



## ENVIRONMENTAL PRODUCT DECLARATION IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Siniat Thermal EPS Board  
Etex Building Performance Limited



EPD HUB, HUB-0960

Publishing date 15 December 2023, last updated on 15 December 2023, valid until 15 December 2028.

# GENERAL INFORMATION

## MANUFACTURER

Manufacturer	Etex Building Performance Limited
Address	Marsh Ln, Easton-in-Gordano, Bristol BS20 0NE, United Kingdom
Contact details	marketing@etexbp.co.uk
Website	https://www.siniat.co.uk/

## EPD STANDARDS, SCOPE AND VERIFICATION

Program operator	EPD Hub, hub@epdhub.com
Reference standard	EN 15804+A2:2019 and ISO 14025
PCR	EPD Hub Core PCR version 1.0, 1 Feb 2022
Sector	Construction product
Category of EPD	Third party verified EPD
Scope of the EPD	Cradle to gate with options, A4-B7, and modules C1-C4, D
EPD author	Julien Soulhat
EPD verification	Independent verification of this EPD and data, according to ISO 14025: <input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification
EPD verifier	Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

## PRODUCT

Product name	Siniat Thermal EPS Boards
Additional labels	-
Product reference	-
Place of production	Bristol plant, Redland Ave, Easton-in-Gordano, Bristol BS20 0FB, UK.
Period for data	01/01/2022 - 31/12/2022
Averaging in EPD	No averaging
Variation in GWP-fossil for A1-A3	-

## ENVIRONMENTAL DATA SUMMARY

Declared unit	1m <sup>2</sup> of board
Declared unit mass	6.30 kg
GWP-fossil, A1-A3 (kgCO <sub>2</sub> e)	2,80
GWP-total, A1-A3 (kgCO <sub>2</sub> e)	2,25
Secondary material, inputs (%)	42.4
Secondary material, outputs (%)	43.5
Total energy use, A1-A3 (kWh)	10.1
Total water use, A1-A3 (m <sup>3</sup> e)	1,42E-02

## PRODUCT AND MANUFACTURER

### ABOUT THE MANUFACTURER

Etex Building Performance Limited is part of the global Etex Group of Companies, which operates across Europe, Africa, Near & Middle East and South America. Etex Building Performance Limited manufactures drywall products and systems for partitions, ceilings, wall linings and external sheathing purposes under the Siniat brand. Our products are used by small builders through to some of the most acclaimed architects and construction companies in the country.

### PRODUCT DESCRIPTION

Siniat Thermal EPS Board is for use as a general purpose drylining panel made of a plasterboard laminated with expanded polystyrene to provide thermal insulation for modest upgrade to existing insulating walls.

Siniat Thermal EPS Board is coloured ivory on the front and has expanded white polystyrene foam on the back. It has tapers down the long edges of the front. The plasterboard is made from aerated calcium sulphate dihydrate enclosed inside liners made from recycled waste paper with bound edges. Core and papers are bonded with starch. Edge glue is PVA. Various thicknesses of expanded polystyrene (EPS) are factory bonded to a Siniat Standard 9.5 mm board using PVA adhesive. The density of the EPS insulation is 13 kg/m<sup>3</sup>. Siniat Thermal EPS Board is available in 1200 mm of width and 2400 mm of length.

Siniat Thermal EPS Board complies with BS EN 13950:2014. The EPS insulation complies with BS EN 13163:2012+A2:2016. Siniat Standard Board, on which the insulation is laminated, complies with BS EN 520:2004+A1:2009 Type A.

Further information can be found at <https://www.siniat.co.uk/>.

This EPD covers the 30 mm Siniat Thermal EPS Board produced in the Bristol plant. In annex of this EPD, a scaling table is provided to provide GWP impacts for the 22 mm, 40 mm and 50 mm Siniat Thermal EPS board.

### PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	88,3	UK and EU
Fossil materials	5,7	UK and EU
Bio-based materials	6,1	UK and EU

### BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0.19
Biogenic carbon content in packaging, kg C	0.013

### FUNCTIONAL UNIT AND SERVICE LIFE

Declared unit	1m <sup>2</sup> of the 30 mm Siniat Thermal EPS Board.
Mass per declared unit	6.30 kg
Functional unit	1m <sup>2</sup> of panel installed vertically by mean of mechanical fixings, offering a seamless finished substrate ready to receive additional finishing solutions.
Reference service life	60 years

### SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

## PRODUCT LIFE-CYCLE

### SYSTEM BOUNDARY

This EPD covers the life-cycle modules listed in the following table.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D		
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

### MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Transport for raw materials considers the distance from the extraction or manufacturing location of the raw material to the production plant and the modelling of the relevant transportation type (e.g. bulk sea fret, road lorry, train, ...) for each raw material.

Transport assumption has also been made to take into account the impact of the transport of diesel and propane which are delivered by road lorries to the plants.

Regarding the energy used: 1) propane is sourced from local dealers from domestic production (e.g natural gas processing, oil refining operations), 2) diesel is also sourced from local dealers and is manufactured in UK refinery compounds from North sea crude oil, 3) natural gas comes within a mix of UK production from north sea extraction compounds, pipeline import from Northern EU countries or Liquefied Natural Gas (LNG) import, 4) 100% of the electricity used in the manufacturing plants is sourced from renewable sources (21% from solar, 79% from wind).

Plant specific manufacturing waste data is reported by each manufacturing location into the Etex internal information system. Based on this data, a representative production loss ratio for each plant was considered in the LCA. Manufacturing wastes are of the following types: 1) Plasterboard wastes generated on the production lines and sent outside the plant to specialize partners for treatment and recycling, 2) Paper wastes coming from paper rolls feeding the production line with front and back paper liner, sent outside the plant to specialize partners for treatment and recycling, 3) waste of insulation material sent to municipal incineration for energy recovery. No process liquid water is released to the environment whereas water vapour is released in the atmosphere during calcination and drying.

The transport assumptions for manufacturing wastes are based on the following principle: 1) transportation distances are calculated taking into account the address of the plant where the waste is issued and the address of the third party location where the waste is treated (Google map has

been used to calculate the distance), 2) the transport method reflects the actual type of transport used to convey the wastes to third party location (i.e. road transport).

### **TRANSPORT AND INSTALLATION (A4-A5)**

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The products are delivered by road from the plants to construction sites and stockists across the UK. The average delivery distance in 2022 to the stockist is estimated to be 180 km from Bristol. We also considered an additional delivery journey to site which is estimated to be 30 km on average.

Thermal boards can be installed by either dot & dab or dryliner method. For dot & dab installation, the thermal board is glued to the wall using Siniat Universal Bonding Compound and then secured with nailable plugs. For the dryliner method, the thermal board is screw fixed to dryliner metal channels and tracks. Then, for both installation methods, the joints are treated with jointing compound.

The consumptions of screws and jointing compound are declared within this section as installation resources, for the dryliner installation method. A small quantity of water is also consumed in the mixing of jointing materials. No significant fuels or energy are consumed during installation and the process does not produce any emissions apart from solid wastes and water evaporation. For both Thermal Boards and jointing materials, a site wastage rate of 5% is assumed. 100 % of this waste is assumed to be recycled as the life cycle model as per the final Ashdown Agreement 2016 report assumes no landfilling of plasterboard waste arising from installation.

### **PRODUCT USE AND MAINTENANCE (B1-B7)**

The product has a reference service life of 60 years, providing the product is installed as per Etex Building Performance Limited recommendations. In such case, the product will last during its life of use without any requirements for maintenance, repair, replacement or refurbishment throughout this period, providing normal and no accidental conditions of usage are encountered. The product will also not need any operational energy nor operational water to fulfil its duty, once installed in the building.

Air, soil, and water impacts during the use phase have not been studied.

### **PRODUCT END OF LIFE (C1-c4, D)**

We have considered that the insulation panels are collected and that the gypsum board is separated from the insulation material. Then we have considered that 100% of the insulation material is going to municipal incineration for energy recovery. We have also considered that 29% share of gypsum boards from those demolition wastes are going to recycling at end of life (a similar share of post-consumer recycling gypsum is used in A1). The remaining 71% share of gypsum boards is going to landfill. The transport of the thermal board wastes to the recycling centre is considered to be 215 km. The transport to landfill or municipal incineration centre is 30km. No energy has been considered for C1, it has been assumed that demolition is carried out without power tools or is using negligible amounts of energy.

## **MANUFACTURING PROCESS**

### **DESCRIPTION**

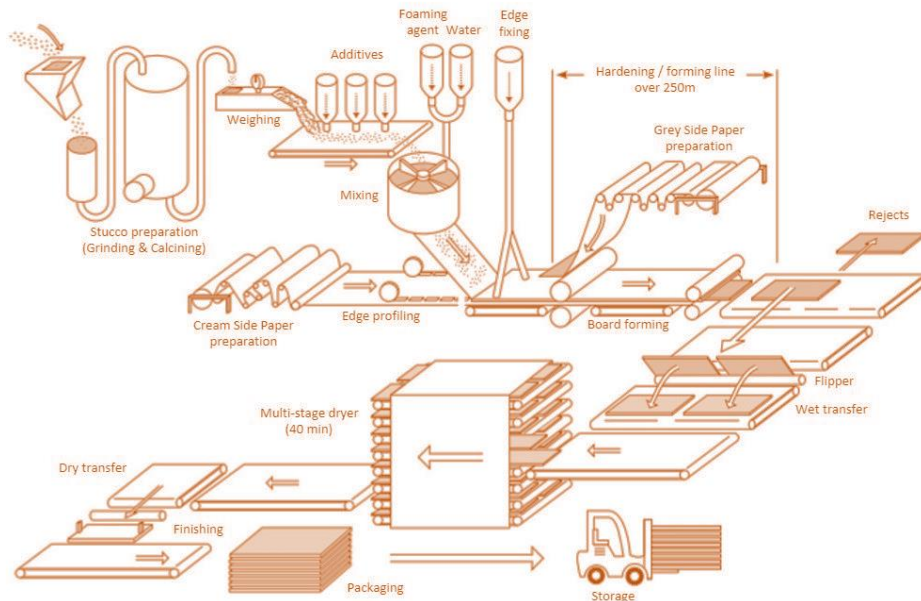
Gypsum is stored in silos than first milled and calcined to plaster by heating to around 160 Celsius. The plaster is then mixed with additives and water to form a slurry in which the rehydration back to gypsum begins. The slurry is introduced between the face and back paper liners in a forming process



which defines board thickness and width. During plaster setting over several minutes a high strength mechanical bond forms at the gypsum/paper interface.

Excess water is removed from boards by passing them through a fan-assisted oven for around 40 minutes. During drying starch migrates to the surface of the gypsum core, adding further strength by means of a chemical bond. Dried boards are cut to size and then packed for storage and distribution.

See below the manufacturing process flow diagram for the plasterboard:



Then after drying, the board is laminated on a thermal insulation panel on the laminating line.

Plasterboard is manufactured using state-of-the-art production equipment to rigorous quality assurance standards complying with the BS EN ISO 9001

standard. Environmental management of the manufacturing process is certified to BS EN ISO 14001. Responsible sourcing of all material supply chains and the production process is certified to the BES6001 Framework Standard (certificate held at "Very Good" level).

### PROCESS FLOW DIAGRAM



## LIFE-CYCLE ASSESSMENT

### CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the reference standard and the applied PCR. The study does not exclude any hazardous materials or substances. The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

### ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. All allocations are done as per the reference standards and the applied PCR. In this study, allocation has been done in the following ways:

Data type	Allocation
Raw materials	No Allocation
Packaging materials	Allocated by mass or volume
Ancillary materials	Allocated by mass or volume
Manufacturing energy and waste	Allocated by mass or volume

### AVERAGES AND VARIABILITY

Type of average	No averaging
Averaging method	Not applicable
Variation in GWP-fossil for A1-A3	n/a

This EPD covers the 30 mm Siniat Thermal EPS board produced in the Bristol plant. The product is manufactured in 1200mm of width. LCA calculation have been carried out for single product on single location, hence no averaging has been used.

### LCA SOFTWARE AND BIBLIOGRAPHY

This EPD has been created using One Click LCA EPD Generator. The LCA and EPD have been prepared according to the reference standards and ISO 14040/14044. Ecoinvent v3.8 and One Click LCA databases were used as sources of environmental data.

# ENVIRONMENTAL IMPACT DATA

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	1,02E+00	1,47E-01	1,08E+00	2,25E+00	2,25E-01	3,42E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,12E-01	9,46E-01	4,20E-01	-1,83E-01
GWP – fossil	kg CO <sub>2</sub> e	1,59E+00	1,47E-01	1,07E+00	2,80E+00	2,25E-01	3,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,12E-01	7,83E-01	2,34E-02	2,88E-02
GWP – biogenic	kg CO <sub>2</sub> e	-5,76E-01	0,00E+00	1,44E-02	-5,61E-01	0,00E+00	2,66E-03	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	1,62E-01	3,97E-01	-2,13E-01
GWP – LULUC	kg CO <sub>2</sub> e	4,05E-03	9,68E-05	7,94E-05	4,22E-03	9,43E-05	4,67E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,68E-05	2,18E-05	2,21E-05	7,45E-04
Ozone depletion pot.	kg CFC <sub>11</sub> e	5,13E-08	3,10E-08	1,58E-07	2,40E-07	4,85E-08	2,37E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,41E-08	1,36E-08	9,49E-09	2,77E-09
Acidification potential	mol H <sup>+</sup> e	5,35E-03	2,44E-03	1,08E-03	8,87E-03	6,62E-04	9,72E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,29E-04	6,55E-02	2,20E-04	3,02E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,63E-05	9,11E-07	2,46E-06	2,96E-05	1,91E-06	4,27E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,48E-07	7,17E-07	2,46E-07	4,93E-06
EP-marine	kg Ne	1,59E-03	5,47E-04	2,85E-04	2,43E-03	1,32E-04	2,98E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,56E-05	1,84E-04	7,63E-05	-9,38E-05
EP-terrestrial	mol Ne	1,24E-02	6,10E-03	3,12E-03	2,17E-02	1,47E-03	3,00E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,30E-04	2,01E-03	8,39E-04	-6,07E-05
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	3,85E-03	1,67E-03	1,09E-03	6,61E-03	5,52E-04	1,41E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,74E-04	4,57E-03	2,44E-04	5,50E-05
ADP-minerals & metals <sup>4)</sup>	kg Sbe	1,53E-04	3,29E-07	8,50E-07	1,54E-04	7,96E-07	2,52E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,95E-07	3,67E-07	5,39E-08	-6,57E-05
ADP-fossil resources	MJ	2,27E+01	2,03E+00	1,81E+01	4,29E+01	3,26E+00	3,39E+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	1,62E+00	7,73E-01	6,43E-01	9,36E-01
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	7,79E-01	8,01E-03	3,60E-02	8,23E-01	1,44E-02	6,00E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,16E-03	2,55E-02	2,04E-03	1,30E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO<sub>4</sub>e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

## ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	5,32E-08	9,44E-09	9,23E-09	7,19E-08	1,79E-08	2,10E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,89E-09	7,43E-08	4,44E-09	1,44E-08
Ionizing radiation <sup>6)</sup>	kBq U235e	2,77E-02	9,49E-03	1,34E-02	5,06E-02	1,53E-02	9,52E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,58E-03	6,92E-03	2,91E-03	3,46E-02
Ecotoxicity (freshwater)	CTUe	5,18E+01	1,59E+00	1,84E+00	5,53E+01	2,99E+00	8,01E+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	1,48E+00	1,54E+01	4,20E-01	-1,74E+00
Human toxicity, cancer	CTUh	6,94E-10	7,82E-11	1,76E-10	9,49E-10	8,42E-11	1,06E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,18E-11	2,16E-10	1,05E-11	2,28E-10
Human tox. non-cancer	CTUh	1,01E-08	1,32E-09	1,57E-09	1,29E-08	2,71E-09	2,09E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,35E-09	4,55E-09	2,74E-10	2,34E-09
SQP <sup>7)</sup>	-	4,15E+00	1,19E+00	2,11E+00	7,45E+00	2,29E+00	4,11E+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	1,13E+00	1,31E+00	1,38E+00	6,13E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.



### USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	1,26E+00	1,98E-02	1,55E+00	2,82E+00	3,87E-02	6,46E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,92E-02	7,48E-02	5,58E-03	1,17E+00
Renew. PER as material	MJ	6,23E+00	0,00E+00	-1,96E-01	6,03E+00	0,00E+00	3,64E-03	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	-1,75E+00	-4,29E+00	1,49E+00
Total use of renew. PER	MJ	7,49E+00	1,98E-02	1,35E+00	8,86E+00	3,87E-02	6,50E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,92E-02	-1,68E+00	-4,28E+00	2,66E+00
Non-re. PER as energy	MJ	1,35E+01	2,03E+00	1,80E+01	3,35E+01	3,26E+00	3,64E+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	1,62E+00	7,73E-01	6,43E-01	8,99E-01
Non-re. PER as material	MJ	9,17E+00	0,00E+00	-9,44E-02	9,08E+00	0,00E+00	-9,94E-02	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	-2,60E+00	-6,37E+00	2,39E-01
Total use of non-re. PER	MJ	2,27E+01	2,03E+00	1,79E+01	4,26E+01	3,26E+00	3,54E+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	1,62E+00	-1,83E+00	-5,73E+00	1,14E+00
Secondary materials	kg	2,66E+00	8,50E-04	1,46E-03	2,66E+00	1,09E-03	1,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,41E-04	5,05E-04	1,35E-04	-2,33E-02
Renew. secondary fuels	MJ	3,12E-02	4,93E-06	6,22E-05	3,13E-02	1,41E-05	2,07E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,01E-06	1,04E-05	3,53E-06	-8,97E-03
Non-ren. secondary fuels	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	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
Use of net fresh water	m <sup>3</sup>	1,31E-02	2,04E-04	8,98E-04	1,42E-02	3,89E-04	1,72E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,93E-04	1,09E-03	7,04E-04	2,67E-03

8) PER = Primary energy resources.

### END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,22E-01	2,99E-03	6,06E-03	1,31E-01	4,72E-03	1,14E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,34E-03	3,49E-03	0,00E+00	2,05E-03
Non-hazardous waste	kg	7,01E-01	3,60E-02	9,48E-02	8,32E-01	7,53E-02	4,53E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,74E-02	2,38E+00	4,45E+00	2,31E-01
Radioactive waste	kg	1,11E-05	1,39E-05	1,27E-05	3,78E-05	2,17E-05	2,70E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,08E-05	4,41E-06	0,00E+00	1,01E-05

### END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	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	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
Materials for recycling	kg	0,00E+00	0,00E+00	3,85E-01	3,85E-01	0,00E+00	3,92E-01	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	2,41E+00	0,00E+00	0,00E+00
Materials for energy rec	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	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
Exported energy	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	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

### ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO <sub>2</sub> e	1,53E+00	1,45E-01	1,05E+00	2,73E+00	2,23E-01	3,36E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,11E-01	7,82E-01	2,30E-02	2,44E-02
Ozone depletion Pot.	kg CFC <sub>11</sub> e	4,53E-08	2,46E-08	1,38E-07	2,08E-07	3,85E-08	1,99E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,91E-08	1,18E-08	7,51E-09	2,16E-09
Acidification	kg SO <sub>2</sub> e	4,18E-03	1,97E-03	8,58E-04	7,01E-03	5,43E-04	8,77E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,70E-04	6,00E-02	1,67E-04	3,01E-04
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	1,64E-03	2,25E-04	1,83E-04	2,05E-03	1,20E-04	3,16E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,95E-05	2,13E-04	3,59E-05	9,00E-05
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	2,52E-04	5,78E-05	7,22E-05	3,82E-04	2,70E-05	3,73E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,34E-05	2,40E-03	6,98E-06	5,33E-06
ADP-elements	kg Sbe	5,66E-06	3,22E-07	8,41E-07	6,82E-06	7,78E-07	4,90E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,86E-07	2,84E-07	5,31E-08	-3,11E-07
ADP-fossil	MJ	2,27E+01	2,03E+00	1,81E+01	4,29E+01	3,26E+00	4,06E+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	1,62E+00	7,73E-01	6,43E-01	9,33E-01

### ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements	kg Sbe	5,65E-06	3,22E-07	8,41E-07	6,82E-06	7,78E-07	6,13E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,86E-07	2,84E-07	5,31E-08	-3,11E-07
Hazardous waste disposed	kg	1,23E-01	2,99E-03	6,06E-03	1,32E-01	4,72E-03	1,14E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,34E-03	3,49E-03	0,00E+00	2,05E-03
Non-haz. waste disposed	kg	6,54E-01	3,60E-02	9,48E-02	7,85E-01	7,53E-02	4,49E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,74E-02	2,38E+00	4,45E+00	2,31E-01
Air pollution	m <sup>3</sup>	2,91E+02	2,54E+01	2,75E+01	3,44E+02	3,32E+01	1,00E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,65E+01	2,64E+02	5,16E+00	-6,06E+01
Water pollution	m <sup>3</sup>	2,80E+00	1,40E-01	5,44E-01	3,48E+00	2,60E-01	2,12E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E-01	1,57E+02	3,41E-02	1,17E+00

### ENVIRONMENTAL IMPACTS – BEPALINGSMETODE, NETHERLANDS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Shadow price	€	1,71E-01	-1,54E-05	-1,06E-02	1,61E-01	0,00E+00	5,23E-04	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	2,01E+00	3,86E-03	5,99E-03
Terrestrial ecotoxicity	DCB eq	5,38E-02	-3,57E-07	-5,84E-03	4,80E-02	0,00E+00	-2,29E-03	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	-1,46E-02	6,39E-05	1,01E-03
Seawater ecotoxicity	DCB eq	1,36E+02	-1,95E-02	-7,23E+00	1,29E+02	0,00E+00	1,74E+01	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	1,66E+04	4,04E+00	0,00E+00
Freshwater ecotoxicity	DCB eq	1,44E-01	-1,95E-06	-1,95E-06	1,29E-01	0,00E+00	-6,06E-03	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	-3,43E-02	4,00E-04	-1,11E-03
Human ecotoxicity	DCB eq	4,41E-01	-5,51E-05	-3,67E-02	4,04E-01	0,00E+00	4,64E-02	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	1,09E+00	1,38E-02	-7,70E-03
EEE	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	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
ETE	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	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

## VERIFICATION STATEMENT

### VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliance with reference standard, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The digital background data for this EPD

Why does verification transparency matter? [Read more online](#)

This EPD has been generated by One Click LCA EPD generator, which has been verified and approved by the EPD Hub.

### THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of the data collected and used in the LCA calculations, the way the LCA-based calculations have been carried out, the presentation of environmental data in the EPD, and other additional environmental information, as present with respect to the procedural and methodological requirements in ISO 14025:2010 and reference standard.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Magaly González Vázquez, as an authorized verifier acting for EPD Hub Limited

15.12.2023



**ANNEX 1: SCALING TABLE FOR THE GWP RESULTS OF THE 22 MM, 40 MM AND 50 MM SINIAT THERMAL EPS BOARD.**

Product		Siniat Thermal EPS Board 22	Siniat Thermal EPS Board 30	Siniat Thermal EPS Board 40	Siniat Thermal EPS Board 50
Thickness		22 mm	30 mm	40 mm	50 mm
Product Weight per 1 m <sup>2</sup>		6,2 kg/m <sup>2</sup>	6,3 kg/m <sup>2</sup>	6,4 kg/m <sup>2</sup>	6,5 kg/m <sup>2</sup>
Impact category		A1-A3	A1-A3	A1-A3	A1-A3
EN 15804+A2, PEF	GWP – total, kg CO2e	0,81	1,00	1,21	1,44
	GWP – fossil,kg CO2e	0,85	1,00	1,17	1,35
	GWP – biogenic,kg CO2e	1,01	1,00	0,99	0,97
	GWP – LULUC, kg CO2e	1,00	1,00	1,00	1,00
EN 15804+A1 , CML / ISO 21930	Global Warming Pot., kg CO2e	0,86	1,00	1,16	1,34

## ANNEX 2: ENVIRONMENTAL IMPACT DATA (SINIAT THERMAL EPS BOARD 22MM)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	6,02E-01	1,43E-01	1,08E+00	1,83E+00	2,21E-01	3,08E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,10E-01	7,03E-01	4,24E-01	-1,84E-01
GWP – fossil	kg CO <sub>2</sub> e	1,18E+00	1,43E-01	1,06E+00	2,39E+00	2,21E-01	3,05E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,10E-01	5,39E-01	2,31E-02	2,88E-02
GWP – biogenic	kg CO <sub>2</sub> e	-5,83E-01	0,00E+00	1,50E-02	-5,68E-01	0,00E+00	2,34E-03	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	1,64E-01	4,01E-01	-2,13E-01
GWP – LULUC	kg CO <sub>2</sub> e	4,04E-03	9,55E-05	7,88E-05	4,22E-03	9,27E-05	4,67E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,60E-05	1,69E-05	2,18E-05	7,45E-04
Ozone depletion pot.	kg CFC <sub>11</sub> e	4,50E-08	3,03E-08	1,58E-07	2,33E-07	4,77E-08	2,32E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,37E-08	1,18E-08	9,33E-09	2,76E-09
Acidification potential	mol H <sup>+</sup> e	4,45E-03	2,43E-03	1,08E-03	7,96E-03	6,51E-04	9,51E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,23E-04	6,47E-02	2,17E-04	3,03E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,62E-05	8,83E-07	2,44E-06	2,96E-05	1,88E-06	4,26E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,31E-07	5,65E-07	2,42E-07	4,94E-06
EP-marine	kg Ne	1,45E-03	5,45E-04	2,85E-04	2,28E-03	1,30E-04	2,89E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,45E-05	1,56E-04	7,51E-05	-9,36E-05
EP-terrestrial	mol Ne	1,09E-02	6,08E-03	3,11E-03	2,01E-02	1,45E-03	2,90E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,17E-04	1,71E-03	8,25E-04	-5,77E-05
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	3,10E-03	1,66E-03	1,09E-03	5,85E-03	5,43E-04	1,36E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,69E-04	4,44E-03	2,40E-04	5,53E-05
ADP-minerals & metals <sup>4)</sup>	kg Sbe	1,53E-04	3,17E-07	8,39E-07	1,54E-04	7,83E-07	2,52E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,88E-07	3,01E-07	5,30E-08	-6,47E-05
ADP-fossil resources	MJ	1,73E+01	1,98E+00	1,81E+01	3,74E+01	3,21E+00	3,11E+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	1,59E+00	7,19E-01	6,32E-01	9,36E-01
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	6,05E-01	7,81E-03	3,56E-02	6,48E-01	1,42E-02	5,10E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,03E-03	2,04E-02	2,01E-03	1,30E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO<sub>4</sub>e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

### ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	4,58E-08	9,18E-09	9,12E-09	6,41E-08	1,76E-08	2,04E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,73E-09	7,30E-08	4,37E-09	1,42E-08
Ionizing radiation <sup>6)</sup>	kBq U235e	2,61E-02	9,27E-03	1,34E-02	4,87E-02	1,50E-02	9,37E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,44E-03	6,47E-03	2,86E-03	3,46E-02
Ecotoxicity (freshwater)	CTUe	4,96E+01	1,55E+00	1,83E+00	5,30E+01	2,94E+00	7,83E+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	1,46E+00	1,45E+01	4,13E-01	-1,67E+00
Human toxicity, cancer	CTUh	6,36E-10	7,69E-11	1,75E-10	8,88E-10	8,28E-11	1,01E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,11E-11	1,68E-10	1,03E-11	2,28E-10
Human tox. non-cancer	CTUh	9,04E-09	1,28E-09	1,55E-09	1,19E-08	2,67E-09	2,00E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,32E-09	4,05E-09	2,70E-10	2,34E-09
SQP <sup>7)</sup>	-	4,11E+00	1,16E+00	2,08E+00	7,35E+00	2,25E+00	4,10E+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	1,11E+00	1,28E+00	1,35E+00	6,14E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

### USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	1,21E+00	1,93E-02	1,52E+00	2,75E+00	3,81E-02	6,42E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,89E-02	6,97E-02	5,49E-03	1,17E+00
Renew. PER as material	MJ	6,23E+00	0,00E+00	-1,99E-01	6,03E+00	0,00E+00	6,27E-03	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	-	-	1,49E+00
Total use of renew. PER	MJ	7,44E+00	1,93E-02	1,32E+00	8,78E+00	3,81E-02	6,48E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,89E-02	6,97E-02	5,49E-03	2,66E+00
Non-re. PER as energy	MJ	1,08E+01	1,98E+00	1,80E+01	3,08E+01	3,21E+00	3,50E+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	1,59E+00	7,19E-01	6,32E-01	8,99E-01
Non-re. PER as material	MJ	6,46E+00	0,00E+00	7,33E-03	6,47E+00	0,00E+00	-9,77E-02	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	-	-	2,39E-01
Total use of non-re. PER	MJ	1,73E+01	1,98E+00	1,80E+01	3,72E+01	3,21E+00	3,40E+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	1,59E+00	7,19E-01	6,32E-01	1,14E+00
Secondary materials	kg	2,66E+00	8,35E-04	1,45E-03	2,66E+00	1,07E-03	1,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,31E-04	4,55E-04	1,33E-04	-2,33E-02
Renew. secondary fuels	MJ	3,12E-02	4,72E-06	6,12E-05	3,13E-02	1,39E-05	2,07E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,88E-06	9,63E-06	3,47E-06	-8,97E-03
Non-ren. secondary fuels	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	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
Use of net fresh water	m <sup>3</sup>	1,25E-02	1,98E-04	8,89E-04	1,36E-02	3,82E-04	1,68E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,89E-04	9,64E-04	6,92E-04	2,67E-03

8) PER = Primary energy resources.

### END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,17E-01	2,92E-03	6,01E-03	1,26E-01	4,64E-03	1,11E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,30E-03	3,45E-03	0,00E+00	2,05E-03
Non-hazardous waste	kg	6,27E-01	3,50E-02	9,41E-02	7,56E-01	7,41E-02	4,38E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,67E-02	2,25E+00	4,38E+00	2,31E-01
Radioactive waste	kg	1,04E-05	1,36E-05	1,27E-05	3,66E-05	2,13E-05	2,69E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,06E-05	4,35E-06	0,00E+00	1,01E-05

### END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	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	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
Materials for recycling	kg	0,00E+00	0,00E+00	3,79E-01	3,79E-01	0,00E+00	3,85E-01	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	2,38E+00	0,00E+00	0,00E+00
Materials for energy rec	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	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
Exported energy	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	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



### ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO <sub>2</sub> e	1,15E+00	1,42E-01	1,05E+00	2,34E+00	2,19E-01	3,04E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,09E-01	5,38E-01	2,26E-02	2,44E-02
Ozone depletion Pot.	kg CFC <sub>11</sub> e	3,99E-08	2,40E-08	1,38E-07	2,02E-07	3,78E-08	1,94E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,88E-08	1,01E-08	7,38E-09	2,15E-09
Acidification	kg SO <sub>2</sub> e	3,42E-03	1,97E-03	8,55E-04	6,24E-03	5,34E-04	8,58E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,65E-04	5,92E-02	1,64E-04	3,02E-04
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	1,53E-03	2,23E-04	1,82E-04	1,94E-03	1,18E-04	3,08E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,84E-05	1,59E-04	3,53E-05	9,01E-05
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	2,07E-04	5,74E-05	7,20E-05	3,36E-04	2,65E-05	3,65E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,31E-05	2,36E-03	6,87E-06	5,33E-06
ADP-elements	kg Sbe	5,54E-06	3,11E-07	8,30E-07	6,68E-06	7,66E-07	4,89E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,80E-07	2,43E-07	5,22E-08	-3,11E-07
ADP-fossil	MJ	1,73E+01	1,98E+00	1,81E+01	3,74E+01	3,21E+00	3,78E+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	1,59E+00	7,19E-01	6,32E-01	9,33E-01

### ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements	kg Sbe	5,53E-06	3,11E-07	8,30E-07	6,67E-06	7,66E-07	6,02E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,80E-07	2,43E-07	5,22E-08	-3,11E-07
Hazardous waste disposed	kg	1,18E-01	2,92E-03	6,01E-03	1,26E-01	4,64E-03	1,11E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,30E-03	3,45E-03	0,00E+00	2,05E-03
Non-haz. waste disposed	kg	5,98E-01	3,50E-02	9,41E-02	7,27E-01	7,41E-02	4,36E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,67E-02	2,25E+00	4,38E+00	2,31E-01
Air pollution	m <sup>3</sup>	2,80E+02	2,50E+01	2,73E+01	3,33E+02	3,27E+01	9,88E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,62E+01	2,59E+02	5,07E+00	-5,95E+01
Water pollution	m <sup>3</sup>	2,78E+00	1,37E-01	5,41E-01	3,46E+00	2,56E-01	2,08E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,27E-01	1,55E+02	3,36E-02	1,17E+00

### ENVIRONMENTAL IMPACTS – BEPALINGSMETODE, NETHERLANDS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Shadow price	€	1,43E-01	-1,52E-05	-8,49E-03	1,35E-01	0,00E+00	2,04E-03	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	1,97E+00	3,80E-03	6,00E-03
Terrestrial ecotoxicity	DCB eq	5,37E-02	-3,51E-07	-5,83E-03	4,79E-02	0,00E+00	-2,28E-03	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	-1,46E-02	6,28E-05	1,01E-03
Seawater ecotoxicity	DCB eq	1,17E+02	-1,92E-02	5,80E-03	1,11E+02	0,00E+00	1,85E+01	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	1,64E+04	3,97E+00	0,00E+00
Freshwater ecotoxicity	DCB eq	1,43E-01	-1,92E-06	-1,92E-06	1,28E-01	0,00E+00	-5,98E-03	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	-3,44E-02	3,94E-04	-1,11E-03
Human ecotoxicity	DCB eq	4,15E-01	-5,43E-05	-3,48E-02	3,80E-01	0,00E+00	4,81E-02	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	1,07E+00	1,36E-02	-7,70E-03
EEE	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	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
ETE	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	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

### ANNEX 3: ENVIRONMENTAL IMPACT DATA (SINIAT THERMAL EPS BOARD 40MM)

#### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	1,49E+00	1,51E-01	1,08E+00	2,72E+00	2,30E-01	3,81E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,14E-01	1,25E+00	4,15E-01	-1,83E-01
GWP – fossil	kg CO <sub>2</sub> e	2,06E+00	1,51E-01	1,07E+00	3,27E+00	2,30E-01	3,78E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,14E-01	1,09E+00	2,39E-02	2,89E-02
GWP – biogenic	kg CO <sub>2</sub> e	-5,68E-01	0,00E+00	1,44E-02	-5,54E-01	0,00E+00	3,03E-03	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	1,60E-01	3,91E-01	-2,12E-01
GWP – LULUC	kg CO <sub>2</sub> e	4,05E-03	9,85E-05	8,02E-05	4,23E-03	9,62E-05	4,68E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,78E-05	2,78E-05	2,26E-05	7,45E-04
Ozone depletion pot.	kg CFC <sub>11</sub> e	5,85E-08	3,19E-08	1,58E-07	2,48E-07	4,95E-08	2,43E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,46E-08	1,57E-08	9,68E-09	2,78E-09
Acidification potential	mol H <sup>+</sup> e	6,35E-03	2,45E-03	1,09E-03	9,89E-03	6,76E-04	9,94E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,36E-04	6,66E-02	2,25E-04	3,01E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,62E-05	9,45E-07	2,48E-06	2,96E-05	1,95E-06	4,28E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,69E-07	9,07E-07	2,51E-07	4,93E-06
EP-marine	kg Ne	1,75E-03	5,49E-04	2,86E-04	2,59E-03	1,35E-04	3,08E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,71E-05	2,18E-04	7,79E-05	-9,39E-05
EP-terrestrial	mol Ne	1,42E-02	6,12E-03	3,13E-03	2,35E-02	1,50E-03	3,11E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,46E-04	2,37E-03	8,57E-04	-6,45E-05
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	4,70E-03	1,68E-03	1,09E-03	7,47E-03	5,63E-04	1,47E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,80E-04	4,73E-03	2,49E-04	5,46E-05
ADP-minerals & metals <sup>4)</sup>	kg Sbe	1,53E-04	3,43E-07	8,64E-07	1,55E-04	8,13E-07	2,52E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,04E-07	4,50E-07	5,50E-08	-6,71E-05
ADP-fossil resources	MJ	2,88E+01	2,08E+00	1,82E+01	4,90E+01	3,33E+00	3,71E+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	1,66E+00	8,41E-01	6,56E-01	9,36E-01
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	9,74E-01	8,27E-03	3,65E-02	1,02E+00	1,47E-02	7,01E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,32E-03	3,17E-02	2,08E-03	1,30E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO<sub>4</sub>e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

#### ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	6,14E-08	9,76E-09	9,36E-09	8,05E-08	1,83E-08	2,17E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,09E-09	7,60E-08	4,53E-09	1,46E-08
Ionizing radiation <sup>6)</sup>	kBq U235e	2,96E-02	9,76E-03	1,35E-02	5,28E-02	1,56E-02	9,69E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,75E-03	7,49E-03	2,97E-03	3,46E-02
Ecotoxicity (freshwater)	CTUe	5,43E+01	1,65E+00	1,86E+00	5,78E+01	3,05E+00	8,22E+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	1,52E+00	1,64E+01	4,28E-01	-1,82E+00
Human toxicity, cancer	CTUh	7,60E-10	7,97E-11	1,78E-10	1,02E-09	8,60E-11	1,13E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,27E-11	2,76E-10	1,07E-11	2,28E-10
Human tox. non-cancer	CTUh	1,12E-08	1,37E-09	1,58E-09	1,42E-08	2,77E-09	2,19E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,38E-09	5,16E-09	2,80E-10	2,34E-09
SQP <sup>7)</sup>	-	4,18E+00	1,23E+00	2,15E+00	7,57E+00	2,33E+00	4,13E+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	1,16E+00	1,34E+00	1,40E+00	6,11E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

### USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	1,31E+00	2,05E-02	1,58E+00	2,91E+00	3,95E-02	6,51E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,97E-02	8,12E-02	5,70E-03	1,16E+00
Renew. PER as material	MJ	6,23E+00	0,00E+00	-1,93E-01	6,04E+00	0,00E+00	6,76E-04	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	-1,75E+00	-4,29E+00	1,49E+00
Total use of renew. PER	MJ	7,54E+00	2,05E-02	1,38E+00	8,94E+00	3,95E-02	6,51E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,97E-02	-1,67E+00	-4,28E+00	2,65E+00
Non-re. PER as energy	MJ	1,65E+01	2,08E+00	1,80E+01	3,66E+01	3,33E+00	3,81E+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	1,66E+00	8,41E-01	6,56E-01	8,99E-01
Non-re. PER as material	MJ	1,22E+01	0,00E+00	7,94E-02	1,23E+01	0,00E+00	-1,02E-01	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	-3,54E+00	-8,67E+00	2,39E-01
Total use of non-re. PER	MJ	2,88E+01	2,08E+00	1,81E+01	4,89E+01	3,33E+00	3,70E+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	1,66E+00	-2,70E+00	-8,02E+00	1,14E+00
Secondary materials	kg	2,66E+00	8,70E-04	1,48E-03	2,66E+00	1,11E-03	1,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,53E-04	5,67E-04	1,38E-04	-2,33E-02
Renew. secondary fuels	MJ	3,12E-02	5,18E-06	6,36E-05	3,13E-02	1,44E-05	2,07E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,16E-06	1,13E-05	3,60E-06	-8,97E-03
Non-ren. secondary fuels	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	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
Use of net fresh water	m <sup>3</sup>	1,36E-02	2,11E-04	9,10E-04	1,47E-02	3,97E-04	1,76E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,97E-04	1,25E-03	7,18E-04	2,67E-03

8) PER = Primary energy resources.

### END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,28E-01	3,07E-03	6,13E-03	1,37E-01	4,82E-03	1,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,40E-03	3,55E-03	0,00E+00	2,05E-03
Non-hazardous waste	kg	7,86E-01	3,74E-02	9,56E-02	9,19E-01	7,69E-02	4,69E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,82E-02	2,54E+00	4,54E+00	2,31E-01
Radioactive waste	kg	1,20E-05	1,43E-05	1,28E-05	3,90E-05	2,21E-05	2,71E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,10E-05	4,47E-06	0,00E+00	1,01E-05

### END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	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	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
Materials for recycling	kg	0,00E+00	0,00E+00	3,93E-01	3,93E-01	0,00E+00	3,99E-01	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	2,44E+00	0,00E+00	0,00E+00
Materials for energy rec	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	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
Exported energy	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	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

### ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO <sub>2</sub> e	1,97E+00	1,49E-01	1,05E+00	3,17E+00	2,27E-01	3,74E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E-01	1,09E+00	2,34E-02	2,44E-02
Ozone depletion Pot.	kg CFC <sub>11</sub> e	5,15E-08	2,52E-08	1,38E-07	2,15E-07	3,93E-08	2,04E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,95E-08	1,39E-08	7,66E-09	2,17E-09
Acidification	kg SO <sub>2</sub> e	5,03E-03	1,98E-03	8,62E-04	7,87E-03	5,55E-04	8,97E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,76E-04	6,09E-02	1,70E-04	3,01E-04
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	1,76E-03	2,27E-04	1,84E-04	2,17E-03	1,22E-04	3,26E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,08E-05	2,80E-04	3,67E-05	8,98E-05
POCP (“smog”)	kg C <sub>2</sub> H <sub>4</sub> e	3,03E-04	5,83E-05	7,25E-05	4,34E-04	2,75E-05	3,82E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,37E-05	2,43E-03	7,13E-06	5,32E-06
ADP-elements	kg Sbe	5,79E-06	3,36E-07	8,55E-07	6,98E-06	7,94E-07	4,91E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,95E-07	3,34E-07	5,42E-08	-3,12E-07
ADP-fossil	MJ	2,88E+01	2,08E+00	1,82E+01	4,90E+01	3,33E+00	4,38E+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	1,66E+00	8,41E-01	6,56E-01	9,33E-01

### ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements	kg Sbe	5,79E-06	3,36E-07	8,55E-07	6,98E-06	7,94E-07	6,24E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,95E-07	3,34E-07	5,42E-08	-3,12E-07
Hazardous waste disposed	kg	1,29E-01	3,07E-03	6,13E-03	1,38E-01	4,82E-03	1,17E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,40E-03	3,55E-03	0,00E+00	2,05E-03
Non-haz. waste disposed	kg	7,18E-01	3,74E-02	9,56E-02	8,51E-01	7,69E-02	4,64E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,82E-02	2,54E+00	4,54E+00	2,31E-01
Air pollution	m <sup>3</sup>	3,03E+02	2,60E+01	2,77E+01	3,57E+02	3,39E+01	1,02E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,69E+01	2,71E+02	5,26E+00	-6,21E+01
Water pollution	m <sup>3</sup>	2,82E+00	1,45E-01	5,48E-01	3,51E+00	2,66E-01	2,16E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,32E-01	1,60E+02	3,48E-02	1,17E+00

### ENVIRONMENTAL IMPACTS – BEPALINGSMETODE, NETHERLANDS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Shadow price	€	2,03E-01	-1,57E-05	-7,01E-03	1,96E-01	0,00E+00	-1,20E-03	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	2,05E+00	3,94E-03	5,99E-03
Terrestrial ecotoxicity	DCB eq	5,40E-02	-3,64E-07	-5,83E-03	4,82E-02	0,00E+00	-2,30E-03	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	-1,46E-02	6,52E-05	1,01E-03
Seawater ecotoxicity	DCB eq	1,57E+02	-1,99E-02	-4,67E+00	1,53E+02	0,00E+00	1,61E+01	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	1,68E+04	4,12E+00	0,00E+00
Freshwater ecotoxicity	DCB eq	1,46E-01	-1,99E-06	-1,99E-06	1,31E-01	0,00E+00	-6,16E-03	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	-3,41E-02	4,09E-04	-1,11E-03
Human ecotoxicity	DCB eq	4,70E-01	-5,62E-05	-3,33E-02	4,37E-01	0,00E+00	4,44E-02	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	1,12E+00	1,41E-02	-7,71E-03
EEE	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	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
ETE	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	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

## ANNEX 4: ENVIRONMENTAL IMPACT DATA (SINIAT THERMAL EPS BOARD 50MM)

### CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total <sup>1)</sup>	kg CO <sub>2</sub> e	2,01E+00	1,55E-01	1,08E+00	3,25E+00	2,34E-01	4,23E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E-01	1,55E+00	4,10E-01	-1,82E-01
GWP – fossil	kg CO <sub>2</sub> e	2,57E+00	1,55E-01	1,07E+00	3,79E+00	2,34E-01	4,19E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,17E-01	1,39E+00	2,44E-02	2,89E-02
GWP – biogenic	kg CO <sub>2</sub> e	-5,60E-01	0,00E+00	1,38E-02	-5,46E-01	0,00E+00	3,39E-03	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	1,57E-01	3,85E-01	-2,12E-01
GWP – LULUC	kg CO <sub>2</sub> e	4,05E-03	1,00E-04	8,10E-05	4,24E-03	9,82E-05	4,69E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,89E-05	3,39E-05	2,31E-05	7,44E-04
Ozone depletion pot.	kg CFC <sub>11</sub> e	6,64E-08	3,27E-08	1,58E-07	2,57E-07	5,05E-08	2,49E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,52E-08	1,79E-08	9,88E-09	2,79E-09
Acidification potential	mol H <sup>+</sup> e	7,47E-03	2,46E-03	1,09E-03	1,10E-02	6,90E-04	1,02E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,44E-04	6,78E-02	2,30E-04	3,01E-04
EP-freshwater <sup>2)</sup>	kg Pe	2,62E-05	9,79E-07	2,51E-06	2,97E-05	1,99E-06	4,30E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,90E-07	1,10E-06	2,56E-07	4,93E-06
EP-marine	kg Ne	1,93E-03	5,52E-04	2,87E-04	2,77E-03	1,38E-04	3,19E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,86E-05	2,52E-04	7,95E-05	-9,41E-05
EP-terrestrial	mol Ne	1,62E-02	6,15E-03	3,14E-03	2,55E-02	1,53E-03	3,24E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,63E-04	2,74E-03	8,74E-04	-6,85E-05
POCP (“smog”) <sup>3)</sup>	kg NMVOCe	5,64E-03	1,69E-03	1,10E-03	8,42E-03	5,74E-04	1,54E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,86E-04	4,89E-03	2,54E-04	5,41E-05
ADP-minerals & metals <sup>4)</sup>	kg Sbe	1,54E-04	3,57E-07	8,78E-07	1,55E-04	8,29E-07	2,52E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,13E-07	5,33E-07	5,61E-08	-6,84E-05
ADP-fossil resources	MJ	3,56E+01	2,14E+00	1,82E+01	5,59E+01	3,40E+00	4,06E+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	1,69E+00	9,10E-01	6,69E-01	9,36E-01
Water use <sup>5)</sup>	m <sup>3</sup> e depr.	1,19E+00	8,53E-03	3,69E-02	1,24E+00	1,50E-02	8,14E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,48E-03	3,80E-02	2,12E-03	1,30E-01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO<sub>4</sub>e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

### ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter	Incidence	7,06E-08	1,01E-08	9,48E-09	9,02E-08	1,87E-08	2,24E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,29E-09	7,77E-08	4,62E-09	1,49E-08
Ionizing radiation <sup>6)</sup>	kBq U235e	3,16E-02	1,00E-02	1,35E-02	5,52E-02	1,59E-02	9,87E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,92E-03	8,06E-03	3,03E-03	3,46E-02
Ecotoxicity (freshwater)	CTUe	5,70E+01	1,70E+00	1,87E+00	6,06E+01	3,11E+00	8,45E+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	1,55E+00	1,74E+01	4,37E-01	-1,90E+00
Human toxicity, cancer	CTUh	8,33E-10	8,12E-11	1,80E-10	1,09E-09	8,77E-11	1,20E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,37E-11	3,36E-10	1,09E-11	2,28E-10
Human tox. non-cancer	CTUh	1,25E-08	1,41E-09	1,60E-09	1,55E-08	2,83E-09	2,30E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,41E-09	5,78E-09	2,86E-10	2,34E-09
SQP <sup>7)</sup>	-	4,23E+00	1,27E+00	2,19E+00	7,69E+00	2,38E+00	4,14E+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	1,19E+00	1,38E+00	1,43E+00	6,10E+00

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

### USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy <sup>8)</sup>	MJ	1,37E+00	2,12E-02	1,61E+00	2,99E+00	4,03E-02	6,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,01E-02	8,76E-02	5,81E-03	1,16E+00
Renew. PER as material	MJ	6,23E+00	0,00E+00	-1,90E-01	6,04E+00	0,00E+00	-2,28E-03	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	-1,75E+00	-4,29E+00	1,48E+00
Total use of renew. PER	MJ	7,59E+00	2,12E-02	1,42E+00	9,03E+00	4,03E-02	6,53E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,01E-02	-1,66E+00	-4,28E+00	2,64E+00
Non-re. PER as energy	MJ	1,99E+01	2,14E+00	1,80E+01	4,01E+01	3,40E+00	3,99E+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	1,69E+00	9,10E-01	6,70E-01	9,00E-01
Non-re. PER as material	MJ	1,56E+01	0,00E+00	-5,77E-02	1,56E+01	0,00E+00	-1,03E-01	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	-4,49E+00	-1,10E+01	2,49E-01
Total use of non-re. PER	MJ	3,56E+01	2,14E+00	1,80E+01	5,57E+01	3,40E+00	3,89E+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	1,69E+00	-3,58E+00	-1,03E+01	1,15E+00
Secondary materials	kg	2,66E+00	8,89E-04	1,49E-03	2,66E+00	1,13E-03	1,37E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,65E-04	6,30E-04	1,41E-04	-2,33E-02
Renew. secondary fuels	MJ	3,12E-02	5,43E-06	6,46E-05	3,13E-02	1,47E-05	2,07E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,32E-06	1,22E-05	3,68E-06	-8,97E-03
Non-ren. secondary fuels	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	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
Use of net fresh water	m <sup>3</sup>	1,43E-02	2,18E-04	9,21E-04	1,54E-02	4,05E-04	1,80E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,02E-04	1,41E-03	7,33E-04	2,67E-03

8) PER = Primary energy resources.

### END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,34E-01	3,16E-03	6,20E-03	1,43E-01	4,91E-03	1,20E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,45E-03	3,60E-03	0,00E+00	2,04E-03
Non-hazardous waste	kg	8,79E-01	3,87E-02	9,63E-02	1,01E+00	7,84E-02	4,86E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,91E-02	2,70E+00	4,64E+00	2,31E-01
Radioactive waste	kg	1,30E-05	1,47E-05	1,28E-05	4,04E-05	2,26E-05	2,72E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E-05	4,54E-06	0,00E+00	1,01E-05

### END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	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	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
Materials for recycling	kg	0,00E+00	0,00E+00	4,00E-01	4,00E-01	0,00E+00	4,06E-01	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	2,48E+00	0,00E+00	0,00E+00
Materials for energy rec	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	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
Exported energy	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	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



### ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO <sub>2</sub> e	2,46E+00	1,53E-01	1,05E+00	3,66E+00	2,32E-01	4,14E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,16E-01	1,39E+00	2,39E-02	2,44E-02
Ozone depletion Pot.	kg CFC <sub>11</sub> e	5,83E-08	2,59E-08	1,38E-07	2,23E-07	4,01E-08	2,09E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,00E-08	1,60E-08	7,82E-09	2,17E-09
Acidification	kg SO <sub>2</sub> e	5,98E-03	1,99E-03	8,65E-04	8,83E-03	5,66E-04	9,20E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,82E-04	6,19E-02	1,73E-04	3,00E-04
Eutrophication	kg PO <sub>4</sub> <sup>3</sup> e	1,90E-03	2,29E-04	1,85E-04	2,31E-03	1,25E-04	3,37E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,21E-05	3,47E-04	3,74E-05	8,96E-05
POCP ("smog")	kg C <sub>2</sub> H <sub>4</sub> e	3,60E-04	5,88E-05	7,28E-05	4,91E-04	2,81E-05	3,92E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,40E-05	2,47E-03	7,27E-06	5,31E-06
ADP-elements	kg Sbe	5,95E-06	3,50E-07	8,69E-07	7,16E-06	8,11E-07	4,93E-06	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,04E-07	3,85E-07	5,53E-08	-3,12E-07
ADP-fossil	MJ	3,56E+01	2,14E+00	1,82E+01	5,59E+01	3,40E+00	4,73E+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	1,69E+00	9,10E-01	6,69E-01	9,34E-01

### ENVIRONMENTAL IMPACTS – FRENCH NATIONAL COMPLEMENTS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADP-elements	kg Sbe	5,93E-06	3,50E-07	8,69E-07	7,15E-06	8,11E-07	6,37E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,04E-07	3,85E-07	5,53E-08	-3,12E-07
Hazardous waste disposed	kg	1,36E-01	3,16E-03	6,20E-03	1,45E-01	4,91E-03	1,21E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,45E-03	3,60E-03	0,00E+00	2,04E-03
Non-haz. waste disposed	kg	7,88E-01	3,87E-02	9,63E-02	9,23E-01	7,84E-02	4,81E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,91E-02	2,70E+00	4,64E+00	2,31E-01
Air pollution	m <sup>3</sup>	3,17E+02	2,66E+01	2,80E+01	3,71E+02	3,46E+01	1,03E+02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,72E+01	2,77E+02	5,37E+00	-6,36E+01
Water pollution	m <sup>3</sup>	2,84E+00	1,50E-01	5,52E-01	3,54E+00	2,71E-01	2,21E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,35E-01	1,62E+02	3,55E-02	1,16E+00

### ENVIRONMENTAL IMPACTS – BEPALINGSMETODE, NETHERLANDS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Shadow price	€	2,38E-01	-1,61E-05	-9,85E-03	2,28E-01	0,00E+00	-3,09E-03	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	2,09E+00	4,02E-03	5,98E-03
Terrestrial ecotoxicity	DCB eq	5,42E-02	-3,72E-07	-5,84E-03	4,83E-02	0,00E+00	-2,31E-03	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	-1,46E-02	6,65E-05	1,01E-03
Seawater ecotoxicity	DCB eq	1,81E+02	-2,03E-02	-6,59E+00	1,74E+02	0,00E+00	1,47E+01	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	1,71E+04	4,21E+00	0,00E+00
Freshwater ecotoxicity	DCB eq	1,47E-01	-2,03E-06	-2,03E-06	1,32E-01	0,00E+00	-6,26E-03	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	-3,39E-02	4,17E-04	-1,11E-03
Human ecotoxicity	DCB eq	5,03E-01	-5,74E-05	-3,58E-02	4,67E-01	0,00E+00	4,24E-02	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	1,15E+00	1,43E-02	-7,72E-03
EEE	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	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
ETE	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	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