EPD®

Environmental Product Declaration

According to ISO 14025 for:

IRIZAR ELECTRIC IE BUS

Programme	*The International EPD® System* www.environdec.com
Programme operator	*EPD International AB*
Registration number	*S-P-04314*
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Geographical validity	*Europe*
Product category rules	*PCR 2016:04 – UN CPC 49112* *Public and private buses and coaches. Ver 2.0*

Irizar e-mobility

for a better life

1. IRIZAR E-MOBILITY

Irizar e-mobility, offers holistic electromobility solutions for cities, both regarding the manufacture of 100% electric zero emission vehicles, and the manufacture and installation of the main infrastructure systems required for energy charge and storage. All these systems are designed and manufactured with technology 100% based on the Group, with the guarantee and service quality provided by Irizar.

Irizar e-mobility belongs to the 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 Ormaiztegi (Guipuzcoa, Spain) where Creatio, the Group's Research and Development Centre, is also located.

Irizar e-mobility

for a better life

Figure 1.- Irizar e-mobility headquarters - Aduna

Founded in 1889, today, the Irizar Group is well-established with more than 3,500 employees and an aggregate sales volume exceeding 800 million euros. It is geographically and industrially diversified, continuously growing and firmly committed to the brand, technology and sustainability.

Irizar e-mobility's business management system is certified according to the following international standards:

- ISO 9001:2015 – Quality management systems
- ISO 14001:2018 – Environmental management systems

2. IRIZAR IE BUS

The product system analysed is the Irizar iebus NG electric bus. In addition to an attractive aesthetic design, this new bus generation, available in 10, 12, 15 and 18 meter versions, incorporates innovation as well as new battery options. The space has been optimised, achieving greater passenger capacity and enhanced modularity.

The new generation of efficient batteries in combination with a brake regeneration system, is capable of further reducing the energy consumption, also offering greater autonomy for the vehicle.

In urban environment, shipping 350 kWh and in standard climatic conditions, an approximate autonomy of 250 km can be obtained, resulting in about 17 hours of operation. In the new Irizar iebus, up to 5 interoperable slow charge point positions are offered, using a combo 2 hose. Charging time has decreased, and slow charge of the vehicle can be completed in 3 hours.

The option of performing a quick charge by pantograph is also available. The charging power can vary from 50 kW to 600 kW. The new generation of the Irizar iebus can be homologated in Class 2.

Figure 2.- Irizar iebus

We were pioneers in complying with the ECE-R66 / 02 anti-tip regulation for electric vehicles. Now we incorporate the AVAS (Acoustic Vehicle Alerting System), an acoustic warning system complying with the R138 regulation, and a new high-quality materials dashboard, which comply with the 118R fire regulation annexes 6, 7 and 8.

The new generation of the Irizar iebus NG, allows vehicle maintenance in an easier and more ergonomic way. We have carefully worked on both the outdoor and indoor design of the bus, achieving a more attractive, efficient, reliable and safe vehicle. The front part, with a stronger and more elegant touch, is even closer to Irizar products' aesthetic features. For the indoor design, although the standard version has a more classic specification, some of the Irizar ie tram options can be incorporated; Low windows, side lighting or screens in the ducts, among others.

The Irizar iebus NG has been operating since 2014 in different European cities. The experience and data gathered during the recent years, guarantee the reliability and safety of this vehicle.

To carry out the life cycle analysis of the vehicle, it was necessary to establish a specific vehicle configuration among all the available options within the iebus catalogue. The technical features of the analysed vehicle, are detailed in next section.

2.1. TECHNICAL DESCRIPTION OF THE VEHICLE

When making the life cycle analysis of the Irizar iebus, a specific vehicle configuration was selected between the different available options within the iebus portfolio. The analysed vehicle, is the iebus bus NG of 12 meters long, lithium-ion "Energy" battery and capacity for 79 passengers. This vehicle belongs to the M3 category, having more than 5 seats and weighting more than 5 tons.

In the next table, further technical details of the vehicle are presented.

GROUP	CONCEPT	VALUE
CHASIS	DENOMINATION	EL180KWS
	LENGHT	12.165 m
	WIDTH	2.55 m
	CAPACITY	79 passengers
	DRIVER CABIN POSITION	Front
ENGINE	DENOMINATION	Siemens 1DB2016-0ND06
	FUEL	Electric
	NOMINAL POWER	240 kW
	MAXIMUM TORQUE	3000 Nm
	EMISSION COMPLIANCE	N.A.
	ENGINE POSITION	Rear
AXLES	AXLES	2
	WHEELS	6
	FRONT AXLE LOAD (MAX)	7,500 kg
	REAR AXLE LOAD (MAX)	13,000 kg
	DISTANCE BETWEEN AXLES	5,955 mm
	FRONT LEDGE	2,805 mm
	REAR LEDGE	3,400 mm
STEERING CONTROL	DENOMINATION	ROBERT BOSCH 8098956128
	WHEEL LOCK	47°
	TURN DIAMETER	21.374 m
BATTERY	DENOMINATION	Energy
	TECHNOLOGY	Lithium-Ion
BRAKE SYSTEM	DENOMINATION	WABCO EBS 3_3
SUSPENSION	DENOMINATION	ECAS II WABCO
	TYPE	ECAS – Electronically controlled air suspension
SECURITY	SYSTEMS	ABS, EBS, ATC, ASR, BFD
AIR CONDITIONER	DENOMINATION	IRIZAR HISPACOLD
ECE REGULATION N°51	MOVING SOND LEVEL	70 dB(A)
	STATIONARY SOUND LEVEL	N.A.

Table 1.- Technical description of the vehicle

2.2. IRIZAR IEBUS CONTENT DECLARATION

The percentage of materials included in the LCA is 99.63% of the theoretical total weight of the product. Note that the remaining percentage, belongs to pieces with unknown material that consequently have not been considered in the study.

GROUP	ANALYSED WEIGHT (KG)	THEORETICAL WEIGHT (KG)
ROOF	1,348.004	14,500.16
PEL	178.552	
TUMBLER	644.170	
SIDES + TOWER	2,749.673	
PLATINGS	812.678	
PAINT	111.560	
PEL2	168.147	
PW0	2,393.361	
REFINEMENT	2,773.400	
COMMISIONING	181.639	
BATTERY	3,085.945	
TOTAL	**14,447.128**	**% ANALYSED → 99.63%**

Table 2.- Weight breakdown by vehicle groups – iebus bus

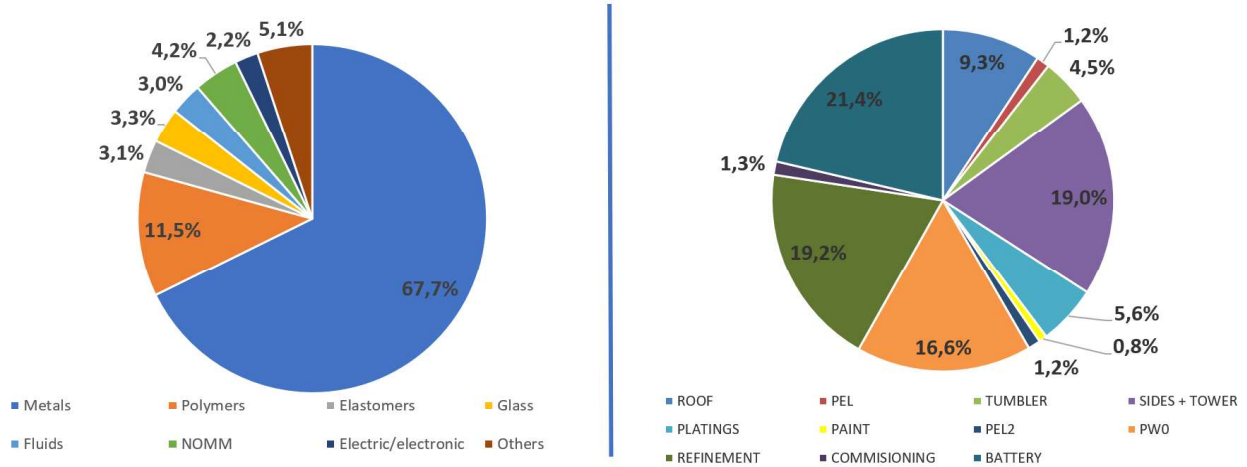


Figure 3.- Content declaration and material breakdown by vehicle groups

None of these 8 groups of materials used for the content declaration is classified as hazardous and none of their environmental properties are considered relevant in the context of the evaluated product.

3. ANALYSED SYSTEM SCOPE

3.1. FUNCTIONAL UNIT

"Transport 1 passenger along 1 Km in the Irizar iebus electric bus"

Given that the Irizar iebus electric bus is designed for urban routes, the annual intensity of use for the product was calculated considering that specific scenario.

SCENARIO	PASSENGER CAPACITY	KM / YEAR	SERVICE LIFE	PASSENGERS*KM
URBAN	79	50,000	15 years	59,250,000

Table 3.- Reference flow

3.2. SYSTEM BOUNDARIES

The following diagram, shows a summary of the different life cycle aspects included in the analysis of the Irizar iebus bus. The life cycle stages, have been divided in 3 different phases known as upstream, core and downstream, as required by the specific requirements set in PCR 2016:04 – UN CPC 49112 - Public and private buses and coaches. Ver 2.0.

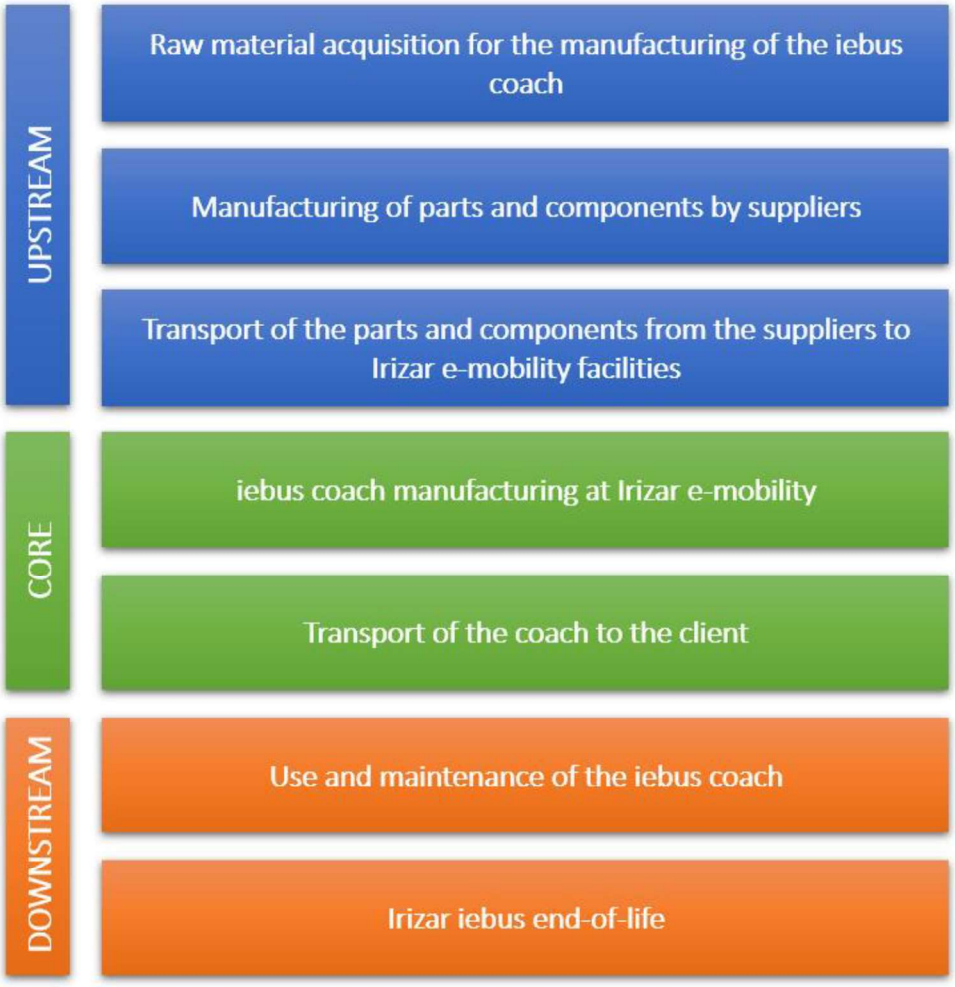


Figure 4.- Life cycle stages

3.3. DETAILS ABOUT THE LIFE CYCLE ASSESSMENT

The information on the raw material acquisition for the iebus manufacturing, was collected directly by Irizar e-mobility's environment department between 2020 and 2021. This information refers to the 12-meter-long iebus NG bus with three doors and Energy model battery.

To obtain the weigh and material for all the pieces, direct piece inspection and weighing carried out internally by Irizar e-mobility personnel, were used as main information sources. Technical datasheets provided by the suppliers and the material declarations of some of the components were also used as data sources during the project.

The manufacturing of the iebus bus is made at the Irizar e-mobility center in Aduna (Spain). Data on the material and energy consumption at Aduna, as well as data about the waste management during year 2020 were gathered.

For the transport to client stage, a transport scenario has been considered using the information on the 12-meter iebus buses sold throughout the 2020 period.

CUSTOMER LOCATION	SOLD UNITS
France	48.6%
Germany	28.6%
Spain	20.0%
Switzerland	2.9%

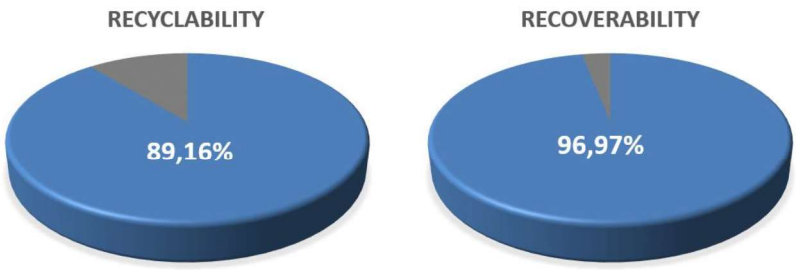
Table 4.- Transport scenario

To find out the amount of electricity an iebus NG bus consumes during its 15-year useful life, the official electricity consumption tests based on E-SORT cycles (Electric Standardized On Road Test Cycles) have been used as data source. These tests, are used to measure the electrical consumption dedicated to vehicle traction of the bus batteries, in kWh / km. The test result, is based on continuous consumption measurements carried out on the iebus bus itself, in a test track while traveling a circuit under different operation conditions, established by the E-SORT protocol itself.

The E-SORT tests, only provide the electrical consumption associated to vehicle traction. Because of this, in addition, the consumption associated with the air conditioning needs of the bus has been added, depending on the geographical area in which the bus is used.

For the maintenance stage, all the spare parts required by the bus during its 15-year useful life have been considered in the analysis. This includes periodic replacement of vehicle fluids, wheels, filters, and batteries.

Finally, to simulate the end-of-life stage of the bus, vehicle's recyclability and recoverability capacity has been calculated, based on the ISO 22628: 2002 standard - "Road vehicles - Recyclability and recoverability - Calculation method".



To carry out the life cycle analysis supporting this environmental product declaration, an LCA model has been made using the Simapro 9 software tool and the Ecoinvent 3.6 life cycle inventories database. The results of the environmental impacts throughout the life cycle of the vehicle have been calculated, as well as the consumption of natural resources and waste management, according to the requirements set out in the PCR 2016: 04 - UN CPC 49112 - Public and private buses and coaches. Version 2.0.

The characterization factors used when calculating each of the environmental impact categories, are those recommended by the reference PCR and by the general programme instructions of the International EPD System. The factors have been extracted from the CML-IA environmental impact calculation methodology (version 4.8 - August 2016), from the Intergovernmental Panel on Climate Change (IPCC 2013 - AR5), from the LOTOS-EUROS methodology as applied in the ReCiPe LCIA 2008 method and from the AWARE method on water scarcity (WULCA recommendations on characterization model for water scarcity 2015, 2017). More information about the characterization factors used, can be found in section 6 "External references".

4. ECO-PROFILE

POTENTIAL ENVIRONMENTAL IMPACTS			1 P*KM TRANSPORTED			
CONCEPT		UNIT	UPSTREAM	CORE	DOWNSTREAM	TOTAL
Global warming potential	Fossil	Kg CO_2 eq	1.61E-03	2.15E-04	6.31E-03	**8.14E-03**
	Biogenic	Kg CO_2 eq	3.55E-06	1.99E-07	3.13E-05	**3.51E-05**
	Land use / Land transformation	Kg CO_2 eq	5.90E-06	4.95E-07	1.38E-05	**2.02E-05**
	TOTAL	Kg CO_2 eq	1.62E-03	2.16E-04	6.36E-03	**8.19E-03**
Formation potential of tropospheric ozone		Kg NMVOC eq	7.65E-06	4.46E-07	1.63E-05	**2.44E-05**
Acidification potential		Kg SO_2 eq	1.73E-05	5.74E-07	3.54E-05	**5.33E-05**
Eutrophication potential		Kg PO_4^{3-} eq	1.42E-06	5.99E-08	4.00E-06	**5.48E-06**
Abiotic depletion potential – Elements		Kg Sb eq	5.54E-07	2.25E-09	1.37E-07	**6.93E-07**
Abiotic depletion potential – Fossil resources		MJ, net calorific value	1.88E-02	3.30E-03	7.25E-02	**9.46E-02**
Water scarcity potential		m^3 eq	5.33E-04	7.83E-05	1.54E-03	**2.15E-03**

Table 5.- Potential environmental impacts

WASTE MANAGEMENT		1 P*KM TRANSPORTED			
CONCEPT	UNIT	UPSTREAM	CORE	DOWNSTREAM	TOTAL
Hazardous waste disposed	Kg	4.59E-07	5.38E-09	1.50E-07	**6.15E-07**
Non-hazardous waste disposed	Kg	4.88E-04	4.18E-05	5.20E-04	**1.05E-03**
Radioactive waste disposed	Kg	7.18E-08	2.77E-08	8.95E-07	**9.94E-07**

Table 6.- Waste management

USE OF RESOURCES		1 P*KM TRANSPORTED			
CONCEPT	UNIT	UPSTREAM	CORE	DOWNSTREAM	TOTAL
PRIMARY ENERGY RESOURCES - RENEWABLE					
USED AS ENERGY CARRIER	MJ, net calorific value	2.31E-03	3.87E-04	2.35E-02	**2.62E-02**
USED AS RAW MATERIAL	MJ, net calorific value	6.49E-05	0.00E+00	1.49E-05	**7.98E-05**
TOTAL	MJ, net calorific value	2.37E-03	3.87E-04	2.35E-02	**2.63E-02**
PRIMARY ENERGY RESOURCES - NON-RENEWABLE					
USED AS ENERGY CARRIER	MJ, net calorific value	2.11E-02	4.74E-03	1.28E-01	**1.53E-01**
USED AS RAW MATERIAL	MJ, net calorific value	1.34E-03	9.83E-05	2.26E-03	**3.70E-03**
TOTAL	MJ, net calorific value	2.24E-02	4.84E-03	1.30E-01	**1.57E-01**
OTHER RESOURCES					
SECONDARY MATERIALS	Kg	7.81E-05	0.00E+00	0.00E+00	**7.81E-05**
RENEWABLE SECONDARY FUELS	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
NON-RENEWABLE SECONDARY FUELS	MJ, net calorific value	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
USE OF NET FRESHWATER	m^3	1.75E-05	1.69E-06	1.07E-04	**1.26E-04**

Table 7.- Use of resources

OUTPUT FLOWS		1 P*KM TRANSPORTED			
CONCEPT	UNIT	UPSTREAM	CORE	DOWNSTREAM	TOTAL
Components for reuse	Kg	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
Materials for recycling	Kg	0.00E+00	4.82E-07	2.17E-04	**2.17E-04**
Materials for energy recovery	Kg	0.00E+00	4.06E-07	1.90E-05	**1.94E-05**
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	**0.00E+00**

Table 8.- Output flows

4.1. RESULT INTERPRETATION

The following figures, show the environmental relevance for each of the life cycle stages of the product.

	LIFE CYCLE STAGE	GWP[1]	POCP[2]	AP[3]	EP[4]	ADP – EL[5]	ADP – FF[6]	WSP[7]
UPSTREAM	RAW MATERIALS ACQUISITION	19.5%	30.6%	32.2%	25.6%	79.9%	19.5%	24.7%
	RAW MATERIALS TRANSPORT	0.3%	0.7%	0.3%	0.4%	0.1%	0.4%	0.0%
CORE	BUS MANUFACTURING	2.2%	1.4%	0.9%	0.9%	0.2%	2.9%	3.6%
	TRANSPORT TO CLIENT	0.5%	0.4%	0.2%	0.2%	0.2%	0.6%	0.1%
DOWNSTREAM	BUS USE	69.7%	54.6%	51.5%	65.5%	6.1%	67.3%	62.1%
	BUS MAINTENANCE	7.0%	11.6%	14.6%	7.2%	13.6%	9.0%	9.4%
	END-OF-LIFE	0.8%	0.7%	0.3%	0.2%	0.0%	0.3%	0.1%

Table 9.- Environmental impacts by life cycle stage

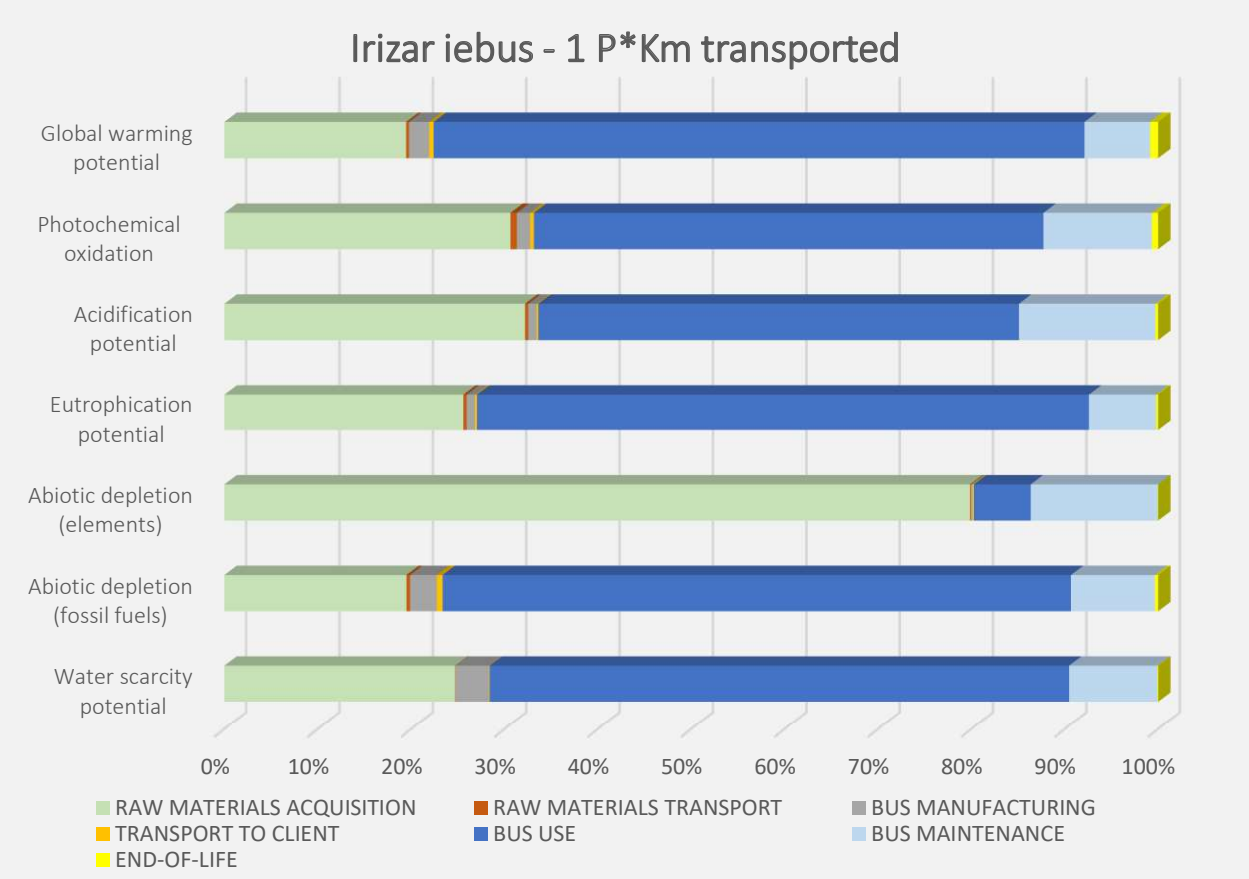


Figure 5.- Eco-profile Irizar iebus

[1] Global warming potential (100y)
[2] Photochemical oxidation
[3] Acidification potential
[4] Eutrophication potential
[5] Abiotic depletion potential – Elements
[6] Abiotic depletion potential – Fossil fuels
[7] Water scarcity potential

As shown in the figure above, the Irizar iebus environmental profile is clearly dominated by the use stage of the product. This stage entails between 51.5% and 69.7% of the impacts for each P * Km transported, in all the categories analysed, except for abiotic depletion (elements), which is a category mainly related to the consumption of materials. Towards this environmental impact category, the impact of this stage is consequently lower, 6.1%.

These impacts are mainly associated with the energy consumption required to charge the bus's batteries during its 15-year useful life, which represent the most relevant environmental aspect of the product.

4.2. SENSITIVITY ANALYSIS

As previously explained, the most critical variable in this study is the electricity consumption required to charge the batteries during the use stage.

To consider the environmental impact of the electricity consumed, the average impact of low voltage electricity consumption in Europe has been used as baseline. This average European case, is a good approximation when trying to know the overall environmental impact of the vehicle's life cycle, but in real situations the result will be more accurate if this information comes specifically from the geographical location of the case under study.

Figure 6.- Irizar iebus rear side

To know the influence of this hypothesis on the final results, a sensitivity analysis has been carried out, varying the impact of the electricity consumed during the use stage of the bus, depending on the country of use. The source used to create the different electricity mixes for each of the countries evaluated, have been the energy demand statistical series published annually by the IEA (International Energy Agency). The results obtained when repeating the analysis modifying the electricity mix, are the ones depicted in the following figure.

If we set the European baseline case with the 100% value, we see how the results can offer important variations if the hypothesis of the bus use location changes. The climate change potential of each P*Km transported, can have up to 53.7% less impact in the most favorable use case (France), or even have an impact up to 17.5% higher in the most unfavorable use case (Germany).

For other impact categories, the greatest variation is identified in the water scarcity potential category, since this method is strongly related to the location of the study.

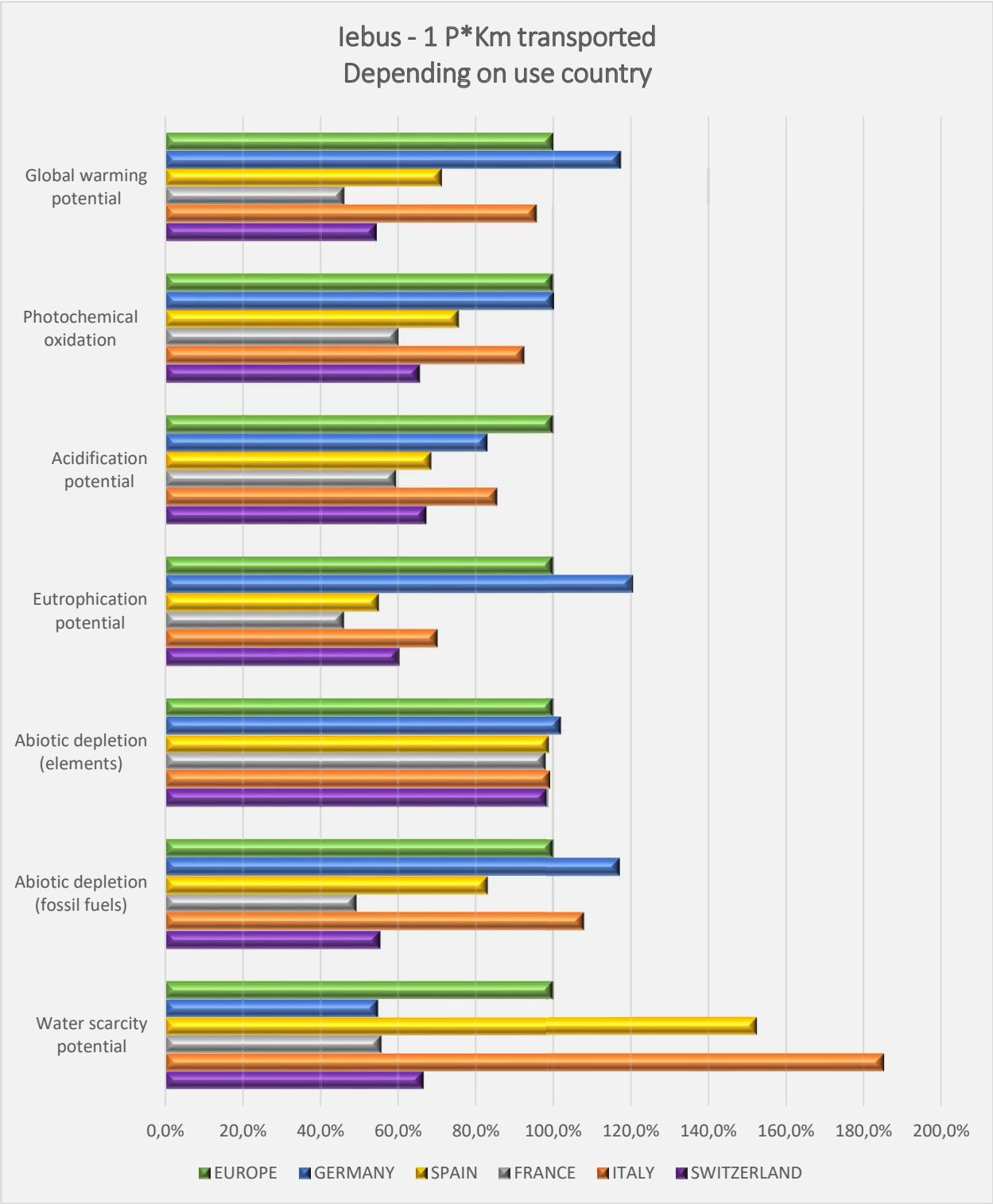


Figure 7.- Eco-profile Irizar iebus – Depending on the use country

The conclusion drawn from the sensitivity analysis, is that the use stage location is of vital relevance for this type of product, since the impacts are highly sensitive to the environmental impact of the electrical mix consumed when charging the batteries.

In addition, it is important to remember that the electricity consumption associated with the vehicle's air conditioning system also depends on the country of use, leading to greater impacts in countries with more extreme temperature profiles. This last effect, is also contemplated in the results shown in the previous figure.

As a consequence, the following table shows the variation in the overall environmental impact results, depending on the use country, as a sensitivity analysis.

POTENTIAL ENVIRONMENTAL IMPACTS 1 P*KM TRANSPORTED			COMMON		GERMANY		SPAIN		FRANCE		ITALY		SWITZERLAND	
IMPACT CATEGORY		UNIT	UPSTREAM	CORE	DOWNSTREAM	TOTAL	DOWNSTREAM	TOTAL	DOWNSTREAM	TOTAL	DOWNSTREAM	TOTAL	DOWNSTREAM	TOTAL
Global warming potential	Fossil	Kg CO_2 eq	1.61E-03	2.15E-04	7.67E-03	9.49E-03	3.99E-03	5.82E-03	1.95E-03	3.77E-03	5.92E-03	7.75E-03	2.61E-03	4.44E-03
	Biogenic	Kg CO_2 eq	3.55E-06	1.99E-07	1.12E-04	1.16E-04	1.03E-05	1.40E-05	6.60E-06	1.04E-05	7.34E-05	7.71E-05	2.50E-05	2.88E-05
	Land use / Land transformation	Kg CO_2 eq	5.90E-06	4.95E-07	9.74E-06	1.61E-05	2.78E-05	3.41E-05	1.35E-06	7.74E-06	1.38E-06	7.77E-06	5.21E-06	1.16E-05
	TOTAL	Kg CO_2 eq	1.62E-03	2.16E-04	7.79E-03	9.62E-03	4.03E-03	5.87E-03	1.95E-03	3.79E-03	5.99E-03	7.83E-03	2.64E-03	4.48E-03
Formation potential of tropospheric ozone		Kg NMVOC eq	7.65E-06	4.46E-07	1.64E-05	2.45E-05	1.04E-05	1.85E-05	6.60E-06	1.47E-05	1.45E-05	2.26E-05	7.97E-06	1.61E-05
Acidification potential		Kg SO_2 eq	1.73E-05	5.74E-07	2.63E-05	4.42E-05	1.87E-05	3.66E-05	1.38E-05	3.17E-05	2.76E-05	4.55E-05	1.80E-05	3.59E-05
Eutrophication potential		Kg PO_4^{3-} eq	1.42E-06	5.99E-08	5.12E-06	6.60E-06	1.54E-06	3.03E-06	1.05E-06	2.53E-06	2.36E-06	3.84E-06	1.83E-06	3.31E-06
Abiotic depletion potential – Elements		Kg Sb eq	5.54E-07	2.25E-09	1.51E-07	7.07E-07	1.30E-07	6.86E-07	1.23E-07	6.80E-07	1.31E-07	6.88E-07	1.27E-07	6.83E-07
Abiotic depletion potential – Fossil resources		MJ, net calorific val.	1.88E-02	3.30E-03	8.87E-02	1.11E-01	5.65E-02	7.87E-02	2.47E-02	4.68E-02	8.00E-02	1.02E-01	3.05E-02	5.26E-02
Water scarcity potential		m^3 eq	5.33E-04	7.83E-05	5.66E-04	1.18E-03	2.67E-03	3.28E-03	5.88E-04	1.20E-03	3.38E-03	3.99E-03	8.22E-04	1.43E-03

Table 10.- Environmental impacts by use country

5. INFORMATION ON THE VERIFICATION SYSTEM

The EPD owner has the sole ownership, liability and responsibility of the EPD. The verifier and the programme operator do not make any claim nor have any responsibility of the legality of the product.
Note that EPDs of the same product category but from different programmes may not be comparable.

Programme	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm (Sweden) www.environdec.com info@environdec.com
Registration number	S-P-04314
Publication date	2021-07-26
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Geographical scope	Europe
Reference year for the data used	2020
Scope	Cradle-to-grave
Product Category Rules (PCR)	PCR 2016:04 Public and private buses and coaches. Ver 2.0
Review of the Product Category Rules (PCR) conducted by	The Technical Committee of the International EPD® System Chair: Maurizio Feschi Contact via: info@environdec.com
Product Category Rules (PCR) prepared by	The Technical Committee of the International EPD® System PCR Moderator: Gorka Benito Alonso – IK INGENIERIA. Contact via: g.benito@ik-ingenieria.com
Product group code	UN CPC 49112 Public-transport type passenger motor vehicles
Independent verification of the data and declaration, as per ISO 14025:2006	☐ EPD process verification ☒ EPD verification
The procedure for monitoring the EPD during its validity period requires external verification	☒ Yes ☐ No
Verifying entity	Tecnalia R&I Certificación, S.L. Verifier: Cristina Gazulla ENAC. Acreditación no.125/C-PR283
LCA study conducted by	IK-Ingeniería www.ik-ingenieria.com
Name of the company and contact	Irizar e-mobility Erribera Industria Gunea, 1, 20150 Aduna, Gipuzkoa (SPAIN) +34 943 84 78 47 www.irizar-emobility.com

Table 11.- Information on the verification system

VERIFICATION STATEMENT CERTIFICATE

CERTIFICADO DE DECLARACIÓN DE VERIFICACIÓN

Certificate No. / Certificado nº: EPD05601

TECNALIA R&I CERTIFICACION S.L., confirms that independent third-party verification has been conducted of the Environmental Product Declaration (EPD) on behalf of:
TECNALIA *R&I CERTIFICACION S.L., confirma que se ha realizado verificación de tercera parte independiente de la Declaración Ambiental de Producto (DAP) en nombre de:*

IRIZAR E-MOBILITY
Erribera Industria Gunea, 1,
20150 - ADUNA (Gipuzkoa) (SPAIN)

for the following product(s):
para el siguiente(s) producto(s):

IRIZAR ELECTRIC IE BUS
AUTOBUS ELETRICO IRIZAR IEBUS

with registration number **S-P-04314** in the International EPD® System *(www.environdec.com)*
*con número de registro **S-P-04314** en el Sistema International EPD® (www.environdec.com)*

it´s in conformity with:
es conforme con:

- **ISO 14025:2010 Environmental labels and declarations. Type III environmental declarations.**
- **General Programme Instructions for the International EPD® System v.3.01.**
- **PCR 2016:04 Public and private buses and coaches. Ver 2.0.**
- **UN CPC Code: 49112 Public-transport type passenger motor vehicles.**

Issued date / *Fecha de emisión:*	27/07/2021
Update date / *Fecha de actualización:*	27/07/2021
Valid until / *Válido hasta:*	25/07/2026
Serial Nº / *Nº Serie:*	EPD0560100-E

Carlos Nazabal Alsua
Manager

This certificate is not valid without its related EPD.
Este certificado no es válido sin su correspondiente EPD.

El presente certificado está sujeto a modificaciones, suspensiones temporales y retiradas por TECNALIA R&I CERTIFICACION.
This certificate is subject to modifications, temporary suspensions and withdrawals by TECNALIA R&I CERTIFICACION.

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ENAC CERTIFICACIÓN Nº 125/C-PR283

6. EXTERNAL REFERENCES

Irizar group
www.irizar.com

Irizar e-mobility
www.irizar-emobility.com

Irizar iebus catalogue
www.irizar-emobility.com/wp-content/uploads/2020/07/Cata%CC%81logo_e-mobility-2020_ES.pdf

Additional information on the International EPD® System
www.environdec.com

The International EPD® System is based on a hierarchical approach using the following international standards:

- ISO 9001, Quality management systems
- ISO 14001, Environmental management systems
- ISO 14040, LCA - Principles and procedures
- ISO 14044, LCA - Requirements and guidelines
- ISO 14025, Type III environmental declarations

www.iso.org

Database used for the LCA:
EcoInvent 3.6 Database, published by the Swiss Centre for Life Cycle Inventories

www.ecoinvent.org

Leiden University / Environmental science institute
www.cml.leiden.edu

Intergovernmental panel on Climate Change (IPCC)
www.ipcc.ch/report/ar5/wg1/

ReCiPe LCIA model
www.rivm.nl/en/Topics/L/Life_Cycle_Assessment_LCA/ReCiPe

AWARE water scarcity method
wulca-waterlca.org/aware/

7 VERSION HISTORY OF EPD

- VERSION 1.0, 2021-07-26: First registration
- VERSION 1.1, 2021-09-17: Minor editorial changes.The word "coach" has been replaced by "bus".