

# Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

BAS2 E16



**BASTEC**

**Owner of the declaration:**  
BASTEC AB

**Product name:**  
BAS2 E16

**Declared unit:**  
1 Unit

**Product category /PCR:**  
PCR EPDItaly011: ELECTRONIC AND  
ELECTRICAL PRODUCTS AND SYSTEMS -  
METERS. PCR EPDItaly007: Electronic and  
Electrical Products and Systems

**Program holder and publisher:**  
The Norwegian EPD foundation

**Declaration number:**  
NEPD-5816-5104-EN

**Registration number:**  
NEPD-5816-5104-EN

**Issue date:** 09.02.2024

**Valid to:** 09.02.2029

# General information

## Product:

BAS2 E16

## Program operator:

The Norwegian EPD Foundation  
Post Box 5250 Majorstuen, 0303 Oslo, Norway  
Tlf: +47 23 08 80 00  
e-mail: post@epd-norge.no

## Declaration number:

NEPD-5816-5104-EN

## This declaration is based on Product

### Category Rules:

PCR EPDIItaly011: ELECTRONIC AND ELECTRICAL PRODUCTS AND SYSTEMS – METERS. PCR EPDIItaly007: Electronic and Electrical Products and Systems

## Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. EPD Norway shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

## Functional unit:

1 Unit of BAS2 E16

## Verification:

Independent verification of the declaration and data, according to ISO14025:2010

internal

external



Silvia Vilčeková

Independent verifier approved by EPD Norway

## Owner of the declaration:

BASTEK AB  
Contact person: Stefan Nilsson  
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## Manufacturer:

BASTEK AB  
Hästvägen 4A, 21235 Malmö  
Phone: +46 10 330 80 00  
e-mail: info@bastec.se

## Place of production:

Malmö, Sweden

## Management system:

ISO14001, ISCC Plus, IQD128 standard, ISO 9001, ISO 22000, SINTEF

## Organisation no:

556346-6738

## Issue date:

09.02.2024

## Valid to:

09.02.2029

## Year of study:

2023

## Comparability:

EPD of construction products may not be able to compare if they do not comply with EN 15804 and are seen in a building context.

## The EPD has been worked out by:

Amit Lotan, CarbonZero AB

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Approved



Manager of EPD Norway

# Company

## Company information:

Bastec develops systems used to control and monitor ventilation, heating, cooling and other technical systems in buildings. Our building automation system BAS2 is used in all types of buildings, ranging from offices and apartments to hospitals and science labs.

# Product

## Product description:

E16 is an expansion module for XE16-COM, based on the flexible and easy-to use BAS2 concept from Bastec. Connecting an E16 module to the existing system increases the number of input and outputs quickly, with ease and cost efficiently. A maximum of two modules can be connected to each XE16-COM.

BAS2 XE16-COM is a compact DDC based on the flexible and easy-to use BAS2 concept. An integrated mounting for DIN rail in combination with a shape that matches standard housings makes incorporation simple and inexpensive, even in small applications. The simplicity and flexibility of the BAS2 system keeps costs down and increases energy savings. BAS2 can also be integrated with other systems, e.g. an existing DHC system.

## Product specification:

E16 is an expansion module for XE16-COM, based on the flexible and easy-to use BAS2 concept from Bastec.

Materials (product)	Weight (g)	Percentage
Lid	70.106	29.84%
A-B-S Cover	51.029	21.72%
Bottom	43.442	18.49%
PCB	36.6	15.58%
Capacitors Other	9.277	3.95%
Electro mechanics	8.474	3.61%
Inductors	4.807	2.05%
Integrated circuits	4.607	1.96%
Locking Device	4.144	1.76%
Semiconductors (not IC)	1.043	0.44%
Resistors	0.816	0.35%
Crystals	0.545	0.23%
Capacitors 0603	0.03	0.01%
Resistors 0603	0.018	0.01%
<b>Total</b>	<b>183.909</b>	<b>100%</b>
Materials (packaging)		
Cardboard	79.9	
<b>Total</b>	<b>79.9</b>	<b>100%</b>

## Technical data:

BAS2 E16: 1Unit – 235gr

### Technical functions:

- Supply voltage: 24 V AC  $\pm$  10%
- Power consumption: Max. 2 W (excl. externally connected objects such as actuators)
- Digital input: 12–30 V DC or 24 V AC, 5 mA input current
- Analogue input: Pt 1000DIN, Ni1000 (L&G, L&S, Siemens), 12-bit resolution (approx. 0.07 °C). 0–10 V, 2–10 V, 0–20 mA, 4–20 mA (with external resistor 500  $\Omega$ )
- Communication: Expansion port (COM) for connection of 1–2 x E16 to one XE16-COM.
- Dimensions (WxHxD): 125 x 120 x 58 mm
- Mounting: DIN rail
- UN CPC code: 4621 “Electricity distribution or control apparatus”
- Certification: CE, SundaHus environmental classification

## Market:

Sweden

## Reference service life, product:

10 years

## LCA: Calculation rules

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### Declared unit:

1 Unit

### Cut-off criteria:

The following procedures were followed for the exclusion of inputs and output.

- All input and output flows in a unit process were considered i.e., considering the value of all flows in the unit process and the corresponding LCI where data was available.
- Data gaps were filled by conservative assumptions with average or generic data. Any assumptions in such cases were documented.
- The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%).

All hazardous and toxic materials and substances are included in the inventory and the cut-off rules do not apply.

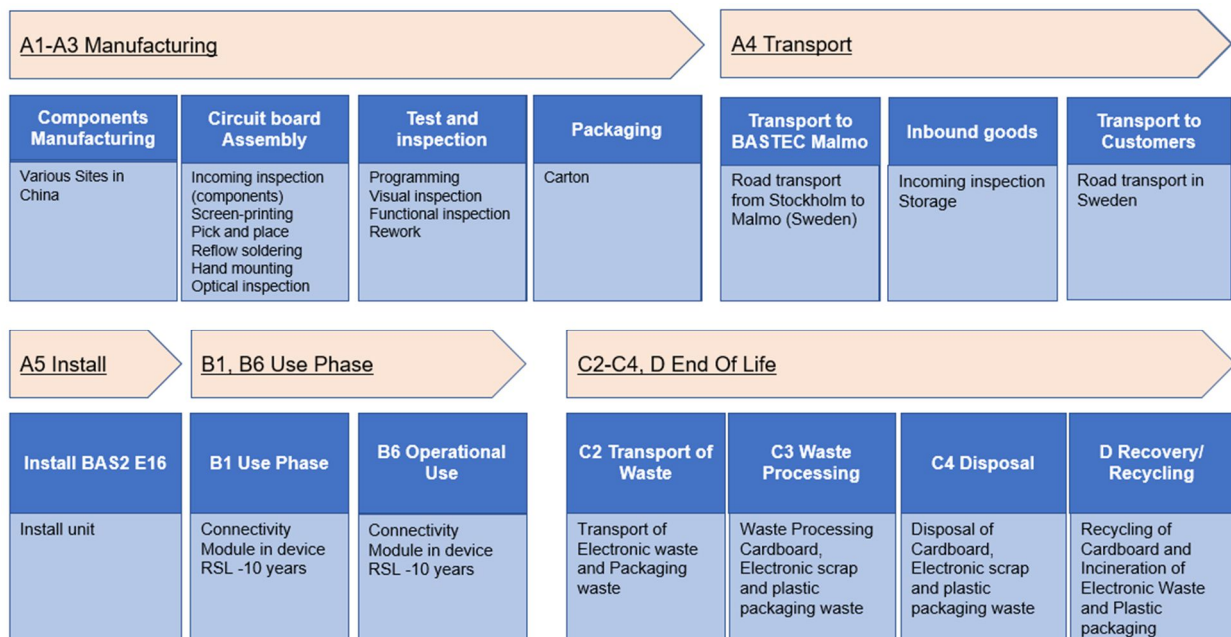
### Allocation:

Allocation criteria is based on mass.

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	MNR	MNR	MNR	MNR	X	MNR	MNR	X	X	X	X

System boundary:



## LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

### Transport from production place to assembly/user (A4)

Transport from production place to assembly/user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption
Truck	61	660	1,95 l/tkm diesel

### End of Life (C1, C3, C4)

The average waste rates from Sweden and Norway has been used as these are the largest markets for this product.

	Value	Unit
Recycling	43	%
Incineration*	53	%
Landfill	4	%

\*Note that the incineration includes energy recovery in module D.

### Transport to waste processing (C2)

Transport from production place to assembly/user (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption
Truck	61	100	1,95 l/tkm

# LCA: Results

## Core environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	B1	B6	C2	C3	C4	D
GWP - total	kg CO <sub>2</sub> eq	1.76E+01	8.27E-03	0.00E+00	0.00E+00	0.00E+00	6.96E-06	0.00E+00	6.96E-06	-2.37E-04
GWP - fossil	kg CO <sub>2</sub> eq	1.76E+01	8.32E-03	0.00E+00	0.00E+00	0.00E+00	7.00E-06	0.00E+00	7.00E-06	-2.37E-04
GWP - biogenic	kg CO <sub>2</sub> eq	3.61E-02	-1.22E-04	0.00E+00	0.00E+00	0.00E+00	-1.04E-07	0.00E+00	-1.04E-07	-1.43E-08
GWP - luluc	kg CO <sub>2</sub> eq	1.02E-02	7.69E-05	0.00E+00	0.00E+00	0.00E+00	6.50E-08	0.00E+00	6.50E-08	-2.45E-09
ODP	kg CFC11 eq	2.38E-04	1.08E-15	0.00E+00	0.00E+00	0.00E+00	6.15E-19	0.00E+00	6.15E-19	-6.43E-17
AP	molc H+ eq	8.55E-02	1.29E-05	0.00E+00	0.00E+00	0.00E+00	9.31E-09	0.00E+00	9.31E-09	-1.71E-07
EP- freshwater	kg P eq	6.88E-05	3.04E-08	0.00E+00	0.00E+00	0.00E+00	2.56E-11	0.00E+00	2.56E-11	-2.76E-11
EP -marine	kg N eq	1.28E-02	4.78E-06	0.00E+00	0.00E+00	0.00E+00	3.29E-09	0.00E+00	3.29E-09	-8.29E-08
EP - terrestrial	molc N eq	1.38E-01	5.64E-05	0.00E+00	0.00E+00	0.00E+00	3.96E-08	0.00E+00	3.96E-08	-9.42E-07
POCP	kg NMVOC eq	3.88E-02	1.14E-05	0.00E+00	0.00E+00	0.00E+00	8.04E-09	0.00E+00	8.04E-09	-2.13E-07
ADP-M&M <sup>2</sup>	kg Sb-Eq	1.62E-03	5.51E-10	0.00E+00	0.00E+00	0.00E+00	4.56E-13	0.00E+00	4.56E-13	-1.65E-13
ADP-fossil <sup>2</sup>	MJ	2.57E+02	1.13E-01	0.00E+00	0.00E+00	0.00E+00	9.55E-05	0.00E+00	9.55E-05	-1.44E-04
WDP <sup>2</sup>	m <sup>3</sup>	3.36E+00	1.00E-04	0.00E+00	0.00E+00	0.00E+00	8.09E-08	0.00E+00	8.09E-08	-4.32E-05

**GWP-total:** Global Warming Potential; **GWP-fossil:** Global Warming Potential fossil fuels; **GWP-biogenic:** Global Warming Potential biogenic; **GWP-LULUC:** Global Warming Potential land use and land use change; **ODP:** Depletion potential of the stratospheric ozone layer; **AP:** Acidification potential, Accumulated Exceedance; **EP-freshwater:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; See “additional Norwegian requirements” for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Reading example: 9,0 E-03 = 9,0\*10<sup>-3</sup> = 0,009

## Voluntary environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	B1	B6	C2	C3	C4	D
GWP-GHG	kg CO <sub>2</sub> eq	1.25E-01	8.07E-03	0.00E+00	0.00E+00	0.00E+00	6.79E-06	0.00E+00	6.79E-06	2.36E-04

## Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	A5	B1	B6	C2	C3	C4	D
PM	Disease incidence	8.59E-07	1.09E-10	0.00E+00	0.00E+00	0.00E+00	7.74E-14	0.00E+00	7.74E-14	-1.29E-12
IRP <sup>1</sup>	kBq U235 eq.	1.41E+00	3.17E-05	0.00E+00	0.00E+00	0.00E+00	1.79E-08	0.00E+00	1.79E-08	-1.01E-06
ETP-fw <sup>2</sup>	CTUe	1.23E+02	8.10E-02	0.00E+00	0.00E+00	0.00E+00	6.73E-05	0.00E+00	6.73E-05	-9.73E-05
HTP-c <sup>2</sup>	CTUh	4.23E-09	1.64E-12	0.00E+00	0.00E+00	0.00E+00	1.36E-15	0.00E+00	1.36E-15	-9.08E-15
HTP-nc <sup>2</sup>	CTUh	2.02E-07	7.32E-11	0.00E+00	0.00E+00	0.00E+00	5.99E-14	0.00E+00	5.99E-14	-6.08E-13
SQP <sup>2</sup>	Dimensionless	4.05E+01	4.73E-02	0.00E+00	0.00E+00	0.00E+00	3.98E-05	0.00E+00	3.98E-05	-3.98E-05

**PM:** Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

<sup>1</sup> This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

<sup>2</sup> The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

## Resource use

Parameter	Unit	A1-A3	A4	A5	B1	B6	C2	C3	C4	D
RPEE	MJ	5.57E+01	8.23E-03	0.00E+00	0.00E+00	0.00E+00	6.76E-06	0.00E+00	6.76E-06	-3.61E-05
RPEM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	5.57E+01	8.23E-03	0.00E+00	0.00E+00	0.00E+00	6.76E-06	0.00E+00	6.76E-06	-3.61E-05
NRPE	MJ	2.58E+02	1.14E-01	0.00E+00	0.00E+00	0.00E+00	9.57E-05	0.00E+00	9.57E-05	-1.44E-04
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	2.58E+02	1.14E-01	0.00E+00	0.00E+00	0.00E+00	9.57E-05	0.00E+00	9.57E-05	-1.44E-04
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m <sup>3</sup>	1.24E-01	9.02E-06	0.00E+00	0.00E+00	0.00E+00	7.45E-09	0.00E+00	7.45E-09	-1.01E-06

**RPEE** Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable primary energy resources used as materials; **TRPE** Total use of non-renewable primary energy resources; **SM** Use of secondary materials; **RSF** Use of renewable secondary fuels; **NRSF** Use of non-renewable secondary fuels; **W** Use of net fresh water.



### End of life – Waste

Parameter	Unit	A1-A3	A4	A5	B1	B6	C2	C3	C4	D
HW	kg	6.54E-05	3.52E-13	0.00E+00	0.00E+00	0.00E+00	3.54E-16	0.00E+00	3.54E-16	-5.79E-15
NHW	kg	4.70E-01	1.73E-05	0.00E+00	0.00E+00	0.00E+00	1.38E-08	0.00E+00	1.38E-08	-5.02E-05
RW	kg	1.36E-02	2.13E-07	0.00E+00	0.00E+00	0.00E+00	1.24E-10	0.00E+00	1.24E-10	-6.68E-09

*HW* Hazardous waste disposed; *NHW* Non-hazardous waste disposed; *RW* Radioactive waste disposed.

### End of life – output flow

Parameter	Unit	A1-A3	A4	A5	B1	B6	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4.52E-03	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5.06E-02	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-2,73E-01	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-4,12E-01	0,00E+00	0,00E+00

*CR* Components for reuse; *MR* Materials for recycling; *MER* Materials for energy recovery; *EEE* Exported electric energy; *ETE* Exported thermal energy.

### Information describing the biogenic carbon content at the factory gate

Biogenic carbon content*	Unit	Value
Biogenic carbon content in product	kg C	3.22E-10
Biogenic carbon content in the accompanying packaging	kg C	2,57E-06

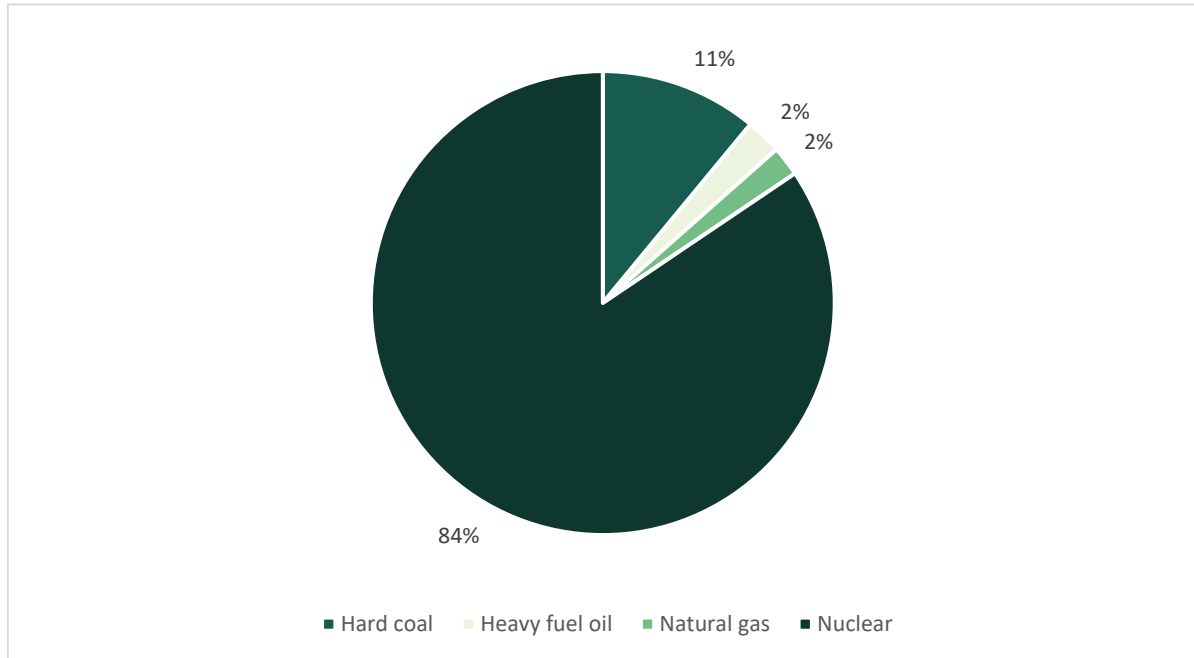
\*44/12 is the ratio between the molecular mass of CO<sub>2</sub> and C molecules

## Additional requirements

### Location based electricity mix from the use of electricity in manufacturing

The manufacturing process has been modelled and calculated according to the national residual mix with data retrieved from the Association of Issuing Bodies (2022).

National electricity grid	Data source	GWP excl. biogenic [kg CO <sub>2</sub> -eq/kWh]
Swedish residual mix	AIB (2020)	0,037



### Indoor Environment

BASTEC have done emission measurements according to ISO 160000-9:2006 for volatile organic compounds (VOC). The test results are in compliance with the requirements.






### Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- The product contains no substances given by the REACH Candidate list.
- The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.
- The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List, see table.
- The product contains no substances given by the REACH Candidate list.
- The product is classified as hazardous waste, see table.

## Bibliography

Association of Issuing Bodies	European Residual Mixes 2021 (2022) <a href="https://www.aib-net.org/sites/default/files/assets/facts/residual-mix/2021/AIB_2021_Residual_Mix_Results_1_1.pdf">https://www.aib-net.org/sites/default/files/assets/facts/residual-mix/2021/AIB_2021_Residual_Mix_Results_1_1.pdf</a> (Retrieved 2023-09-20)
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
PCR 011/007	PCR EPDIItaly011: ELECTRONIC AND ELECTRICAL PRODUCTS AND SYSTEMS – METERS. PCR EPDIItaly007: Electronic and Electrical Products and Systems
SCB	Swedish Statistics. (2020) Treated waste by treatment category and waste category. Every second year 2010 – 2020. <a href="https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START_MI_MI0305/MI0305T003/">https://www.statistikdatabasen.scb.se/pxweb/en/ssd/START_MI_MI0305/MI0305T003/</a> (Retrieved 2023-09-20)
SSB	Statistics Norway. (2021) Waste account for Norway (1 000 tonnes), by treatment, contents, year and material. <a href="https://www.ssb.no/en/statbank/table/10513/tableViewLayout1/">https://www.ssb.no/en/statbank/table/10513/tableViewLayout1/</a> (Retrieved 2023-10-30)

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