Product Environmental Profile

ENTITY PRO SIGI O 22

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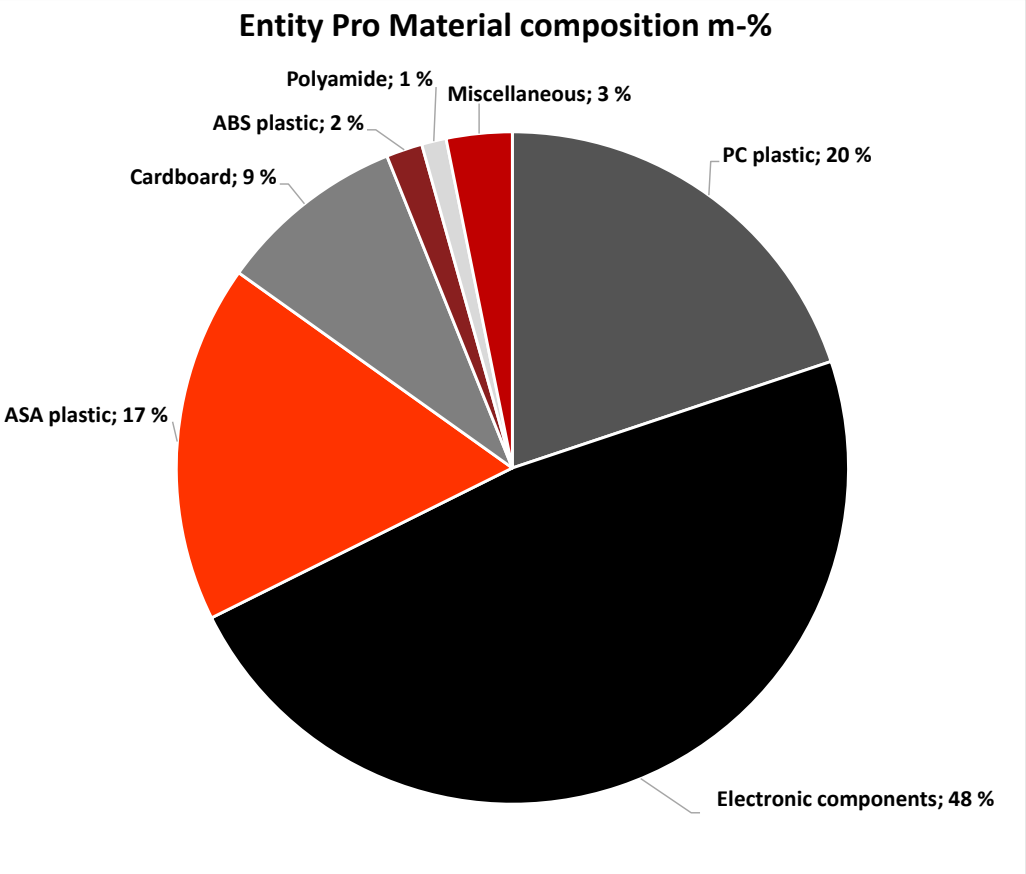
PEP number: GARO-0001-V01.01-EN

General information

Reference product	Entity Pro SIGI 22 O
Description of the product	The charging station of Entity Pro 22 SIGI O for electric vehicles is suitable for installation in single-family homes, residential complexes, and office parking lots or parking garages. In terms of installation options, the station can be mounted on a wall, affixed to a post using a dedicated bracket, or positioned on a standalone pedestal specifically designed for charging stations. It incorporates built-in electronic kWh metering or a visible MID-approved kWh meter, alongside an integrated residual current device (RCD) featuring mechanical AC and DC circuit breakers, ensuring compliance with all relevant standards. Moreover, these charging stations are capable of intercommunication through Ethernet wiring or mesh WiFi, with internet connectivity accessible via LTE CAT M1, Ethernet, or WiFi. The main function of studied product is to provide a dedicated location where electric vehicles (EVs) can be connected to an electrical power source to recharge their batteries.
Reference product mass	4.05 kg including the product and its packaging
Manufacturing location	Poland
Reference technical properties	
Product family	Active
Station type	Wallbox running on alternating current (AC)
Installation type	Wall installation: garages, roofed sheds, or exterior parking areas in collective residential buildings or buildings used as offices, car parks or the public highway
Charging type	Normal
Number of charging points	Type 2 socket
Charging mode	Mode 3
Presence of connected sockets	1pcs, 16A 2P+T domestic sockets
Reference power	32A, 230V, 22 kW three-phase
Current type	AC
Reference service life	10 years
Indcluded elements as defined in PSR	- 1 type 2S socket connected to rated current of 32 A - 1 controller - 1 housing - 1 electrical protection device - 1 OCPP to CPO communication module

Constituent materials

The Entity Pro SIGI 22 O and its packaging weight 4.05 kg.



Material composition	Unit (%)
Metals	1.40
Plastics	41.0
Others	57.6

Biogenic carbon content	Unit (kg C)
Biogenic carbon content in the product	0.00
Biogenic carbon content in accompanying packaging	0.17

LCA background information

Functional unit	As required by PSR, the functional unit for the reference product is “Supply 1 kWh to one vehicle in accordance with the reference use scenario for a private or semi-public AC station at the charging point. The Reference Life Time (RLT) for the product is 10 years, as reported in the PSR. Calculating the environmental impact at a Functional Unit (FU) level: Environmental impact of the PEP (for 1 kWh) = Environmental impact of the reference product / Quantity of energy supplied to one or more vehcles by the EVCI over its RL. Conversion factors between Declared Unit and Functional Unit: 3.54E-05
Declared unit	1 charging system operating in accordance with the reference usage scenario over a period equal to the reference service life.
System boundary	The environmental information included in the PEP covers all the stages of the life cycle, from "cradle to grave".
Description of data representativeness	All used data is mainly representative for Europe, while some components are sourced globally. Used inventory data from Ecoinvent is sometimes over 10 years old, but updated with current energy profiles. Technological representativeness is as good as possible without primary data from suppliers.
Allocation methods applied	The “polluter pays” principle for EoL allocation. Allocation choices in secondary datasets may vary between datasets. There are no co-products in this product system, so no allocation of inputs and outputs is necessary.
Cut-off rule applied and main exclusions	Cut-off: The mass, energy flows or environmental impacts of intermediate flows not considered shall be less than or equal to 5% of the mass of the elements/total energy consumption or environmental impacts of the reference product corresponding to the functional unit. As suggested by the PSR, the elements used for connecting the station to the main grid and to the monitoring and communication network are excluded.
Applied standards and rules	The results of the study are used to obtain the PEP ecopassport®, according to PEP-ed-4.1-EN-2017 10 17 “General Instructions of the PEP ecopassport® program”, PCR-ed4-EN-2021 09 06 “Product Category Rules for Electrical, Electronic and HVAC-R Products” and the PSR0018-ed1-EN-2021 09 13: “Specific Rules for Electric Vehicle Charging Infrastructures”, in compliance with ISO 14025 standard.
Modelling software	SimaPro 9.5.0.1. The environmental impacts have been calculated according to the PCR-ed4-EN-2021 09 06 using the method EN 15804: 2012 + A2: 2019.
Secondary dataset	Ecoinvent 3.9.1 (Cut-off system model)

Inventory data

Manufacturing (A1-A3)	Manufacturing includes life cycle stages from cradle-to-gate, including material acquisition, component manufacturing, assembly of products and transportation between these facilities. Energy consumption in assembly stage is calculated as specific consumption based on electric machinery and lighting required by the assembly and testing phase. There is no primary data on the waste generated at the assembly site, and thus, the default scenario from PSR-0018-ed1-EN-2021 09 13 is applied here. Components are sourced from Europe and globally.
Distribution (A4)	Distribution transport scenario includes transport from centralized warehouse to retailers and from retailers to final users. For distribution of the product from the warehouse to the end customer, the countries mainly in Europe in which the product was sold in the reference year (2023) were considered. The distribution packaging is assumed to be sent to waste treatment in the distribution stage at the retailers' premises.
Installation (A5)	Installation stage considers waste management of product packing materials of the product. Screws for wall mounting are included in installation stage as they are not delivered with the product. Energy consumption in installation is negligible and is excluded.
Use B1-B7	The use stage includes the electrical energy consumption during 10 years of reference life time. No other materials or energy are consumed in the operation of the charger. Electricity consumption of EV-charger during the use stage has been calculated as it is stated in the reference PSR-0018-ed1-EN-2021 09 13, paragraph 3.5.4, for AC stations and private or semi-public usage. The use stage related environmental impacts are likely to be different at the user site depending on the origin of energy consumed.
End of life C1-C4	Removal, dismantle and transportation of the dismantled EV-charger to the treatment site and the treatment process.

Life cycle stage	Energy models
Manufacturing stage	Manufacturing plant: Market for Electricity, medium voltage {PL} The energy-related processes used for the remaining inputs of the manufacturing stage are those included in the ecoinvent 3.9.1 datasets selected for the analysis
Use	Electricity for charging vehicles: Market group for electricity, low voltage {Europe without Switzerland}
End-of-life	The energy-related processes used for the inputs of the end-of-life stage are those included in the ecoinvent datasets selected for the analysis

USE SCENARIO FOR ENTITY PRO SIGI 22 O	
Type of power supply	Wallbox AC
Type of usage	Private or semi-public
Reference power (kW)	22
Current	three phase
Number of charging points	1
Reference life (years)	10
Average quantity of energy supplied for a given charging point on the station's RL (kWh)	28 251
Station consumption associated with losses (kWh/RSL)	69.45
Intrinsic consumption of the charging system (kWh / RSL)	438.00
Conversion factors between declared and functional units	3.54E-05
Total consumption with regard to the Functional Unit (kWh)	1.80E-02

Environmental indicators

RESULTS OF ENVIRONMENTAL IMPACT INDICATORS PER KWH CORRESPONDING TO THE FUNCTIONAL UNIT

Indicator	Units	Total	Manufac-turing	Distribu-tion	Installa-tion	Use	End of Life
Climate change	kg CO_2 eq	1.09E-02	3.93E-03	2.96E-05	4.15E-05	6.47E-03	3.78E-04
Climate change - Fossil	kg CO_2 eq	1.08E-02	3.95E-03	2.96E-05	2.00E-05	6.46E-03	3.77E-04
Climate change - Biogenic	kg CO_2 eq	0.00E+00	-2.21E-05	0.00E+00	2.14E-05	0.00E+00	6.23E-07
Climate change - Land use and LU change	kg CO_2 eq	2.38E-05	7.53E-06	4.18E-08	6.54E-08	1.61E-05	7.79E-08
Ozone depletion	kg CFC11 eq	3.28E-10	2.00E-10	3.82E-12	2.94E-13	1.23E-10	1.36E-12
Acidification	mol H^+ eq	7.00E-05	3.10E-05	1.68E-07	8.65E-08	3.70E-05	1.79E-06
Eutrophication, freshwater	kg P eq	1.09E-05	4.72E-06	4.72E-09	7.49E-09	6.12E-06	8.60E-08
Eutrophication, ma-rine	kg N eq	1.17E-05	5.46E-06	5.29E-08	7.57E-08	5.98E-06	1.59E-07
Eutrophication, ter-restrial	mol N eq	1.14E-04	5.71E-05	5.66E-07	1.91E-07	5.41E-05	1.74E-06
Photochemical ozone formation	kg NMVOC eq	3.67E-05	1.85E-05	2.12E-07	6.86E-08	1.74E-05	5.54E-07
Resource use, min-erals and metals	kg Sb eq	1.24E-06	1.15E-06	1.71E-10	2.01E-10	7.71E-08	2.02E-08
Resource use, fos-sils	MJ	2.02E-01	5.42E-02	4.40E-04	2.30E-04	1.46E-01	9.97E-04
Water use (AWARE)	m^3	2.61E-03	9.20E-04	4.25E-06	2.56E-06	1.65E-03	3.09E-05
Particulate matter	disease inc.	3.58E-10	2.12E-10	2.84E-12	1.15E-12	1.35E-10	6.70E-12
Ionising radiation	kBq U-235 eq	4.53E-03	4.29E-04	1.40E-06	2.43E-06	4.08E-03	8.08E-06
Ecotoxicity, freshwater	CTUe	1.28E-01	1.00E-01	2.07E-04	1.91E-04	2.46E-02	3.36E-03
Human toxicity, can-cer	CTUh	7.82E-12	4.18E-12	6.06E-14	4.69E-14	3.02E-12	5.21E-13
Human toxicity, non-cancer	CTUh	3.45E-10	1.96E-10	3.52E-13	2.97E-13	1.20E-10	2.86E-11
Land use	Pt	5.49E-02	2.29E-02	2.50E-03	8.64E-05	2.86E-02	8.68E-04

Resource use indicators per FU

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	3.84E-02	5.88E-03	4.31E-04	3.39E-05	3.19E-02	1.15E-04
Use of renewable primary energy resources used as raw materials (PERM)	MJ	4.40E-04	4.40E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT)	MJ	3.88E-02	6.32E-03	4.31E-04	3.39E-05	3.19E-02	1.15E-04
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	2.00E-01	5.26E-02	4.40E-04	2.30E-04	1.46E-01	9.98E-04
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	1.61E-03	1.61E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT)	MJ	2.02E-01	5.42E-02	4.40E-04	2.30E-04	1.46E-01	9.98E-04
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m^3 world eq.	1.48E-04	3.13E-05	1.33E-07	1.21E-07	1.15E-04	1.01E-06

Waste and output indicators per FU

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Hazardous waste disposed	kg	8.22E-04	7.54E-04	5.77E-09	9.24E-10	2.57E-07	6.80E-05
Non-hazardous waste disposed	kg	1.10E-03	4.19E-04	1.89E-05	1.12E-05	5.84E-04	6.94E-05
Radioactive waste disposed	kg	1.16E-06	1.14E-07	3.58E-10	6.16E-10	1.05E-06	2.07E-09
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	4.77E-05	9.88E-06	0.00E+00	6.51E-06	0.00E+00	3.13E-05
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, total	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

RESULTS OF ENVIRONMENTAL IMPACT INDICATORS PER PRODUCT

Indicator	Unit	Total	Manufac-turing	Distribu-tion	Installation	Use	End of Life
Climate change	kg CO_2 eq	3.07E+02	1.11E+02	8.36E-01	1.17E+00	1.83E+02	1.07E+01
Climate change - Fossil	kg CO_2 eq	3.06E+02	1.12E+02	8.35E-01	5.64E-01	1.82E+02	1.07E+01
Climate change - Biogenic	kg CO_2 eq	0.00E+00	-6.23E-01	0.00E+00	6.05E-01	0.00E+00	1.76E-02
Climate change - Land use and LU change	kg CO_2 eq	6.74E-01	2.13E-01	1.18E-03	1.85E-03	4.56E-01	2.20E-03
Ozone depletion	kg CFC11 eq	9.27E-06	5.64E-06	1.08E-07	8.32E-09	3.47E-06	3.84E-08
Acidification	mol H^+ eq	1.98E+00	8.75E-01	4.76E-03	2.44E-03	1.04E+00	5.07E-02
Eutrophication, freshwater	kg P eq	3.09E-01	1.33E-01	1.33E-04	2.12E-04	1.73E-01	2.43E-03
Eutrophication, ma-rine	kg N eq	3.31E-01	1.54E-01	1.50E-03	2.14E-03	1.69E-01	4.48E-03
Eutrophication, ter-restrial	mol N eq	3.21E+00	1.61E+00	1.60E-02	5.40E-03	1.53E+00	4.91E-02
Photochemical ozone formation	kg NMVOC eq	1.04E+00	5.23E-01	5.99E-03	1.94E-03	4.91E-01	1.56E-02
Resource use, miner-als and metals	kg Sb eq	3.51E-02	3.23E-02	4.83E-06	5.68E-06	2.18E-03	5.70E-04
Resource use, fossils	MJ	5.71E+03	1.53E+03	1.24E+01	6.51E+00	4.13E+03	2.82E+01
Water use (AWARE)	m^3 world eq.	7.36E+01	2.60E+01	1.20E-01	7.23E-02	4.66E+01	8.74E-01
Particulate matter	disease inc.	1.01E-05	5.99E-06	8.03E-08	3.24E-08	3.82E-06	1.89E-07
Ionising radiation	kBq U-235 eq	1.28E+02	1.21E+01	3.96E-02	6.86E-02	1.15E+02	2.28E-01
Ecotoxicity, freshwa-ter	CTUe	3.63E+03	2.83E+03	5.84E+00	5.39E+00	6.94E+02	9.49E+01
Human toxicity, can-cer	CTUh	2.21E-07	1.18E-07	1.71E-09	1.32E-09	8.52E-08	1.47E-08
Human toxicity, non-cancer	CTUh	9.75E-06	5.54E-06	9.96E-09	8.38E-09	3.38E-06	8.09E-07
Land use	Pt	1.55E+03	6.47E+02	7.07E+01	2.44E+00	8.08E+02	2.45E+01

Resource use indicators per product

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE)	MJ	1.09E+03	1.66E+02	1.22E+01	9.58E-01	9.03E+02	3.24E+00
Use of renewable primary energy resources used as raw materials (PERM)	MJ	1.24E+01	1.24E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (PERT)	MJ	1.10E+03	1.79E+02	1.22E+01	9.58E-01	9.03E+02	3.24E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE)	MJ	5.66E+03	1.49E+03	1.24E+01	6.51E+00	4.13E+03	2.82E+01
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ	4.54E+01	4.54E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (PENRT)	MJ	5.71E+03	1.53E+03	1.24E+01	6.51E+00	4.13E+03	2.82E+01
Use of secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	m^3	4.17E+00	8.84E-01	3.76E-03	3.42E-03	3.25E+00	2.85E-02

Waste and output indicators per product

Indicator	Unit	Total	Manufacturing	Distribution	Installation	Use	End of Life
Hazardous waste disposed	kg	2.32E+01	2.13E+01	1.63E-04	2.61E-05	7.27E-03	1.92E+00
Non-hazardous waste disposed	kg	3.12E+01	1.19E+01	5.35E-01	3.16E-01	1.65E+01	1.96E+00
Radioactive waste disposed	kg	3.29E-02	3.22E-03	1.01E-05	1.74E-05	2.96E-02	5.85E-05
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.35E+00	2.79E-01	0.00E+00	1.84E-01	0.00E+00	8.85E-01
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, total	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

References

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Ecoinvent 3.9.1

Garo Oy. 2023. Inventory data.

Registration number: GARO-0001-V01.01-EN	Drafting rules "PEP-PCR-ed4-EN-2021 09 06" Supplemented by "PSR-0018-ed1-EN-2021 09 13"
Verifier accreditation number: VH44	Information and reference documents: www.pepecopassport.org
Date of issue: January 14, 2025	Validity period: 5 years
Independent verification of the declaration and data, in compliance with ISO 14025.	
Internal □	External ■
The PCR review was conducted by a panel of experts chaired by Julie Orgelet (DDemain)	
PEP are compliant with XP C08-100-1 :2016 or EN 50693:2019. The elements of the present PEP cannot be compared with elements from another program.	
Document in compliance with ISO 14025: 2006, "Environmental labels and declarations. Type III environmental declarations".	