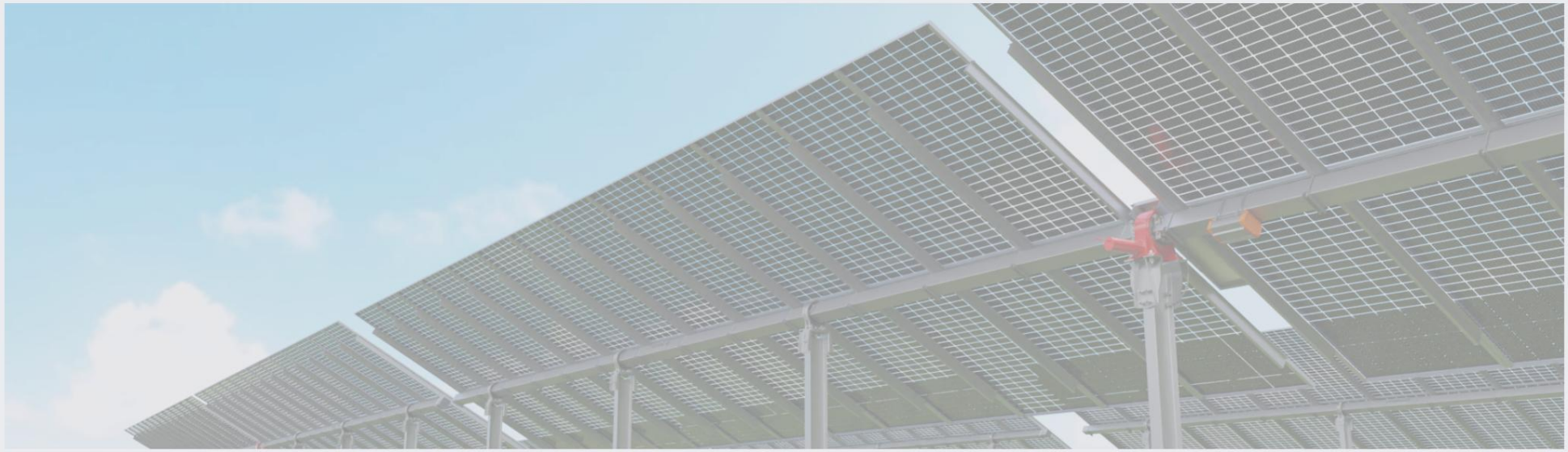
soltec

CARBON FOOTPRINT OF PRODUCT

SF 7



RMC | INGENIERIA AMBIENTAL

INDEX

INDEXOFTABLES

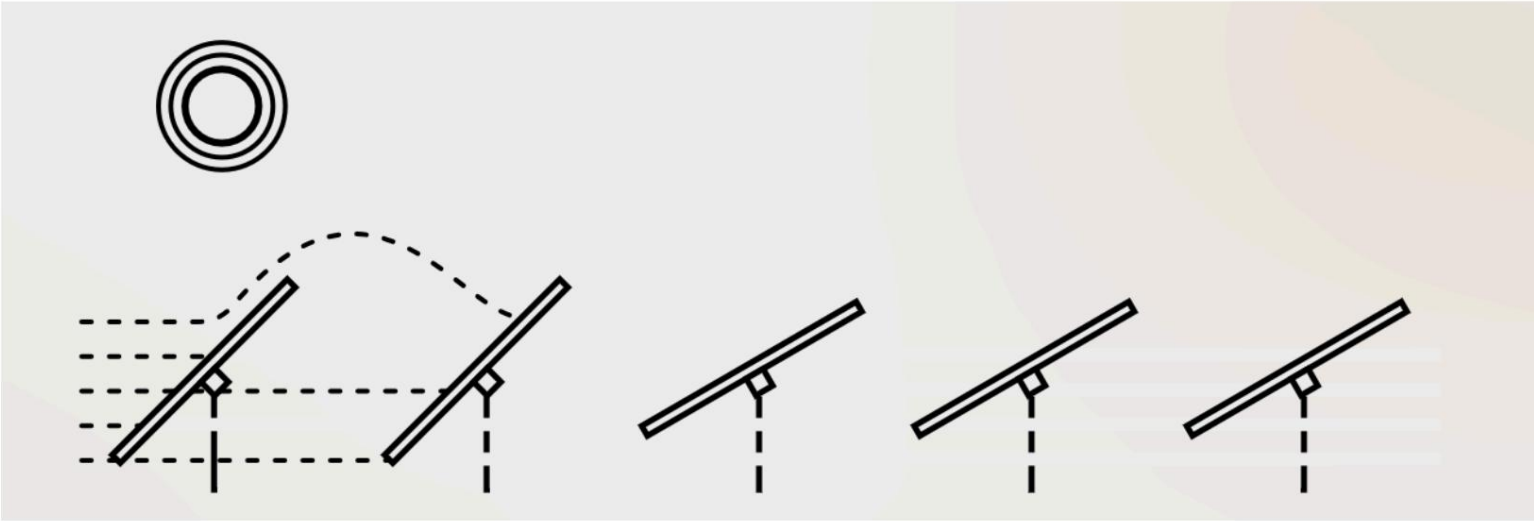
INTRODUCTION

The Carbon Footprint is a tool that organizations and business activities have available to assess the total impact that our activities have on the climate, in reference to greenhouse gas emissions.

Knowing the emissions associated with our organization and our products is the first step to establishing redesign actions, replacing less polluting materials and planning activities aimed at reducing our Carbon Footprint.

Greenhouse gas emissions from products occur throughout their entire “cradle to grave” life cycle, from the extraction of raw materials, through manufacturing and distribution, to use by customers and final disposal or management as waste.
SOLTEC has been calculating the emissions from activities derived from its organization since 2017 and has proposed actions that have resulted in a reducing their emissions.

Knowing the Carbon Footprint of the SF7 Product opens a window of possibilities in the design of our products, and allows us to align ourselves with European net zero emissions policies.



CARBON FOOTPRINT
OBJECTIVES OF THE PRODUCT

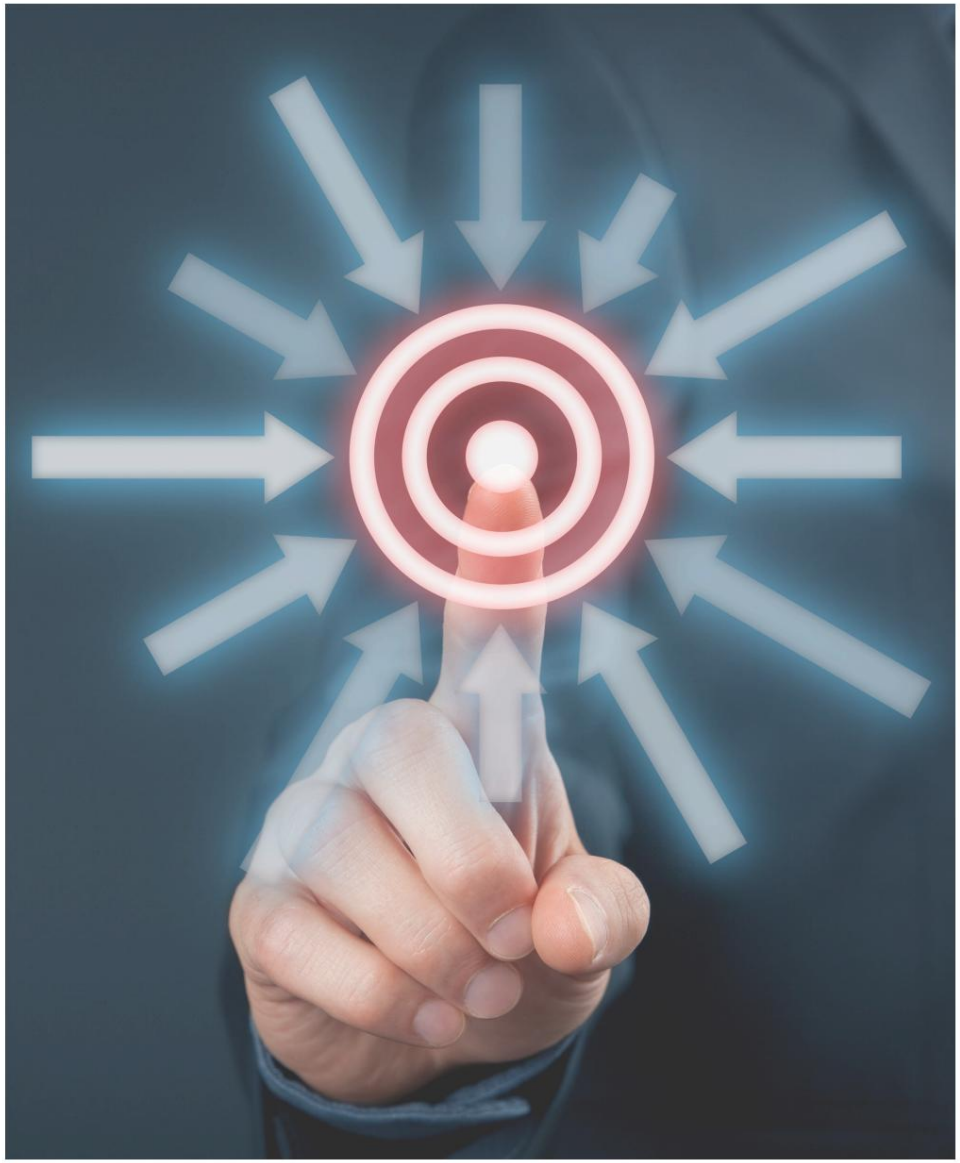
SF7

The objective of the study is to evaluate the Carbon Footprint of the life cycle of the SF7 Solar Tracker product, called Tracker SF7, for monitoring solar energy captured by solar installations, consisting of the Tracker SF7 (structural and mechanical components) and the Tracker Control Box (electrical components).

The objective of the study has been divided into the following objectives:

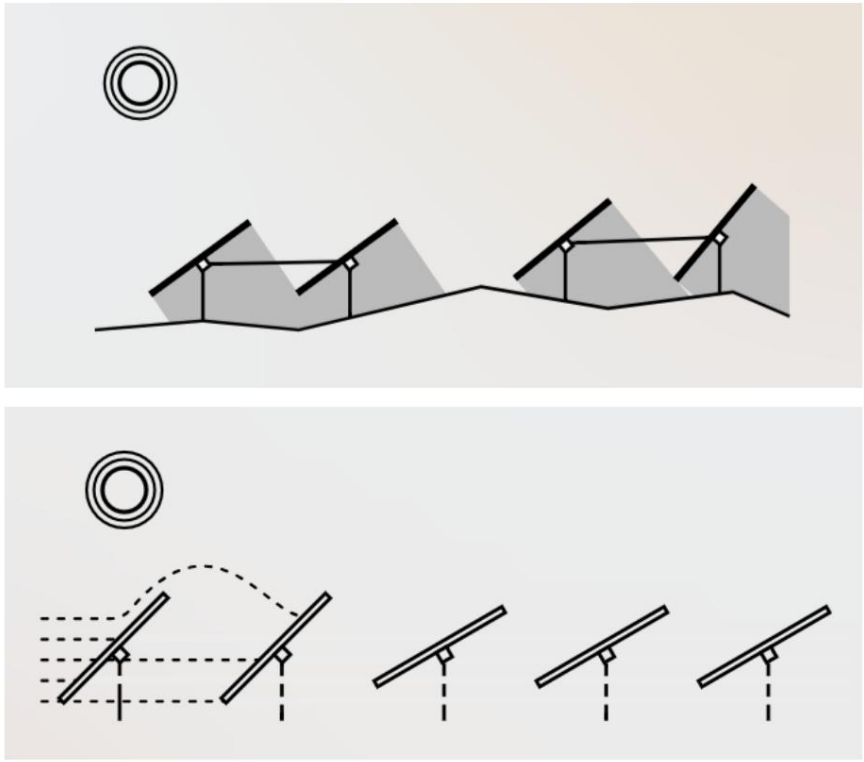
-Make a detailed inventory of the life cycle HC associated with the production, use and disposal of the Tracker SF7 product.

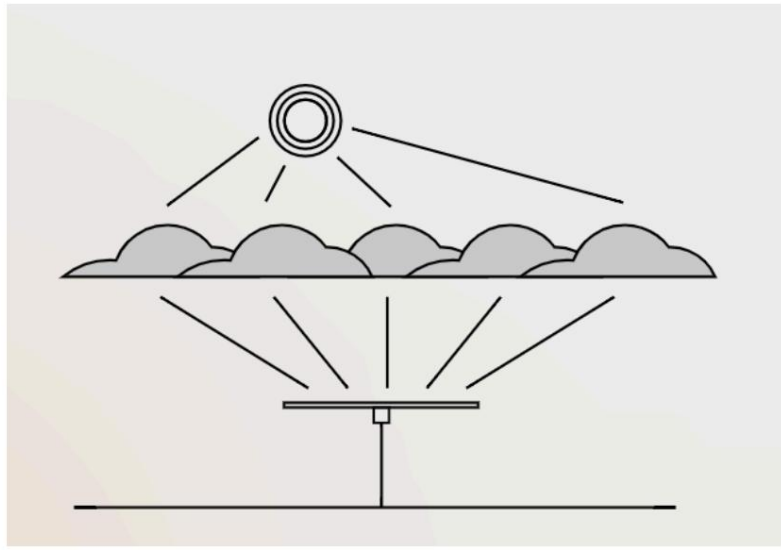
-Compare the results of this study with other similar life cycle studies and identify the main reasons for possible significant differences that may be found.



INTENDED USE OF THE PRODUCT

The product is called SF7 Solar Tracker or SF7 Tracker for use in industrial installations.
It is a mechanical device capable of orienting the solar panels so that they remain approximately perpendicular to the sun rays, following the sun from the east at sunrise to the west at sunset.
The intended result is the maximum performance of a photovoltaic installation.





SCOPE OF PCF

The objective of the study is an evaluation of the “cradle to gate” Carbon Footprint life cycle of the Tracker SF7 solar tracker product.

The unit processes included are the following:

-Production of raw materials.

-Energy consumption in the facilities.

-Manufacturing (assembly)

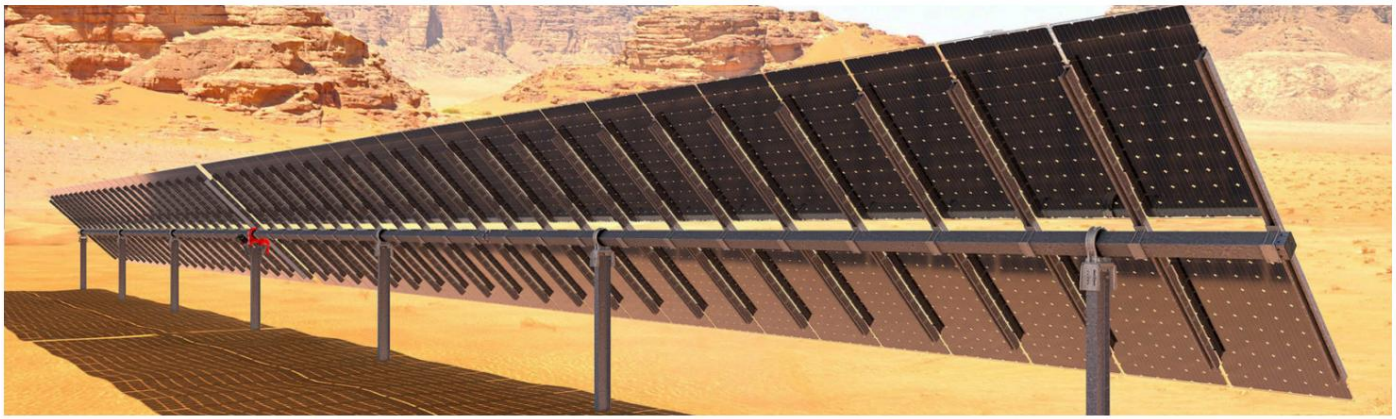
-Operation of facilities.

-Transportation of the necessary electronic components to the facilities.

-Storage of products on the premises.

The subsequent process of transport to customer premises, assembly at customer premises and installation are outside the scope of this Carbon Footprint.

GHG emissions and removals associated with the production of capital goods (buildings, manufacturing machinery, transport trucks, etc.) employees in the product life cycle are excluded from the PCF assessment.



SYSTEM LIMITS

The system studied is based on a “cradle to gate” Life Cycle Analysis carried out in accordance with the recommendations and requirements of the International Standards ISO 4040:2006 and ISO 14044:2006 and the European Standard UNE - EN 15804:2012+A2:2020 and Product Category Rule 2019:2014, Version 1.2.5, Construction Products.

This Environmental Product Declaration (EPD) covers the stages of the life cycle of “Cradle to Gate with Options” , being the option chosen for the study f) Construction service EPD: Cradle to gate with modules A1-A5 and optional modules.
The life cycle stages included in the Carbon Footprint are the following:

Stage of product	A1	Supply of raw materials	**X**
	A2	Transport to factory	**X**
	A3	Manufacturing	**X**
Construction on	A4	Transport to project	**X**
	A5	Installation / Construction	**X**
Stage of use	B1	Use	MNE
	B2	Maintenance	MNE
	B3	Repair	MNE
	B4	Substitution	MNE
	B5	Rehabilitation	MNE
	B6	Energy use in service	MNE
	B7	Water use in service	MNE
End of Life	C1	Deconstruction / Demolition	MNE
	C2	Transport	MNE
	C3	Waste treatment	MNE
	C4	Elimination	MNE
	D1	Reuse potential, recovery and/or recycling	MNE

X= Module included in the CF; NR= Non-relevant module; MNE= Module not evaluated

Table 1. Stages of stroke included in the HCP SF7 study.

METHODOLOGY

Different calculation procedures based on the units in which the activity data were avalable have been used to carry out this study.

The activities carried out by SOLTEC to develop its functions can be classified in various ways (litres of fuel consumed in machinery and vehicles, kWh of electricity consumed, euros spent on services received, etc.).

The methodological basis for calculating greenhouse gas emissions resulting from these activities is always the same, and consists of applying the following formula:

Carbon Footprint = Activity Data x Emission Factor

Being:

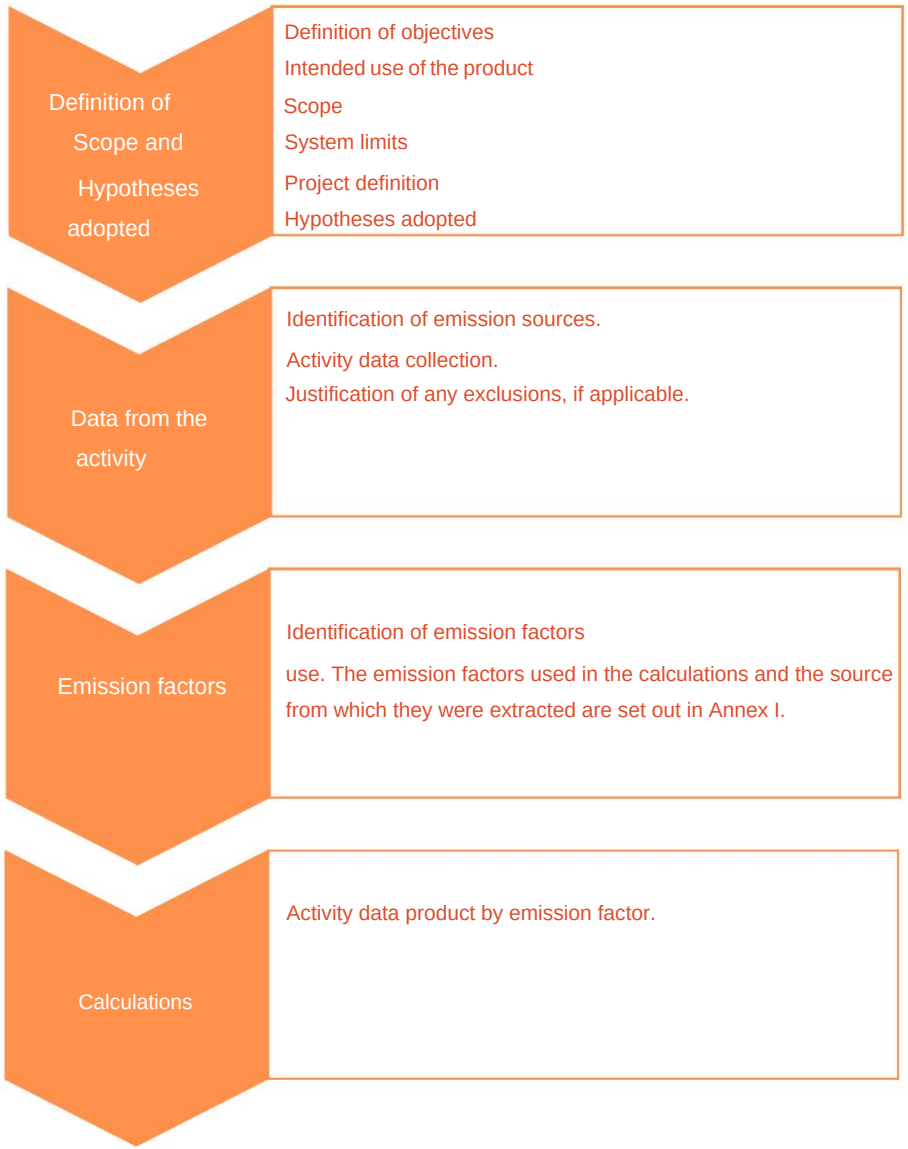
- ***Activity data:*** parameter that defines the degree of activity (e.g.: liters of diesel C)

- ***Normalized emission factor:*** assumes the amount of greenhouse gases emitted by each unit of the “activity data” parameter (e.g.: 2.868 kg CO2/l)

The unit used to present the results is t CO2eq (tons of CO2 equivalent), universal unit of measurement that indicates the global warming potential (GWP) of each of the greenhouse gases, expressed in terms of the GWP of a unit of carbon dioxide. It is used to measure the impact on climate change of the release of different greenhouse gases through the same unit.

The methodology used to perform the scope 1+2 and 3 calculations is based primarily on the procedures described in the Standard accounting and reporting corporate of the Greenhouse Gas Protocol, a system that constitutes the international methodology with greater implementation today and following IPCC guidelines.

Next is a diagram describing the steps that have been followed to calculate the carbon footprint:



SF7 DESCRIPTION

The SF7 solar tracker is the two vertical (2P) tracker and is one of the most advanced products on the market.
It has bifacial modules to capture energy on both the front side as rear, which allows to achieve 30% more efficiency thanks to its ability to capture radiation reflected by the ground surface under and around the tracker.
It has 46% fewer batteries per MW, 15% fewer parts and another 15% less screws per battery.

ELEMENTS THAT MAKE UP SF7

Model	SF7 Solar Tracker
Mounting the PV module	No rating
Design load index	N/A
Grounding the PV module	Yeah
Maximum voltage of the PV system	1500 Vdc
Maximum System Protection to overcurrent	20 A
Environmental index (tables/boxes) electrical)	Type 3x

Table 2. General characteristics of the SF7 Tracker.

Setting up the phase entrance	DC
Nominal voltage (VDC)	24
Nominal current (A)	<8
Power (W)	130
Weight (kg)	8.3

Table 3. Engine characteristics.

Exit velocity	< 0.5 rpm
Rated output torque	6500 Nm
Holding torque	55 kN.m
Weight	80 kg
Material	Iron

Table 4. Slewing drive characteristics.

Structural and mechanical components

ELEMENT DESCRIPTION	CATEGORY	MATERIAL
Pile W8x18 L=6150mm/242in HDG90	PILES	S355JR Steel
Pile W8x13 L=6240mm/246in HDG90	PILES	S355JR Steel
Pile W8x10 L=6240mm/246in HDG90	PILES	S355JR Steel
PV Mounting rail 90x30x25x2-VL=3915mm	RAIL	S420JR HDG Steel
PV Mounting rail 80x30x25x2-VL=3515m	RAIL	S420JR HDG Steel
PV Mounting rail 80x30x25x1.5-VL=3515mm	RAIL	S420JR HDG Steel
Torque Tube 150x150x3.5 PG L=11340mm/446in	TORQUE TUBE	S350JR ZM310 Steel
Torque Tube 150x150x3 L=11915mm/469in	TORQUE TUBE	S350JR ZM310 Steel
Torque Tube 150x150x3 L=10820mm/426in	TORQUE TUBE	S350JR ZM310 Steel
SF7-SDrive-VE8_130_T	SLEWING DRIVE + MOTOR	Motor and reducer. Iron reducer. Motor is considered a electrical and electronic component
Asymmetric Load Plate #7 dist.57	OTHER COMPONENTS (OB)	Steel
Lower bushing bracket	OTHER COMPONENTS (OB)	Polyamide plastic
Side bushing hook bracket	OTHER COMPONENTS (OB)	Polyamide plastic
Side bushing hole bracket	OTHER COMPONENTS (OB)	Polyamide plastic
Bushing	OTHER COMPONENTS (OB)	Polyamide plastic
SINGLE PILE L-BRACKET-TOP E=6MM	OTHER COMPONENTS (OB)	Steel
Slewing drive support 8IN	OTHER COMPONENTS (OB)	Steel
U Washer PV Mounting Rail	OTHER COMPONENTS (OB)	Steel
Lower module support e= 5mm	OTHER COMPONENTS (OB)	Steel

ELEMENT DESCRIPTION	CATEGORY	MATERIAL
Lower module support e= 4mm	OTHER COMPONENTS (OB)	Steel
HEXAGON SCREW DIN 931 M10X190 8.8	OTHER COMPONENTS (OB)	Steel
HEXAGON SCREW DIN 933 M6X25 8.8	OTHER COMPONENTS (OB)	Steel
HEXAGON SCREW DIN 933 M6X20 8.8	OTHER COMPONENTS (OB)	Steel
HEXAGONSCREWDIN933M12X5010.9	OTHER COMPONENTS (OB)	Steel
SCREW DIN 931, M16X160 8,8	OTHER COMPONENTS (OB)	Steel
HEX SCREW M16X40 DIN933 DELTA-SEAL 12.9	OTHER COMPONENTS (OB)	Steel
HEXAGON SCREW DIN 931 M20X80 10.9	OTHER COMPONENTS (OB)	Steel
SELF-DRILLING SCREW M5.5X19 DIN 7504	OTHER COMPONENTS (OB)	Steel
HEXAGONAL LOCK NUT M6, DIN 985	OTHER COMPONENTS (OB)	Steel
SELF LOCKING NUT DIN 985 M10 8	OTHER COMPONENTS (OB)	Steel
HEXAGONAL NUT M12, DIN 934; 10	OTHER COMPONENTS (OB)	Steel
SELF LOCKING NUT DIN 985 M16 8	OTHER COMPONENTS (OB)	Steel
HEXAGON NUT DIN 934 M20 10.9	OTHER COMPONENTS (OB)	Steel
FLAT WASHER M6, DIN 125	OTHER COMPONENTS (OB)	Steel
SERRATED WASHER M8 DIN 6798	OTHER COMPONENTS (OB)	Steel
WASHER DIN 125 M10	OTHER COMPONENTS (OB)	Steel
WASHER DIN 125 M12	OTHER COMPONENTS (OB)	Steel
SPRING WASHER DIN 127 M12	OTHER COMPONENTS (OB)	Steel

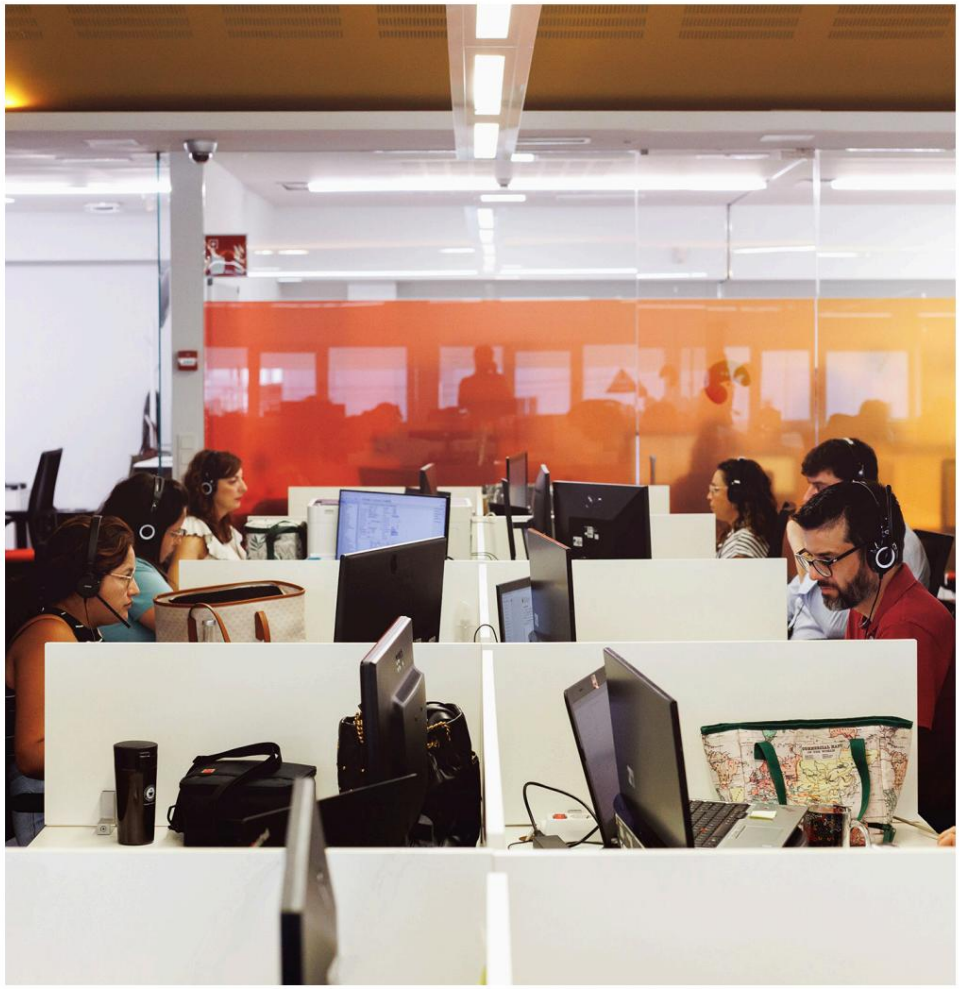
ELEMENT DESCRIPTION	CATEGORY	MATERIAL
STRUCTURAL WASHER DIN 7989 M20	OTHER COMPONENTS (OB)	Steel
WASHER DEXT16 - DINT 6.6	OTHER COMPONENTS (OB)	Steel
SELF LOCKING NUT DIN 985 M8 8	OTHER COMPONENTS (OB)	Steel
WASHER DIN 125 M8	OTHER COMPONENTS (OB)	Steel
Tracker end cap	OTHER COMPONENTS (OB)	Polypropylene plastic
Section splice block 150x4 to 150x3	OTHER COMPONENTS (OB)	Polyamide plastic
SD Interface 8” - Tube 150x3.5	OTHER COMPONENTS (OB)	Polyamide plastic
Transmission omega plate	OTHER COMPONENTS (OB)	Steel
Ground connection Plug Ø=13-24 with Sn+ZnNi	OTHER COMPONENTS (OB)	Selenium + zinc and nickel wire
Screw block bent plate	OTHER COMPONENTS (OB)	Steel
Rivet 6.4x15 Alu-Steel	OTHER COMPONENTS (OB)	Aluminum-steel

Table 5. Structural and mechanical components.

Electronic Components Tracker Control Box

ELEMENT DESCRIPTION	CATEGORY	MATERIAL
WASHER GTM-0815-005	OTHER COMPONENTS (OE)	Steel washer
BUSHING, PFM-0708-0275	OTHER COMPONENTS (OE)	Plastic plug
FIXING ELEMENT REF.308 DELTA TONE 10-11MM	OTHER COMPONENTS (OE)	Fixing the box to the axle. Aluminum
JCW015-2.4G, RP-SMA MALE, UV RESISTANT	OTHER COMPONENTS (OE)	Adapter (hardware)
CABLE ADAPTER RP-SMA FEMALE TO SMA MALE,RG58 2.6M	OTHER COMPONENTS (OE)	Adapter (hardware)
QUICK ATTACHMENT DEVICE	OTHER COMPONENTS (OE)	Cable lug. Steel
POLYAMID PLUG M20X1.5MM	OTHER COMPONENTS (OE)	Polyamide plug
U-BOLT M8	OTHER COMPONENTS (OE)	Steel
RED JUMPER 881545-2-ND	OTHER COMPONENTS (OE)	Electronic component fuse
JCW015 ANTENNA SUPPORT - 27X35	OTHER COMPONENTS (OE)	Antenna
TRACKER 5.1 REV8 HEAD LOW Tº	OTHER COMPONENTS (OE)	Aluminum
TRACKER C 5.1 REV8 SUB LOW Tº 320W SWITCHING P	OTHER COMPONENTS (OE)	Aluminum

Table 5. Electronic components.



ADOPTED HYPOTHESES

The hypotheses adopted for the calculation of the Carbon Footprint of the Totana IV Project are as follows:

1. Flows from infrastructure, construction, production of equipment and tools that are not directly consumed in the process, have been excluded from the Life Cycle Inventory, since they do not have the potential to cause significant environmental impact.
2. Personnel-related flows, such as transport to and from the workplace, have also not been accounted for in the Workplace Life Cycle Inventory.
3. The hypothesis used for the treatment and final disposal of the waste is that all components of the Tracker SF7 are potentially recyclable due to their economic value.
4. The GHG considered are those established in the Kyoto Protocol and in the IPCC.
5. LCI data shall include, according to EN 15804, a minimum of 95% of the total inputs (mass and energy) per module.

IDENTIFICATION OF EMISSION SOURCES AND ACTIVITY DATA

Once the limits of the Carbon Footprint study system have been determined and the product has been described, the following sources of carbon are identified: emissions associated with the different operations, as well as the activity data of each of the Trackers defined above.

COMPONENT	FUNCTION	MATERIAL	QUANTITY 1 TRACKER	Gross Weight (kg)	Net Weight (kg)
PILE W8X13 L=6240MM/246IN HDG90	SINGLE PILE L-BRACKET-TOP E=6MM	Steel	4	505.69	481.84
PILE W8X10 L=6240MM/246IN HDG90	SIMPLE PILE L-BRACKET-BOTTOM E=6MM	Steel	4	427.19	406.73
TORQUE TUBE 150X150X3.5 PG L=11340MM/446IN	OMEGA PLATE TRANSMISSION	Steel	2	389.11	355.92
OMEGA RIVETED ASSEMBLY 80X30X25X1.5-VL=3515MM	SLEWING DRIVE SUPPORT 8IN	Steel	27	305.85	306.41
TORQUE TUBE 150X150X3 L=11915MM/469IN	SINGLE PILE L-BRACKET-TOP E=6MM	Steel	1	175.93	162.41
PILE W8X18 L=6150MM/242IN HDG90	SIMPLE PILE L-BRACKET-BOTTOM E=6MM	Steel	1	166.89	162.05
TORQUE TUBE 150X150X3 L=10820MM/426IN	OMEGA PLATE TRANSMISSION	Steel	1	160.17	147.48
OMEGA RIVETED ASSEMBLY 90X30X25X2-VL=3915MM	SLEWING DRIVE SUPPORT 8IN	Steel	8	155.89	138.96
OMEGA RIVETED ASSEMBLY 80X30X25X2-VL=3515MM	SINGLE PILE L-BRACKET-TOP E=6MM	Steel	6	97.22	96.65
SF7-SDRIVE-VE9_130W C3 H-FANG 2TERMIN NO CONNECTOR	SIMPLE PILE L-BRACKET-BOTTOM E=6MM	Steel	1	70.45	70.45
SINGLE PILE L-BRACKET-TOP E=6MM	OMEGA PLATE TRANSMISSION	Steel	8	34.07	36.84
SIMPLE PILE L-BRACKET-BOTTOM E=6MM	SLEWING DRIVE SUPPORT 8IN	Steel	8	34.07	32.25
OMEGA PLATE TRANSMISSION	SINGLE PILE L-BRACKET-TOP E=6MM	Steel	4	24.36	23.76
SLEWING DRIVE SUPPORT 8IN	SIMPLE PILE L-BRACKET-BOTTOM E=6MM	Steel	2	20.30	21.01

Table 6. Activity data of structural and mechanical components.

The activity data for the Tracker Control Box is as follows:

COMPONENT	FUNCTION	MATERIAL	QUANTITY 1 TRACKER	Gross Weight (kg)	Net Weight (kg)
TRACKER C 5.1 REV8 SUB LOW Tº 320W SWITCHING P	Aluminum	Aluminum	1	2.39	2.42
Lithium battery	Battery	Battery	1	1.5	1.5
TRACKER 5.1 REV8 HEAD LOW Tº	Aluminum	Aluminum	0	0.46	0.46
U-BOLT M8	Steel	Steel	2	1.81	0.32
CABLE ADAPTER RP-SMA FEMALE TO SMA MALE,RG58 2.6M	Adapter (Hardware)	Iron	2	0.13	0.17

Table 7. Electronic component activity data.

SF7 CARBON FOOTPRINT CALCULATION

To calculate the Carbon Footprint of the SF7 product, the Ecoinvent_391_cuoff database and the openLCA 1.11.0 software have been used.
The environmental indicator used is the Global Warming Potential 100 (IPCC). The results obtained for each of the components are as follows:

DENOMINATION	EMISSIONS (Kg CO2eq)
TRACKER SF7	5956.65
TRACKER CONTROL BOX	34.88
TOTAL	**6000.53**

Table 8. Results in kg of CO2eq of the SF7 Solar Tracker.

The openLCA software has been used for the modelling of each of the components and stages of the process. The result obtained for each component is expressed as: Climate Change (GWP 100) corresponds to 100% of the carbon emitted, Climate Change Biogenic (GWP 100) corresponds to the biogenic carbon emitted, the Climate Change Fossil (GWP 100) corresponds to the fossil carbon emitted and the Climate Change Land Use (GWP 100) corresponds to the carbon emitted as a result of changes in land use.

TRACKER SF7

The results obtained for each of the carbons emitted in the life cycle of the Tracker SF7 are:

Climate Change GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER ASSEMBLY TRACKER SF7	**5,956,646**	kg CO2-Eq
	89.02%	MANUFACTURING OF PARTS OF STEEL	5,302,786	kg CO2-Eq
	10.98%	MANUFACTURING OF SLEWING SF7 (MOTOR + SLEWING DRIVE)	653,860	kg CO2-Eq

Table 8. Climate Change of mechanical and structural components.

Climate Change Biogenic GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER ASSEMBLY TRACKER SF7	**5,871**	kg CO2-Eq
	80.70%	MANUFACTURING OF PARTS OF STEEL	4,738	kg CO2-Eq
	19.30%	MANUFACTURING OF SLEWING SF7 (MOTOR + SLEWING DRIVE)	1,133	kg CO2-Eq

Table 9. Biogenic carbon of mechanical and structural components.

Climate Change Fossil GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER ASSEMBLY TRACKER SF7	**5,945,739**	kg CO2-Eq
	89.04%	MANUFACTURING OF PARTS OF STEEL	5,294,309	kg CO2-Eq
	10.96%	MANUFACTURING OF SLEWING SF7 (MOTOR + SLEWING DRIVE)	651,430	kg CO2-Eq

Table 10. Fossil carbon of mechanical and structural components.

Climate Change Land Use GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER ASSEMBLY TRACKER SF7	**5,035**	kg CO2-Eq
	74.25%	MANUFACTURING OF PARTS OF STEEL	3,738	kg CO2-Eq
	25.75%	MANUFACTURING OF SLEWING SF7 (MOTOR + SLEWING DRIVE)	1,297	kg CO2-Eq

Table 11. Carbon Land Use Change of mechanical and structural components.

Biogenic carbon is carbon from the decomposition of products containing organic matter of animal or vegetable origin, and which was previously captured by living organisms. Therefore, it is considered that belongs to a carbon neutral cycle.
However, the protocol recommends quantification and reporting of the biogenic CO2 emissions, since in some processes the organic material of Animal and plant origin can be used as a source of energy instead from fossil fuels.

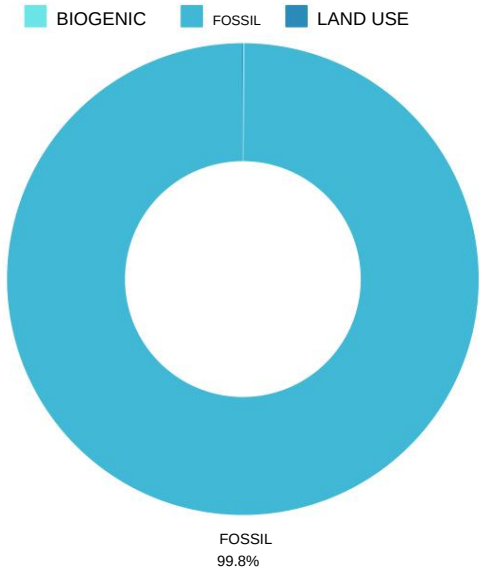
In the manufacture of the Tracker SF7 solar tracker, emissions due to biogenic carbon represents 0.10% of the total.

The emissions that contribute most to global warming in manufacturing of the Tracker SF7 solar tracker, are those due to fossil carbon. They represent, In this case, **99.82%** of the total emissions, and are due to the consumption of fossil fuels (coal, oil and gas) in the manufacturing process of raw materials that make up the Tracker SF7.

On the other hand, emissions due to land use change represent 0.08% of total emissions. The CO2 emitted as a result of a land use change, which usually involves deforestation, is carbon dioxide accumulated in its vegetation, which escapes into the atmosphere.

Total CO2 equivalent emissions amount to 5956.65 kg of CO2 for each unit of SF7 tracker manufactured.

Of the two main processes required to manufacture a unit of Tracker SF7, the steel parts manufacturing process is the process that contributes most to the total CO2 equivalent emissions (89.02%). The manufacturing of SF7 slewing (motor and slewing drive) contributes 10.98% to the total emissions from the manufacture of the Tracker SF7 solar tracker.



TRACKER CONTROL BOX

The results obtained for each of the carbons emitted in the life cycle of the Tracker Control Box are:

Climate Change GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER CONTROL ASSEMBLY BOX	**34,875**	kg CO2-Eq
	48.06%	LITHIUM BATTERY MANUFACTURING	16,761	kg CO2-Eq
	46.97%	ALUMINUM BOX MANUFACTURING	16,380	kg CO2-Eq
	02.92%	CABLE ADAPTER MANUFACTURING	1,019	kg CO2-Eq
	02.05%	MANUFACTURING OF STEEL PARTS	0.715	kg CO2-Eq

Table 12. Climate Change of electronic components.

Climate Change Biogenic GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER CONTROL ASSEMBLY BOX	**0.086**	kg CO2-Eq
	65.53%	LITHIUM BATTERY MANUFACTURING	0.056	kg CO2-Eq
	28.94%	ALUMINUM BOX MANUFACTURING	0.025	kg CO2-Eq
	04.78%	CABLE ADAPTER MANUFACTURING	0.004	kg CO2-Eq
	00.74%	MANUFACTURING OF STEEL PARTS	0.001	kg CO2-Eq

Table 13. Biogenic carbon from electronic components.

Climate Change Fossil GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER CONTROL ASSEMBLY BOX	**34,710**	kg CO2-Eq
	48.04%	LITHIUM BATTERY MANUFACTURING	16,673	kg CO2-Eq
	46.99%	ALUMINUM BOX MANUFACTURING	16,310	kg CO2-Eq
	02.92%	CABLE ADAPTER MANUFACTURING	1,013	kg CO2-Eq
	02.06%	MANUFACTURING OF STEEL PARTS	0.714	kg CO2-Eq

Table 14. Fossil carbon from electronic components.

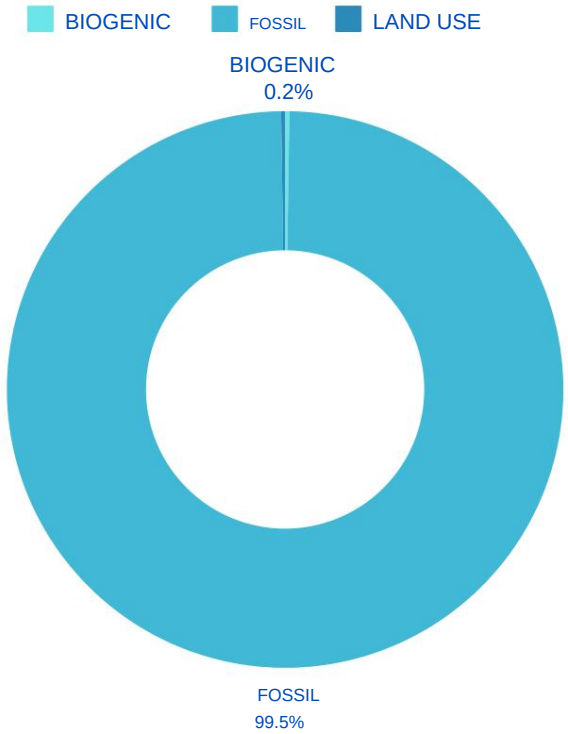
Climate Change Land Use GWP 100

CONTRIBUTION		PROCESS	AMOUNT	UNIT
100.00%		TRACKER CONTROL ASSEMBLY BOX	**0.079**	kg CO2-Eq
	57.22%	LITHIUM BATTERY MANUFACTURING	0.045	kg CO2-Eq
	39.90%	ALUMINUM BOX MANUFACTURING	0.032	kg CO2-Eq
	02.24%	CABLE ADAPTER MANUFACTURING	0.002	kg CO2-Eq
	00.64%	MANUFACTURING OF STEEL PARTS	0.001	kg CO2-Eq

Table 15. Carbon Land Use Change of electronic components.

In the manufacturing process of the Tracker Control Box, the carbon that most contributes to total CO2 equivalent emissions, it is **fossil carbon, representing 99.53% of the total,** compared to 0.25% of biogenic carbon, and 0.23% of emissions due to land use change.

The process that contributes most to emissions within the manufacturing of Tracker Control Box is the manufacture of lithium battery, with 48.06% of the total, followed by the aluminum box manufacturing process, with 46.97% of total emissions.



CARBON FOOTPRINT BY WEIGHT OF PRODUCT

The Carbon Footprint per kg of manufactured product has been calculated, with the following results:

DENOMINATION	QUANTITY (KG)	TOTAL AMOUNT (KG)	CO2 EMISSIONS PER KG OF PRODUCT
STEEL	2467.92	**2556.07**	**2.35**
PLASTIC	11.01		
OTHER COMPONENTS MECHANICS	1,72615		
ELECTRICAL COMPONENTS	4.96		
MOTOR AND SLEWING DRIVE	70.45		

Table 16. Results in kg of CO2eq per kg of product.

2.35 kg of CO2 per kg of product

CONCLUSIONS

1. The emissions of the SF7 Solar Tracker product amount to 6 tons of CO2 equivalent.
2. Emissions from structural components, mostly made of steel, and mechanical components amount to 5,956 tons of CO2 equivalent.
3. The emissions from the electrical components that make up the Tracker Control Box amount to 0.034 Tn of CO2 equivalent.
4. The manufacturing of steel parts is the process that contributes most to CO2 emissions from structural components and mechanics with the emission of 5,302 Tn.
5. The manufacturing of lithium batteries is the process that contributes most to CO2 emissions from electrical components with the emission of 0.016 Tn.
6. Fossil carbon is the type of carbon that contributes most to the Climate Change environmental indicator, accounting for over 90% in all processes.

EDITORIAL TEAM OF THE PROJECT

Raquel Ros Alcaraz. 23031086J.

Bachelor in Environmental Sciences.

Membership Number 42 of the Official College of Environmentalists of the Region of Murcia.

Jorge Cegarra Hernandez. 23043880L.

Bachelor of Environmental Sciences.

Reviewed by Fernando Ortuño Prados.

Quality & EHS Global Director. Soltec.

In Murcia, September 23, 2024