

## PRESS RELEASE: **BUSWORLD 2017**

### **A new generation of Irizar buses and coaches Leaders in technology and sustainability**

*Kortrijk, 20th October 2017*

Irizar, a world leader in the manufacture of buses and coaches, is attending the Busworld 2017 international Bus and Coach exhibition with several exhibition spaces that total more than 1600m<sup>2</sup>. In these areas, the company will be presenting its brand, technology and sustainability strategy and its new generation of products and technological solutions available to all markets.

At the stand in Hall 4, you will be able to see the **new generation** of Irizar coaches and the various technological solutions aimed at integral and **hybrid** coaches. The highlights of this space are the Irizar i8, **named this year as Coach of the Year 2018**, the new Irizar i6S and the Irizar i4H, the latter in a hybrid version.

At a second stand, Irizar will be showcasing its commitment to the future with its integral turnkey electromobility solutions for cities.

The range of products exhibited at Busworld 2017 will be rounded off by the **ie bus**, a 12-metre city bus, and the **ie tram**, an 18-metre tram version articulated bus, both of which are 100% electric zero emission vehicles, in addition to a pantograph charging system that Irizar is presenting in **its world premier**.

Irizar is therefore showcasing its future strategic lines and its firm commitment to its customers and society, to whom it provides high added value through its products and services, without overlooking such fundamental aspects as design, personalisation, safety, reliability and sustainability

It must also be mentioned that Irizar is receiving the prize for **Best Bus Constructor, which will be awarded in the Busworld Academy Awards during the opening of the Fair**.

## **The Irizar brand: Giant steps towards a great future**

The development of Irizar's brand strategy based on technology, sustainability and customer focus, along with finding synergies in the Group, is producing great results. We have made great technological advances in our entire range of electric coaches and buses and their main components and systems.



Our parent plant in Ormaiztegui has again surpassed 1300 production coaches and the manufacture of integral buses has grown 30%. New growth is expected for the coming year.

The service network is still in the process of expansion and it is currently possible to locate an approved Irizar warranty workshop in all places where its coaches operate.

Moreover, R & M services are increasingly being offered so that the customer has Irizar as its sole contact.

Note the evolution of the Spanish, French and English markets where Irizar is growing and obtains greater brand recognition thanks to the customers appreciating the reliability, design and service provided by the brand. Irizar has become a benchmark for both long distance operators or discretionary service with the Irizar i6S and for tour operators and VIP cars with the Irizar i8.

In Italy, where Irizar has been a benchmark for many years, the range of coaches offered with integral models has been expanded. This year, 20% of total sales in Italy will be Irizar coach brands. The expansion of the sales and after-sales network, customer proximity and the supply of R & M contracts will continue in order to achieve higher market shares.

### **The best range of products ever seen**

We have a new generation of high tech coaches for the Premium sector, class I and II intercity buses with hybrid technology or biodiesel and class I zero emissions electric buses.

A catalogue of products which aims to provide competitive advantage in safety, reliability, sustainability, technology and profitability for our customers.

Our hybrid coaches offer a 20% reduction in fuel consumption compared to a conventional diesel coach.

Only EURO6 C engines are available that can operate with state-of-the-art diesel (10 ppm sulphur content) or HVO (hydrogenated vegetable fuels).

The whole range of buses and coaches has the most advanced active and passive safety systems and technologies on the market. Designed to meet the most demanding parameters, Irizar coaches are robust, light, quiet and reliable.

All of this enables us to cover all sectors of public passenger transport, from occasional services to regular public commuter services, encompassing urban, intercity and long-distance routes and to position ourselves at the head of the mobility market.

### **Pioneering spirit: State-of-the-art technology**



At Irizar we provide customers and society with high added value, state-of-the-art products and services that incorporate multiple pioneering technological solutions produced to solve the great challenges of the present and of the future.

As proof of this, this year at the Busworld fair we are unveiling to the market the new generation of Irizar engines and the new Irizar virtual clock box, as well as the 18-metre articulated electric bus, the Irizar electric tram (ie tram), which integrates a new electric motor, new batteries and new pantograph charging systems.

We are involved in important and ambitious projects at European level to outline future directions in mobility and other business areas where we operate. Many of them are being carried out with the knowledge and contribution of our own technology from Group companies and supported by the CIDETEC Technological Centre.

These projects relate to driverless vehicles, electric mobility, energy storage systems, energy efficiency, standardization of charging systems, connectivity, big data, which are basic in the new generation of clean, efficient, fast, standardized and smart transportation.

### **New generation engines - Model Year 2018**

Irizar is presenting new solutions that will signify a great leap in terms of efficiency and improvements in consumption. The new DAF motors pursue the minimum fuel consumption possible to achieve maximum reduction in emissions. Likewise, the new ZF-Traxon transmission, which replaces the current ZF-AsTronic, goes beyond efficiency in consumption, with advanced functions offering more economic, easier driving. The new features include Pre Vision GPS, the transmission/GPS system interface that enables a predictive driving strategy that adapts the gear-shifting sequence to the route topography. The option for the drive shaft is the same as the current solution, although there will also be a new generation of "direct drive" shafts available from the end of 2018 that will reduce noise and consumption.

Irizar has focussed on the concept of "power on demand", by going further with systems that consume power only when demanded by the service. The optimization of the behaviour of the engine cooling system, the new steering pump or the compressed air system are the initial solutions where work is taking to place in search of real fuel consumption savings.

This new generation of engines will set new standards in efficiency, with improvements in consumption in excess of 5% compared to current kinetic chains and consequently reducing CO2 emissions.

Irizar virtual cockpit

### **New Irizar Virtual Cockpit**

The new Irizar virtual cockpit is the virtual dashboard that offers innovative functions both in terms of technology and quality. The high resolution 12.32" display has a colourful, dynamic



and intuitive design and displays comprehensive information in flexible form that can be adapted to any needs arising at any time.

The Irizar virtual cockpit offers all the necessary information in an attractive colour design, with fixed elements on the screen combined with dynamic elements that are shown in the central window, depending on the information requested by the driver at the time. Controlled by the multifunction steering wheel, the switches on the steering wheel are used to navigate through the different system menus.

### **Assistance throughout the entire process Maximum efficiency**

Irizar service boasts customised solutions, designed and created to offer you the best: (financing, repair and maintenance contracts plus collection of your used vehicle). The availability of a fully guaranteed comprehensive repair, tune-up and maintenance service 24 hours a day, 365 days a year remains a feature that sets us apart.

At Irizar we know that fuel is the major cost component for operators, so Irizar makes every effort to reduce consumption. The new generation of coaches offers the minimum TCO (total cost of ownership), with the following basic elements: minimum fuel consumption, long oil and filter change intervals (up to 150,000 km), particle filter with automatic regeneration and without maintenance up to 700,000 km, very competitive spare parts price and a large number of service points throughout Europe.

We have a help desk in each European country and a central help desk with 24h support, 365 days of the year. As a consequence, the residual value of our vehicles is very high which also reduces their financing cost.

In summary, a very competitive TCO, below-average CO2 emissions and an after-sales service which is a benchmark in the sector.

Moreover, we can equip coaches with the most advanced technology for comprehensive monitoring and control of costs and efficiency, which helps transport companies to optimise the performance and profitability of each fleet.

Irizar offers customers close follow-up and advice that translate into optimization of vehicle reliability and availability. It includes integrated electronic management, Irizar connectivity, as well as fleet management solutions and remote diagnosis that result in a considerable reduction of consumption and emissions.

All in all, Irizar is ready to respond to the current and future service and sustainable mobility needs of passenger transport.



## The Irizar i8, the Best of the Best

**For the first time in its history, the Irizar brand has won one of the most prestigious European awards**

**The Irizar i8 bus has been nominated as the Best Coach of the Year in Europe**

A jury of specialist journalists from the most prestigious magazines in the sector in 22 European countries has decided to award the prize to Irizar I8 for its countless attributes and the high added value it offers.

The award recognises the great strategic leap taken by Irizar in recent years, to position itself among the best independent European manufacturers (OEM).

The Irizar i8 is a thoughtful combination of design, technology and sustainability that offers exceptional comfort to the driver, guide and passengers and confers prestige on its owners. It is also the maximum expression of quality, safety, profitability, robustness and reliability in a sector in which its strong personality and visual impact stand out.

The Irizar i8, together with the other coaches of its range, is the pillar on which this brand is building its future prospects in the long-distance and occasional service sector. It can be affirmed therefore, that Irizar currently has the best range of coaches in Europe as affirmed by the numerous customers who have new generation Irizar vehicles.

The exceptional performance and response of the vehicle during the Euro Coach braking and acceleration tests and the open road driving tests on a mixed 30 km route between dual carriageway and secondary road have given Irizar i8 a victory. It should be mentioned that this first position is even more meritorious given that the vehicle submitted was a 3-axle, 14-metre version and was competing with three other 12 m, 2 axle vehicles - which are significantly lighter.

There are some reasons that must be highlighted that have led it to the podium. Its exterior and interior design, and its unbeatable breaking behaviour and turning circle. The environmental considerations are very positive in relation to the maximum vehicle capacity, reduced energy consumption and minimal levels of vibration and noise, even on sharp bends. Regarding technology, the dashboard is a benchmark, multiplexing keys and offering a HMI for the first time as standard. With regards to safety: FULL LED headlights, pioneering systems such as AEBS, LDW, TPTMS, ACC and DFT as options. In addition, it meets R 66.02." In the section on total costs, taking into account the purchase price, depreciation and residual value, consumption and repair and maintenance costs make the i8 a benchmark".

**Candidates for the Award**



For the first time in history, Sweden has hosted the Coach Euro Test trials. Specifically, the city of Linköping, 240 kilometres south of Stockholm, hosted the test, where six participating coaches were brought together for the latest edition: the Irizar i8 integral, the Iveco Bus Evadys, the Mercedes-Benz Tourismo, the Neoplan Tourliner, the Scania Interlink HD and the VDL Futura FDD2-141 double decker.



## Irizar e-mobility: Ready for the electrification of cities with their own reliable and proven technology

Our commitment to the sustainability and well-being of our customers and citizens leads us to go much further.

Three years after the delivery of the first 100% zero emissions electric buses to the cities of San Sebastian and Barcelona, we can now proudly say that we are fully prepared for the electrification of the public transport service in European cities with a wide range of comprehensive mobility solutions tailored to the needs of each customer, with products and services that have state-of-the-art technology developed entirely in the Irizar Group.

The first 25 units are running at full capacity in a dozen European cities with proven battery range, efficiency and reliability.

The current portfolio of orders and the high demand for zero emissions products that is shortly expected to materialize has spurred the Irizar Group to begin serial production at the new Aduna plant which is geared exclusively towards the development and manufacture of electric mobility solutions for cities.

The first hundred direct and indirect jobs have already been created and we are starting our journey in this area by producing and offering advanced technology products that mean that we can be competitive from Europe.

At this year's Busworld fair we are featuring the world premiere of our articulated 18 metre Irizar ie Tram which extends the current supply of electric vehicles to articulated vehicles with opportunity charging; next to it will be the well-known, tried and tested sector benchmark, the Irizar ie bus.

### **The Irizar ie tram - A tram on the tarmac**

The Irizar ie tram is an articulated 18 metre bus. It is a vehicle with the aesthetic attributes of a tram, developed based on the idea that the design participates in the attractiveness of the service and in the development of comfort for the citizen.

The combination of flexibility regarding the mobility of an urban bus and the large capacity, easy access and interior spatial organization of a tram, with zero emissions, define the DNA of this new vehicle. The Irizar ie tram offers a design that starts from a minimalist aesthetic language, without ornaments, with all of its features responding to specific functional aspects allowing it to create an identity and an image that are easily recognisable to its users.

One of the most significant features of its design is the chrome edging that flows around the body of the vehicle. It makes for immediate identification and creates an appearance that is



different to other similar vehicles. This edging, like an icon, is an identifying feature associated with the brand.

The chrome edging runs around the large glass surface of the sides, which becomes a canvas on which the environment through which the vehicle travels is reflected.

The front of the vehicle reflects fluidity and style and with a large glazed surface it evokes the heritage of the tram, which together with the full led optics integrated in the edging rings, creates a composite appearance that is avant-garde but technological and rational at the same time. The rear section, breaking away from the cubism of the bus, is our big aesthetic commitment.

Care has been taken with the most minor details to achieve the aesthetics of the tram, for example the hubcaps, as well as the wing mirrors, have been replaced by cameras that project their images onto two displays located in the interior of the vehicle either side of the driver.

The innovative, inspiring design of the Irizar ie tram breaks with the classic transport codes and enhances the charm of the city by reflecting urban cultural diversity.

### **The interior: The search for a unique space**

Irizar e-mobility has designed the passenger interior with consideration for traveller behaviour and interaction with the urban vehicle and also based on different lifestyles and future trends, therefore the seat layout attempts to encourage social cohesion. It offers seats with a high level of comfort and the integration of essential features like comfort and safety.

Accessibility, safety, movement flow and passenger comfort inspire the interior design architecture. The arrangement of the interior spaces enables the adaptation of the different types of users, offering them all a comfortable solution. Thus, the spaces offered are bright and pleasant, designed for students, because it has been observed that on all public transport networks, they prefer to sit at the back.

The interior design seeks to offer the user a feeling of openness and light, where the transition between inside and outside is minimized through the transparency of the windows, so the passenger becomes observer of what happens outside the vehicle. The large side windows, together with the LED interior lighting and its central "open air" vault, provide brightness that transfers the user to a safe and pleasant environment.

In the inter circulation area, a system with very low lateral inclinations has been designed to provide an open space towards the rear trailer. The system is translucent and avoids the separation of the two passenger areas. Furthermore, it is equipped with LED lighting.

These 18-metre vehicles have capacity for 155 people, making them unique among electric buses. They allow the installation of four sliding doors to facilitate the exchange of passengers with a reduction in waiting time at the station, which is indispensable in reducing journey time and increasing the punctuality of high level service lines.



The integral low floor and arrangement of the seats inside the vehicle ensure that passenger entrances and exits in stations and movement inside the vehicle proceed smoothly.

### **We think of everything and everyone**

Furthermore, it offers the mass transit seat configuration that is ideal for improving the flow of passengers in the rear passenger compartment of the vehicle, allowing for improved access to the articulation.

The vehicle can accommodate 2 areas for folded pushchairs and wheelchairs and 2 seats for people with reduced mobility. The fitting of these areas consists of a stop request button in Braille, signs for the reserved seats (size and colour of the seats), a buzzer indicating the stop request and approved signs in the wheelchair space. In summary, it is a vehicle that is accessible for all.

Accessibility is further enhanced by the installation of ticket validation devices near all doors, the design of the driving position, the interior layout with large internal movement aisles and improved manoeuvrability of people in wheelchairs and others with reduced mobility.

These Irizar vehicles offer the same degree of thermal comfort as the rest of the Irizar range, and they contribute to the creation of a noise-free atmosphere.

The “kneeling” function, with heights of between 250-270 mm, enables comfortable and effortless access to the bus.

For your entertainment, Irizar enables the installation of a wide range of solutions: USB chargers, WiFi, Braille buttons, luggage racks, passenger information, interior vinyls, etc.



## The Irizar Hallmark: Pioneering Technology

The Irizar ie tram comes complete with own-brand technology. It is technology that has been tested in Irizar's laboratories and test benches, and in the vehicle itself. It is technology that optimises the flow of energy between the different systems involved in electrification, such as the traction chain, the battery storage, the Wabco EBS and auxiliary equipment.

### **Energy management and storage system**

The high-power density and long-life batteries are lithium Ion of the LTO family (Lithium Titanate Oxide).

The Irizar battery system responds to a modular concept, designed to meet the needs of any operator. It also allows easy isolation and fast replacement in the event of an error in one of the modules, without affecting the operation of the rest.

The estimated useful life of the batteries depends to a large extent on the operating and consumption conditions, especially mileage, operating hours, recharge cycles, bus occupancy and weather. Irizar offers an optimised solution for maximum life.

### **Safety in use**

The temperature stabilisation of the batteries is done independently and their management system is integrated into the vehicle's circuits, so there is no fire or explosion risk. Moreover, they do not need preventive maintenance.

The system is as solid and safe as required by the latest European regulations: R100, R10 and UN38.3.

### **Recyclability**

Once the battery reaches 80% of its working charge capacity, Irizar will change the battery and give it a second life by using it in static up to 50% of its working charge capacity. The recycling process can then take place.

### **Irizar electric motor:**

Unlike other projects, constrained by more standardised motors, the motorisation of the Irizar ie tram also responds to technologies designed and developed exclusively by the Irizar Group that adapt perfectly to the vehicles' requirements.



The engine, manufactured by Alconza, a group company, a permanent magnet synchronous motor with capacity of 230 Kw, sufficient to respond to the required operations.

### **Air conditioning system**

The Hispacold air conditioning system, designed specifically for zero emissions electric vehicles, offers a perfect balance between the thermal comfort of passengers and energy optimization obtained by Irizar for its electric vehicle.

### **Electric doors**

The doors installed in the Irizar ie tram are electric doors developed by Masats; the single front door, swinging with a safety sensor and the others, also double doors, are metre with sensor. They include a management control system with manual, automatic and shuttle modes.

The electric and manual ramp is Masats model RT1 1300.

### **The Irizar Pantograph**

The new Irizar pantograph allows the vehicle to be charged in just a few minutes during its journey. Its modern and minimalist design offers easy integration into the urban landscape.

This charger is a system for conversion of energy from a three-phase power network - rated power of 600 KW, and has been approved by ENEDIS, a French company that manages the state electrical network, therefore Irizar has become the first manufacturer of systems to obtain this validation.

The system allows automatic or manual connection of the charger to bus batteries. It is an articulated mechanism installed in the roof of the vehicle and a vault connected to the charger and located in a structure or adapted pole. When the bus needs its batteries charging, the pantograph arm extends and establishes timely connections.

The operator can choose from different protocols related to the opportunity charging procedure (automatic mode or manual mode).

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