



MAFEX

Mafex corporate magazine
Spanish Railway Association

Issue 23. July 2020



RAILWAY,
the main character of a new
SUSTAINABLE, safe and innovative era



SUSTAINABILITY AS A PRIORITY

The role of railway transport in the face of environmental challenges.



DIGITIZATION

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The European Union stands firm in its commitment to the railway as a key element in the green transition that is being driven since the Green Deal.

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The fight against climate change has become a global priority. Aware of the need to act together, the UN approved the 2030 agenda on sustainable development with 17 key objectives. Railway transport has much to contribute to help reduce global greenhouse gas emissions.

**GOODS: MULTIMODAL, ECOLOGICAL
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The smart cities seek an integration of the different modes of transport, the railway among them, and they are focusing on the user.

**DIGITALISATION: AN INDUSTRY 4.0 AT
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**ADMINISTRATIONS, OPERATORS,
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Companies, operators and administrations join forces to regain users' confidence on public transport following the impact of covid-19. In this context of change, the multiple measures taken and the technological advances of a pioneering industry make it possible to place the railway as the mode that best suits the new sanitary conditions to offer a journey with the maximum security measures.

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A new phase for the sector marked by sustainable safety and mobility

The railway sector resumes its activity following a phase marked by the global health emergency caused by the impact of Covid-19.

Over the past few months, intensive work has been done to ensure a safe environment in public transport, and in particular the railway, by implementing all the measures issued by the health authorities in an agile and efficient manner. However, efforts must now focus especially on regaining user confidence to resume the usual circulation flows.

The following pages contain numerous testimonies from public administrations, institutions, operators, metros and trams detailing how work is being carried out to face these new challenges and to convey to the passengers full reliability in railway infrastructure and services.

From Mafex we would particularly like to thank you for your participation and the valuable testimonies you give us to learn more about the roadmap you have set out to achieve this goal and to give back to the railway the central place it has in today's mobility.

Precisely, this ability to react to such special circumstances has been made possible by the technological advances of the industry and its wide range of solutions. The most cutting-edge developments, once again, have been key to providing real-time information, having a robust system of capacity control and asset monitoring, making electronic payments or applying disinfection methods of maximum efficiency, among other multiple examples.

It should also be noted that, in the scenario of new normality, the railway is shaping up as the best alternative for safe, sustainable and efficient mobility. Proof of this is the administrations' commitment to strengthen reconstruction based on a carbon-neutral economy, as set out in the European Green Pact (Green Deal) and the United Nations Sustainable Development Goals (SDGs). The agreement wants the evolution of the economy towards more efficient and less polluting model of society.

To this end, the European authorities are committed to a modal shift and a more environmentally friendly mobility with a clear main character, the railway. It is the most environmentally friendly, accessible, digitalised and safe mode of public transport. With its high energy efficiency, low CO2 emissions and ability to

safely move millions of people and tons of goods around the world, this means presents itself as the solution to major social challenges from globalization to new smart city models, climate change or travel in the new normal.

The boost to this means is also crucial for business revival, as its industry, key to GDP, generates more than 400,000 direct and indirect jobs across Europe. In addition, it has an innovative supply chain, made up of hundreds of SMEs and large corporate groups, which stand out for their technological advances and excellence in service.

To return to the path of sustainable growth in the current scenario, the railway must remain the backbone of transport policies. It is necessary to maintain the planned investment in infrastructure and mobile material, to continue with public tenders by the administration and to redesign a comprehensive internationalisation strategy, to promote the competitiveness of all its companies. This is in addition to making a strong boost to R&D&I as a differentiation factor.

The sector must now respond to the new challenges it faces, both present and future, with the capacity for innovation that characterises it. Further progress needs to be made on issues such as intermodality, energy efficiency, Mobility as a Service (MaaS) or digitalisation. All this, accompanied by communication and awareness campaigns to regain confidence in public transport.

Once again, the joint work of a consolidated sector such as the railway will be key to confidently advance towards sustainable mobility, free of emissions and with full guarantees for travellers and the planet.

Pedro Fortea, General Director MAFEX

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Data from international organizations highlight the role of transport in a sustainable development economy. For this reason, they stress the importance of betting on those models of mobility that help reduce the environmental footprint, increase accessibility among society and ensure a better quality of life.

The world is moving towards this new model of sustainable society where the environmental challenge will guide all decisions. The European Union works along these lines, which proposes a green and inclusive transi-

The **railway**, the main character of a new safe and innovative sustainable era

GLOBAL DEVELOPMENTS TOWARDS A NEW GREEN ECONOMY REQUIRE A PROFOUND TRANSFORMATION OF THE CURRENT MODEL OF MOBILITY. THE RAILWAY IS DESTINED TO BE THE MAIN CHARACTER, AS IT IS THE MOST EFFICIENT MEANS OF GROUND TRANSPORTATION.

The United Nations (UN) warns that climate change is one of the greatest challenges of today's society. The organization highlights the fact that the time to act is short, as "we have until 2030 to mitigate the numerous environ-

mental consequences that come from 95% of the impact of activities generated by human factors".

Of this high percentage, only transport represents one third of the final energy and one quarter of the total

greenhouse gas emissions, as the European Environment Agency points out. This is in addition to other repercussions such as noise generation, large spaces occupancy or urban sprawl.

tion to help people's well-being and ensure the future of the planet. This redesign is governed by concepts such as equity and prosperity based on a modern, competitive and highly resource-efficient economy.

One of the most important aspects of this eco transformation focuses on the need to address climate change through a reshaping of the current scheme of passenger and freight transport. On this front, the goal is to scale back the emissions as far as possible to be a climate-neutral economy.

Commitment to new technologies, digitalisation and renewable sources.

Europe's trust in the railway as the future of mobility has been reaffirmed



Challenges and measures for change

To achieve a more powerful railway transport system, progress must be made in areas such as the intermodality and the integration, which means that all modes are present in a single system.

The modal shift towards railway hegemony entails strategic action at European level. Each member state must also act and legislate for the common objectives to become a reality.

First of all, efforts must be made to achieve a greater balance of regional connections across Europe, which requires strengthening the development of secondary regional lines and

infrastructures in rural areas. Increasing such networks will help reduce social inequalities and boost local economies.

Other challenges to be faced are those relating to more balanced charging systems, the commitment to digitalisation and efficiency, as well as a pricing and taxation policy in line with the environmental impact of each mode.

Alongside the role of institutions, the sector faces several challenges to increase the trust it already enjoys and improve in aspects such as user satisfaction, travel comfort, accessibility or interconnection with other modes,

in addition to advancing further in areas such as mobility and service.

In this transformation all stakeholders have a very important role, both industry and public and private operators. A coordinated and joint action will make the railway a real and affordable sustainable alternative. To this end, it will also be crucial to resolve issues such as funding and legislative development to advance on key issues such as cybersecurity, digitalisation or door-to-door services.

Also, the process of liberalising passenger transport underway is also an opportunity for change and to boost the development and use of railway infrastructures.

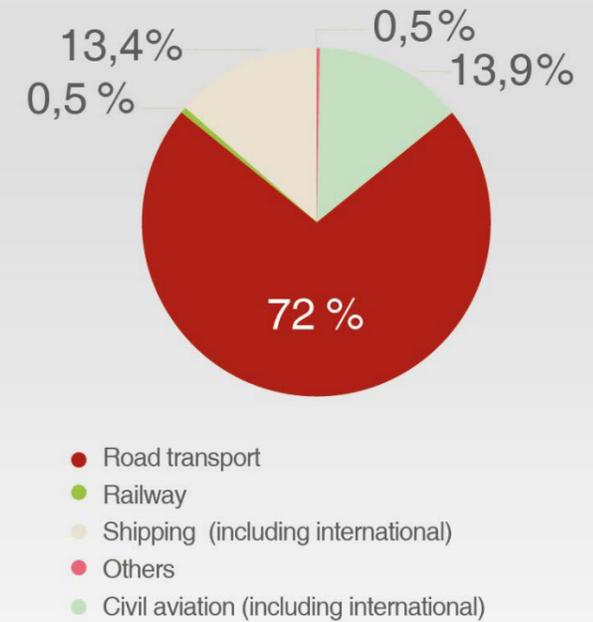
these days with the aid package that the European Commission has presented worth EUR 750 billion. These funds will contribute to the revival of the industry with direct support to aspects such as sustainability and digitalisation. Funding is reaffirmed in the transport strategy contained in the European Green Deal to boost sustainable mobility among all cities and regions of the member countries. Furthermore, an additional 1.5 billion EUR will be reserved for the "Connecting Europe" facility. This initiative promotes the creation of high-performance transport infrastructures to facilitate cross-border connections. These funds will also promote the deployment of 5G networks and the development of technological advances in strategic areas such as cybersecurity, artificial intelligence or supercomputing, among others.

The heart of change

The path towards improved mobility will continue and there will be a clear main character: the railway. This mode of transport brings together numerous advantages such as the combination of energy efficiency, safety on board, comfort, speed, frequencies and its reduced greenhouse gas emission. Its multiple benefits and the ability to adapt to the needs of travellers make it the heart of the shift towards a green economy.

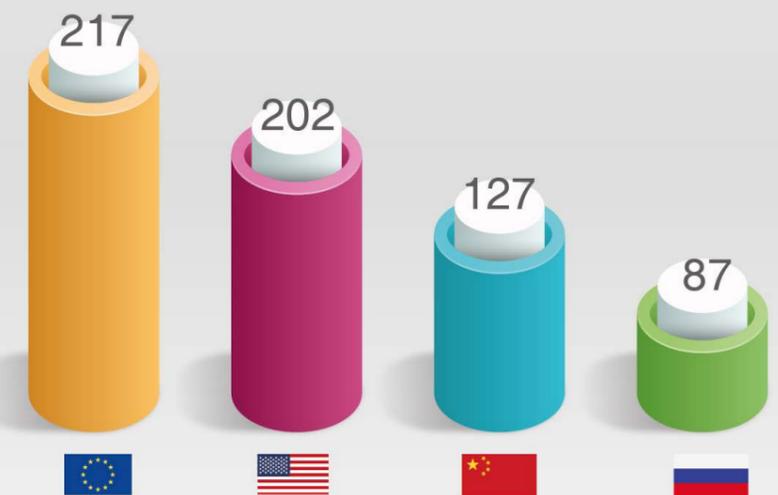
Railway is sustainable

Greenhouse gas emissions from transport (EU 28, 2017)



The railway connects people

Length of railway lines in use, in 1,000 km



Source: Statistical Pocketbook 2019



The backbone of modal change

THE EUROPEAN UNION STANDS FIRM IN ITS COMMITMENT TO THE RAILWAY AS A KEY ELEMENT IN THE GREEN TRANSITION THAT IS BEING PROMOTED IN THE GREEN DEAL.

Europe is moving towards a sustainable future. An objective for which it has approved the European Green Deal. It consists of a plan that includes 50 concrete actions to combat climate change and that aims to make Europe the first climate-neutral continent in 2050. Before that date, the European authorities have set out to reduce emissions associated with

transport by 90%, as they account for a quarter of the total. Of this figure, according to the European Environment Agency, in 2017 the railway accounted for only 0.5% of these emissions compared to 71.7% of the road, 13.9% of aircraft and 13.3% of maritime traffic.

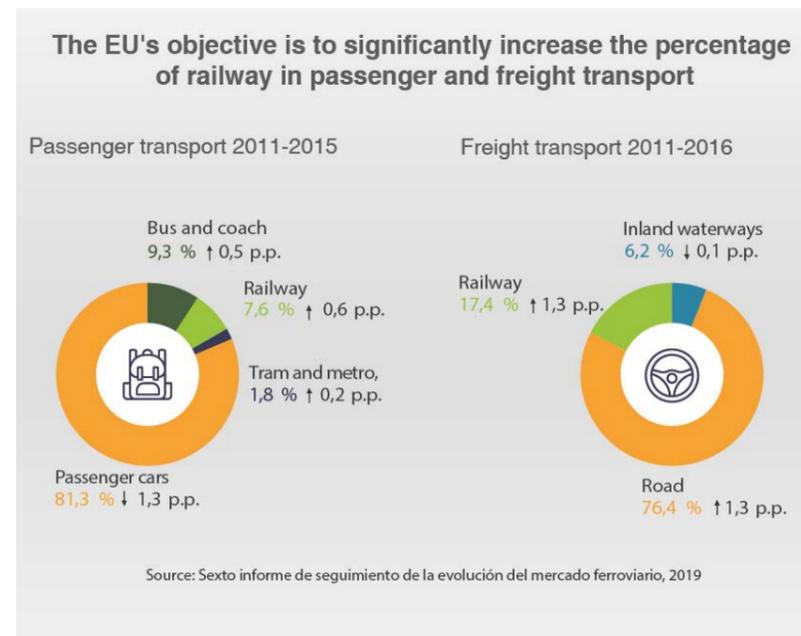
The Green Deal places, for the first time, the environmental and clima-

te agenda at the highest level. The agreement wants to bring together the development and the economy with the care for the planet and to achieve a more efficient and less polluting model of society.

This guide includes the different actions that will be taken to drive efficient use of resources through the transition to a clean and circular economy, the restoration of biodiversity and the reduction of pollution. Also, it collects the investments required to implement these initiatives, as well as the funding tools available, and it explains how to ensure a fair and inclusive transition.

Key actions

To be a climate-neutral economy by 2050, action will be taken across all



sectors by investing in environmentally friendly technologies, supporting all industries, including the railway industry, to promote innovation and

the deployment of cleaner and cheaper public and private transport systems. Also, the aim will be to move towards the improvement of global

environmental regulations. The European Commission will rely on the Just Transition Mechanism to achieve the target of a green economy and it will designate at least 100 billion EUR by 2027 to this end. These funds will be used in those regions, industries and workers most affected by the change and which face the greatest challenges.

The new green growth strategy sets mobility as one of the key aspects of the clean transition. It is about implementing a profound change in the current form of travel, with a commitment to a collective and electrified transport, since it is the most efficient and least aggressive route in terms of emissions.

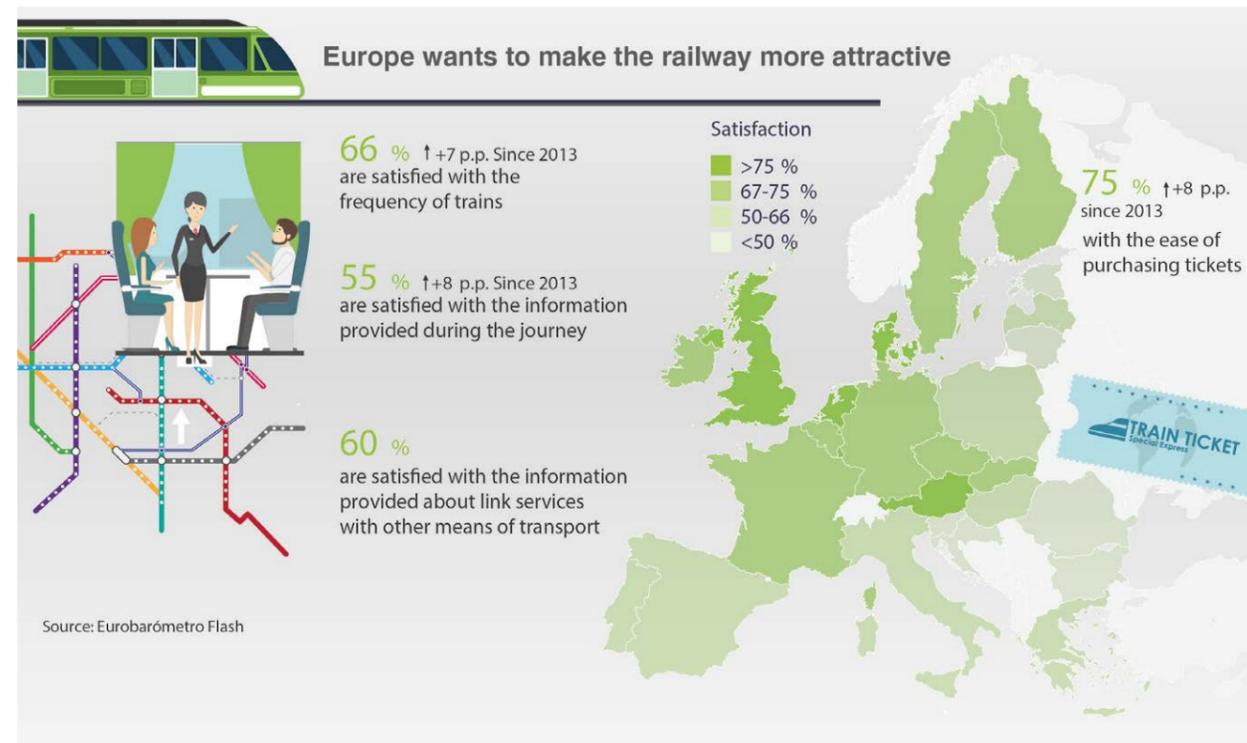
To this end, the aim is to reduce road traffic by 75% by transferring to other modes, such as the railway. In this area, the Green Deal is based

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on four points: to achieve more sustainable travel, to be governed by the principle of "polluter pays" in any mode of transport, to promote connectivity and accessibility of all citizens and to work on the implementation of alternative and sustainable solutions.

This new scheme attaches particular importance to automated and connected multimodality, as it is considered that systems and infrastructures will need to adapt to reduce congestion and pollution, especially in urban areas. To this end, it has been announced that work will be done on the development of "intelligent traffic management systems and mobility solutions" and on the incorporation of clean vehicles and alternative fuels.

In this sense, digital transformation will also contribute to boost mobility as a service, promoting the use of shared and more efficient transport.

As recently announced by the European Commission President Ursula von Der Leyen, the package of concrete measures to increase the capacity of railway networks will be proposed by the EU Executive by 2021.

Europe pushes for a modal shift for a more sustainable transport.

2021, EUROPEAN YEAR OF THE RAILWAY

The weight given to railway transport highlights the initiatives being carried out to stress the importance of promoting its development in a sustainable way. In this regard, it should be noted that the European Commission has proposed that 2021 be the "European Year of the Railway".

This initiative aims to contribute to the achievement of the objectives of the European Green Deal in the field of transport. During the next fiscal year, events, campaigns and initiatives will be carried out that will promote the railway as a sustainable, innovative and safe mode of transport. Moreover, according to the Commission, "it will highlight its benefits to people, the economy and the climate, and it will focus on the remaining challenges to create a true single European railway area without borders". It will also serve to highlight

other key issues such as the Shift2Rail programme, the revision of the TEN-T Regulation or the Fourth Railway Package.

This date has been chosen because 2021 "will be the first full year in which the rules agreed under the Fourth Railway Package will be applied throughout the Union". It is also considered the best option, as next year marks several important anniversaries for the railway as the 20th anniversary of the first railway package, the 175th anniversary of the first railway link between two EU capitals (Paris-Brussels), the 40th anniversary of the TGV and the 30th anniversary of ICE. The road to the sustainable future lies in boosting the railway in the coming years. This is work which has already involved institutions, transport administrations, operators and the wide range of companies that make up the value chain of the sector.



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Spain is on the move towards full decarbonisation of transport

The Spanish Council of Ministers approved on 19th May 2020 the Preliminary Bill for the Climate Change and Energy Transition Law. This regulation puts decarbonization and promotion of renewable sources at the heart of political action, as the key vectors of economic revival. It is the institutional framework for sustainable development and the decarbonization of the Spanish economy that seeks to achieve greater social cohesion with a model of activity that protects the environment.

The preamble to the Act highlights that more than 200 billion EUR of investment, with private and public capital, will be mobilized between

THE LAW ON CLIMATE CHANGE AND ENERGY TRANSITION THAT SPAIN PROCESSES ALIGNS WITH "THE EUROPEAN GREEN DEAL" AND SEEKS THE DECARBONIZATION OF THE ECONOMY. THE PROGRESSIVE IMPLEMENTATION OF THE MEASURES WILL ALSO ENTAIL A TRANSFORMATION IN THE RAILWAY SECTOR. IN PARALLEL, THE EXECUTIVE WORKS ON THE "SAFE, SUSTAINABLE AND CONNECTED MOBILITY STRATEGY".

2021 and 2030. Many of the planned initiatives will be accelerated to boost economic activity after the pandemic.

The first targets are set for 2030 when greenhouse gas emissions are to be reduced by at least 20% compared to 1990. That same year the aim is to achieve an introduction of

renewable energy in the final consumption of 35%. Also 70% of the electrical system must be supplied from clean sources.

By 2050 GHG emissions should be reduced by at least 90% compared to 1990 and the electricity system should already be 100% renewable.

Towards a 100% renewable electricity system

- Renewable energies will boost the **decarbonization** of the rest of the sectors
- They activate the economy and **new business opportunities**
- They improve business and industrial **competitiveness**
- They generate **future employment** in the short term
- They are the **cheapest** source of energy

EMISSION-FREE MOBILITY

Section IV of the aforementioned law entitled "Emission-free mobility and transport" seeks to achieve a passenger car fleet and light commercial vehicles without direct CO2 emissions.

In the large municipalities of more than 50,000 inhabitants and insular territories, measures will be introduced for the improvement and use of the public transport network for its electrification and for the use

of other fuels without greenhouse gas emissions, such as biomethane. There will also be a greater boost to shared electric mobility. Railway transport in Spain also subscribes to this change of model.

SAFE, SUSTAINABLE AND CONNECTED MOBILITY STRATEGY

Plans towards the decarbonization of the Spanish economy are reinforced by other initiatives of the Executive such as the "Safe, Sustainable and Connected Mobility Strategy".

It works in line with the SDGs and the 2030 agenda that advocates a comprehensive and inclusive understanding of transport policies, focused on environmental respect and intensive use of new technologies.

There is a commitment to low-emission means of transport and to turn infrastructures into smart and sustainable networks.

Measures suggested include transfer to modes such as the train, the use of eco-friendly vehicles, the increased energy efficiency of the industry as a whole, the boost to a smart railway power network, rolling stock renewal or LED lighting in stations.



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SDG: Sustainability as a priority

To combat the adverse effects of climate change, during the COP21 (United Nations Climate Change Conference) held in Paris five years ago, a universal and binding agreement was reached to reduce global greenhouse gas emissions by 95%.

THE FIGHT AGAINST CLIMATE CHANGE HAS BECOME A GLOBAL PRIORITY. AWARE OF THE NEED TO ACT TOGETHER, THE UN APPROVED THE 2030 AGENDA ON SUSTAINABLE DEVELOPMENT WITH 17 KEY OBJECTIVES. RAILWAY TRANSPORT HAS MUCH TO CONTRIBUTE TO HELP REDUCE GLOBAL GREENHOUSE GAS EMISSIONS.

The planned actions are reflected in the "2030 Agenda on Sustainable Development", which has 17 objectives ranging from poverty elimination, zero hunger, health and combating climate change, to environmental defence or the design of sustainable communities and cities. These targets were set in 2015 and a 15-year deadline was set to reach them.

A global consensus is that joint action by governments, society and the private sector is necessary to achieve these objectives.

Once again, the railway can act as a lever of change for clean, emission-free transport.

In addition, companies in the sector also work to incorporate the different SDGs into their own business strategy and daily activity in order to fully cooperate with the reduction of emissions and the care for the environment.



SDG n°9 Industry

SDG 9: Industry, Innovation and Infrastructure

The railway sector has a wide range of advanced solutions for the development of reliable, resilient and quality infrastructures and the promotion of inclusive industrialization. In addition, its industry's contribution to employment will increase significantly by 2030.

Companies are also aligned with SDG 9 to promote the adoption of clean and environmentally sound industrial technologies and processes, to increase research and to improve technological capacity.

SDG n°11 Cities

SDG 11: Cities and communities

The goals of this SDG include increasing efficient use of resources and mitigating climate change. The railway is one of the modes that can contribute the most to achieve more sustainably connected cities.

The implementation of metro, light rail, tram, tram-train or cable car networks in some areas will help to provide access to safe, affordable and accessible transport systems for all citizens by 2030.

SDG n°13 Climate action

SDG 13: Climate Action

Target 13 calls for emergency measures to combat climate change and mitigate its effects.

In this regard, encouraging the expansion of the presence of the railway, for both passengers and goods, will be key to reducing greenhouse gas emissions. The data support it. It is the least polluting and most environmentally friendly mode. The railway emits only 0.5% of total CO2 emissions.

SDG 6, 7 and 12: Circular Economy

Several of the SDGs are closely related to the circular economy. Alongside those mentioned above, SDG 6 (Water), SDG7 (Energy), and SDG 12 (Production and Consumption) are also included in this concept.

The circular economy means talking about an activity in harmony with its environment, which is committed to local development and employment, as well as maximum care for the environment. It is about acting in order to minimize waste production and to commit to reuse, repair and recycling. Also with the idea of reducing supply chains, and taking care of aspects such as land use, water, or energy, to protect biodiversity.

In this sense, companies in the sector work in line with these objectives to maintain natural capital, take care of the planet and improve the quality of life of the environment in which they develop their activity.



Reducing emissions in transport is one of the SDG targets.

Goods: Multimodal, ecological and efficient networks



RAIL FREIGHT TRANSPORT IS AN ESSENTIAL ALLY TO ACHIEVE A MULTIMODAL, INTEGRATED AND EFFICIENT SUPPLY CHAIN. IN THE COMING YEARS IT WILL BE KEY TO COMMIT TO A MODAL CHANGE TO ACHIEVE A COMPETITIVE ECONOMY AND PRESERVE THE PLANET IN THE FACE OF THE CONSTANT INCREASE IN TRADE.

Railway freight networks are key to an efficient, low-emission supply chain. In the coming years the transport of raw materials and products will increase by 30%, according to the White Paper on Transport in Europe, drawn up by the Rail Freight Forward alliance.

This increase in logistics operations will also lead to increased environmental pollution if the current high road transport figures are maintained. In terms of saving greenhouse gas emissions, industry players and

operators call for administration efforts to focus on increasing the railway share to achieve a sustain-

nable economic model over time, in line with the United Nations targets.

► FREIGHT RAILWAY IN FIGURES

With a market share of 7%, it releases less than 2% of the total greenhouse gases of the whole transport sector.

It generates 8 EUR for each tonne transported over 1,000 kilometers, while light trucks generate 145 EUR, heavy trucks 34 EUR and in river navigation up to 11 EUR.

Globally, with 7% of the market share, it consumes and releases less than 2% of the whole energy from transport greenhouse gases.

Globally, electrified lines by more than 70% can implement renewable energies without changing technology.

It has six times fewer external costs than road transport.

*Source: Renfe Operadora/RFF

NOAH'S TRAIN AS A SYMBOL OF CHANGE

Rail Freight Forward (RFF), an alliance of 16 European freight transport companies, in addition to the Community of European Railway Companies (CER) and the International Union of Railways (UIC) supports the need to increase railway freight transport by 30% by 2030 in order to protect the climate. For this purpose, the journey throughout Europe of "Noah's Train", named after its reference

to Noah's Ark, the saving vessel of all animal species during the Universal Flood, has been successfully completed.

This composite of railway cars has been the first international campaign to raise awareness across the whole population of the need to commit to a sustainable transport and the protection of the planet.

A VERY EFFECTIVE CHANNEL IN THE CURRENT SITUATION

The railway has been the great support in Europe given the health emergency situation. In a single unit with an average of 33 containers, it has been possible to transport some 660 net tonnes of food and thus avoid 30 trucks to make those journeys, according to calculations of lo-

gistics companies operating in Spain and Europe.

Other essential goods and diverse medical equipment (beds, protective equipment, etc.) have also been mobilized, eliminating a large number of trucks from the road.

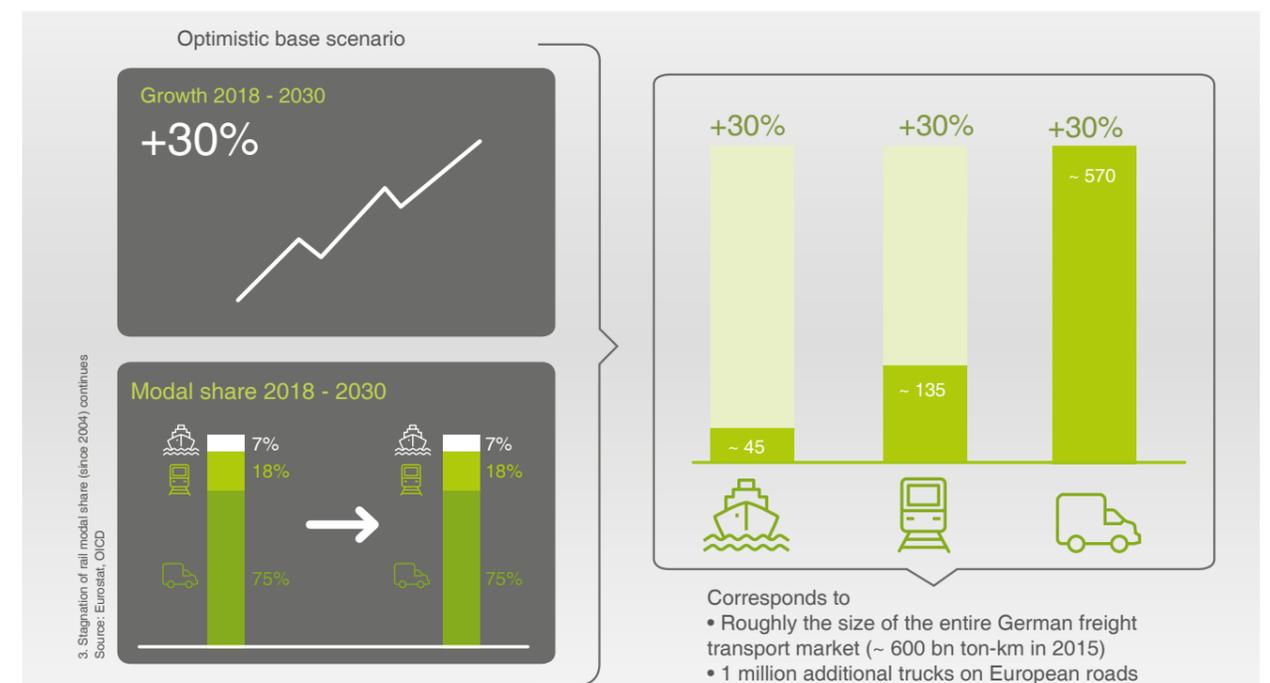
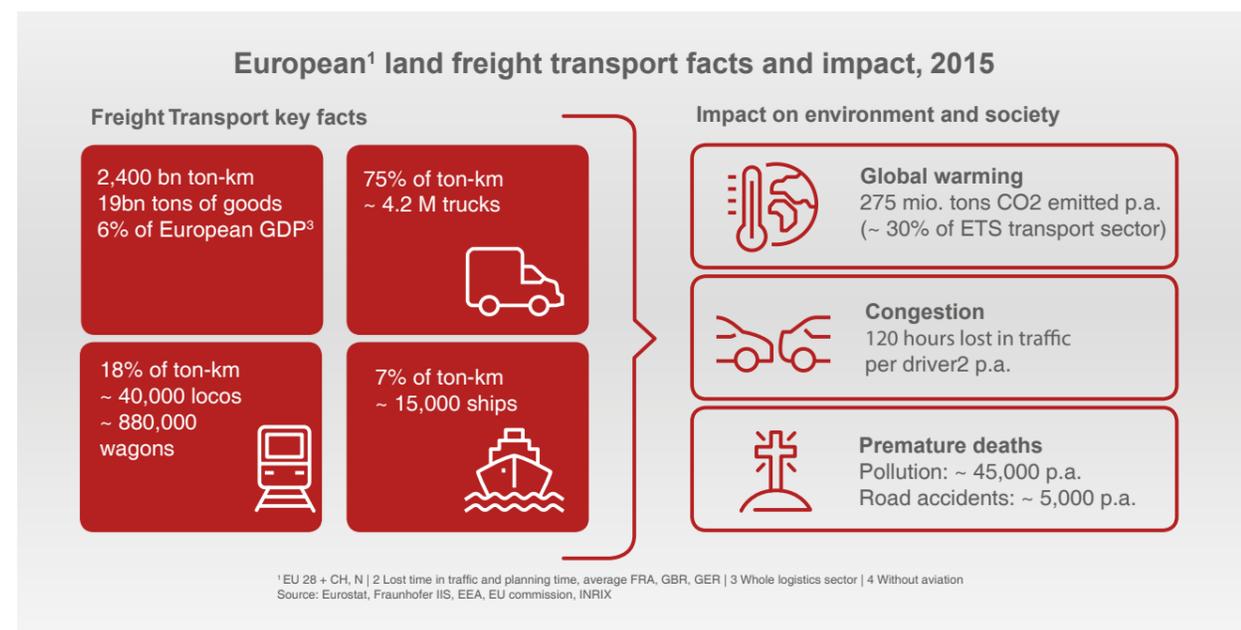
A NECESSARY BOOST IN SPAIN

Freight railway routes have a weight in the Spanish national market five times lower than the European average. The issue of the desirability of increasing its quota is already on the table and the lines of work required to meet this challenge in the coming years have been proposed.

On the one hand, industry players (logistics companies, private operators, etc.)

consider it essential to recover intermodal traffic, to rely on large capacity border terminals, the increase of exclusive connections in UIC width, as well as operational improvements.

Projects such as the Mediterranean or the Atlantic Corridor, within the nine set up as a priority by Europe, will also serve to gain in weight and efficiency against other modes.





Mobility as a Service (MaaS) will have a great weight in the coming years in the field of transport and intermodality.

MOBILITY AS A SERVICE

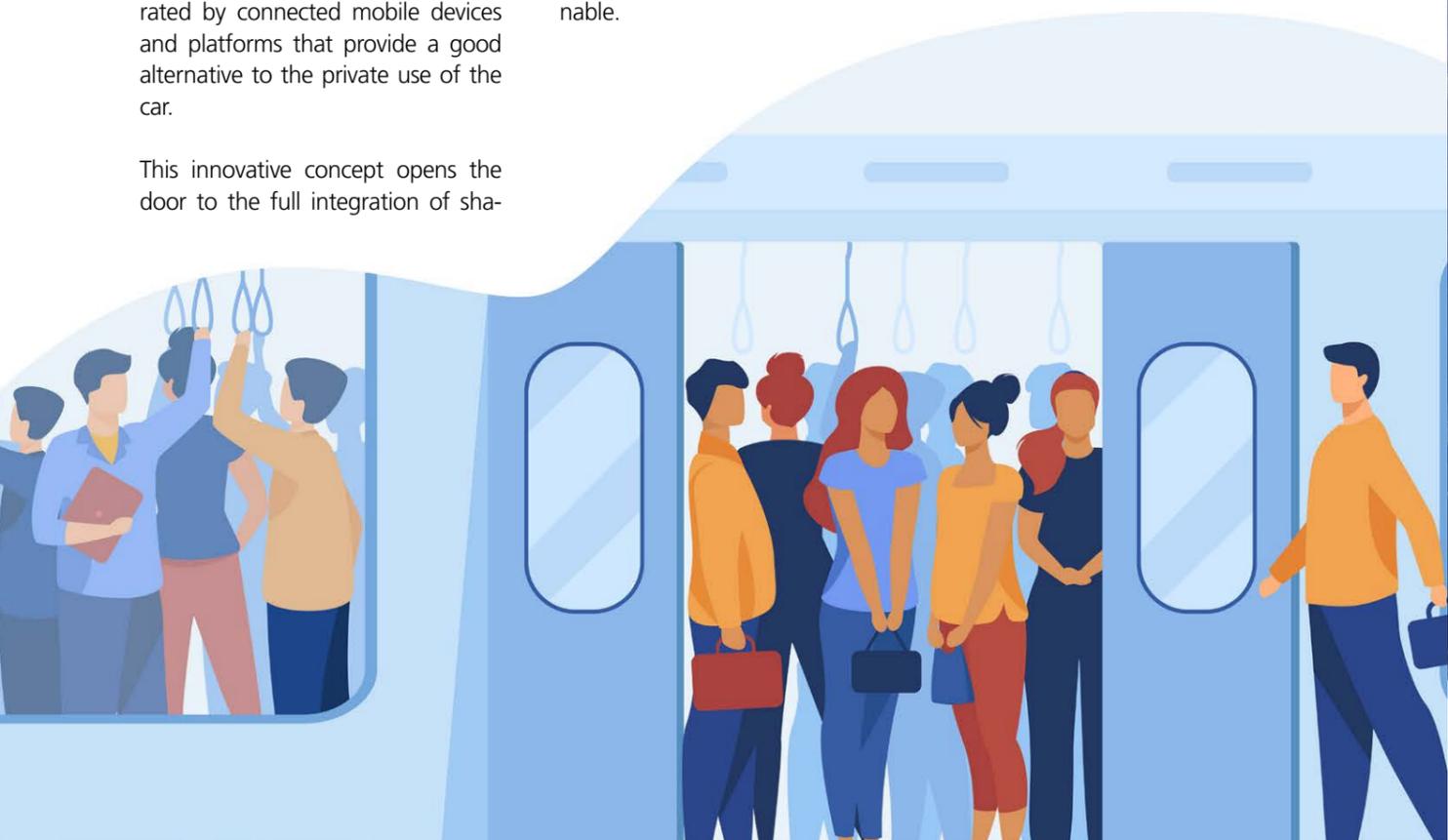
Mobility as a Service (MaaS) is born when changing the traditional model of offering transport to another in which it is the traveller who chooses how to commute, which means to combine and how to book and pay in an easy, economical and flexible way that suits their needs. All this, based on the information generated by connected mobile devices and platforms that provide a good alternative to the private use of the car.

This innovative concept opens the door to the full integration of sha-

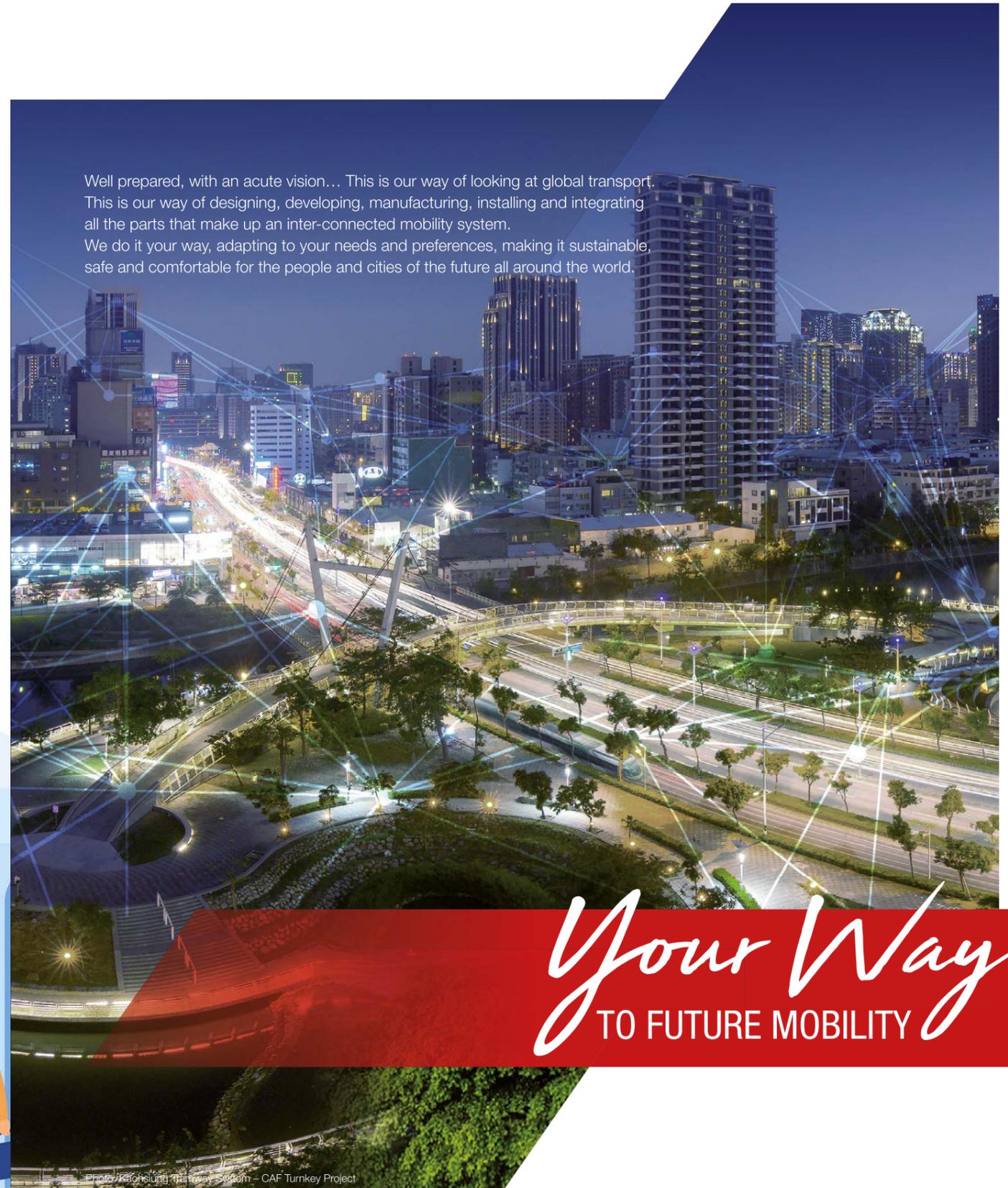
red transport (energy efficient rental cars, electric bikes) with commuter systems, metro, tram and buses.

In addition, it encourages the implementation of more efficient business models and creates new formats to optimize revenue in a unified digital ecosystem to be commercially sustainable.

The benefits for society are also multiple, as it promotes a form of socially responsible travel, where the railway carries weight as one of the most present modes in large urban centers and peripheral areas.



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Your Way
TO FUTURE MOBILITY

SMART AND SAFE OPERATION

Safety, one of the values inherent in railway transport due to its extremely low accident rates, is also greatly reinforced by technological advances. Spain stands out for being the country in Europe with the largest number of kilometres of track with the ERTMS (European Rail Traffic Management System) communication system.

Another field where Spanish solutions are pioneers is the automated operation of trains, with the well-known ATO (Automatic Train Operation) technology, both on metro lines and also more recently, on more complex commuter lines.

Spanish companies also stand out for the blockchain solutions for the management

of railway transport safety operations and the compliance with the strict European protocols. In addition, passenger protection is greatly reinforced by the implementation of systems that allow real-time control of the capacity of the stations, in order to ensure that the currently necessary safety distances are met. These video surveillance solutions rely on devices for the analysis of images and are based on artificial intelligence.

The contributions of Spanish companies also have an impact on the development of "cloud infrastructures" or in the cloud, which store, process and analyse a huge amount of data in order to improve operations, and the customisation of services.

PREDICTIVE TRAIN MAINTENANCE

The Spanish industry has developed powerful analytical tools from machine learning in recent years, which allow to monitor the operation of the mechanical and electrical systems of the train and avoid incidents. These asset monitoring solutions enable the attention to critical elements of rolling stock and ensure reliability. These companies have achieved major milestones in the field of maintenance, including, for example, the launch of the world's most advanced automated train repair shop, with equipment that has intelligent data systems.

PROJECTS WITH INNOVATIVE DESIGNS

Digital transformation begins in the design and engineering phase. The application of BIM or 3D technologies allows to work with a high degree of detail in any railway infrastructure project and centralise the information to optimise the process and supervision of the work.

New work approaches give these professionals greater versatility and open the door to new functionalities. Technological advances are also very relevant in the concept and design phase of rolling stock, as it contributes to the manufacture of lighter, sturdier and of longer life-cycle units.

R+D: THE IMPORTANCE OF JOINING EFFORTS

The European Union wants to strengthen the overall leadership of the railway industry through research. To do this, it has a battery of technological and economic resources in place to advance in R&D and in a safe and sustainable mobility. An example of this is the Shift2rail programme, with a large participation of Spanish companies, which focuses on three key objectives: to improve the capacity of the railway network, to increase the quality and reliability of the services, which will result in greater safety for the passenger and to reduce the costs of the system life cycle.



Digital transformation pushes the advancement of transport and solutions for greater sustainable mobility.

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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RailLive 2020
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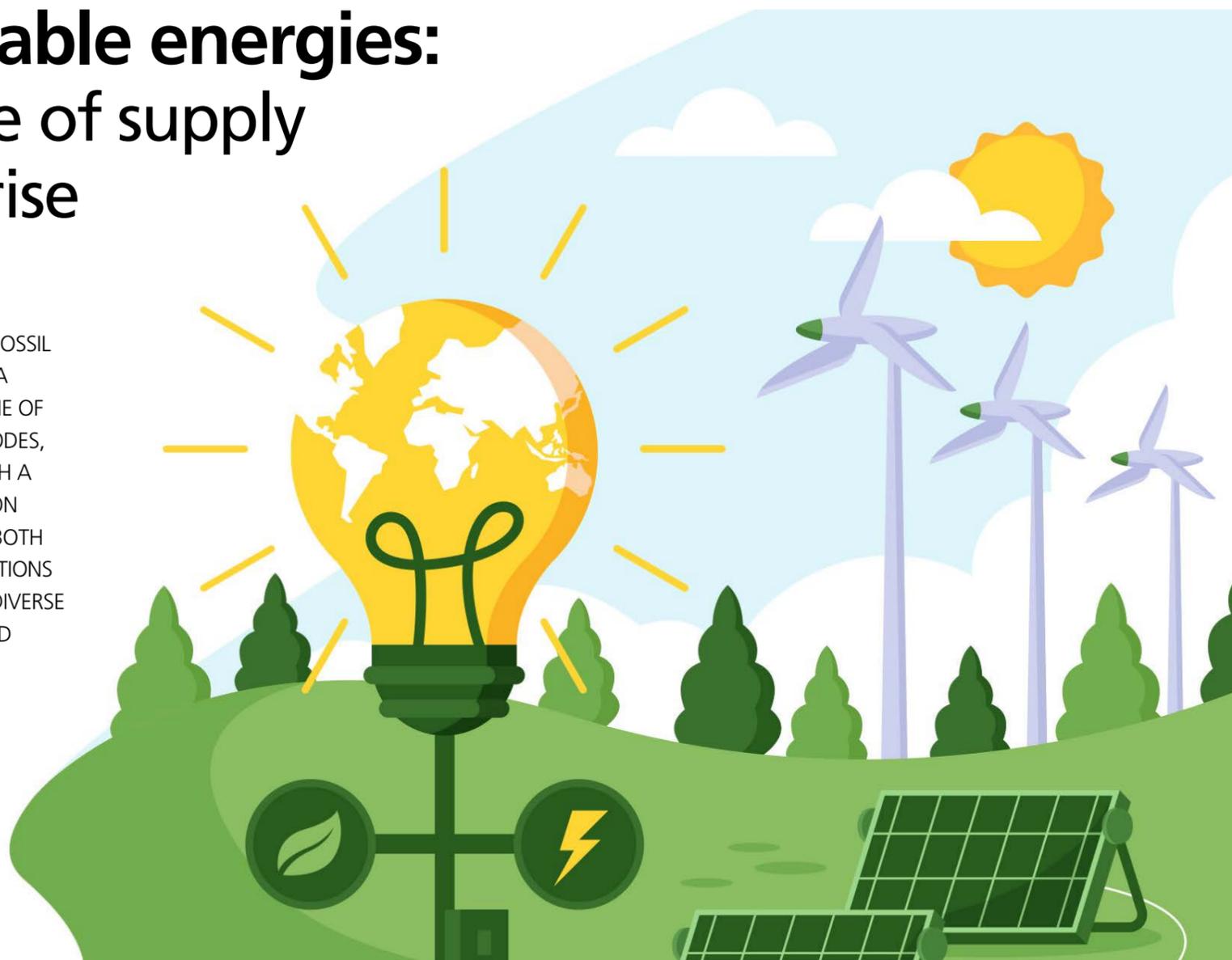


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Renewable energies: A source of supply on the rise

REDUCING THE USE OF FOSSIL FUELS IN TRANSPORT IS A PRIORITY. THE TRAIN, ONE OF THE MOST EFFICIENT MODES, BECOMES GREENER WITH A PERFORMANCE BASED ON RENEWABLE ENERGIES, BOTH IN COMMERCIAL OPERATIONS AND IN THE SUPPLY OF DIVERSE FACILITIES, STATIONS AND EXCHANGERS.



Reducing the carbon footprint in transport is a priority goal. In any case, the railway is the most respectful mode of transport towards the planet and the one that contributes the most in terms of efficiency. This mode further contributes to minimizing greenhouse gas (GHG) emissions with the use of renewable sources for the energy supply of stations, logistics centres and various facilities, as well as for the operation of both passenger and freight lines.

In recent years, a breakthrough has been seen in this field with the progressive implementation of

very innovative renewable energy generation systems, which have allowed the natural resources to establish themselves as a great alternative.

Solar energy

The increase in environmental sustainability has been growing in railway transport with the incorporation of diverse elements such as autonomous railings and street lamps fed by the sun to illuminate stations.

In addition, photovoltaic panels for power generation in tunnels, roofs and other points already feed the operation of many trains with re-

newable. The commitment to this clean source goes further, with the clear example of some electrified lines where trains run supplied with 100% energy from solar plants. There are also other alternatives such as the different models of hybrid trains, which move with solar energy and fossil fuels.

Wind

The wind also joins the sustainable future in transport. In Spain, for example, very innovative systems have been implemented, such as the vertical axis wind turbines in several stations to power the facilities with wind energy.

there are, at the engineering stage, development projects of prototype-pilots for traction of goods, which rely on European funds.

In addition to natural gas, the railway sector is making progress in the use of other carbon-neutral fuels such as biomethane or green hydrogen. The latter already has its application with the recent launch of the first two hydrogen trains in the world that, in addition, use renewable energies to charge their batteries and incorporate lithium-ion batteries that store excess energy and the power released during the braking process.

Recovery of braking energy

Along with the use of renewable energies, the railway industry proposes solutions to move forward with a more sustainable transport. Among the most outstanding innovations is the technology for the use of the braking energy of trains through reversible electrical substations, which allow it to be returned to the grid. On this path to energy transition there are very significant R+D developments. In Spain it is already possible to recover the braking energy of the trains for electric cars in the so-called "ferrolineras". These charging points are connected to the rail network in facilities near the station.

The railway further contributes to minimizing greenhouse gas (GHG) emissions with the use of renewable sources.



SOME MAFEX PARTNERS WITH

SUSTAINABILITY PROJECTS

► **ALSTOM**

After 530 days and more than 180,000 driven kilometres, the successful trial operation of the world's first two hydrogen trains was officially completed. Alstom's Coradia iLint model is a sustainable and efficient alternative to diesel-powered trains. Despite the various electrification projects ongoing

in several European countries, a good part of the European railway network will continue being catenaryless. In Spain, for example, there are still more than 5,000 km of non-electrified lines and more than 200 diesel traction trains running on those lines. The Coradia iLint is the world's first passenger train powered by a hydrogen

fuel cell, which produces electrical power for traction. This zero-emission train emits low levels of noise, with exhaust being only steam and condensed water. Performance match that of regular diesel multiple units, with a maximum speed of 140 km/h and comparable acceleration and a range of 1,000 kilometres.



► **CAF**

The city of Medellín in Colombia has become a benchmark in sustainable public transport systems in recent years. Its metro system, integrated with other means of transport such as the Metrocable and an articulated bus network, has been key to meeting the mobility challenges and the development of the city. Thanks to the metro, users can move quickly, efficiently and economically.

CAF has been the supplier of the Inneo metro units for this system. The design of these trains allows significant energy savings thanks to the provision of wide passenger areas and the optimization of passenger capacity per unit.

These units are equipped with highly efficient traction equipment that allows minimizing energy losses and optimizing consumption. Furthermore, CAF places a special emphasis on the recyclability and recoverability of the materials used in the manufacture of its trains.



► **ARDANUY INGENIERÍA**

Ardanuy Ingeniería is involved in various Innovation Projects aimed at improving Safety and Energy Efficiency in Railway Networks. Four of these projects are part of the EU's R&D Program, Shift2Rail: ETALON (Energy Storage for Signalling and Communication Systems), Astrail (Signalling and Automation Technologies) Mistral (Communication System of the Future) and Optima (Platform for Reinforcing Connections Associated with Traffic Control and Coordination Systems). The Engineering Consultancy Firm also contributes to bolstering Sustainable Mobility with Research Projects such as the Electromobility Study for Public Transport in Latin America, commissioned by the Corporación Andina de Fomento (CAF). Apart from these works, the Company has also been involved in Project Design and Works Supervision for the implementation of Metro, Light Rail, Tram and

Cable Car Networks in numerous countries around the world. These Projects are carried out conjointly with Ardanuy's

Delegations and Subsidiaries distributed throughout Europe, Latin America and Asia.



► **COMSA**

Sustainability and responsible growth have always been hallmarks of COMSA Corporación. In recent years, the group has reinforced its commitment to this field through the participation in projects whose main goal is to respond to the challenge posed by sustainable mobility in the infrastructure sector.

In this context, the group leads a consortium of companies that collaborate in the RESILTRACK program to develop simulation and predictive maintenance tools that provide railway infrastructure resilience to climate change. The designed system offers information in real time about the state of the infrastructure and its affectation regarding adverse climatic phenomena, as well as to foresee the performance of the infrastructure to act where necessary.



SOME MAFEX PARTNERS WITH SUSTAINABILITY PROJECTS

► IDOM

With our sights set on a sustainable future, we provide our clients with bold and innovative engineering solutions that ensure financial, social, and environmental sustainability.

In Latin America, countries like Colombia or Chile have signed up to this challenge.

IDOM is working in these countries at intuitional and business level, collaborating to reach this goal. In the Medellin Metro project, innovation has become a key tool for the growth and sustainability of this type of transport in the city. IDOM was called on to make it happen. We have worked on projects such as the AV80 tram, the Ayacucho Tram and the design of the expansion

of the Tulio Ospina depot and workshops. The mobility solutions incorporated in the Medellin Metro means that an amount of diesel equivalent to filling 110 Olympic-sized swimming pools has not been used. In addition, emission of almost 23,000t of pollutants and more than 750,000t of CO2 have not been released into the atmosphere.



► INDRA

Prointec, Indra's engineering subsidiary, in consortium with OBERMEYER Planen + Beraten GmbH, will be responsible for the design and supervision, during the construction of the section between the Estonian city of Pärnu and the border with Latvia, of the Rail Baltica project, currently the largest railway infrastructure project in Europe.

The new rail network will have ecoducts, special passages for animals to cross the tracks, 11 of them in the section designed by Prointec.

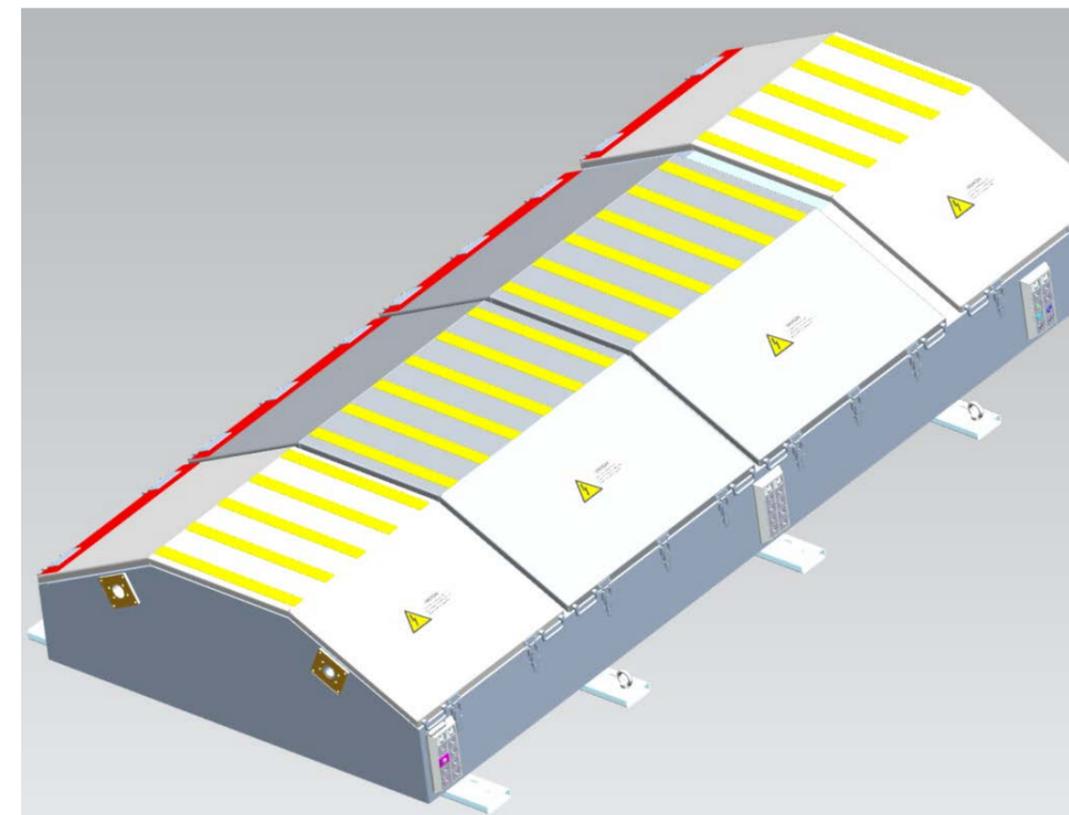
It will be fully electrified and will have the most innovative technologies and materials to cut emissions, reduce noise and vibrations. It is planned to avoid Natura 2000 protected areas, to the greatest possible extent, and it will not have a significant impact on other environmentally sensitive protected areas.

► INGETEAM

INGETEAM offers energy efficient solutions through mastering electric power conversion, research of new components and development of new products.

-INGETRAC Power converters for rolling stock, based on power modules that guarantee power density and minimize energy losses to optimize performance, thanks to state-of-the-art components and configurations.

-INGEBER converters allow the energy recovery from regenerative braking. The consumption reduction allows better energy efficiency and reduction of CO2 emissions (example: 400 Tns of CO2 /year for 1 INGEBER- 3.000 Vdc system).



► SICE

The Board of Directors of ADIF Alta Velocidad has granted SICE the contract of the fi-

xed and WiFi telecommunications networks in the ADIF passenger stations of Córdoba, Málaga and Sevilla.

This project is part of ADIF's goal to achieve an exchange of information between the smart platforms of the station and the city, which will be based on five pillars: intermobility, tourism, hyper-connectivity, sustainability and safety.

A fixed telecommunications network will be designed and deployed by SICE, to implement a network to access data within the station. It also includes the implementation of a WiFi-based wireless telecommunications network, which will provide connectivity to the internal services of ADIF and the rail operators rendering service at the station.

This project will also involve an improvement of our anti-COVID safety protocols, minimizing contact with passengers, expediting boarding processes and promoting the use of paper-less or electronic train tickets, in a clear commitment to sustainability and minimization of waste.



Source: Adif (Córdoba)

SOME MAFEX PARTNERS WITH SUSTAINABILITY PROJECTS

STADLER

Stadler builds trains putting reliability, flexibility and innovation into practice. We are constantly improving the performance and efficiency of our trains using state-of-the-art technologies such as the bi-mode traction and the use of batteries.

These new traction technologies are an innovative and cost-effective way of providing an environmentally-friendly service by enabling 'smart electrification' of the infrastructure.

EURODUAL is the technological response of Stadler to the challenges posed by rail freight transport in Europe. This bi-mode locomotive is already operating in France and Germany. It offers the possible savings on the energy consumption bill and the environmental benefits (no exhaust gas and CO2 emissions) of an electric locomotive and the flexibility of diesel locomotives to optimize transport routes.

FLIRT, Stadler's best-selling passenger train family with almost 2,000 vehicles in more

than 20 countries, can already be found as FLIRT BMU (diesel + electric) operating in Italy and in the UK. Wales region will be the first to enjoy the tri-mode version of the FLIRT, capable of running on diesel, overhead electric wires and battery power, as well as the hybrid CITYLINK battery-powered train-tram vehicles. Other developments include the battery-powered FLIRT AKKU, which is being tested in Germany, and the WINK low-floor regional train for secondary lines that will start operating this year in the Netherlands.



TEKNIKER

The STEFAN project ("Soluciones Tribológicas en el Sector Ferroviario") began on

January 1st of 2020 with the aim of optimizing critical tribological systems in rail transport by developing new components,

materials, lubricants, rail solutions, etc; for wheel-rail and grease box bearing systems. The project is considered in a multidisciplinary dimension: encompassing not only tribology, but also sensorization, intelligent maintenance, IoT; implemented with the BIM methodology.

The project will be carried out by a consortium made up of 5 companies with the support of a scientific committee made up of Metro Barcelona and Metro Sevilla. The companies are IDP, ArcelorMittal, Brugarolas, NBI Bearings Europe S.A. and Grupo Técnico RIVI.

The consortium and the scientific committee will have the collaboration of the Tekniker technology center and the Polytechnic University of Valencia.



RAILLIVE!

Monday 30th November - Tuesday 1st December

Rail Live! brings the global leaders of the railway industry together to discuss how new technologies are shaping the future of rail. Covering all the key areas of development in rail including intelligent infrastructure, freight, automation, sustainability, cyber security, smart mobility and stations. Speakers include world leading CEOs and visionary thinkers from networks and projects around the world.

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Rail transport and the Environmental Challenge

Introduction

The transport sector is one of the largest consumers of energy and one of the main causes of continuously increasing greenhouse gas (GHG) emissions. In Spain, the transport sector is the main CO2 generator, with more than 27% of total emissions.

The European Green Deal establishes the key pillars that should structure climate action so that the European Union can become a carbon neutral and competitive economy by 2050. The first European "Climate Law", whose proposal was presented by the European Commission in March 2020, will set a target of reducing current emissions to 50% by 2030 (which would represent 55% compared to 1990 levels).

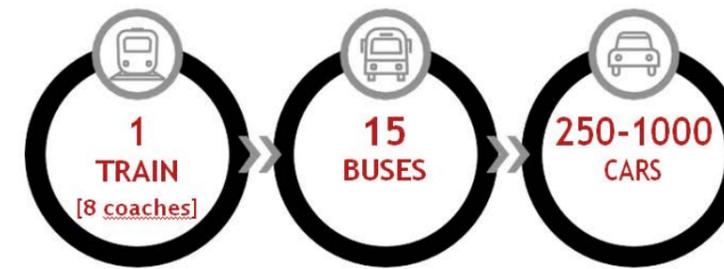
Rail transport is the mode of public transport with the lowest emissions per

passenger and, therefore, has a **decisive role in the fight against climate change**. And only by promoting the railway as the backbone of national transport and sustainable mobility policies, it will be possible to achieve the objectives set by the European Union and the international community.

The **shift from other modes to rail** will allow a reduction in emissions to the atmosphere. And it will not only contribute to the reduction of greenhouse gases but also of **other polluting gases** (NOx and particles) and other environmental pollutants such as noise, luminescence, etc.

On the other hand, railway is not only the most environmentally friendly mode of transport due to its low emissions of polluting gases, but also because of its **capacity efficiency**, that is, thanks to its enormous capacity to transport both passengers and freight with a very low environmental impact. In addition, modern rolling stock is easily configurable and flexible to adapt itself to changing demand.

Rail has also proved to have a low accident rate and high efficiency in transfers since, if efficiently managed, it is not affected by delays or adverse weather



Source: UITP-Unión Internacional del Transporte Público, 2003.

conditions as much as other modes of transport.

Energy expenditure is also another key aspect in rail transport and therefore in the sector. Proof of this is that Adif and Adif-AV (High Speed branch) have opted for the Purchase of Green Electric Energy, that is, energy with Origin Guarantee Certificates (GdO), thanks to which it is guaranteed that all the electricity consumed both by Adif and Adif AV, as for other railway operators, is of renewable origin.

In addition, the European railway industry in general and the Spanish in particular, is one of those that invest the most in innovation and technologies which contribute to **greater energy efficiency** in many aspects, such as traffic management systems, signaling, energy recovery and regeneration, energy storage, reversible substations, useful life of materials, measurement systems,

¹ Objectives established during the United Nations Framework Convention on Climate Change (COP21 held in Paris in 2015) and the 2030 Agenda for Sustainable Development which collects 17 Sustainable Development Goals).

² CO2 emissions are calculated using an estimate of the amount of CO2 per passenger and kilometer.

Different modes of transport are analyzed, using as estimation an average number of passengers per mode of transport. As the number of passengers in a vehicle increases, the total CO2 emissions of that vehicle increase, but the emissions per passenger decrease

³ To move 1,000 people you need 15 buses or a range of 250-1,000 cars instead of one single 8 coach-train.

maintenance, etc. And it is especially efficient in energy consumption during the manufacturing of rolling stock and equipment.

The concept of **circular economy** has begun to take significant relevance in our sector. Aware of the limitation of resources and the need to obtain the highest value from these for the longest possible time, many companies have modified their products / services so that when materials and components reach their end of life, these can be recovered and recycled.

In the railway sector, **digitization** is being developed on four main axes: user experience, operational processes, employee training and transformation of the business model. Digitization provides travelers with more attractive and integrated mobility, enhancing the passenger experience. Furthermore, it enables railway operators to make their infrastructures intelligent, guaranteeing availability and increasing sustainability throughout the entire life cycle of the product.

From both a Spanish and European perspective, **sustainability** plays a determining role as a factor of competitiveness for our industry, both at the manufacturing, operation and maintenance levels, compared to competitors from emerging countries, increasingly present in the global market.

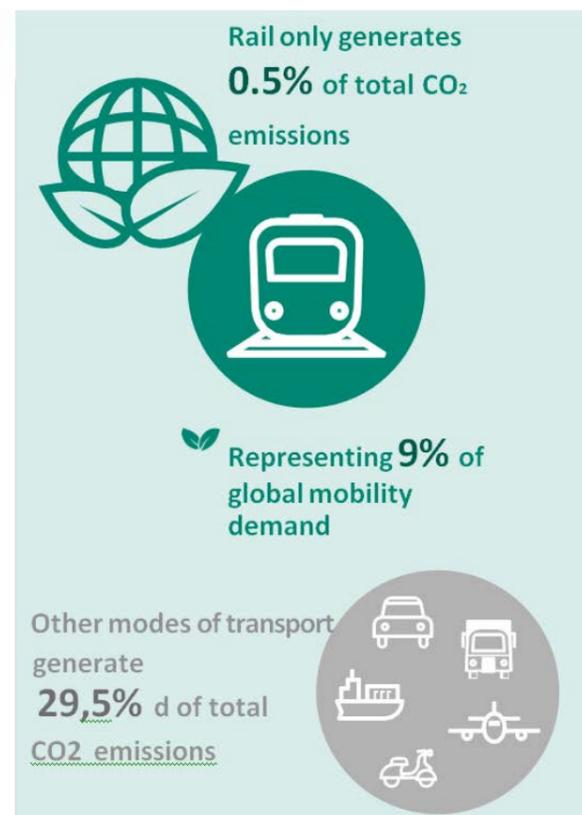
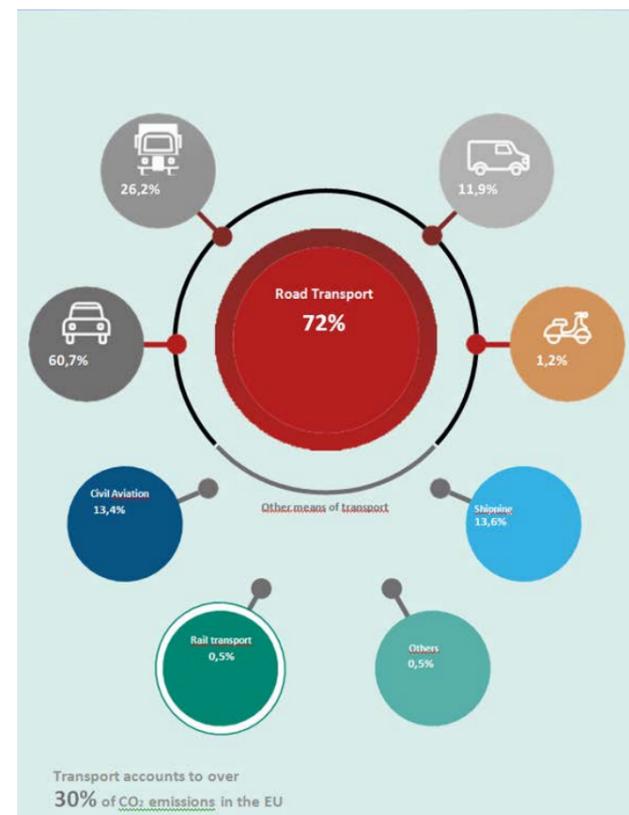
Objective

To achieve the global objectives in the fight against climate change, Spanish and international institutions must implement sustainable mobility measures. Consequently, it is necessary to place rail transport, for both people and goods, as the backbone of national transport policies, as well as to promote a mayor implementation and business development.

In this sense it is necessary:

- That Public Administrations promote and support railway transport as the axis of their policies and strategies for sustainable transport in the medium and long term, where intermodality plays a key role, favoring a modal shift in the transport of passengers and goods in favor of the railway.
- A firm commitment by Public Administrations with RTD programs, including long-term financing plans, to promote the development of rail transport along the value chain.

- An industrial and institutional leadership to promote the latest technological developments allowing the reduction of emissions and greater, even if possible, efficiency in energy expenditure, from early phases to manufacturing, operation and maintenance; betting on smart grids, the use of simulators that facilitate efficient driving or improving the sustainability of stations and hubs.



Source: European Environment Agency, 2016



Railway transport must play a key role in the face of environmental challenges.

• National and international financial organizations have appropriate **financing mechanisms** to ensure the implementation of sound sustainable transport policies that support the use of rail, taking into account the advantages that the use of public transport represents for citizens beyond the economic factor and direct costs.

It is necessary to place railway transport as a backbone of national transport policies.

• An **integrated public transport network**, comprising comfortable, fast, safe and reliable urban and interurban railways, must be considered a priority as an intelligent and sustainable mo-

bility solution for **Smart Cities**. It will also be necessary to integrate into this ecosystem of smart mobility new actors that are emerging and that also have an impact on mobility (carsharing, dete-

rent parking lots, etc.). By 2050, 68% of the world population is expected to be urban. Currently, more than 80% of the population of Latin American and Caribbean region lives in cities, and half

a million new residents are registered every month. New digital technologies are going to transform the way we approach mobility. This process should be carried out from a perspective that puts users at the center of the system, offer-

ing the best experience in mobility. Providing the most efficient solution at all times by integrating data from different sources for an easy and simple intermodality, which allows moving towards new paradigms of mobility until reaching **Mobility as a Service**.

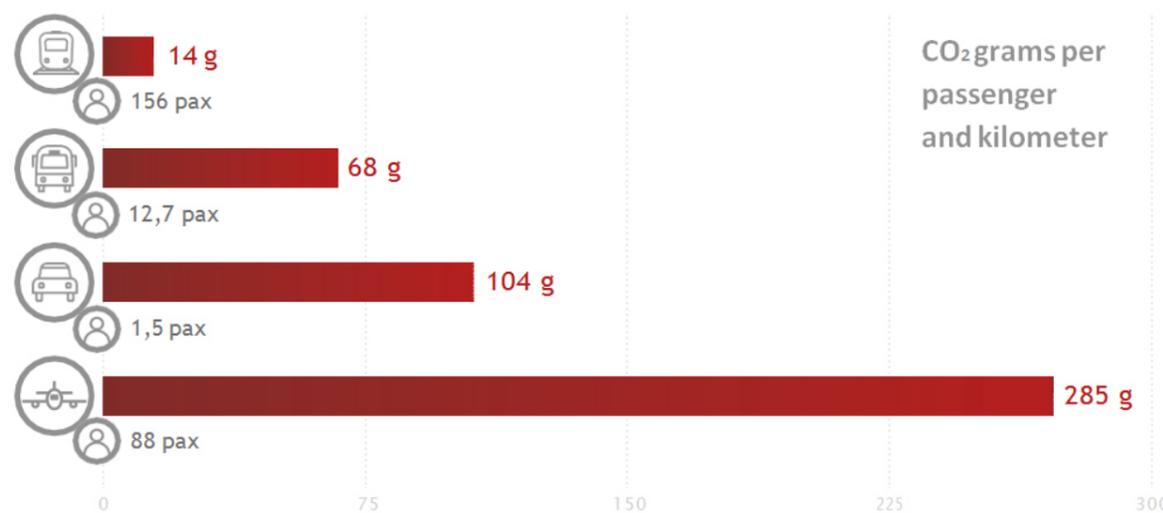
• Public Administrations must also commit to upgrading rail infrastructure and rolling stock in order to promote the competitiveness of **passengers and freight rail transport**. In this sense, it is of vital importance the development of operation and propulsion systems, as well as new materials which will dematerialize the sector.

• Public advertising and dissemination campaigns must be carried out, especially addressed to passengers, to **raise awareness and promote the use of public transport**, highlighting environmental sustainability of rail sector transportation.

Conclusion

Rail transport must play a fundamental role in the face of environmental challenges and the fight against climate change. For this reason, its defense and further development is key, placing rail as the backbone of transport policies and strategies, at both national and global, in the long term.

CO₂ emissions from passenger rail transport in Europe² (passengers per kilometer travelled)



Source: European Environment Agency, 2016

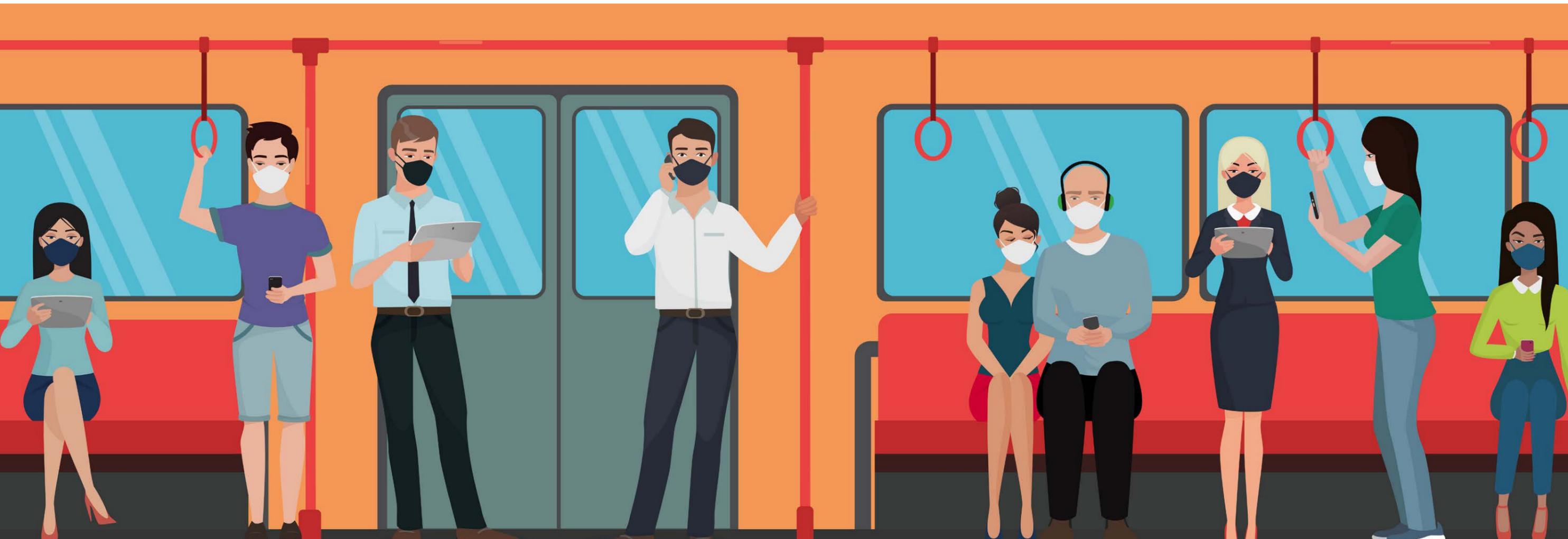
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Public transport in the new reality:

During the state of alert, railway operators have worked very intensively, and in close collaboration with health authorities, to design a plan to ensure the safety of travellers and their staff in the new normal.

One of the greatest challenges now focuses on regaining the trust of regular public transport users and especially in the railway mode. To this end, all health prevention measures that were put in place since the beginning of the pandemic will be maintained.

These measures include the installation of partitions between customer service stands, exhaustive cleaning and disinfection of facilities, spaces

COMPANIES, OPERATORS AND ADMINISTRATIONS JOIN FORCES TO REGAIN USERS' TRUST IN PUBLIC TRANSPORT FOLLOWING THE IMPACT OF COVID-19. IN THIS CONTEXT OF CHANGE, THE MULTIPLE MEASURES TAKEN AND THE TECHNOLOGICAL ADVANCES OF A PIONEERING INDUSTRY ALLOW THE RAILWAY TO BE POSITIONED AS THE MODE THAT BEST ADAPTS TO THE NEW SANITARY CONDITIONS TO OFFER A JOURNEY WITH THE MAXIMUM GUARANTEE.

and rolling stock, compulsory use of face masks, hydroalcoholic gel dispensers or random temperature checks.

These guidelines have also been incorporated to the day-to-day of staff from different networks (metro, tram, commuter trains, regional

trains, high speed trains, etc.) who are also subject to continuous health monitoring, as indicated by medical prescriptions, through clinical analysis and testing.

Also many operators validate their commitment to maximum quality in the service with the request for the

Safe, comfortable and highly reliable travel

AENOR protocol certificate against COVID-19. Obtaining this seal is a proven guarantee that all the procedures necessary to reduce any risk and avoid contacts are applied, based on the UNE EN 13816:2003 regulation.

To recover that return from travellers and get back to normal, another key aspect will be to support these measures with an intense communication action that conveys to users

that railway transport complies with the strictest guarantees of protection on commuting. These messages are transmitted to the population through different channels of billboard advertising in stations, social networks, newsletters, media news, etc.

There is also a desire to have direct contact with users to know their opinion by conducting surveys that allow to find out what their percep-

tion is about the health safety of railway transport.

Innovation as a response

One of the key features to address these challenges is that the railway sector has relied on innovation to provide an effective response in line with the specific needs of the current context. In this respect, collaboration with the main research centres is essential strengthening the hygienic-sanitary protection of operations.

This joint experience has resulted in the implementation of advanced initiatives such as the reprogramming of mobile material cycles for cleaning work, the application of aseptic meshes or the testing with

The modal shift towards the railway will intensify in this new phase.



filters before and after disinfection to control the possible reactivation of the virus.

Also, modern techniques of contact surface analysis are offered to users to rule out traces of bacteria.

In terms of cleaning, disinfections are being carried out with comprehensive misting to reduce the expenditure and ensure that deep sweeps are performed at all levels of the vehicle. The ozonized air technique is also used. To protect the vehicle fleet, very innovative and non-corrosive products are being used, based on quaternary ammonium and hydrogen peroxide, that prevent the wear and tear of certain elements of the vehicle.

Planning and information

Another advantage of applying technological advances to the current situation is that the traveller has additional support to plan their itineraries and can rely on safe and up-to-date information at all times. The systems and applications that

Industry stakeholders put the traveller at the centre of the new measures to ensure their safety.

Spanish companies have developed in recent years are now the most useful and reflect the importance of having opted for R+D for many years. Citizens have tools to consult the estimated average occupancy on each line, the provision of services by time slots and other criteria of interest.

Flow management

With regards to the operators, they reinforce the health safety conditions with the use of the technologies created by numerous Spanish companies.

There is currently work being done on a new methodology to ensure key aspects such as the management of passenger flows and the control of loads in real time. This prevents crowds and can provide a service appropriate to the demand. Another methodology that is being applied for capacity control is the image treatment, which can achieve an approximate actual estimation with more than 97% level of certainty.

All these measures respond to new challenges to alleviate the impact of the pandemic. The different stakeholders have reacted quickly and efficiently to ensure that the return of railway public transport is safe and comfortable. A very proactive attitude that boosts a reactivation with all the necessary measures for a daily operation adapted to the new normal.

The railway industry reinforces its commitment to passenger safety through innovation

The industry's commitment to passengers and the administrations and operators has always been at the heart of innovation in the sector. Companies work to create safer, more comfortable, reliable and environmentally friendly quality environments, ensuring that more effective solutions and technologies are developed in the face of the Covid-19 threat.

Spain has a highly qualified and technologically developed railway industry to meet the challenges posed by the situation, but institutional support is needed to launch awareness-raising campaigns to restore citizens' confidence in the use of collective passenger transport and, on the other hand, it must be complemented by the implementation of existing technological solutions and innovations in an agile manner. Let's be part of the solution.

Restoring users' confidence in passenger railway transport is key to the economic revival of the sector and the country. To do this, we must resort to concrete measures which, of course, are subject to the evolution of both, technology and the health crisis itself.

The Administration, as well as the operators and the industry, are clear by now that the priority is to prevent possible contagion, so there has been a total consensus to implement measures that are also not exclusive to railway transport.

MAFEX HAS PREPARED AND DISTRIBUTED A NEW POSITIONING PAPER HIGHLIGHTING THE ACTIVE ROLE OF THE RAILWAY INDUSTRY IN DEVELOPING SOLUTIONS THAT ENSURE PASSENGER SAFETY AND HELP REDUCE THE RISK OF VIRUS SPREAD AND CONTAGION IN PUBLIC TRANSPORT. THE ULTIMATE GOAL IS TO RESTORE CONFIDENCE TO THE TRAVELLER.

Benefits of passenger railway transport

According to data published by UIC (International Union of Railways), UITP (International Association of Public Transport) and UNIFE (European Railway Industry Association) in a joint note, passenger transport by train in Europe reaches a market share of 7.6%, generating only 0.5% of greenhouse gas emissions, making it the least polluting mode of transport.

With regards to energy consumption, it is seven times more efficient in cities than the private vehicle and its capacity also highly superior when transporting people or cargo generating low impact on the environment.

In other words, not only is the passenger being offered punctuality and convenience in transfers but also passengers are being discouraged to use modes of transport less environmentally friendly and a sensible management of public space, without traffic jams, is being promoted.

With the creation of efficient networks of urban transport, economic and social development is also provided by encouraging investment in it and by connecting areas with different degrees of social and economic development.

Also, to promote the pedestrian use of public space, railway transport is the best option when removing cars from the roads and freeing up lanes that can be destined for a more efficient reordering of public space (either for pedestrian or tram use, etc.).



Operators, metros and trams
face new transport challenges following the pandemic
International and national institutions
showcase their vision on flexible, innovative, sustainable and
reliable rail transport

OPERATORS, METROS AND TRAMS TELL US HOW THEY ARE DEALING WITH THE NEW CHALLENGES AFTER THE PANDEMIC, THE MEASURES THEY HAVE TAKEN TO STRENGTHEN SECURITY AND REGAIN USER'S CONFIDENCE, AND WHAT MEASURES THEY DEMAND TO PROMOTE THE RECOVERY OF MOBILITY RATE AT THE LEVEL BEFORE TO THE IMPACT OF THE CRISIS.



RAILACTIVATION OPEN CALL

RailActivation is launching the Open Call to select 20 SMEs. The pilot schemes will be tested in companies selected by the interregional networks, by using the 75% of the grant for support the SMEs. The project will define therefore The Pilot Support Scheme (PSS) Call aimed at providing a total direct innovation support of to foster collaboration and help the SMEs with their Open culture transformation process, including organizational and production processes.

The types of activities to perform that qualify for receiving financial support are:

- LOT 1:** Direct innovation support to SMEs
 - Coaching- mentoring
 - Implementation of Pilot Scheme in real conditions
 - Travel voucher granting
 - Other activities included in the correct performance of LOT 1
- LOT2:** Indirect innovation support- Part 1
 - Mapping Program
- LOT2:** Indirect innovation support- Part 2

JESÚS HERRERO
GENERAL SECRETARY
ATUC



The public transport companies are complying meticulously from day one with the sanitary and cleaning protocols established.

The public transport companies are complying meticulously from day one, as could not be otherwise, with the sanitary and cleaning protocols established to protect users and employees.

Considering that the service provided by our companies is essential, we demand that the measures are appropriate. We demand from the Government an urgent aid plan in view of the lack of liquidity of the companies that ensure the maintenance of this essential public service.

We guarantee a fundamental right such as the mobility of all citizens and that is why we work hard to offer a service that is in line with this right. We are the sustainable alternative and, of course, a safe alternative.

This is an unavoidable need that must be accompanied by measures that allow a rational increase in occupation and adequate management of demand, especially at peak times.

- Scalability: Use case Promotion
- Expected duration of participation: 10 months
- Maximum amount of support for each third party: 10.020€
- Call Identifier: RailActivation Open Call
- Language in which proposal should be submitted: English

Email address for further information: garazi@mafex.es

www.railactivation.eu

IMANOL LEZA
GENERAL MANAGER
EUSKOTREN



Rail transport is the most sustainable means of mass transportation.

Rail transport is the most sustainable means of mass transportation and has therefore managed to improve its utilisation rates in recent years. We cannot allow COVID-19 to mean a return to society using private vehicles.

Public transport's safety cannot be put into question. As part of its return to normality contingency plan, Euskotren has therefore implemented all the measures at its disposal to guarantee optimum safety and hygiene in its operations.

It was the first railway operator in the Basque Country to restore and implement the summer service, specifically, on 8 June.

It was also the first railway company of the Basque Country

and of Spain to obtain the AENOR certificate regarding anti-COVID protocol management. This is clear proof that the best practices against COVID-19 have been adopted and is a further reason for the company's workers and the passengers to trust in its management.

This certification, which endorses the company's effort, is an additional guarantee aimed at restoring passenger transport to its usual mobility percentages as soon as possible.

Public means of transport are safe, but that safety requires the joint-responsibility of the users, who have to comply with all the protection and safety rules in force. Euskotren is therefore calling for social responsibility, the other determining factor in this battle that we will certainly win.

TOMÁS CEBRIÁN CUESTA
OPERATIONS MANAGER
FGV



It is necessary to adopt measures to add to those already implemented.

Since mid-March, before the state of alarm was declared, Ferrocarrils de la Generalitat Valenciana (FGV), like almost all the companies in the sector, has been adopting and continues to implement different measures to deal with the health emergency caused by COVID-19.

After different service reorganizations, FGV now offers practically 100% of our usual circulations in Metrovalencia and TRAM d'Alacant. The growth of travellers is gradual, and we are already at a percentage of 40% and 50% in Valencia and Alicante, respectively, of the users who registered at this time in previous years.

In view of this new reality, it is necessary to adopt measures to add to those already implemented in previous months and to facilitate the use of public transport. FGV is already working on two projects, one related to the analysis of samples to determine the presence or absence of COVID-19 in trains and facilities, and another aimed at controlling passenger access to train.

In mid-June, as part of a project involving other operations as well, we began to analyse samples and air quality of Me-

trovalencia and TRAM d'Alacant trains and facilities, with the aim of detecting the possible presence of the virus. The first results from Valencia and Alicante have confirmed the absence of traces of SARS-CoV-2 genetic material in the facilities and trains analysed.

As specialists in viral analysis, the Institute of Agrochemistry and Food Technology (IATA), which reports to the Spanish National Research Council (CSIC) of the Ministry of Science and Innovation, has been contacted.

Together with this initiative, FGV is working on the development of a project that will make it possible to establish the limitation on access to those trains in the Metrovalencia network that may exceed the expected capacity. In this way, we will be able to determine the maximum number of people who can get on at each station and thus limit the passage of travellers at the ticket validation area of that station.

These are two initiatives that form part of the many that have been and are being carried out at this time by FGV, with the aim of continuing to provide our transport service, but now even more so with greater guarantees for our workers and users.

RICARD FONT I HEREU
PRESIDENT
FERROCARRILS DE LA
GENERALITAT DE CATALUNYA



More than ever, digitization and technology have proven themselves as key factors on fighting the pandemic.

FGC has guaranteed service operation whilst prioritizing protection measure for passengers and staff which, particularly those linked to sanitizing, will be added to standard procedures. More than ever, digitization and technology have proven themselves as key factors on fighting the pandemic.

Effective communication has proven essential and will be even more so on the recovery of trust in transport servi-

ces both urban, interurban and touristic. The message that public transport is a safe space should be reinforced.

FGC is committed on achieving this recuperation and we prove it by operating at full capacity as well the metropolitan and regional transport as the touristic services which have already opened the summer season with full guarantees.

However, it is essential a full support from government and authorities guarantee not only the economic issues but reinforcing the role of rail transport as an

essential part on the configuration of a sustainable transport system. We must not forget that the challenge of climate change is as significant now as before the pandemic, or even more!

MAFEX

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

mafex@mafex.es

SILVIA ROLDÁN
CEO
METRO DE MADRID



Metro de Madrid has implemented a set of measures to guarantee the health and safety of both users and workers.

Metro de Madrid has implemented a set of measures to guarantee the health and safety of both users and workers throughout all stages of the COVID 19 pandemic crisis. First of all, we have focused on both cleaning and disinfecting all the stations and trains. Furthermore, we have increased the offer and frequency of trains in order to reinforce social distancing.

Lastly, during the de-escalation process, we are combining these measures with new technology. Since the main challenge is to control the maximum capacity, we have designed a system, based on 'big data', enabling automatic turnstile block in case of passenger capacity excess.

To get our customers back we need public transport to be seen as a safe place. It will be a gradual process, but to regain the confidence of passengers it is essential to return to a true normality, also with regard to new projects. Public transport must continue being the main agent of mobility in cities and we are sure that prevention is key at a time like this.

FERNANDO LOZANO
GENERAL MANAGER
METRO DE MÁLAGA



The current challenge is to restore our passengers confidence overcome the fear of infection and regain the market share.

In Metro Malaga we have thrown ourselves into the protection of our passengers and employees. 4 areas were established to deal with the containment of COVID-19: organisational measures and alteration of the train timetables, occupational health, cleaning and disinfection and communication and customer service.

The current challenge is to restore our passengers confidence overcome the fear of infection and regain the market share. We are currently obtaining the AENOR protocol

to combat COVID-19 certificate, a measure that allows us to have an international leading body supervise and confirm that our protocols are adapted to the recommendations of national and international organizations.

However, the messages aimed at our users to regain confidence in the use of public transport would fall on deaf ears without solid and determined support from the public administration.

From the collective transport sector, we perceive that we have retraced part of the path undertaken many years ago, in the course of which, we saw that people valued public transport as a safe, economic and sustainable choice.

Therefore, it is essential that, after the many contradictory messages sent from the public administration discouraging the use of public transport, its promotion be resumed, given the primary role that public transport must play in the sustainable development of our cities.

JULIO JESÚS CABALLERO SÁNCHEZ
PUBLIC WORKS AGENCY CEO
ANDALUCÍA REGIONAL
GOVERNMENT



The permanent analysis of the demand is a fundamental tool to recover public transport users.

Building up the trust of future users of public transport is a key social challenge after the serious crisis caused by the coronavirus pandemic at the beginning of 2020. Measures implemented by the Andalusian Government during the State of Alarm included limiting travel (only essential travel was allowed), to guarantee the health and safety of workers and users of Andalusian transport networks.

The Public Works Agency of the Andalusian Government, which manages the Seville and Malaga metro lines (an administrative concession), and Granada Tram or light rail, has ensured that all regulations issued by the health authorities were implemented so as to prevent infections. The result of this work in Granada's light rail network is currently being assessed within the framework of the AENOR Protocol Certificate against Covid19.

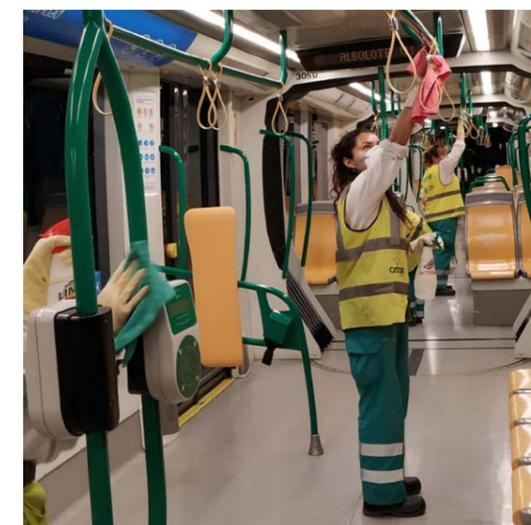
In Andalusia, metro station and train cleaning and disinfection protocols were drastically stepped up, additional cleaning of each line's beginning stations joining the usual nightly cleaning and disinfection of rolling stock. This extra cleaning protocols were carried out in an agile way during commercial hours, in order not to interfere with the service. The Granada light rail, which is directly managed by the Public Works Agency, cleaning and disinfection works were intensive, including the signing of an ad hoc contract to provide the additional services in the short to medium term. Also, hydrogel dispensers have been placed for users in all stations, main contact points have been

disinfected, and opening automatic doors have been installed on trains to avoid users having to press the button.

Customer information has been continuous, with the public-address system, screen displays and information signs distributed throughout Metro stations and trains presenting the customer with itineraries and advice. Additionally, the websites and social media accounts of our metropolitan railways published complementary information about COVID-19.

The frequencies and schedules were adjusted during the State of Alarm, as well as the occupancy of the trains. The transport service has been progressively gone back to normal as the region progressed through different phases of emergency. Now the service (services, schedules, and frequencies) is back to normal, and the only limitation is the standing capacity of trains. The permanent analysis of the demand is a fundamental tool to recover public transport users. We analyse daily reports of passenger traffic (of all three metro networks), broken-up by time of the day and stations, and compare them with pre-pandemic data.

Now it is time to continue implementing these guidelines to maintain the public trust, avoid possible risk situations, and use technology and innovation to bring up user numbers to pre-pandemic levels. That will contribute to the healthy growth that we all want and to progressively recover pre-health crisis demands.



**ANDRÉS MUÑOZ DE DIOS
RODRÍGUEZ**
CEO
METROTENERIFE

The financial support is vital to the survival of the sector.



At Metrotenerife, we carry out the same policies as in any other national or European network. However, our differentiating element is the application of ticketing, viamovil, which lets the passenger buy, top up and validate his/her ticket using his/her own mobile, without having to touch any surface or object, thus reducing the risk of transmission of the virus.

Public transport has been just one more victim of this crisis. It has even been stigmatised by the public administra-

tion as a possible vector for contagion, totally contrary to a historical policy of promotion of public transport. Furthermore, it has suffered a brutal loss of income while maintaining its cost structure. Now we have to win back the confidence of our customers and get our income back.

As is stated in the EU Declaration and by the UITP, financial support is vital to the survival of the sector. If there is no income, public transport faces an uncertain future.

GERARDO LERTXUNDI
CEO
TMB

We want to regain the trust of our users and we need the support of governments.



We are applying all the protocols of disinfection of areas and air renewal. We are even exploring new virucidal methods such as UVC ultraviolet light.

We help users to comply with hygiene regulations by marking itineraries, placing hydroalcoholic gel dispensers in the main stations and offering it next to the masks in vending machines. To avoid crowds, we have innovated in communication by publishing in the website the expected occupation for each line according to time slot and direction.

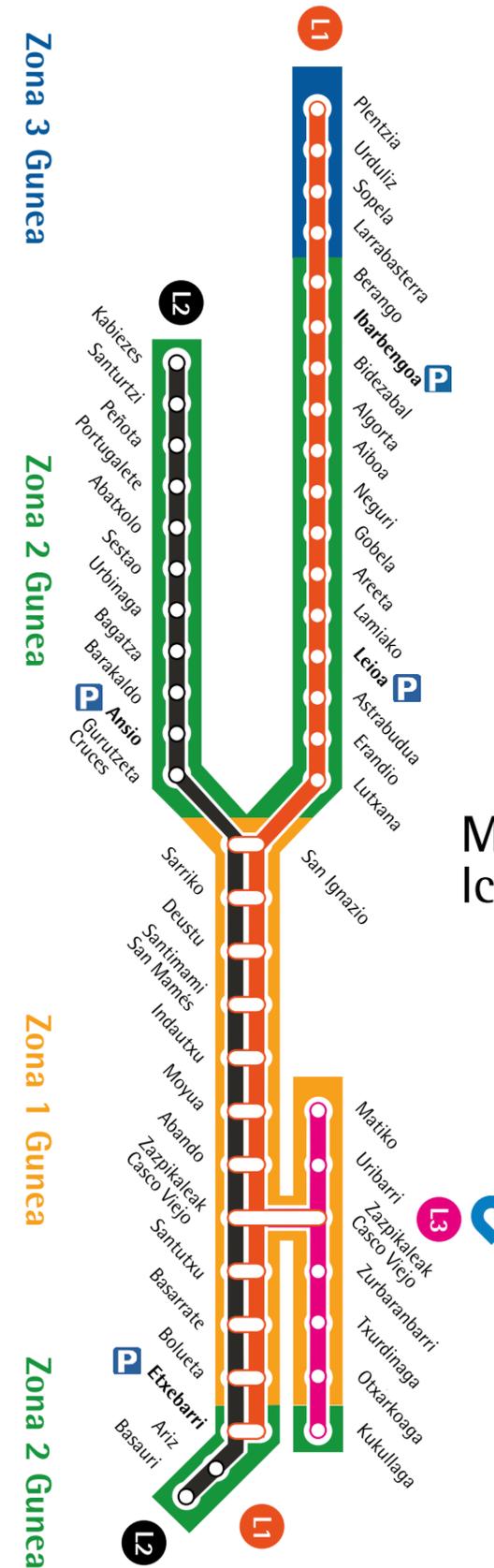
Our sector has proved to be a generator of opportunities: economic promotion, sustainability, territorial and social cohesion, employment...

Before the pandemic, we were moving towards new mobility: capable of satisfying growing demand, providing greener and higher quality service.

We want to regain the trust of our users and we need the support of governments so that less sustainable options do not displace public transport from its role.

**Mugitu metroz
Muévete en metro**

**Move the tube
Ici, en metro**



SEVERIANO ARIAS
MANAGER
TRANVÍA DE MURCIA



Murcia Tram is committed to users and the city.

From Murcia Tramway, it has been clearly and responsibly committed to safety and to maintaining the trust of our users. A security protocol for users has been developed, consisting of measures such as cleaning and disinfecting seats, vertical bars and accessible areas, which are applied to users after each carousel in the main service, and three times a day in service shuttle to UCAM. In addition it is done; daily disinfection of trams (interior and exterior), the; installation of hydroalcoholic gel dispensers in all vehicles, as well as the disposal of users; delivery of face masks to those users who do not have it.

In short, these measures, together with different awareness-raising actions implemented, have allowed the recovery of passenger confidence, thus allowing the Murcia Tramway to continue to be the most widely used form of public transport. Yes, we want to take this opportunity to indicate the strong commitment of Tranvía de Murcia

with its users and with the city. This commitment is reflected in the operation of the service throughout the development of the health crisis caused by COVID-19. The schedules have been adapted and made flexible to the demand and requests of the administration. We continue to be punctual, comfortable, reliable and very safe transportation.

In addition to the cleaning and disinfection actions described in the previous question, Murcia Tram has not stopped, it has stopped developing actions to obtain managers for the development of responsible and sustainable public transport. We have implemented developed measures to improve our efficiency: installation of photovoltaic panels in our facilities for self-sufficiency, installation of led lights at stops to avoid light pollution as much as possible and reduce electricity consumption. Sample of our commitment to sustainability we have renewed, the renewal of the seal in the Carbon Footprint Registry.

We have been the best rated and most used public transport by Murcia for nine years. We want to continue being it incorporating all the necessary measures so that the journey of our users is the safest and most efficient. Because we like to bring people closer, we invite you to move by tram.

MATEU CAPELLÀ
MANAGING DIRECTOR
SERVICIOS FERROVIARIOS
DE MALLORCA (SFM)



It is essential that all mobility authorities work in a coordinated manner.

From the early moment of the outbreak of the health crisis, SFM acted quickly and implemented strict hygiene protocols with two objectives: to ensure the safety of the few travelers who had to move and to convey confidence to users so that when things could return to a certain normal.

We have taken measures such as: adapting frequencies to demand, disinfecting each train or metro unit when it completed a journey at the terminal station, constant cleaning of facilities and mobile material, installing hydroalcoholic gel dispensers on trains and stations or signaling safety distances and occupation of trains and elevators.

All workers have had protective material from the outset and cleaning equipment, equipped with EPI suits.

Communication to the user is being constant to remember preventive measures and conditions of use of transport.

For SFM, it is essential that all mobility authorities work in a coordinated manner to bring to the population as a whole that the railway remains a totally safe and absolutely necessary means to reduce the needs of private vehicle use in cities, even more so in a context of shifting towards a more sustainable society of progress.

ANA MORENO LORENTE
CEO. SEM
TRANVIAS DE ZARAGOZA S.A..



Tranvía de Zaragoza has given service with full capacity, operating with double-train trams.

As well as the cleaning and disinfection works, the Tram has been free to ride for health and nursery homes employees, hand-sanitizing gel dispensers had been placed inside the vehicles, and masks vending machines had been installed in the stops.

Confidence is a key factor. The Tram company has promoted with the City Council a global campaign for the whole public transport, with

different contents in the media and in billboards, with messages like "Tram takes care of you" and remarking the efforts made in safety.

Through the EU and the Spanish Government, it is necessary to develop financial support to the public transport, that has been and is essential. By the middle of June, Tram has recovered the 49% of the demand that had in the same dates of 2019.

Zaragoza Tram, the line with the most users in Spain, has made an intense work in order to offer the best safety and cleaning, and to recover the customers confidence. Since the pandemic began, the public transport has maintained its whole capacity, operating with double-train trams and extended frequencies. In line with the evolution of the different phases of the State of Alarm, Zaragoza Tram recovered its normal timetable and the operation with single units.

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ISABEL PARDO DE VERA
PRESIDENT
ADIF



It is necessary to act decisively to defend a sector that represents thousands of jobs.

The COVID 19 disease has caused a painful and complicated situation, which, however, has also shown the resilience of our country, since we managed to solve the main needs of the population effectively. Railways enabled the mobility of people and goods, and therefore, the supply of our markets and our industry, ensuring the transportation of essential personnel in a reliable and safe manner. I want to take this opportunity, once again, to thank the Adif and Adif AV workers for the enormous professionalism they have shown during these months.

In the European environment, there was a close collaboration that allowed us to adopt best practices and coordinate our responses. In our country, public-private collaboration has not stopped and, looking to the future, an important agreement was signed between Adif and Mafex. Thanks to this agreement, Spanish companies will have access, with Adif's support, to new markets in which the commitment to rail, in the post-COVID environment, may be more decisive.

The consequences of the pandemic have been severe for the railway sector, due to the collapse of mobility and the slowdown in projects. It is necessary to act decisively to defend a sector that represents thousands of jobs. We must seize this opportunity so that the railway occupies its rightful place in the logistics chain, as a sustainable and clean mode of transport. Our efforts, both in the public and private sectors, must be aimed at ensuring that the Green Deal, announced by the EU, is translated into ambitious and realistic funding.

This circumstance also adds to the liberalization process in which we are immersed, that will allow for new operators to enter the market, and through the increase in traffic, will improve the entity's sustainability.

In short, Adif and the rest of the railway sector have before them a list of challenges to tackle, that we will overcome by working together.

ISAÍAS TÁBOAS
CHAIRMAN
RENFE



The railway is doing what it does best: facilitating the mobility of passengers and goods in a fast, sustainable and committed way.

The coronavirus continues to alter public life worldwide. We know that the pandemic dramatically affects the transportation sector due to restrictions on mobility. The scenario continues to be conditioned by the degree of progress of the research and the level of effectiveness of the virus control strategies, and by the effectiveness of the political and economic stimulus measures mobilized. The situation will improve hand in hand with these factors, and due to the efforts of companies in offering safe spaces and with new hygienic and sanitary protocols that are here to stay.

This situation implies that operators have to review their short and medium-term strategies in the face of possible changes in mobility guidelines. At Renfe we are focused on it, updating our Strategic Plan.

Our approach is that the railway will emerge stronger from this situation. During this period we have achieved certification with AENOR of travel protocols, from check-in to disembarkation, including all cleaning, disinfection and information activities on board our HS and long distance services, which guarantee a travel space safe from the health point of view, and we are already working on a certification for commuter trains, the true engine of urban mobility in many cities in Spain.

Meanwhile comes the end of this terrible pandemic, the railway is doing what it does best: facilitating the mobility of passengers and goods in a fast, sustainable and committed way.

During the worst days of the disease in Spain, the railway world has shown its best side, allowing, for example, that more than 25,000 health professionals have traveled free on board in HS services. We have also worked with various public and private organizations to transport essential medical equipment urgently at high speed, with the aim of saving lives.

Now, when we have left the worst scenario behind, we will continue to accompany our clients and users to guarantee their mobility needs, gradually increasing the frequencies and seats in the different services according to the needs of the demand.

The challenges, such as the liberalization of passenger transport and technological disruption, are still there and it is necessary to continue working to achieve full adaptation. The train has been and will be one of the best ways to travel quickly, safely and comfortably. And doing so with Renfe will continue to be a guarantee.

The challenges and opportunities of COVID for European Rail Infrastructure Managers



GUUS DE BRUIJN
LEGAL & POLICY EXPERT



JAVIER MORENO COLOMA
TECHNICAL MANAGER



MONIKA HEIMING
EXECUTIVE DIRECTOR

EUROPEAN RAIL INFRASTRUCTURE MANAGERS (EIM)

The current President of the EC, Ursula von der Leyen, declared to aim for a resilient, green, and digital Europe¹. This ambition comes with numerous opportunities but also challenges for the rail sector, including infrastructure managers.

Furthermore, COVID introduced new opportunities, such as the recognition of rail as an essential ecosystem of the European single market.

The challenge consists in delivering on the rising expectations on rail to make Europe green, digital and resilient. In this context, EU initiatives, such the rollout of 5G, ERTMS, TEN-T and the revision of the Technical Specifications of Interoperability (TSIs) are key to make rail the transport mode of the future. An important enabler in this sense is digitalisation which makes up more than half of the changes in the TSIs.

Another key enabler is the 4th RP and in particular its technical pillar² which is delivered through the EU Agency for Railways. COVID has also illustrated the importance of seamless logistics flows and ERTMS is critical to ensure the rollout of a harmonized technology.

COVID also triggered political support for a European Network of Rail Passenger Corridors which will require more connectivity between rail and other modes. Therefore, it is important that the next EU budget will put rail at its core.

The way forward

To conclude, investments in rail are key to make Europe green, digital and resilient. COVID has extrapolated the strengths and weaknesses of Europe and its transport modes. Rail proved that it delivered. It is important to turn the risks of COVID into an opportunity.



Source: EIM

PERE CALVET
PRESIDENT, INTERNATIONAL ASSOCIATION OF PUBLIC TRANSPORT (UITP)
CEO, FERROCARRILES DE LA GENERALITAT DE CATALUÑA



We have a chance to bring cities back to people. Public transport plays a key role in the economic, social and environmental recovery. #Better Mobility

The crisis generated by Covid-19 has had a major impact on public transport systems across many regions of the world. Public and private sector stakeholders have adopted all the necessary measures to guarantee service continuity, ensuring the mobility of essential front-line workers.

However, the health situation has powered a widespread and unsustainable fall in public transport ridership and associated farebox revenues of close to 90%, and the sector is now literally fighting to survive.



Climate, air quality and health, social inclusion, road safety and the economy are all under attack. Public transport, based on high-capacity rail modes, is a vital pillar for economic, social and environmental recovery, both in the short and long term.

No doubt, railway networks are the backbone of our cities and countries, facilitating the achievement of the Sustainable Development Goals, leaving no one or no place behind. Fundamental pillars such as customer orientation, security and efficiency, supported by levers for improvement (innovation, digital transformation and strategic alliances, MaaS) are our key assets to recover cities for people.

In this context, at UITP we have launched the global campaign "Back to Better Mobility", highlighting the benefits of courageous urban strategies, betting on public transport investments on a critical sector for the society and conveying a positive image of public transport.

LIBOR LOCHMAN
EXECUTIVE DIRECTOR
CER

The intermodal competitive field should be redressed with fairer rules.



Some weeks ago, at the height of the COVID-19 crisis, policymakers started wondering whether the sustainability ambitions of the European Union could be maintained, and if the path set by decades of pro-climate public debate was the right way to a quick economic recovery.

Luckily enough the European Commission made clear that sustainability will have to be a necessary feature of any Member State recovery plan hoping to benefit from the resources of Next Generation EU (the EU extraordinary fund also known as 'Recovery Fund').

In this context, the environmental and energy efficiency credentials of railways – coupled with the remarkable resilience shown during the worst days of the pandemic – should make them prime targets of national government attention. Of course nothing will be easy: today, even though rail is recognised as the leading green mode, much remains to be done to enable rail services' offer to meet citizens' demand

for sustainable, efficient and affordable mobility.

CER's key message is triple:

- Adequate funding should be provided to rail investments, ensuring the right quality level of infrastructure and of passenger and freight services.
- The intermodal competitive field should be redressed with fairer rules. The wide application of the 'polluter-pays' and 'user-pays' principles across all transport modes is key to internalise transport externalities.
- Last but not least, further digitalisation of rail will contribute to making the system both more sustainable and more competitive.

If we want to achieve net-zero emissions in the wider EU economy by 2050, both EU and national policymakers had better take note of these three suggestions and keep them in mind when reflecting upon any upcoming legislative initiative.

PHILIPPE CITROËN
GENERAL DIRECTOR
UNIFE



The EU must prioritise empowering rail to serve as the backbone for a decarbonised mobility system.

During the last 3 months of the COVID-19 crisis, the world has been examining society to understand how it fell into this circumstance. This public health emergency has been in part caused and exacerbated by a concurrent one that may contribute to the rise of other pandemics: climate change. Just as rail has proven invaluable to COVID-19 crisis response due to its continued transportation of essential personnel and critical goods, our sector has the potential to make crucial contributions to global climate action initiatives.

As Europe's - and the world's - greenest mass mobility solution, the EU must make positioning and empowering rail to serve as the backbone for a decarbonised mobility system while it pursues the EU Green Deal and coronavirus recovery. This will require the mobilisation of considerable EU funds such as the 2021-2027 MFF, the Connecting Europe Facility and the newly announced "Next Generation EU" recovery supplement, the implementation of railway harmonisation legislation and definition of international trade expectations. Hopefully,

Spain will ensure this through the swift transposition of the 4th Railway Package by 31 October 2020. Europe needs a truly single European rail area that makes use of sustainable, smart equipment, such as the "game changers" being researched and developed through the Shift2Rail Joint Undertaking and continued under its successor.

Additionally, EU companies must be able to interact with foreign competitors on a level international playing field to avoid a severe market contraction following COVID-19 and be on track to achieve its EU Green Deal objectives.

UNIFE commends the EC's foresight in prioritizing sustainability and recognising it as a principle for economic growth in a maturing international economy. We urge all European institutions to emulate their holistic approach to these joint crises by empowering rail and its supply industry to act as the backbone of the sustainable, interoperable mobility paradigm of the future.

The journey to sustainable and smart mobility begins with rail

To pave the way to a greener future through sustainable and smart mobility, four overarching goals are pivotal:

- Net-zero greenhouse gas (GHG) emissions from transport by 2050 at the latest**
→ This is key to achieve net-zero emissions in the wider EU economy by 2050 and requires agreement on GHG emission reduction milestones for transport: - 25% by 2030 (on 1990 levels, amounting to -42% for 2017-2030) - 65% by 2040 (on 1990 levels) - 100% by 2050 (climate-neutral transport)
- A rail freight modal share of at least 30% by 2030**
→ This is key to meet rising transport demand without more emissions and requires a pan-European deployment plan for rail freight digitalisation based on a system approach where all technologies are interlinked.
- Marginal social-cost pricing (MSCP) promoted in all transport policy reflection.**
→ This is key to implement the 'polluter-pays' and 'user-pays' principles across all transport modes, so as to internalise transport externalities. Railways comply with these principles better than any other mode; now others must follow.
- A rail modal share of passenger traffic of at least 15% by 2030 and 20% by 2050**
→ This is key to realise sustainable travel ambitions and relies on an enhanced digitalised purchasing and travel experience accessible to all passengers in both national and international rail services.

PUBLIC RAILWAY TRANSPORT

FRANÇOIS DAVENNE
GENERAL DIRECTOR
THE INTERNATIONAL
UNION OF RAILWAYS
(UIC)



The public must understand rail's value to urban life.

How close collaboration across the transport family can spread best practice and keep mobility chains open UIC, as the technical platform for railway cooperation at world level, is the place of exchange for best practice, bringing together many networks of experts. On March, 5 2020, UIC has launched the Covid-19 Task Force. Since then, a series of UIC guidance documents have been released: <https://uic.org/covid-19/>

Our world is more interconnected than ever before in history, bringing new risks – most evident today is the increased possibility of pandemics manifested as the Covid-19 crisis that has disrupted all our lives. However, that challenge which we face was also in part caused by the deepening consequences of climate change.

For the transport sector, these two phenomena are closely linked. Mobility services provide the connectivity that enables increased trade and the ability of modern economies to create ever greater prosperity. Unfortunately, many available modes disproportionately generate greenhouse gas emissions (GHG) that have contributed to today's dis-

ruptions. Unlike rail, unsustainable services are responsible for 22% of emissions that endanger natural ecosystems on which we depend on for our very lives, putting us in contact with novel pathogens.

However, rail and public transport are part of the solution. In Europe, rail accounts for 7.6% of passenger and 17.6% of freight transport, but only creates 0.5% of its GHG emissions. With regard to the average energy consumption, urban rail with its 0.12 kWh per passenger-km is 7 times more energy efficient

than private cars in cities. Rail's carbon footprint is significantly smaller than those of the other transport modes.

As we collectively rethink sustainable mobility, it is quintessential that transportation is not synonymous with individual vehicles. In order to do so, the public must understand rail's value to urban life. Due to its higher capacity, its utilization can make cities less congested and less polluted, while maintaining a multimodal system that adequately and equally serves metropolises, conurbations and their surrounding regions.

Rail and public transport are part of the solution. In Europe, rail accounts for 7.6% of passenger and 17.6% of freight transport, but only creates 0.5% of its GHG emissions.



To read the UIC-Unife-UITP Joint Statement: <https://bit.ly/2MTwACI>



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MAFEX Revista corporativa de Mafex
Asociación Ferroviaria Española





A train we cannot miss

The railway industry represents more than 50% of the global production of equipment and infrastructure services, directly providing approximately 400,000 jobs (UNIFE) and with commitments for innovation and development projects worth approximately €1 billion globally (ERRAC).

Covid-19 is going to bring changes. It is expected to trigger new environmental and sustainability policies and initiatives. The industry should play a key role as we predictably shift towards decentralisation, supporting sustainable local lifestyles and telecommuting. Based on this, the process of modernisation and liberalisation should be accelerated despite the uncertainties.

In this sense, the railway sector has many things in its favour to become

THE RAILWAY SECTOR HAS MANY THINGS IN ITS FAVOUR TO BECOME ONE OF THE PROJECTS SELECTED BY GOVERNMENTS AS AN ECONOMIC DRIVER

one of the projects selected by governments as an economic driver. At an estimated €86 billion, the German initiative is the largest railway investment project in the last 180 years.

The estimated amount for the United Kingdom is €22 billion, with defined projects such as the HS2, Crossrail and transport for the northern region. These are two examples of governments that were already committed to the railway sector prior to the crisis, and in light of the current situation, they will likely proceed with most of these investments.

The latest information available about operators in Spain mentions an investment of €1.8 billion, and approximately half of this amount is for Renfe's purchase of high-speed trains. This investment by Renfe is in addition to the amount allocated to buy equipment for public service trains, valued at another €2.7 billion.

Despite the crisis, this is a train that we cannot miss.

Mario García Cueto
CEO ASERTA ESPAÑA
Surety Insurance Company



Change is coming

Change that opens up new challenges in the railway sector where **ASERTA ESPAÑA** is able to offer all its expertise as a leading company in **SURETY INSURANCE**. Over 300,000 clients trust our solutions.

Change is coming. And we're ready for it.

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Máster en Ingeniería Ferroviaria



La puerta de acceso al mundo ferroviario

Un máster con un fuerte enfoque profesional con la participación de expertos y empresas más representativas del sector

El máster pretende formar a profesionales en diferentes áreas del sector ferroviario, aportar conocimiento en temas relacionados con el material rodante, las instalaciones y señalización, con el estudio del comportamiento de la superestructura, con el diseño y la simulación de las operaciones, con la gestión de los recursos humanos, considerando el marco normativo. El máster se compone de 4 **módulos** que dan lugar cada uno a títulos propios emitidos por la Universidad de Cantabria (3 cursos de especialización y un título de experto). Al cursar los 4 módulos y presentar el trabajo fin de máster se obtiene también el título de Máster.

Máster en Ingeniería Ferroviaria

1

INTRODUCCIÓN A LOS SISTEMAS FERROVIARIOS

Curso de especialización

2

PROYECTO, CONSTRUCCIÓN Y MANTENIMIENTO

Título de experto

3

MATERIAL RODANTE FERROVIARIO

Curso de especialización

4

PLANIFICACIÓN Y EXPLOTACIÓN FERROVIARIA

Curso de especialización



Prácticas Remuneradas en empresas ferroviarias

No obligatorias máximo 6 meses a lo largo del curso



1 año de duración

Hay que asistir al 80% de las clases de forma presencial u on-line.



Clases impartidas por profesionales del sector

Profesorado seleccionado con alta experiencia.

Máster en Ingeniería Ferroviaria

Selección de candidatos

La selección de candidatos se realizará mediante un proceso en el que se valorará el expediente académico, el dominio de idiomas y el manejo de herramientas informáticas a nivel de usuario. Además, se evaluarán las aptitudes personales de los candidatos. Tras la selección previa, se llevará a cabo una entrevista personal con cada uno de los candidatos seleccionados.

Coste de matrícula

Las tasas de matrícula del Máster ascienden a **7.500 Euros**. Al formalizar la matrícula podrán elegir el abono del importe total de una sola vez o dividido en dos plazos.

Así mismo se concederán hasta **5 becas de 3.750 Euros** cada una para sufragar el 50% de la matrícula del máster. El coste de los 4 módulos por separado es el siguiente:

Módulo I: 1.750 €
Módulo II: 2.000 €
Módulo III: 1.750 €
Módulo IV: 2.000 €

Admisión

El candidato no admitido en alguno de los plazos pasará automáticamente en reserva al siguiente plazo abierto.

En todo caso siempre quedarán disponibles plazas para el periodo de septiembre.

Es posible acceder al Máster sin haber obtenido aún el título de Grado, siempre que se acredite que al candidato le queda un número reducido de créditos para la obtención del mismo. Según la normativa de la Universidad de Cantabria, se podrá incorporar un número limitado (el 5 %) de profesionales con experiencia.



Impartición

Las clases se impartirán en la Escuela de Ingenieros de Caminos Canales y Puertos de la Universidad de Cantabria y se retransmitirán en directo a los alumnos que no puedan desplazarse a Santander. Es obligatoria la asistencia al 80% de las clases ya sea de forma presencial (física) u on-line. Las clases se impartirán los viernes por la tarde y los sábados por la mañana y por la tarde.

Fechas Importantes

Preinscripción: del 27/07/20 al 30/09/20
Matrículas: del 23/09/20 al 30/09/20
Inicio del curso del Máster: 05/10/20
Fin del Máster: 01/09/21

Preinscripción y Matrícula

La preinscripción y matrícula se puede hacer online accediendo a la web de la Universidad de Cantabria en el siguiente link:

<https://web.unican.es/admision/acceso-a-estudios-propios-de-posgrado>

COLABORAN:



BOMBARDIER



IDOM

ineco



renfe

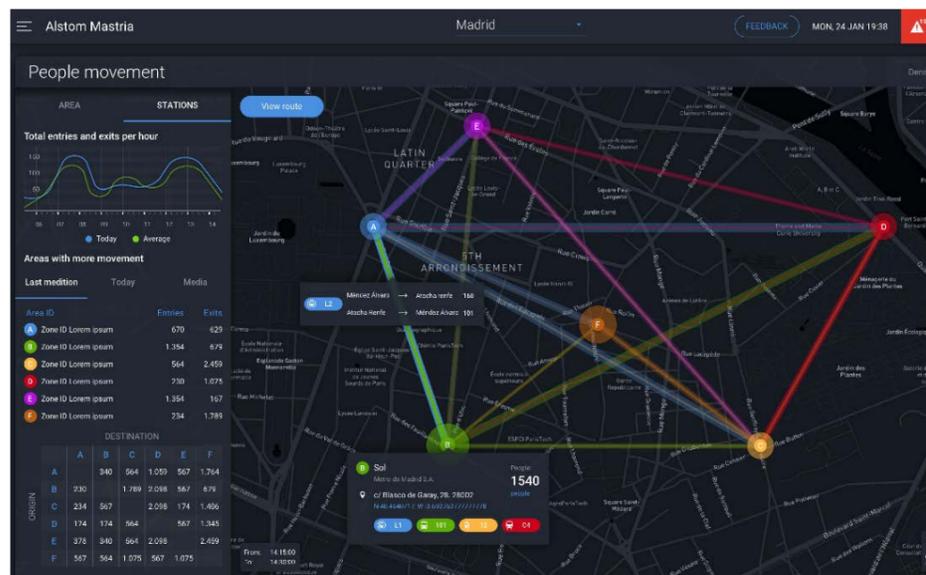


SOME MAFEX PARTNERS WITH

PROJECTS FOR THE POST-COVID ERA

ALSTOM

Alstom has launched a new application of its Mastria mobility management technology to provide new passenger flow management and urban mobility solutions that adapt to the social distancing and public gathering requirements that have arisen due to the COVID-19 virus. Thanks to Big Data and Machine Learning, operators can anticipate, control and manage passenger density and operations in a real time basis (train frequency, capacity and necessary number of trains, access to stations, etc). The solution proposed by Alstom teams collects information on passenger demand from train weight sensors, ticketing machines, traffic signalling, management systems, surveillance cameras and the use of mobile networks in order to offer a real time picture of user flows. However, Mastria goes beyond this and



also offers operators information to ensure and anticipate certain percentages of occupation. It can suggest increasing train frequency, re-routing passengers to another nearby station, reinforcing alternative transportation systems or, even, propose

a distribution of passengers on the platform to facilitate their access to cars with more vacancies. Its powerful prediction algorithms can anticipate these situations, thereby guaranteeing proper planning of the entire system.

ARDANUY INGENIERÍA

Ardanuy Ingeniería will take part in the EActiVate Initiative in order to help boost economic recovery and give visibility to the role of transport in this new world context.

EActiVate serves as a forum for companies of all sizes whose goal is to launch initiatives and ideas which will generate opinion and trust in the country as a whole. This endeavor focuses on fields such as

employability, productivity, sustainability or infrastructure; these all being areas where the railway sector has a very relevant weight and will continue to play an important role in the coming years.



AQUAFRISCH

As part of our continuous effort developing new applications Aquafrisch has integrated in Train Washing Plants the new Compact MBR systems to guarantee that all recycled water to be re-used in our plants is treated against Virus and Bacteria. No chemical products are used and almost no maintenance is required. The reused water is free from solids, bacteria and virus, achieving a very high quality effluent that also complies with the most demanding discharge regulations. The treatment follows a 2 steps program:

1. Ultrafiltration by means of submerged membranes eliminating suspended solids with a reduction of up to 99 %.
2. Water disinfection by ultraviolet light, effectively and quickly eliminating viruses and bacteria.

Germicidal ultraviolet light is the only alternative in the sterilization and disinfection processes that does not generate or release by-products and guarantees the elimination between 99.90% and 99.99% of pathogens.

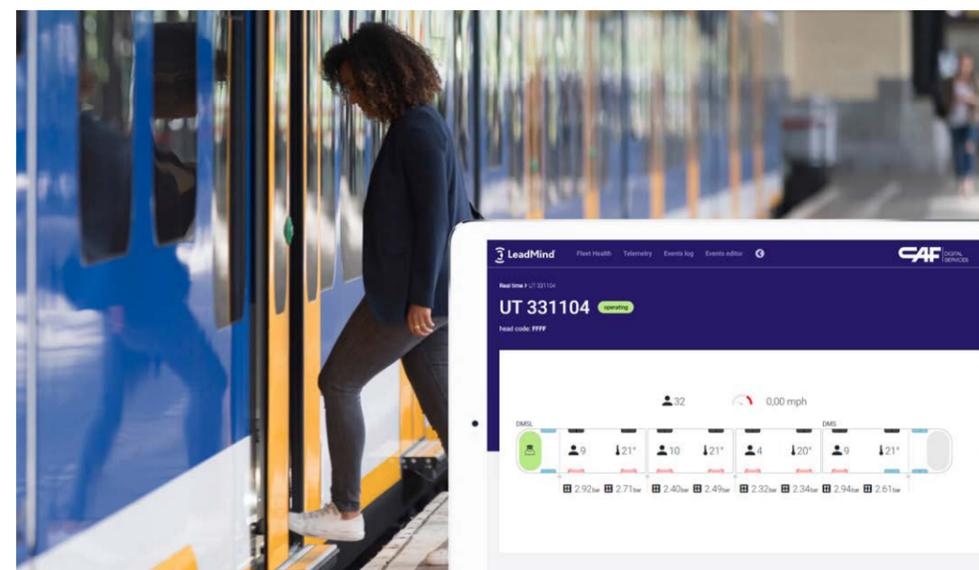
CAF

There are many new challenges that we need to face in these days, the safety of the passengers is one of the main ones for the railway operators in this new phase.

The challenges of the new reality have allowed to leverage the functionalities offered by LeadMind, the digital train platform managed by CAF Digital Services. The real-

time data monitoring solution allows you to have total control over the number of passengers travelling in each car.

The possibility to integrate this information with existing systems of each operator makes it feasible, for example, to indicate in the stations to those passengers who wait for the train, how to distribute better towards the more empty cars. These data also allow identifying stations, periods of the year or schedules with greater demand to manage the regularity of the service. In this way we help to reduce the risk of contagion and maintain an optimal service for passengers.



SOME MAFEX PARTNERS WITH

PROJECTS FOR THE POST-COVID ERA



ICON MULTIMEDIA

With the aim of managing the influx and mobility of passengers in the railway sector and also to guarantee the safety distance, ICON Multimedia integrates capacity control solutions, people counting systems and wagon occupancy into its Passenger Information System, DENEVA.

Now, it's possible to show real-time information about the occupation of the platforms in all the screens managed with DENEVA, by using advanced AI algorithms, and integrated the IP cameras of the stations to the displays. In addition, it allows to launch visual and audio alerts thought PA, when the maximum occupancy

in platforms is exceeded, in order to avoid crowds. This solution is one of the DENEVA Safe and Tech solutions, as well as the one that is already integrated, that allow to display the occupation of wagons, so that passengers could distribute themselves along them, keeping the safety distance.

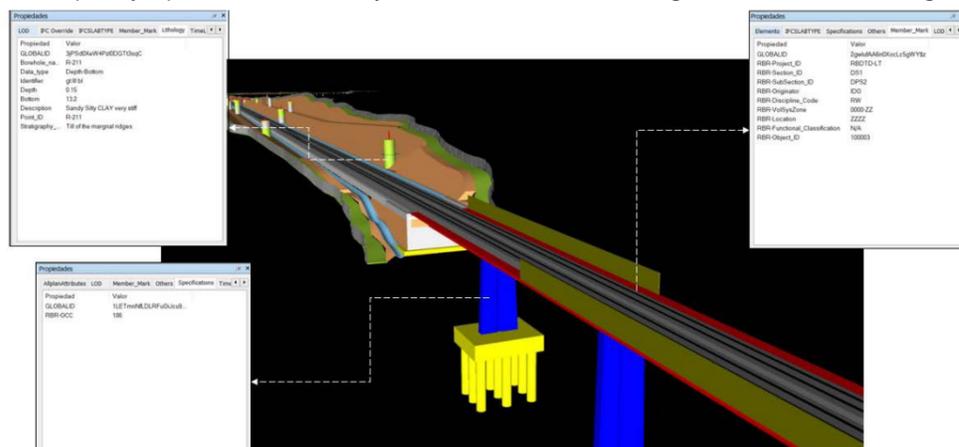
IDOM

In the post Covid-19 era, collaborative environments like BIM, which offer the possibility of creating operations models (digital twins), are tools with increasingly more powerful applications.

Online collaborative work, real-time visualization, and monitoring the useful life of infrastructures are especially important features.

At IDOM, we are using BIM technology, pushing its boundaries, on projects such as MetroLink (Dublin), Rail Baltica and Ring 3 LRT (Copenhagen). The widespread use of BIM in our organization has allowed us to progress efficiently with the development of our projects, keeping to schedules and delivering work with the usual high quality. Our professionals have been working effectively in close collaboration and alongside

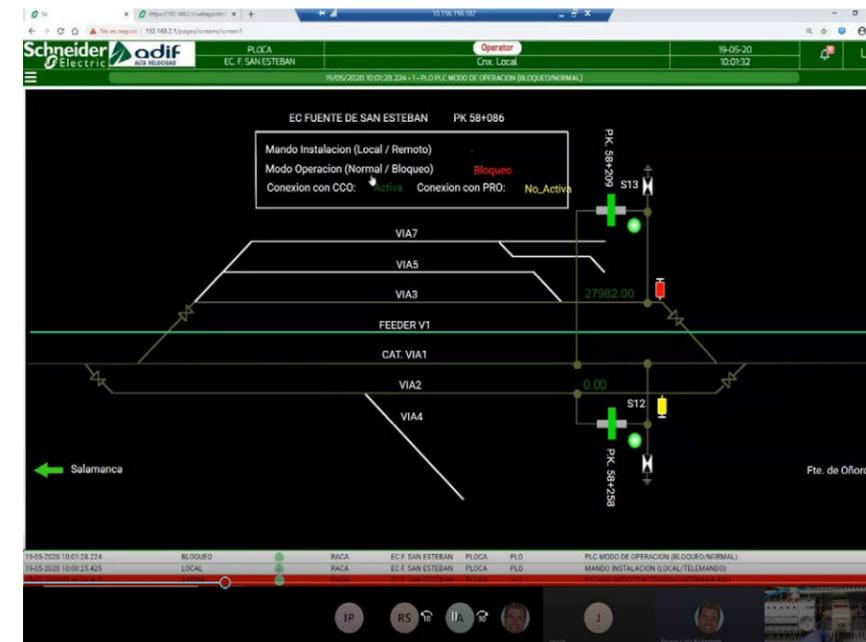
the client, regardless of location, using new work practices thanks to the use of Common Data Environments (CDE). The Asset Identification Standard (AIS) being developed by IDOM, allows any asset that is found in the infrastructure to be named in a unique and unequivocal way. The result is a BIM model which is also a virtual mirror of the construction itself, improving information management even further.



SCHNEIDER ELECTRIC

Schneider Electric ha realizado las pruebas FAT del proyecto de electrificación de la línea Salamanca-Fuentes de Oñoro de Adif de forma remota y virtual, convirtiéndose en pioneros en España de este nuevo formato.

Los técnicos han hecho pruebas físicas, completando todos los puntos del protocolo y solventando todas las dudas que han surgido al cliente de los armarios tipo y de los sistemas de control a través de conexiones remotas virtuales, lo que les ha permitido presentar in vivo todas las posibilidades y funcionalidades al cliente sin poner en riesgo la salud de los implicados. Además, las pruebas han sido grabadas y los protocolos guardados, estando disponibles en todo momento.



Haramain Amurrio in the Mecca-Medina High Speed Railway



Switch devices able to work in the toughest conditions on the planet

55 AV4 turnouts for the Haramain High Speed line. Designed for speeds up to 350 km/h on direct track and 175 km/h on the deviated track. We specialize in solutions for the most demanding projects. Large projects, such as

Haramain. Or small, starting from a single unit. In any type of application, anywhere in the world. Does your rail project have special needs? Call Amurrio. That's what we are there for.



SOME MAFEX PARTNERS WITH

PROJECTS FOR THE POST-COVID ERA



► LA FARGA

Copper is a vital metal for human health thanks to its antimicrobial properties. Scientific studies demonstrate that on copper surfaces, the COVID-19 only lasts 4 hours, while the plastic and stainless steel stay up to 3 days.

It is estimated that 80% of infections are transmitted by contact, so the use of copper surfaces would prevent contagion. Currently it is already applied in healthcare environments and high traffic areas. An example of this are the trains that have already opted for it incorporating handrails and copper handles in order to improve the quality of life of passengers.

La Farga is committed to creating sustainable, safe and healthy environments and that is why we choose copper, a material that guarantees society security, reliability and quality.

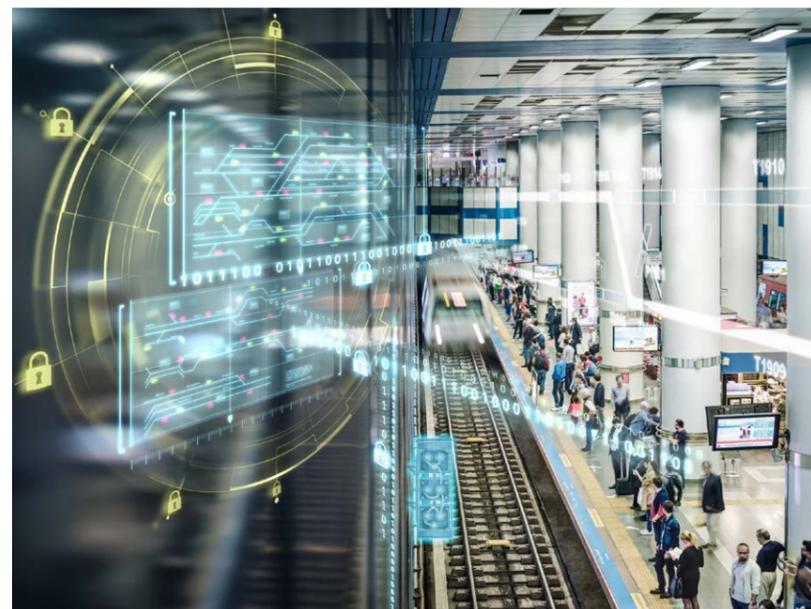
► SIEMENS

Siemens Mobility Spain has a portfolio of solutions to mitigate the risks to which rail transport users could be subjected, making them safer from the threat of the Covid-19. These solutions also help operators and administrations to have the necessary technology to manage restrictions in occupation, social distance and access control to stations.

Digital Station's Capacity solution enables intelligent and predictive analysis of passenger flow, their presence on the platforms and wagon occupation, showing which are overloaded or empty and where passengers prefer to sit, as well as the use of station infrastructure to identify those areas of greatest risk of contagion and manage their maintenance and cleanliness. It presents the information in a single centralized and remotely accessible interface that allows the operator to make crucial decisions for capacity control.

AIRO Smart Traffic Manager is an Artificial Intelligence engine that adapts train frequency to passenger demand with the aim of reducing waiting times in stations and avoiding service disruption.

The Intelligent Access Control System is an app that allows the user to book in advance and access the station in such a way as to ensure a correct flow of people to avoid crowding and guarantee social distance.



► TELTRONIC

Railway operations, both in terms of driving vehicles and coordinating passenger service activities, require robust, efficient and always available communication systems. Systems based on wireless technologies such as TETRA and LTE integrate critical communication voice services and broadband data

services, essential to support applications imposed by the new COVID-19 security protocols, such as on-board video surveillance, passenger counting or remote management of public address systems. In addition, TETRA and LTE systems are the means of train-ground communication for signalling systems and other on-board

subsystems, such as the TCMS management system, which needs to send to the Control Centre information about the location or possible alarms and events occurring in the train. In this context, Teltronic offers integral communication solutions, including the RTP-800, a new multi-technology (TETRA, LTE and WIFI) on-board radio terminal.

► THALES

Thales has developed a technological solution for analysing and monitoring infrastructure occupancy in real time able to detect crowding, planning routes and various capacity conditions, generating alerts and indicators allowing the operator to trigger effective operational safety protocols.

The Thales intelligent passenger density solution allows us to evaluate the density of people in a particular area using existing CCTV and video analysis algorithms based on AI, enabling us to extract individuals' morphological characteristics (skeletons) with a high degree of reliability as compared to traditional technologies.

Information is displayed to the operator in structured form on transport network cartography based on heat maps, and alarms can be coordinated with passenger information systems available at stations.



MEMBERS DIRECTORY

ENGINEERING, CONSULTANCY AND CERTIFICATION

Projects and infrastructure technical assistances, superstructure, signalling, communications and ticketing

- ▶ Aimen Centro Tecnológico
- ▶ Albatros, S.A.U.
- ▶ Ardanuy Ingeniería, S.A.
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- ▶ Caf Turnkey & Engineering, S.L.
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- ▶ SGS Group Spain
- ▶ Teknorail - Grupo Eurofinsa
- ▶ Tecnivial S.A.
- ▶ Tectronic
- ▶ Tekniker
- ▶ Thales España Grp, S.A.U.
- ▶ TPF Getinsa Euroestudios, S.L.
- ▶ Trigo Group
- ▶ Typsa - Técnica Y Proyectos, S.A.
- ▶ Vicomtech
- ▶ WSP Spain-Apia S.A.

Systems, environmental, financial management and IT consulting

- ▶ Aimen Centro Tecnológico
- ▶ Aquafriech, S.L.
- ▶ Ardanuy Ingeniería, S.A.
- ▶ Colin Buchanan Consultores, S.A.
- ▶ Citef (Fundación para el fomento de la innovación industrial)
- ▶ Eurogestión
- ▶ Fundación Gaiker
- ▶ Idom-Engineering, Consulting, Artchitecture
- ▶ Ineco-Ingeniería y Economía del Transporte, S.A.
- ▶ Segula Technologies España, S.A.U.
- ▶ Sener Ingeniería y Sistemas, S.A.
- ▶ SGS Group Spain
- ▶ Teknorail - Grupo Eurofinsa
- ▶ TPF Getinsa Euroestudios, S.L.
- ▶ Vicomtech
- ▶ WSP Spain-Apia S.A.

Technical Specifications Drafting and supervision of rolling stock manufacturing

- ▶ Aimen Centro Tecnológico
- ▶ Albatros, S.A.U.
- ▶ Ardanuy Ingeniería, S.A.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Eurogestión
- ▶ Hispacold S.A.

- ▶ Idom-Engineering, Consulting, Artchitecture
- ▶ Ineco-Ingeniería y Economía del Transporte, S.A.
- ▶ Rosni S.L.
- ▶ Segula Technologies España, S.A.U.
- ▶ Sener Ingeniería y Sistemas, S.A.
- ▶ SGS Group Spain
- ▶ Teknorail - Grupo Eurofinsa
- ▶ Trigo Group
- ▶ WSP Spain-Apia S.A.

Work supervision

- ▶ Aimen Centro Tecnológico
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- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Idom-Engineering, Consulting, Artchitecture
- ▶ Indra Sistemas, S.A.
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- ▶ Inserail, S.L.
- ▶ Segula Technologies España, S.A.U.
- ▶ Sener Ingeniería y Sistemas, S.A.
- ▶ SGS Group Spain
- ▶ Sice Tecnología y Sistemas
- ▶ Tpf Getinsa Euroestudios, S.L.
- ▶ Typsa - Técnica y Proyectos, S.A.
- ▶ WSP Spain-Apia S.A.

Product and process certifications

- ▶ Aimen Centro Tecnológico
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- ▶ Cetest, S.L.
- ▶ Citef (Fundación para el fomento de la innovación industrial)
- ▶ Dsaf-Dinamicas De Seguridad, S.L.
- ▶ Eurogestión
- ▶ Fundación Gaiker
- ▶ Goal Systems SL
- ▶ 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
- ▶ Teknorail Group
- ▶ WSP Spain-Apia S.A.

Drafting of operation and maintenance (O&M) plans and transport and demand studies

- ▶ Aimen Centro Tecnológico
- ▶ Ardanuy Ingeniería, S.A.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Citef (Fundación para el fomento de la innovación industrial)
- ▶ Colin Buchanan Consultores, S.A.
- ▶ Duro Felguera Rail, S.A.U.
- ▶ Gantrex Spain
- ▶ Goal Systems SL
- ▶ Idom-Engineering, Consulting, Artchitecture
- ▶ Ineco-Ingeniería y Economía del Transporte, S.A.
- ▶ Rosni S.L.
- ▶ Segula Technologies España, S.A.U.
- ▶ SGS Group Spain
- ▶ Tekniker
- ▶ Teknorail Group
- ▶ Tpf Getinsa Euroestudios, S.L.
- ▶ Typsa - Técnica y Proyectos, S.A.

Training and simulations tools

- ▶ Aimen Centro Tecnológico
- ▶ Colin Buchanan Consultores, S.A.
- ▶ Goal Systems SL
- ▶ Tekniker
- ▶ Segula Technologies España, S.A.U.
- ▶ Lander
- ▶ Rosni S.L.
- ▶ WSP Spain-Apia S.A.

INFRASTRUCTURE AND SUPERSTRUCTURE

Civil works (platforms, stations, depots)

- ▶ Aimen Centro Tecnológico
- ▶ Azvi S.A.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Comsa Corporacion
- ▶ Dominion
- ▶ Funor, S.A.
- ▶ Inserail, S.L.
- ▶ 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

- ▶ Aimen Centro Tecnológico
- ▶ Alstom Transporte, S.A.
- ▶ Amurrio Ferrocarril y Equipos, S.A.
- ▶ Arcelormittal España, S.A.
- ▶ Artech (Electrotécnica Artech 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.
- ▶ Duro Felguera Rail S.A.U.
- ▶ Flexix, S.A.
- ▶ Funor, S.A.
- ▶ Hicasa-Hierros y Carbones, S.A.
- ▶ Ikusi SLU
- ▶ Inserail, S.L.
- ▶ Jez Sistemas Ferroviarios, S.L.

MEMBERS DIRECTORY

- ▶ Ladicim
- ▶ Lantania
- ▶ 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
- ▶ Talleres Alegría, S.A.
- ▶ Talleres Zitron
- ▶ Tecnivial 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 Alegría, S.A.
- ▶ Tria Ingeniería, 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
- ▶ Enclavamientos 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
- ▶ Tecnivial 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.
- ▶ Azvi S.A.
- ▶ Bombardier European Holdings, S.L.U.

- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Comsa Corporacion
- ▶ Dominion
- ▶ Dsaf-Dinamicas De Seguridad, S.L.
- ▶ Indra Sistemas, S.A.
- ▶ Inserail, S.L.
- ▶ Segula Technologies España, S.A.U.
- ▶ Semi- Sociedad Española de Montajes Industriales, S.A.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Telice, S.A.
- ▶ Thales España Grp, S.A.U.
- ▶ Vicomtech

Systems and equipment for collection, ticketing and access control

- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Calmell, S.A.
- ▶ Comsa Corporacion
- ▶ Dominion
- ▶ Ecomputer S.L.
- ▶ Gmv Sistemas, S.A.U.
- ▶ Ikusi SLU
- ▶ 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.
- ▶ Telice, S.A.
- ▶ Vicomtech

Communications

- ▶ Albatros, S.A.U.
- ▶ Azvi S.A.
- ▶ Cables de Comunicaciones Zaragoza, S.L.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ CEIT
- ▶ Comsa Corporacion
- ▶ Dominion
- ▶ Enclavamientos y Señalización Ferroviaria ENYSE S.A.U.
- ▶ Eurogestión
- ▶ Gmv Sistemas, S.A.U.
- ▶ Ikusi SLU
- ▶ 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.
- ▶ Tectronic, S.A.U.
- ▶ 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
- ▶ Dominion
- ▶ Turnkey & Engineering, S.L.
- ▶ Gmv Sistemas, S.A.U.
- ▶ Icon Multimedia, S.L.
- ▶ Indra Sistemas, S.A.

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.
- ▶ Talleres Alegría, 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.
- ▶ Talleres Alegría, S.A.

MANUFACTURERS OF VEHICLE COMPONENTS, AUXILIARY EQUIPMENT AND SYSTEMS

Traction and propulsion components

- ▶ Aimen Centro Tecnológico

- ▶ Alstom Transporte, S.A.
- ▶ Artech (Electrotécnica Artech Smart Grid, S.L.)
- ▶ Bombardier España
- ▶ Caf Power & Automation, S.L.U.
- ▶ Flexix, S.A.
- ▶ Ik4 Research Alliance
- ▶ 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

- ▶ Aimen Centro Tecnológico
- ▶ Albatros, S.A.U.
- ▶ Alstom Transporte, S.A.
- ▶ Artech (Electrotécnica Artech 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.
- ▶ Ik4 Research Alliance
- ▶ 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.
- ▶ Aimen Centro Tecnológico
- ▶ Artech (Electrotécnica Artech Smart Grid, S.L.)
- ▶ Danobat, S. COOP.
- ▶ Fundiciones del Estanda, S.A.
- ▶ Funor, S.A.

Mechanical components

- ▶ Agui S.A.
- ▶ Alstom Transporte, S.A.
- ▶ Bombardier España
- ▶ Caf-Construcciones y Auxiliar de Ferrocarriles, S.A.
- ▶ Flexix, S.A.
- ▶ Funor, S.A.
- ▶ Fundiciones del Estanda, S.A.
- ▶ Gamarra, S.A.
- ▶ Hispacold S.A.
- ▶ Ik4 Research Alliance
- ▶ Metalocauchos, S.L.
- ▶ Mgn Transformaciones del Caucho, S.A.
- ▶ Rosni S.L.
- ▶ Stadler Rail Valencia, S.A.U.
- ▶ Talleres Alegría, S.A.
- ▶ Zeleros

Interiors

- ▶ Agui S.A.
- ▶ Bombardier España
- ▶ Colway Ferroviaria, S.L. (Nexus Management)
- ▶ Flexix, 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.
- ▶ Artech (Electrotécnica Artech 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

- ▶ Aimen Centro Tecnológico
- ▶ 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

- ▶ Aimen Centro Tecnológico
- ▶ Alstom Transporte, S.A.
- ▶ Artech (Electrotécnica Artech 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
- ▶ Patentes Talgo, S.L.
- ▶ Rosni S.L.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Stadler Rail Valencia, S.A.U.
- ▶ Talleres Alegría, S.A.
- ▶ Talleres Zitrón
- ▶ Technology & Security Developments

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

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

- ▶ Azvi S.A.
- ▶ Bombardier España
- ▶ Caf Signalling, S.L.
- ▶ Caf Turnkey & Engineering, S.L.
- ▶ Dsaf-Dinamicas de Seguridad, S.L.
- ▶ Dominion
- ▶ Gmv Sistemas, S.A.U.
- ▶ Ikusi SLU
- ▶ Indra Sistemas, S.A.
- ▶ Inserail, S.L.
- ▶ Jez Sistemas Ferroviarios, S.L.
- ▶ Luznor Desarrollos Electrónicos, S.L.
- ▶ Patentes Talgo, S.L.
- ▶ Semi- Sociedad Española de Montajes Industriales, S.A.
- ▶ Sice Tecnología y Sistemas, S.A.
- ▶ Siemens Rail Automation, S.A.U.
- ▶ Schneider Electric
- ▶ Telice S.A.

Maintenance of systems, equipment and vehicles components

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

Supply of maintenance equipment

- ▶ Aimen Centro Tecnológico
- ▶ Albatros, S.A.U.
- ▶ Alstom Transporte, S.A.
- ▶ Aquafriech, S.L.
- ▶ Bombardier España
- ▶ Danobat, S. COOP.
- ▶ Kimua Group
- ▶ Ingeniería Viesca S.L.
- ▶ Nem Solutions
- ▶ Newtek Solidos S.L.
- ▶ 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)**
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- ▶ lm.gil@agui.com
- ▶ www.agui.com



AIMEN TECHNOLOGY CENTRE

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

- ▶ **C/ Relva 27 A - Torneiros | 36410 O Porriño (Pontevedra)**
- ▶ +34 662 489 181
- ▶ sepsacomercial@sepsa.es
- ▶ www.sepsa.es



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 28320 Pinto (MADRID)**
- ▶ +34 91 495 70 00
- ▶ 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.

- ▶ **Martinez Villergas, 49 - Edificio V - 28027 (MADRID)**
- ▶ +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 Aquafriech 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. Aquafriech is also a reference in industrial water treatment, potabilization and purification. In Aquafriech we take care of the design, manufacture, installation, commissioning, training and maintenance of the machines according to the customer's needs. Aquafriech is certified in ISO9001:2015, ISO14001:2015 and OHSAS2007.

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



ArcelorMittal

ARCELMITTAL

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

🚩 ArcelorMittal Asturias. Edif. de Energías, 2 pl. 33691 Gijón (ASTURIAS)
 ☎ +34 985 187 750
 📧 rails.specialsections@arcelormittal.com
 🌐 <https://rails.arcelormittal.com/>

Ardanuy**ARDANUY INGENIERÍA, S.A.**

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

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

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

🚩 Avda. Europa, 34 28023 (MADRID)
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 🌐 www.ardanuy.com

**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)
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 ☎ +34 946 155 628
 📧 marketing@arteche.com
 🌐 www.arteche.com

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

CAF is one of the world leaders in the design and implementation of comprehensive transit systems. CAF provides comprehensive project and engineering management throughout all stages of the project including feasibility analysis and investigations, system design, civil work, signalling, electrification and other electromechanical systems, rolling stock supply and system operation and maintenance.

In terms of rolling stock, CAF supplies and maintains high speed trains, regional and commuter trains, locomotives, metro units, trams and buses.

🚩 J.M. Iturrioz, 26 20200 Beasain (GUIPÚZCOA)
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 ☎ +34 943 881 420
 📧 caf@caf.net
 🌐 www.caf.net

**CAF POWER & AUTOMATION**

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

🚩 Mikeltegi, 58 - 2, Parque Tecnológico de San Sebastián (GUIPÚZCOA)
 ☎ +34 943 309 251
 📧 info@cafpower.com
 🌐 www.cafpower.com

**CAF SIGNALLING, S.L**

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

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

🚩 Avda. de la Industria, 51 28108 Alcobendas (MADRID)
 ☎ +34 91 789 27 50
 ☎ +34 91 661 37 51
 📧 cabsignalling@cabsignalling.com
 🌐 www.cabsignalling.com

Azvi**AZVI**

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.

🚩 Almedralejo, 5. 41019 (SEVILLA) / Maudes, 51, 2º. 28003 (MADRID)
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 🌐 www.azvi.es

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)
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 ☎ +34 91 650 75 18
 📧 javier.hinojal@rail.bombardier.com
 🌐 www.bombardier.com/en/worldwide-presence/country.spain.html

**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.alzorric@cablescom.com
 🌐 www.cablescom.com

**CAF TURNEY & ENGINEERING**

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

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

**CALMELL, S.A.**

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

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

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

🚩 Pol. Ind. Pla d'en Coll C/ Fresser, 12 C 08110 Montcada i Reixac (BARCELONA)
 ☎ +34 93 564 14 00
 📧 dsala@calmell.net
 🌐 www.calmell.net

**CEIT**

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

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

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

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🌐 www.citef.es

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

Buchanan is a Transport Planning consultancy established in Spain in 2007, which origins 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.

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**DANOBAT S.COOP.**

Specialised Machine Tools and production systems for railway industry offering technologically advanced solutions and services, including among others engineering, consultancy, which are fully adapted to clients' needs.

DANOBAT focuses its activity in the supply of turnkey solutions for the manufacturing and maintenance of railways rolling stock, incorporating own leading technology products, together with those manufactured by specialised companies.

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**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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**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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**COMSA**

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

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**CUNEXT COPPER INDUSTRIES**

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

🚩 Av. de la Fábrica, s/n 14005 (CÓRDOBA)

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**DF 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.

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

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

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

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

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**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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**GEMINIS LATHES, S.A.**

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

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

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

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

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**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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**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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**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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**GOAL SYSTEMS SL**

Goal Systems is a company dedicated for 27 years to the production and implementation of software solutions for optimization of human and material resources, especially in the transport sector, as well as to the provision of services related to such projects. These systems form part of the Intelligent Transportation Systems (ITS) family of software for infrastructures and operations in the world of transport.

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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 an 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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IDOM CONSULTING, ENGINEERING AND ARCHITECTURE S.A.U

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

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IKUSI, S.L.

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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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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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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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.

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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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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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LA FARGA YOUR-COPPERSOLUTIONS, S.A.

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

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

MTC, being part of Wabtec Corporation, designs and manufacture rubber-metal components for suspension and vibration control systems used on railway, automotive and industrial applications. With headquarters in Spain, MTC has 4 production facilities in 1) Spain, 2) China, 3) India and 4) USA, which offers to customers the possibility to localize production in any of these countries.

Thanks to a wide commercial presence in any country of the world, MTC gives local support to develop projects for both OE and Aftermarket business.

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

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🌐 www.wabtec.com/business-units/metalcaucho-mtc

**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.

🚩 Candelaria, 9 28864 Ajalvir (MADRID)
☎ +34 91 887 40 35
✉ enp@mgncaucho.com
🌐 www.mgncaucho.com

**NRF**

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

🚩 Av. Asegra, 22, 18210 Peligros (GRANADA)
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✉ a.lara@nrf.eu
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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.

🚩 Ctra. Virgen del Monte, 1 13260 Bolaños de Calatrava (CIUDAD REAL)
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**PATENTES TALGO, S.L.U.**

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

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



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

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

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 📠 +34 91 359 12 46
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 🌐 www.preconsa.es



PRETENSADOS DEL NORTE, S.L.

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

🚩 Miravalles, 4 Zona Indus. de Betoño 01013 (VITORIA)
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 📠 +34 945 261 400
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 🌐 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 intercomms, public address and information panels, to systems related with revenue/cost issues, like ticketing, tolling and access control, and also with operator oriented solutions like railway telephony, signalling (level crossings, point heaters and inspection systems) and station control. More than 45 years of experience. Projects deployed in 24 countries.

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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 Pares 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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 🌐 www.gruposemi.com



SENER INGENIERÍA Y SISTEMAS, S.A.

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

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 🌐 www.ingenieriaconstruccion.sener



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.

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 ✉ alvaroquinones@rosni.com
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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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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.

🚩 Bac de Roda, 52 Edificio A 08019 (BARCELONA)
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 📠 +34 93 484 33 16
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 🌐 www.se.com



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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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.

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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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SIEMENS*Ingenio para la vida***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)
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✉ www.siemens.es/siemens-mobility

STADLER**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.

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**TALLERES ALEGRÍA, S.A.**

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

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**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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**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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**TECNIVAL,S.A.**

In TECNIVAL 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 NANOTECH 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 Corporative Image projects according to the needs of the customer; design & installation.

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**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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**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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**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, been 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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**TYPESA**

Founded in 1966, TYPESA is a leading consulting engineering group in the fields of transport, buildings, water, environment, energy and rural development. We have a long-standing relationship with public, private and institutional clients in the Americas, Europe, Africa, Asia and the Middle East, assisting them in the development of infrastructure, energy and city projects from concept to completion. In addition to providing world-class engineering services, TYPESA has extensive experience in building the capacity of local firms and in strengthening institutions to guarantee the sustainability of the infrastructure.

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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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