for surface treatment (sanding, metallizing, shot blasting, painting, drying, polishing). Since 1982 we have been growing and evolving until become a leading company with our own technological development, capable of developing important projects in rail, wind, aeronautical, etc ... sectors.

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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 KÄCHELE-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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- +34 944 977 190
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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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 comercial@funorsa.es
 www.funorsa.es

**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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**GAMARRA, S.A.**

GAMARRA S.A. is one of the foremost producers of Low Alloy Carbon Steel Castings in Europe. We produce Steel castings for most Railway Carriage and Locomotive Manufacturers throughout Europe and beyond. We also produce a wide range of castings for Commercial Vehicles, Off-Road Construction Machinery, Public Works, Ministry of Defence, Lifting and Farming Machinery and General Industrial requirements. Our products can be supplied in rough cast, machined or assembled with other accessories. We produce more than 7,000 tonnes of castings per year in the range of 10 kg to 300 kg and dimensions up to 1,100 x 1,100 mm.

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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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**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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 www.iconmm.com

**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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 www.gantrex.com

**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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 geminislathes.com

**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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**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 possess 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.**

At Ikusi, we provide complex turnkey integration project design, engineering and development services both for rolling stock and for infrastructure, with the agility and flexibility required by the rail industry. We are oriented towards improving our clients' competitiveness and innovation capacities, thanks to our deep business knowledge developed during these years.. Our business focus is the design and supply of innovative technological solutions to help vehicle builders, transport operators and authorities optimize and transform their business while guaranteeing quality of service and enhancing passenger experience in terms of security, information, comfort and accessibility.

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**IMPLASER 99 SLL**

IMPLASER is a Spanish manufacturer of security signaling products specialized in railway projects. Innovation and quality are our greatest exponents; our design, manufacturing and service procedures have been certified according to ISO 9001:2000 since 2001. Furthermore, we are the first SME being certified in R+D+i in Spain. Our wide range of products is certified by AENOR with photoluminescent values of 150, 300, 580 and 720 mcd/sqm. We are also specialized in the manufacturing of security, informative and accessibility decals for installation inside and outside the railway coaches.

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**INDRA**

Indra is one of the leading global technology and consulting companies and the technological partner for core business operations of its customers world-wide. It is a world-leader in providing proprietary solutions in specific segments in Transport and Defense markets, and a leading firm in Digital Transformation Consultancy and Information Technologies in Spain and Latin America through its affiliate Minsait. Its business model is based on a comprehensive range of proprietary products, with a high-value focus and with a high innovation component. In the 2018 financial year, Indra achieved revenue of €3.104 billion, with 43,000 employees, a local presence in 46 countries and business operations in over 140 countries.

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**INECO**

Global leader in transport engineering and consultancy, it has contributed to the development of transport infrastructures for over 50 years in more than 50 countries. Its high level technical specialisation allows its activity to diversify into new markets and reinforce its presence in those where it is already established. Its participation in the whole railway system in Spain has led the company to develop important international projects like the Makkah-Madinah high speed in Saudi Arabia, the HS2 project in the United Kingdom or the deployment of ERTMS in Europe.

- Paseo de la Habana, 138 - 28036 (MADRID)
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**INGENIERÍA VIESCA S.L.**

We are specialists in design and manufacture of power electronic equipment. Our equipment work satisfactorily in all the continents with high reliability and availability, making efficient use of the available energy. We adapt our products to customer needs and requirements according with the applicable standards and the best quality. The expected functionality is guaranteed by means of specific test protocols. Our innovation is present in all our products: auxiliary power converters, battery chargers, flat battery starters, ...

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**INTERNACIONAL HISPACOLD, S.A.**

Hispacold, a World leader Company for climate systems with more than 40 years' experience is specialized in passengers comfort. Hispacold designs and manufactures HVAC solutions for all rail vehicles: trams, metros, EMUs, DMUs, LRVs... with proven and reliable technology solutions. Hispacold is certified in the most recognized International quality management, environment and safety standards: ISO 9001, ISO 14001, OSHAS 18001, EN 15805-2 and the prestigious IRIS ISO/TS 22163.

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**JEZ SISTEMAS FERROVIARIOS, S.L.**

JEZ is 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. At JEZ we fit our developments to meet clients' needs.

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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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**INGETEAM POWER TECHNOLOGY, S.A.**

Ingeteam is an international group specializing in power and control electronics (inverters, frequency converters, controllers and protections) and electrical engineering and automation projects. The company operates in 22 countries, with 3,900 employees. R&D is at the backbone of its business activities.

In railways, the traction converters INGETRAC are based on an smart integration of proved Proved Modules, comprising all necessary elements to be fully operational, on each required application.

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**INSE RAIL S.L.**

Inse Rail is an engineering firm that is highly specialized in the railway industry and specifically its installations and systems. Founded in 1994, it is dedicated to engineering, consulting and project management in the railway, industrial, energy and building construction industries, carrying out its activities in the different stages of planning, design, construction and operation of investments.

Inse Rail participates in the international development of the High Speed Rail and metropolitan transportation, with a strong specialization in electrification, signaling, security and communication systems, and other railway transport installations.

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**LA FARGA YOUR-COPERSOLUTIONS, 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.

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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.

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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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**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.

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

MTC, being part of Wabtec Corporation, designs and manufactures 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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**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.

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**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.

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**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.

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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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**NEM SOLUTIONS | NUEVAS ESTRATEGIAS DE MANTENIMIENTO, S.L.**

NEM Solutions offers digital solutions to maximize productivity of train fleets; to lengthen life-cycle and to optimize maintenance and operational strategy. The principal purpose is to attain maximum profit, which facilitates the decision-making process and management. Through A.U.R.A. technology NEM Solutions provides real time predictive analytics. The operator gets total data control and enables the decision-making process and the follow-up of set objectives, in real time, with a global vision of the fleet situation. NEM Solutions look after the safety and efficiency of 250 train fleets, which means looking after 4,4M train passengers managing more than 67.000 assets in 25 countries.

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🌐 www.nemsolutions.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.

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🌐 www.newteksolidos.com

**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 trenTalgo, 2 28209 Las Matas (MADRID)
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✉ 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)
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📠 +34 91 359 12 46
✉ fsanchez@precon.cemolins.es
🌐 www.preconsa.es

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

PRETENSADOS DEL NORTE, is one of the most important producers of pre-stressed steel in the world. Our products are recognized for having the best quality on the market. Our high standards of quality mean that we are talking about the best pre-stressed 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 specialized in pre-stressed steel and its many applications.

➤ Miravalles, 4 Zona Indus. de Betoño 01013 (VITORIA)
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📠 +34 945 261 400
✉ pretenorte@pretenorte.com
🌐 www.pretenorte.com

**REVENGA SMART SOLUTIONS**

Revenga 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 intercoms, 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

**ROSNI S.L.**

ROSNI has the necessary capabilities to manufacture, repair and provide design on railway elements of significant dimensions, considered basic in structures and equipment. In addition, ROSNI is considered autonomous, as an important base in the manufacturing, both in the configuration of mechanical welding, as well as in machining, shot blasting, priming and painting, in addition to having the capacity to provide the corresponding quality documentation. Certificates, welding, painting, in addition to others that may be required.

➤ Antigua Carretera de Extremadura Km 20,800 28935 Móstoles (MADRID)
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**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)
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mvega@satys.com
www.satys.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.

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**SDEA SOLUTIONS, S.L.**

SDEA Solutions is a technical consulting firm specialized in providing engineering and design solutions for the railway sector, Energy and Transport mainly. We have a team of highly qualified engineers working in 3 main areas, Rail Sector Designs and BIM projects for linear works; Advanced Calculation and Simulation (FEA/FEM and CFD Calculations); Process Engineering and Thermo-mechanical designs. With our participation we hope to provide new knowledge using tools that the sector is demanding, especially in the development of BIM methodology with international presence and bidding for the R+D development.

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36210 Vigo (PONTEVEDRA)
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**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/Trespaderne, 29, 3º Edificio Barajas I, 28042 - MADRID
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www.sgs.com

**SCHNEIDER ELECTRIC**

At Schneider Electric, we believe access to energy and digital is a basic human right. We empower all to make the most of their energy and resources, ensuring Life Is On everywhere, for everyone, at every moment.

We provide energy and automation digital solutions for efficiency and sustainability. We combine world-leading energy technologies, real-time automation, software and services into integrated solutions for Homes, Buildings, Data Centers, Infrastructure and Industries.

We are committed to unleash the infinite possibilities of an open, global, innovative community that is passionate about our Meaningful Purpose, Inclusive and Empowered values.

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www.amufer.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.

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**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 Pabellón del Vallés 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.

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**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).

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sice@sice.com
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
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stadler.valencia@stadlerrail.com
www.stadlerrail.com

**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
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Talleres Alegría, s.a.

TALLERES ALEGRIA, 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.

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www.talegria.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.

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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.

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**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...

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**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.

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**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.

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FIND OUT MORE ABOUT ALL ACTIVITIES AND SERVICES WE HAVE PREPARED FOR 2020 REGARDING INTERNATIONALISATION AND COMPETITIVENESS AND INNOVATION

mafex@mafex.es

**TECHNOLOGY & SECURITY DEVELOPMENTS**

Technology & Security Developments (TSD) is a Spanish company localized in Herencia (Ciudad Real) which operates in more than 80 countries in the world and has an experience of more than 30 years in the sector of the design, development, fabrication and maintenance of special vehicles. TSD offers adapted solutions to the security forces, security companies and another fields of the physical security. Since 10 years ago, TSD has a line of product specialized in railway. Under the name of TSD Rail, the activity is focused on the fabrication of new components, restoration and makeover process, as well as the rehabilitation and maintenance of these vehicles.

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www.tsdinternational.com

**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.

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**TPSA**

Founded in 1966, TPSA 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, TPSA has extensive experience in building the capacity of local firms and in strengthening institutions to guarantee the sustainability of the infrastructure.

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**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.

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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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**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.

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**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.

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**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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ArcelorMittal

At the forefront of Rails Solutions

ArcelorMittal Rails & Special Sections has rail production facilities in Poland, Luxembourg, Spain and the United States 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:

- **Corporate Social Responsibility:** ArcelorMittal has received the Ecovadis Gold rating.
- **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 centre 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.
- **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 applications.

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New rail calculation tool
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Railway Traction

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READY FOR YOUR CHALLENGES

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IMAGINING THE MOTION



INGETRAC Traction converters are based on the smart integration of proven Power Modules (BPM) and a configuration adapted to the vehicle's needs.

At Ingeteam, we imagine vehicles in motion, and we are ready to successfully address any challenge related to rail vehicle traction.

