

# Comprehensive electromobility solutions for cities.

100% electric  
zero-emission  
buses.

 **Irizar e-mobility**





FOR A  
BETTER  
LIFE.

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## FOR A BETTER LIFE

Because we want to contribute to building a better world.

Sustainable mobility is a fundamental part of the energy transition. That is why at **Irizar e-mobility** we keep being committed to turn-key electromobility solutions to provide sustainable, efficient, accessible, safe and connected public transport.



**Zero-emissions**



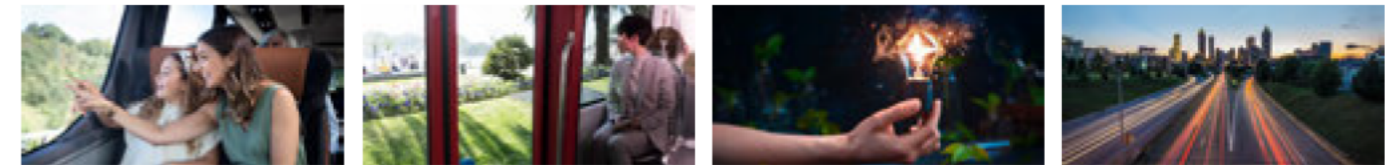
**Zero noise**



**Design**



**Autonomy**



Irizar Group, a solid and continuously growing group.

## IRIZAR GROUP



IRIZAR Group

**Irizar** is a business group with an **international presence** whose business is focussed on the passenger transport, electromobility, electronics, electric motors and generators, connectivity and energy sectors.

The Irizar Group consists of seven companies (Irizar, Irizar e-mobility, Alconza, Datik, Hispacold, Masats and Jema) with production operations in 13 production plants in Spain, Morocco, Brazil, Mexico and South Africa in addition to their own R&D centre whose purpose is applied research and technological development of products and systems for the Group. Irizar, S. Coop is the parent company of the Group and its central headquarters is located in Ormaiztegui (Guipúzcoa, Spain) where Creatio, the Group's Research and Development Centre, is also located.

Founded in 1889, the Irizar Group, with more than 3000 people, is today a solid geographically and industrially diverse group in continuous growth that is firmly committed to the brand, to technology and to sustainability.



Irizar e-mobility headquarters in Aduna, Guipúzcoa.

## IRIZAR E-MOBILITY

- + **Zero emissions vehicles**
- + **In-house battery packs**
- + **Charging infrastructures**
- + **Fleet Management**
- + **Integral After-Sales Service**

At Irizar e-mobility we provide integral electromobility solutions for cities, including both manufacturing **100% electric, zero-emissions vehicles** and developing and installing the main **infrastructure systems** needed for charging and energy storage. We implement all of that using in house technology and with the Irizar guarantee and quality of service.

Our range of products includes **10, 12 and 18 metre urban buses** that have been on the road since 2014 in several European cities.

All with the goal of providing operators with the additional advantage of having a single interlocutor for **all phases of the project**, including detailed consulting, integral vehicle service and after-sales service, and customised repair and maintenance (R&M).

## Comprehensive electromobility solutions.



### Irizar e-mobility does it for you:

- **Customized study** of the operator's service lines (data on operations, speed, climate, terrain).
  - **Advice on the energy** needed to embark, optimization strategy.
  - **Integral monitoring and maintenance.**
  - **Guidance** with electrifying your fleet and recommendations for optimising service operation.
  - **Advice on optimum parameters** for power, charging strategies and times and battery life.
  - **Incorporated systems updates** to optimize the life of each vehicle, improving its assets' value.
  - **Coordination of civil engineering.**
  - **Installation and commissioning** the system.
- All with Irizar Group technology.**



The first electromobility factory in Europe powered by **100% renewable energy.**



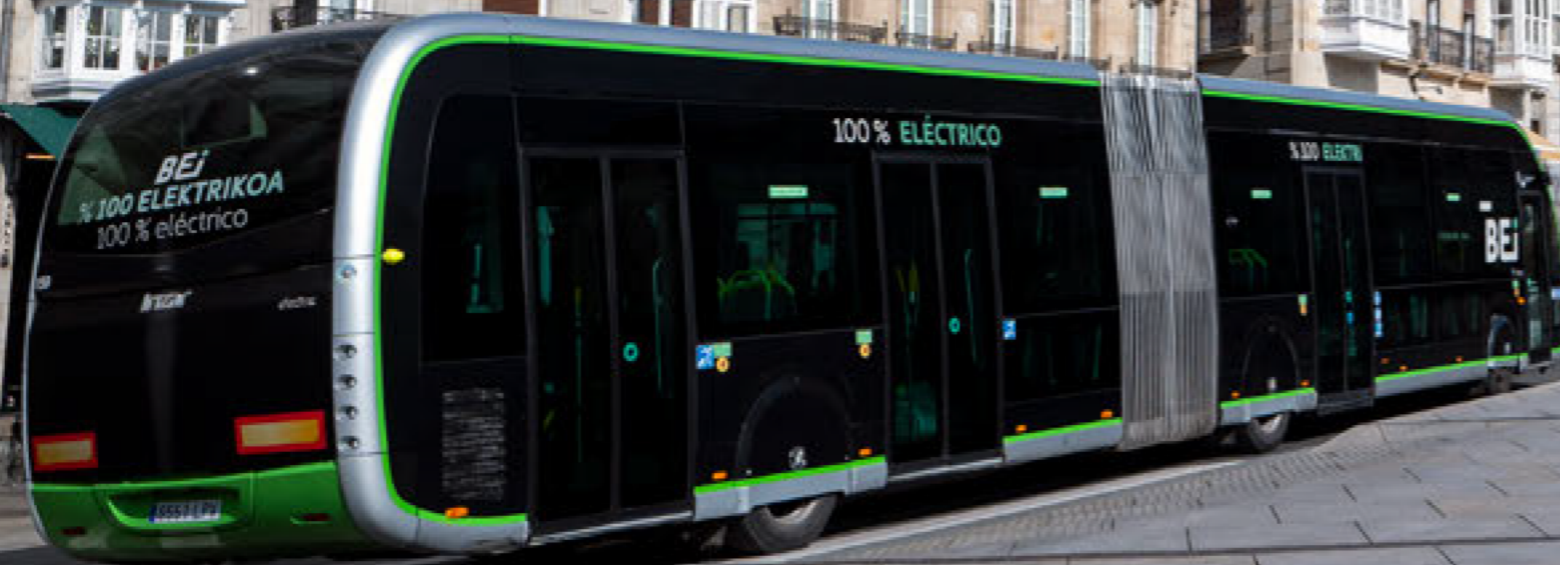
- 100% self-supplied energy using photovoltaic energy.
- 3 MW investment in Ekian, the largest photovoltaic park in the Basque Country.
- The supply of Ekian exceeds Irizar e-mobility's consumption by 15%.
- It includes a warehouse and domestic hot water heating system that works by using the surplus steam from a company located in the adjoining plot.
- And it has an 18,000 m2 manufacturing plant designed exclusively for electromobility.
- An innovative and state-of-the-art plant which is open to knowledge and talent that generates wealth and employment.
- It was built with environmental and green design principles.
- Energy efficiency certificate.
- Completely sustainable production processes where personal health and safety are the top priority.
- Manufacturing components, products and solutions with 100% electric zero-emissions technology.
- In house circuit and test benches.


## OUR RANGE OF **100% ELECTRIC** ZERO-EMISSIONS BUSES

Our buses are characterised by being exceptionally quiet and not generating emissions but also for their accessibility and modern and innovative aesthetic design.

The entire range of buses uses our latest generation batteries. The Irizar e-mobility battery portfolio provides an optimal solution for both slow charging and ultra-fast opportunity charging operations.

We can provide up to four positions for interoperable charging points using a combo 2 hose, in addition to a charging solution using an inverted pantograph or one mounted on the roof.



 **Irizar e-mobility**

# OUR ZERO EMISSION ELECTRIC BUSES

The innovation and knowledge provided by the Irizar Group companies are the pillars on which we promote mobility in cities, promoting the use of the bus as the best alternative for mass transport of people in urban environments.

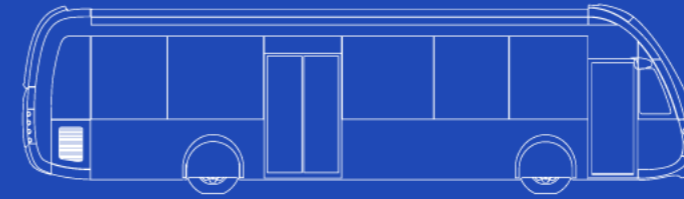
Discover our models:



Our electric buses are available in the following lengths:

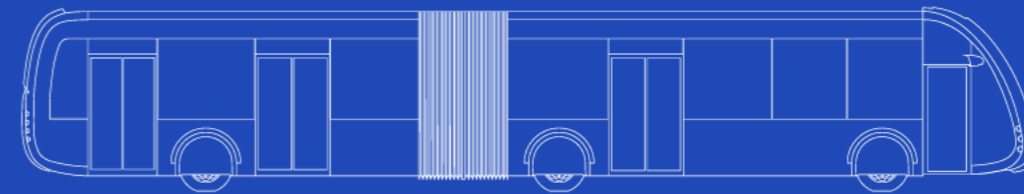
## **Irizar ie tram**

**12 metres**  
Two to three doors



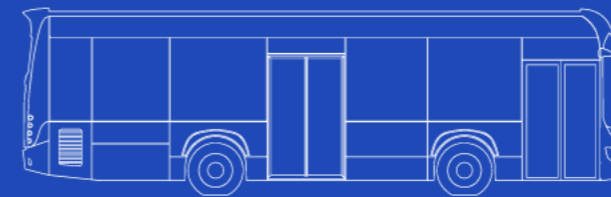
## **Irizar ie tram**

**18 metres**  
Up to four doors



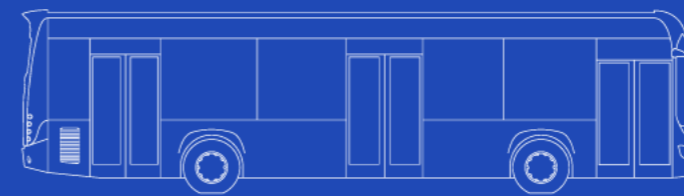
## **Irizar ie bus**

**10 metres**  
Two to three doors



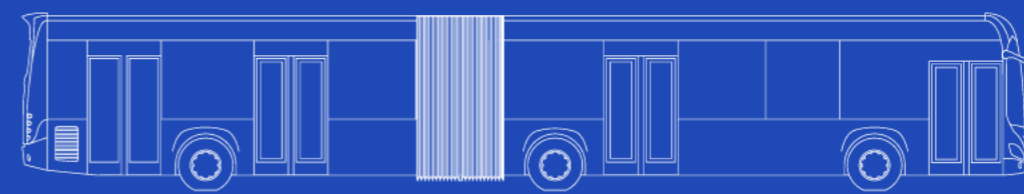
## **Irizar ie bus**

**12 metres**  
Two to three doors



## **Irizar ie bus**

**18 metres**  
Up to four doors



– BUS

# Irizar ie tram

## A minimalist and refined design

The combination of the high capacity, ease of access and movement inside of a tram with being zero-emissions define the DNA of this new vehicle. 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.

- Available in 12 and 18 metres
- Up to 300 km range
- Engine power: up to 320 kW

See page 30 for distribution and technical data.



## A TRAM ON WHEELS THAT LEAVES NO ONE INDIFFERENT



The Perimeter Ring

One of the most significant characteristics of its design is the chrome perimeter arc that flows all around the volume of the vehicle and frames the large glazed surface of the sides.



The Front

Reflects fluidity and elegance. Its large glazed surface, an evocative throwback to a tram, alongside the full LED optics integrated into the perimeter rings confer a vanguard quality and impetus that is at once technological and rational on the whole.



The Rear

The rear is another aesthetic wager, bridging the rupture with the cubism of the bus.



The Hubcaps

Attention was paid to the smallest details to achieve the aesthetics of a tram.



– BUS

# Irizar ie bus

## Designed for the City

The bus's meticulous design inside and out makes a more attractive, reliable and safe vehicle. The front of the vehicle, with a more striking and elegant look, adopts the aesthetic features of Irizar's products. When it comes to the interior design, although the standard version has a more conventional specification, some of the Irizar ie tram options may be incorporated, including large windows, side lighting or screens above the windows, among others.

- Available in 10, 12 and 18 metres
- Up to 300 km range
- Engine power: up to 320 kW

See page 34 for distribution and technical data.



## YOUR CITY COACH



## Why choose the **Irizar e-mobility** electric range?

### ① ACCESSIBILITY IN EVERY WAY

Our buses guarantee safe and comfortable access for all users.

- Buses with a continuous **Low Floor**.
- **Ramps**.
- Emergency opening system for **PRM accessible doors**.
- Spaces reserved for **wheelchairs** and markings on the floor.
- Spaces for **prams**.
- **Seatbelts** can be used in the wheel-chair areas.
- Reserved **priority seating** for people with reduced mobility.
- **Stop request** buttons can be in **Braille**.
- The door open buttons have **light** and **sound signals** for activation and authorisation and relief, colour contrast and a legend in Braille.
- **Interior megaphone** activation by pushing a remote control.
- **Audible stop** requested and ramp requested information.
- **Grab bars** that have **signage with colour contrasts**.
- **Bars next to the doors** with a different texture to indicate the exit is near.
- And a lot more...



## ② PROVEN SAFETY AND A DESIGN FROM THE FUTURE

Our buses use AVAS (Acoustic Vehicle Alerting System), which complies with regulation R138, and they have a new dashboard with high quality materials that comply with fire resistance regulation 118R. Moreover, they comply with anti-rolling regulation ECE-R66/02 for electric vehicles.

Our buses have been operating since 2014 in a good number of European cities. The experience and data obtained from that service period are proof of the reliability and safety of the vehicles.





### ③ COMFORT WHILE DRIVING

Our design of the driver's area puts a high priority on concepts like ergonomics, comfort, functionality, safety and service, following the EBSF and VDV recommendations.

We've developed the climate control so it has greater independence from passenger climate control. Based on our research, we've added new extra features in the driving area for autonomous driving, for example a double speed limiter or an electronic hand brake, among other things.

In order to reduce driver fatigue, we've included suspended brake and accelerator pedals, light sensors and rain sensors, etc. We also wanted to ensure safety by giving an unobstructed view of the surroundings with an optimised cabin concept, with comfortable and ergonomic access and a modular distribution and solutions (cabin door with a safety window or a closed cabin).



### ④ A PLEASANT AND COMFORTABLE TRIP

We have a concept of the interior that optimises passenger flow to maximise space and make trips a special experience.

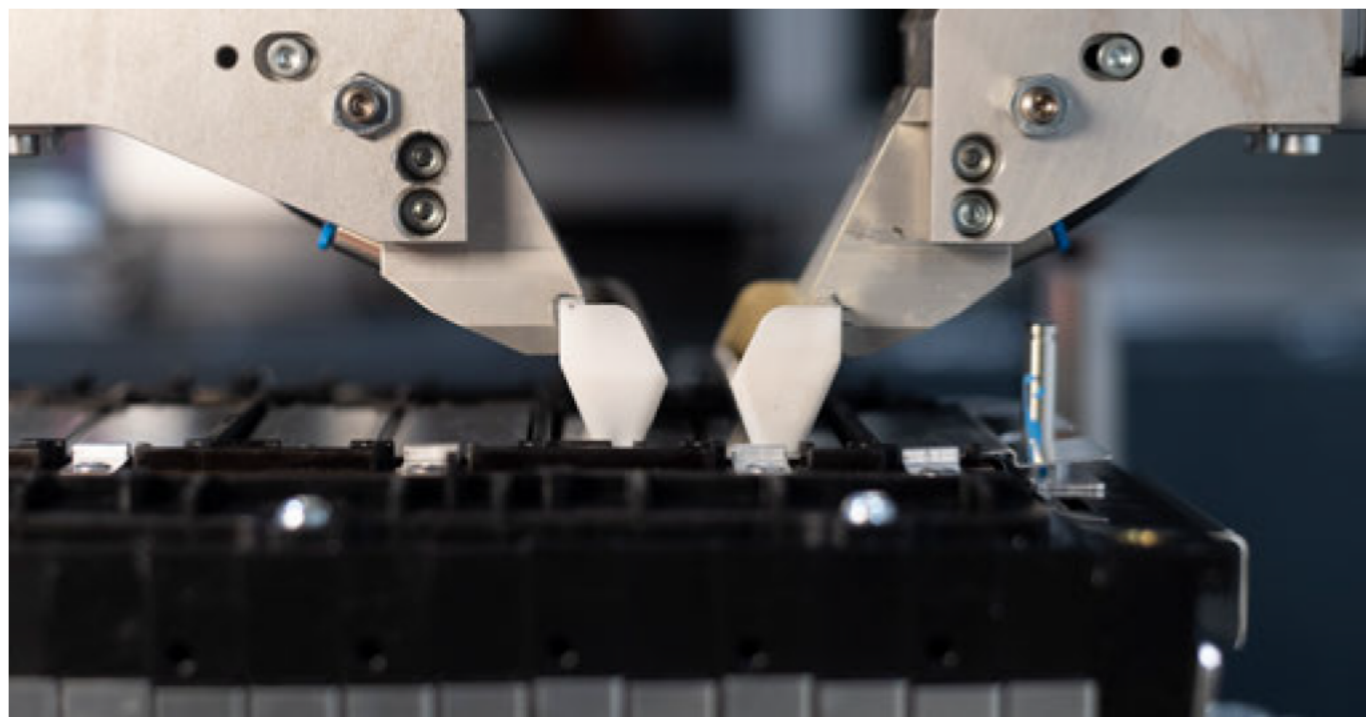
- An atmosphere free of acoustic emissions.
- A quiet vehicle, low noise level.
- A light and spacious environment.
- Sliding electric doors to facilitate the exit and entry of passengers, thus reducing stop time in the station.
- An accessible vehicle: wheelchair and pram areas, Braille.
- Fluid movement inside the vehicle.
- A wide range of solutions: USB, WiFi and buttons on the luggage racks, passenger information, interior vinyl, etc.



## ⑤ AHEAD IN RANGE

In European markets, our buses have a **range of approximately 300 kilometres** at an average speed of 15-17 km/h on a single 3-4 hour charge. That guarantees a full day of driving.

As part of the *tailor made* solution by Irizar e-mobility, we do energy studies of the operator's lines and we use them to quantify the energy buses need on board, with the goal of guaranteeing the maximum range possible.



## IRIZAR ENERGY STORAGE AND MANAGEMENT

Our energy management and storage solutions, developed and manufactured in our Aduna plant (Guipúzcoa), are designed to cover the needs of today's European market and to offer the best solution for each of the operator's requirements.

We offer different modular solutions, based on Lithium-ion technology:



### Slow Charge

Designed so the vehicle can travel the maximum number of kilometres and complete the operation with a single daily charge. Its design enables us to find a balance between vehicle range and number of people.



### Fast Charge

The perfect coupling of vehicle range and charging capacity. Ideal for mixed operations, where the vehicle has sufficient battery life to operate during peak hours. The charge may be both slow and fast.



### Ultra-Fast Charge

The solution for 24/7 operation with charges up to 600 kW.

	Slow Charge	Fast Charge	Ultra-Fast Charge
Loaded energy	510 - 710 kWh	470 kWh	90 - 150 kWh
Range per charge	>300 km	250 - 300 km	55 - 75 km

For vehicles that do around 65,000 km/year



## OUR CHARGING SOLUTIONS ARE INTEROPERABLE

We offer a range of smart charging options to provide solutions to the different conditioning factors clients face in terms of power limits, as well as space and operational restrictions.



### In-depot charging

Available from 50 kW to 180 kW in indoor and outdoor models. Up to three vehicles can be charged simultaneously with these chargers.



### Pantograph in depot

With this solution, we're making it possible to completely automate slow charging in garages by using pantographs. This alternative reduces the presence of cables on the floor and, therefore, improves the safety of the operators. And it leads to an optimisation of the space.



### Intelligent charging system

This is a custom solution that efficiently manages all the charging conditions/restrictions in the depot. It identifies the different charging needs of a fleet to optimise the total power required.



### Opportunity charging

The power of the chargers varies between 450 kW and 600 kW for both pantographs mounted on the roof and inverted pantographs. Recommended when the vehicle has a reduced range and needs to charge during journeys and can be operational 24/7.



## FLEET MANAGEMENT

We have fleet management systems with the latest technology on the market that can be completely personalised to cover every client's needs.

Goal of the fleet management tools:



**Help lower costs**



**Improve safety**



**Increase transport service quality**



**Achieve the highest fleet profitability**



## INTEGRAL AFTER-SALES SERVICE: ALWAYS CLOSE TO YOU

We accompany customers through the entire project life cycle, offering a comprehensive vehicle and infrastructure maintenance.



**After-Sales**

We have a high quality and exclusive after-sales service with personalised R&M packages managed by expert technicians and local teams.



**Constant training**

Constant training for high quality services.



**Adaptability**

Personalised solutions designed and created to provide the best in terms of technical assistance.

– DISTRIBUTION AND TECHNICAL DATA

# Irizar ietram

## 12 m



### DIMENSIONS

Length	12.160 mm (2 axles)
Maximum height	3.400 mm
Width	2.550 mm
Wheelbase	5.955 mm
Overhang front / rear	2.805 mm / 3.400 mm
Interior height	2.400 mm
Lead angle	7,1°
Departure angle	7,1°
Height on step:	
• Door 1	250 mm (320 mm without kneeling)
• Door 2,3	270 mm (340 mm without kneeling)
Door width:	
• Door 1	800 mm
• Door 2	1.200 mm
• Door 3	1.100 mm

### POWERTRAIN

Manufacturer	Irizar Group
Type	Central synchronous motor
Nominal power	206 kW
Nominal torque	1.500 Nm
Traction capacity even on 18% maximum slopes	

### ENERGY STORAGE SYSTEM

Battery technology	Lithium ion
<b>Slow charging:</b>	
• Max. installed energy	510 kWh (depending on customer needs)
• Charging power	up to 150 kW
• Charging time	3-4 h**
<b>Fast charging:</b>	
• Max. installed energy	470 kWh (depending on customer needs)
• Charging power	300 kW (pantograph) – 150 kW (Combo2)
• Charging time	5 min (pantograph) – 2h (Combo2)**
<b>Ultra-fast charging:</b>	
• Max. installed energy	90 kWh (depending on customer needs)
• Charging power	450 kW
• Charging time	5 min (pantograph)**



	A	B
Num. of doors	3	3
Wheelchair areas	1	3
Num. of seats	28	21
Num. of standing passengers	68	75

For further distribution possibilities, please ask for information.

### AIR CONDITIONING SYSTEM

Driver - Hispacold Zero Emissions climate control system	(cold: 3,5 kW, heat: 13 kW)
Passengers - Hispacold Zero Emissions climate control system	(cold: 28 kW, heat: 32 kW)

### PASSENGERS AREA AND ACCESSIBILITY

Maximum No. passengers***	105
Low - Floor	
One or two wheelchair areas	
Four seats for PRM	
Electric ramp for people with disabilities	
Two to three doors	
Possibility of assembling cantilever seats at the front area	

### SAFETY AND REGULATION

Compliance with fire-resistance regulation 118R, annex 6,7 and 8
Compliance with ECE-R66/02 safety regulation
AVAS (Acoustic Vehicle Alerting System) integrated according to R138 regulation
Compliance with standard ITxPT
Driver are in accordance with: ISO16121, VDV234 and EBSF
Electromagnetic compatibility regulation 10R
Creepage and Hillholder function
EcoAssist: efficient assisted driving
Eco-mode: intelligent management of air conditioning once the vehicle is switched off

### WEIGHT

Maximum front axle weight	8.200 Kg
Maximum rear axle weight	13.000 Kg

### OTHER

Aluminium lateral and roof structure	
Grating / floor Stainless steel	
Front divided into five parts for easy and economic interchange of external bodywork	
Acoustic insulation of ceiling and sides	
Turning diameter	21.374 mm
LED interior and exterior illumination	
Anti-graffiti materials	

\* For more options, please contact the sales department.

\*\* Depending on specific operating conditions.

\*\*\* No. of standees - Data varies depending on the MAM of each country and the number and type of batteries installed on the bus.





FOR A  
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