LCA Result Summary

VHS Sills

Date: Thursday, 30 October 2025

Dutch Building Hardware Association VHS	Client: Dutch Building Hardware Association VHS P.O. Box 840 NL-2700 AV Zoetermeer
ELSE-A	LCA performed by: Elsemieke Juffer Else-a info@else-a.nl
SGS SEARCH	LCA reviewer: SGS-Search P.O. Box 83 NL-5473 ZH Heeswijk
DIT PRODUCT IS OPGENOMEN IN DE NATIONALE MILIEUDATABASE	Environmental Declaration Number: • **202549** – for single windows and doors • **202550** – for sliding doors • **202551** – for double doors
BUVA	As a licensee of the Brancheverenigning Hang- en Sluitwerk VHS, BUVA B.V. is entitled to provide this EPD

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1 Introduction

This report for review is the result of a Life Cycle Assessment (LCA) conducted using the R<THiNK application from NIBE and SimaPro. The report is based on the following chapters that correspond to the phases of an LCA:

- Purpose and Scope Definition
- Life cycle inventory
- Impact assessment
- Interpretation of results

1.1 Company information

This LCA study was carried out on behalf of the VHS Dutch Building Hardware Association VHS, Zilverstraat 69, P.O. Box 840, NL-2700 AV Zoetermeer.

Website: https://vhsbranche.nl/

On behalf of the VHS, three members were approached to provide information to the LCA.

1.2 Author of the LCA

The project team for this LCA consists of the following people:

Else-a
Ms. E. Juffer (LCA consultant)

1.3 Purpose and target group of the study

This study was commissioned by the Dutch association Branchevereniging Hang- en Sluitwerk (hereinafter referred to as VHS) and presents the results of a comprehensive environmental analysis of letter plates sold under various brand names of VHS members.

The purpose of this LCA is to collect environmental data on materials and products used in the built environment, so that this data can be used in calculations for buildings and/or civil engineering works. The purpose of this report is to compile an assessment file containing the results of 'Set 1' and 'Set 2' for the product as specified in the Environmental Performance Assessment Method for Buildings (NMD), version 1.2, dated January 2025. This document defines a standardized method for an LCA in the Netherlands for a product used in the built environment, in addition to EN 15084+A2. The assessment file complies with EN 15804+A2, ISO 14040, and ISO 14044.

The target groups for this LCA study are: Users of the NMD or programs that use this database, such as BREEAM-NL, GPR Gebouw and GPR Bouwbesluit, MRPI Freetool, DuboCalc, etc. An EPD is intended for business-to-business (B2B) communication.

1.4 LCA-calculation information

LCA calculation for: VHS - stills
Generated on: 27/10/2025
Issue date: 27/10/2025
Expiration date: 27/10/2030
Version core R<THiNK calculation: v2.0
Version NMD Environmental Profile Database: v3.10
PCR: NMD Determination Method Environmental Performance Construction Activities v1.2 January 2025

LCA software: Simapro 9.1.1
Characterization method: Determination method 'set 1', 'set2' & param (NMD 3.7) v1.00
LCA database profiles: EcoInvent version 3.6 & 3.9.1
Database version: v3.19 (20250306)

1.5 Comparability

The results of LCA studies and resulting Environmental Product Declarations (EPDs) are only comparable if they comply with the assessment method. For more information on comparability, see EN 15804 and ISO 14025. EPDs within the same product category but from different programs may not be comparable.

1.6 Verification

This LCA was reviewed by SGS Search based on the NMD Determination Method version 1.2 and approved on 27 October 2025. The method, inventory, and report comply with the requirements of the NMD Determination Method version 1.2 and the underlying standards: ISO 14025, ISO 14040, ISO 14044, and EN 15804.

SGS Search Consultancy

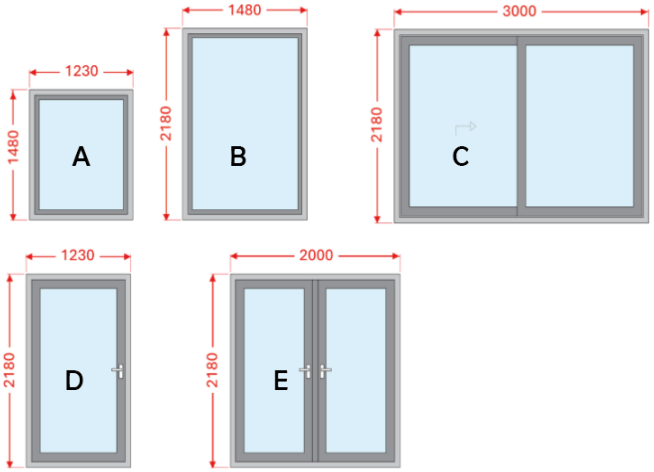
Martijn van Hövell

2 Product information

2.1 Product description

A sill forms the bottom of a window or door opening and ensures a tight, stable, and water-resistant transition between the frame and the facade. The sill drains rainwater, prevents water ingress, and contributes to the durability and insulation of the structure.

This study assumes window or door sills made of glass fibre reinforced plastic (GRP). The average weight per m² for a door or window sill is 3-3.6 kg, and for a sliding door, it is approximately 4.8 kg/m². These weights include studs and other accessories. A sill itself typically weighs 2.5-3 kg/m², depending on the design.



Figuur 1. Afmetingen visueel weergegeven

Image 1: Situations standard sizes PCR

2.1.1 Application

A sill is used to create an effective seal at the bottom of the door when it is closed. Its main applications and benefits are:

- Prevents drafts and heat loss
- Keeps out dust and dirt
- Creates a threshold for door passage
- Protects against water and moisture ingress
- Provides a durable and wear-resistant transition between the frame and the façade

2.1.2 Technical data

Each sill has its own specific characteristics, but the following generally applies to synthetic sills:

- Density: ± 1.7–1.9 g/cm³
- Compressive strength: > 100 MPa
- Flexural strength: 150–300 MPa
- Water absorption: < 0.5%
- Temperature resistance: -40°C to +80°C

No raw materials listed as very hazardous substances (SVHCs) are used during the production process or in the final product.

2.1.3 Time period input data

The production data refer to the production year 2023-2024.

2.2 Description of production process

The production process for a plastic sill begins with the feeding of fiberglass reinforcement from reels. These fiberglass threads—possibly supplemented with fiberglass mats—are guided through an impregnating bath, where they are impregnated with a thermosetting resin mixed with dyes, flame retardants, and other additives.

Guide plates guide the fibres into position to achieve the desired strength and fibre distribution. The impregnated fibres are then pulled through a heated die. In this die, the profile takes on its final shape and the material hardens.

The continuously formed profile is pulled through the machine by a gripper system, which maintains its dimensions within tight tolerances. After leaving the die, the profile is cut to the desired length with a diamond saw, after which it is ready for use as a sill.

A 3% loss has been allowed for the production process for the start-up and end-of-line process, unless otherwise stated and substantiated.

2.3 Description of construction process

Sills are manually attached to a door or window frame. Generally, the following installation steps are followed:

- Creating a supporting surface: The substrate (brickwork, concrete, or frame) is levelled and cleaned.
- Positioning: The sill is laid to exact dimensions, often with some space at the ends for expansion and sealant.
- Anchoring: Screws or anchors are usually used for plastic or aluminium sills; this is not included in the LCA.
- Joints: The joints along the sill are filled with joint mortar or sealant, depending on the material and location (not included in the LCA).

5% construction waste is assumed, in accordance with the NMD.

2.4 Reference Service Life of product

The technical lifespan is set at 75 years. This is based on category 3 data, which assumes a lifespan of 100 years, combined with the assumption that a home will last 75 years in the MPG calculation. Furthermore, it is assumed that a sill is generally not removed when replacing a door or frame, as these components are replaced separately.

3 Goal en Scope definition

3.1 Unit of reference

One linear meter of sill; including paint, studs, sealant, screws, gaskets, and sliding rail (sliding door).

The functional unit (hereinafter referred to as "FE") is set at 1 m² of sill for installation in a door or window frame over a project lifespan of 75 years.

3.2 System boundaries

In this study, all inputs and outputs—such as emissions, energy, and material inputs—were included in the calculation in accordance with the Determination Method (NMD, 2022).

In a life cycle assessment, the environmental impact is often distributed across multiple product systems. In this LCA, the waste processes are classified under the relevant module.

The scope of this study is cradle-to-grave (A1-D). This includes all materials (A1-A3), transport to the construction site (A4), installation phase (A5), use phase (B), demolition phase (C), and the processing phase (D).

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	mnd	mnd	mnd	mnd	mnd	X	X	X	X	X

Table 1: Overview of lifecycle stages LCA. MND = Module not Declared

Module A1 = Supply of raw materials
Module A2 = Transport to producer
Module A3 = Production
Module A4 = Transport to construction site
Module A5 = Construction phase
Module B1 = Operation
Module B2 = Maintenance
Module B3 = Repair
Module B4 = Replacement
Module B5 = Renovation
Module B6 = Operational energy consumption
Module B7 = Operational water consumption
Module C1 = Deconstruction, demolition
Module C2 = End-of-life transport
Module C3 = Waste processing
Module C4 = Final disposal
Module D = Benefits and costs outside the system boundaries

4 Life cycle inventory

4.1 Supply and production of raw materials (A1-A3)

The content of these phases is not visible because it is confidential information. This information is described in the LCA Background Report.

4.2 Transport to construction site (A4)

The net mass to be transported to the construction site is calculated using a standard transport distance of 150 km, as established in the NMD Determination Method 1.2. Transport impact is calculated in tonne-kilometres, which is equal to the mass in metric tons multiplied by the transport distance in km (tonnes*km = tkm). 1 metric tonne equals 1000 kg. The mass here includes production losses (purchased gross mass).

Transport to the location in the Netherlands where the final operations are performed/distribution takes place is modelled in A2.

The selected environmental profiles for each process are shown in the table below.

Material c.q. process	Environmental profile	Database/source
Transport construction site	Transport, freight, lorry, unspecified {RER}| market for transport, freight, lorry, unspecified | Cut-off, U	EcoInvent 3.6 EcoInvent 3.9.1

4.3 Construction phase (A5)

The installation process is manual. Therefore, no energy consumption occurs during this phase. However, some packaging material is lost during this phase and installation losses are taken into account.

4.3.1 Loss of packaging material

Waste processing is included in Module A5, and potential costs and/or benefits are included in Module D. Detailed information on the waste scenarios used can be found in Chapter 6 of the individual LCAs. The waste scenarios used are summarized in the table below.

Waste processing Scenario packaging A5	Stort	AVI	Recycling	Re-use
Cardboard: Corrugated board / Core board (PEF scenario) | (u=10%, glue=2%) corr. acc. EN16449	0%	25%	75%	0%
Wrapping film (LDPE): polyolefins (i.a. pe, pp) (i.a. pipes, foils) (NMD ID 57	10%	85%	5%	0%
PET strips / tape: plastics, via residue (NMD ID 43)	20%	80%	0%	0%
Pallet: wood 'clean', via residue (NMD ID 35) | (u=10%) corr. acc. EN16449	10%	85%	5%	0%
Clips: Metals, others (i.a. fasteners, fittings) (NMD ID 50)	5%	5%	90%	0%

4.3.2 Installation losses

Waste flows resulting from on-site losses are assumed to be 5%. The additional 5% required for raw materials (A1), transport to the production facility (A2), product production (A3), transport to the construction site (A4), and end-of-life scenarios (C1-C4) are included in module A5. Potential costs and/or benefits are included in module D. Modules that have not been declared (see 3.2) are not considered.

4.4 User phase (B1-5)

To fulfil the functional unit, no maintenance, repairs, or replacements are required during the use phase. Therefore, no input or output flows are modelled in phase B.

- No leaching occurs during the lifespan.
- No scheduled maintenance activities occur during the lifespan.
- No scheduled repair activities occur during the lifespan.
- No replacements occur during the lifespan.
- No scheduled renovation activities occur during the lifespan.
- No energy consumption occurs during the lifespan.
- No water consumption occurs during the lifespan.

4.5 De-construction phase (C1)

No inputs are required for the product during the dismantling/demolition phase. Disassembly is performed manually or with a screwdriver in seconds. Therefore, no energy is consumed during this phase.

4.6 End of life transport (C2)

For the (various) waste scenario(s), the following transport modes and distances per waste stream are used, based on the Environmental Performance Assessment Method for Construction (NMD), version 1.2, dated January 2025.

Material c.q. process	Environmental profile	Justification
Transport to sorting facility	Transport, freight, lorry, unspecified {RER}| market for transport, freight, lorry, unspecified | Cut-off, U	Weight over 50 km (fixed value)
Transport to Incineration		Weight over +100 km (fixed value)
Transport to Landfill		Weight over +50 km (fixed value)
Transport to Recycling		Weight over +0 km
Transport to Re-use		Belongs to the following life cycle,

4.7 Waste processing (C3)

After demolition and transport of the waste streams to the appropriate waste processing routes, the waste is processed for final disposal, recycling, and/or reuse. The calculated percentages and the applicable end-of-life scenario are shown below.

4.8 Final waste processing (C4)

Some waste streams are not used for reprocessing or energy recovery, but are permanently disposed of. This is the case when the material is landfilled and/or when the product is not removed and remains in the process. The following quantities apply to the product per final discharge stream.

4.9 Benefits and burdens outside the system boundary

Where the substituting recycling and/or re-use process of primary content exceeds the end-of-waste point, Module D shall take into account an additional burden and/or benefit for the difference between the end-of-waste point and the substituting process.

5 Results

5.1 Environmental impact indicators Situation A, B, D

5.1.1 Set 1 Situation A, B, D

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Depletion of abiotic resources-elements	Kg Sb	1,15E-04	4,82E-06	7,65E-06	1,27E-04	1,90E-06	2,33E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,63E-06	8,68E-06	7,69E-08	1,00E-06	1,64E-04
Depletion of abiotic resources-fossil fuels	Kg Sb	2,84E-02	1,58E-03	5,34E-03	3,53E-02	5,48E-04	6,50E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,70E-04	2,72E-03	8,27E-05	-1,68E-02	2,88E-02
Global warming	Kg CO2 Equiv.	3,25E+00	2,36E-01	7,94E-01	4,28E+00	7,45E-02	1,15E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,39E-02	7,13E+00	7,36E-02	-1,90E+00	1,09E+01
Ozone layer depletion	Kg CFC-11 Equiv.	2,76E-07	3,99E-08	3,71E-08	3,53E-07	1,32E-08	7,69E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E-08	2,17E-07	1,77E-09	-2,15E-07	4,59E-07
Photochemical oxidants creation	Kg Ethene Equiv.	1,32E-02	2,19E-04	6,13E-04	1,40E-02	4,49E-05	2,49E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,85E-05	2,31E-04	1,75E-05	-4,89E-04	1,63E-02
Acidification of soil and water	Kg SO2 Equiv.	1,56E-02	4,88E-03	3,13E-03	2,36E-02	3,27E-04	3,99E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,81E-04	2,44E-03	4,82E-05	-1,71E-03	2,89E-02
Eutrophication	Kg PO43- Equiv.	3,40E-03	3,90E-04	4,11E-04	4,20E-03	6,46E-05	7,79E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,54E-05	3,92E-04	2,44E-05	-2,34E-04	5,28E-03
Human toxicity	kg 1.4 DB	3,31E+00	1,11E-01	2,84E-01	3,71E+00	3,14E-02	6,93E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,69E-02	4,66E-01	5,64E-03	-3,35E-01	4,60E+00
Ecotoxicity. fresh water	kg 1.4 DB	8,99E-02	2,34E-03	8,24E-03	1,00E-01	9,16E-04	1,96E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,85E-04	2,65E-02	3,49E-03	-6,31E-05	1,52E-01
Ecotoxicity. marine water	kg 1.4 DB	1,12E+02	9,76E+00	2,14E+01	1,43E+02	3,29E+00	3,13E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,82E+00	7,71E+01	3,66E+00	-5,94E+00	2,55E+02
Ecotoxicity. terrestric	kg 1.4 DB	2,15E-02	3,69E-04	3,53E-03	2,54E-02	1,11E-04	4,55E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,50E-05	1,15E-03	1,47E-05	2,85E-03	3,42E-02

5.1.2 Set 2 - Situation A, B, D

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Global Warming Potential total (GWP-	kg CO2 eqv.	1,21E+01	6,33E-01	2,61E+00	1,53E+01	7,52E-02	1,49E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,11E-02	7,13E+00	7,42E-02	-1,97E+00	2,22E+01
Global Warming Potential fossil fuels	kg CO2 eqv.	1,19E+01	6,32E-01	2,58E+00	1,51E+01	7,51E-02	1,16E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,09E-02	7,12E+00	7,41E-02	-1,96E+00	2,17E+01
Global Warming Potential biogenic	kg CO2 eqv.	3,14E-01	1,61E-04	3,51E-02	3,49E-01	3,03E-05	3,45E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,31E-05	9,97E-04	3,92E-05	-7,06E-04	6,95E-01
Global Warming Potential land use and	kg CO2 eqv.	1,55E-01	7,28E-04	7,35E-03	1,63E-01	2,76E-05	8,23E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,53E-04	6,73E-04	6,26E-06	-4,08E-03	1,68E-01
Depletion potential of the stratosperic ozon	kg CFC 11 eq.	6,15E-07	1,03E-08	1,07E-07	7,33E-07	1,66E-08	4,84E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,26E-09	1,94E-07	1,87E-10	-1,13E-07	8,81E-07
Acidification potential, Accumulated	mol H+ eq.	6,95E-02	1,38E-02	1,05E-02	9,38E-02	4,36E-04	4,96E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,39E-04	2,98E-03	5,89E-05	-1,79E-03	1,01E-01
Eutrophication potential, fraction of	kg P eq.	1,73E-03	4,58E-06	1,24E-04	1,86E-03	7,57E-07	9,44E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,05E-07	1,99E-05	1,26E-07	-3,79E-07	1,98E-03
Eutrophication potential, fraction of	kg N eq.	1,25E-02	5,39E-03	2,33E-03	2,03E-02	1,54E-04	1,01E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E-04	8,33E-04	5,13E-05	-5,80E-04	2,19E-02
Eutrophication potential, Accumulated	mol N eq.	1,34E-01	5,95E-02	2,40E-02	2,17E-01	1,69E-03	1,08E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,38E-03	9,31E-03	2,29E-04	-6,66E-03	2,34E-01
Formation potential of tropospheric ozone	kg NMVOC	5,03E-02	1,08E-02	7,44E-03	6,86E-02	4,83E-04	3,74E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,69E-04	2,65E-03	9,55E-05	-3,42E-03	7,26E-02
Abiotic depletion potential for non fossil	kg Sb-eq.	5,06E-04	1,18E-06	3,31E-05	5,40E-04	1,90E-06	2,73E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,22E-07	3,59E-06	1,72E-08	5,01E-06	5,78E-04
Abiotic depletion for fossil resources	MJ	2,08E+02	8,12E+00	3,17E+01	2,48E+02	1,13E+00	1,30E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,01E+00	4,97E+00	1,74E-01	-2,96E+01	2,38E+02
Water (user) deprication potential,	m3 world eq.	6,51E+00	2,57E-02	5,72E-01	7,10E+00	4,05E-03	3,75E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,54E-03	3,24E-01	7,27E-03	-2,63E-01	7,56E+00
Potential incidence of disease due to PM emissions (PM)	disease incidence	6,69E-07	3,02E-08	1,10E-07	8,08E-07	6,74E-09	4,39E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,00E-09	2,59E-08	1,22E-09	-2,52E-08	8,68E-07
Potential Human exposure efficiency	kBq U235 eq.	2,38E-01	2,52E-03	5,49E-02	2,95E-01	4,75E-03	1,61E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,96E-04	1,74E-02	9,93E-05	-4,90E-03	3,29E-01
Potential Comparative Toxic Unit for	CTUe	1,67E+02	4,36E+00	1,60E+01	1,88E+02	1,01E+00	1,40E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,49E-01	8,24E+01	6,01E-01	-3,42E+00	2,83E+02
Potential Comparative Toxic Unit for humans	CTUh	1,26E-08	3,14E-10	1,16E-09	1,41E-08	3,28E-11	6,69E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,75E-11	1,28E-09	4,97E-12	-1,30E-10	1,59E-08
Potential Comparative Toxic Unit for humans	CTUh	2,97E-07	3,65E-09	3,73E-08	3,38E-07	1,11E-09	1,79E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,15E-10	1,37E-08	1,75E-10	2,27E-09	3,74E-07
Potential soil quality idex (SQP)	Pt	3,75E+01	2,28E+00	4,44E+01	8,41E+01	9,83E-01	3,31E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,01E-01	1,48E+00	3,90E-01	-1,20E+01	7,91E+01

5.2 Additional impact indicators – Situation A, B, D

5.2.1 Parameters describing resource usage

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Renew. PER as energy	MJ	1,15E+01	8,44E-02	6,30E+00	1,79E+01	1,42E-02	9,34E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,43E-02	5,87E-01	3,34E-03	-3,54E+00	1,59E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	2,27E-03	2,27E-03	0,00E+00	1,14E-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	2,39E-03
Total use of renew. PER	MJ	1,15E+01	8,44E-02	6,30E+00	1,79E+01	1,42E-02	9,34E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,43E-02	5,87E-01	3,34E-03	-3,54E+00	1,59E+01
Non-re. PER as energy	MJ	1,93E+02	8,13E+00	3,11E+01	2,32E+02	1,20E+00	1,22E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,02E+00	4,97E+00	1,74E-01	-2,97E+01	2,22E+02
Non-re. PER as material	MJ	1,51E+01	0,00E+00	6,25E-01	1,57E+01	0,00E+00	7,84E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,47E-03	1,65E+01
Total use of non-re. PER	MJ	2,08E+02	8,13E+00	3,18E+01	2,48E+02	1,20E+00	1,30E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,02E+00	4,97E+00	1,74E-01	-2,97E+01	2,38E+02
Secondary materials	kg	7,10E-02	0,00E+00	4,40E-03	7,54E-02	0,00E+00	3,77E-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	7,92E-02
Renew. 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
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
Use of net fresh water	m^3	1,65E-01	9,84E-04	1,80E-02	1,84E-01	1,38E-04	9,82E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,45E-04	9,67E-03	1,78E-04	-1,18E-02	1,92E-01

5.2.2 Parameters describing waste categories

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Hazardous waste	kg	7,83E-04	5,09E-05	1,71E-04	1,00E-03	2,87E-06	7,24E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,47E-06	4,45E-04	8,55E-07	4,70E-04	2,00E-03
Non-hazardous waste	kg	1,29E+00	1,69E-01	3,45E-01	1,81E+00	7,19E-02	3,40E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,71E-02	2,79E+00	6,74E-01	-7,18E-02	5,68E+00
Radioactive waste	kg	1,61E-04	1,48E-06	4,33E-05	2,05E-04	7,46E-06	1,14E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,32E-07	1,22E-05	6,07E-08	-5,46E-06	2,31E-04

5.2.3 Parameters describing output flows

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
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
Materials for recycling	kg	9,45E-02	0,00E+00	1,68E-02	1,11E-01	0,00E+00	1,56E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,60E-01	0,00E+00	6,83E-02	4,96E-01
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
Exported energy	MJ	0,00E+00	0,00E+00	7,74E-01	7,74E-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	2,11E+01	2,19E+01
Exported energy – Thermic	MJ	0,00E+00	0,00E+00	4,90E-01	4,90E-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	1,34E+01	1,38E+01
Exported energy – Electric	MJ	0,00E+00	0,00E+00	2,84E-01	2,84E-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	7,75E+00	8,04E+00

Other situations are elaborated in the appendix.

5.3 Biogenic carbon content per piece

The following information describes the biogenic carbon content in (the main components of) the product at the factory gate per piece:

Biogenic carbon content	Amount	Unit
Situation A		
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.08378	kg C
Situation C		
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.084	kg C
Situation E		
Biogenic carbon content in the product	0	kg C
Biogenic carbon content in accompanying packaging	0.08424	kg C

The following amount of carbon dioxide uptake is considered. Related carbon dioxide uptake and release in downstream processes are not included in this figure, although they are present in the presented results. One kilogram of biogenic carbon content is equal to 44/12 kg of biogenic carbon dioxide uptake.

Uptake Biogenic Carbon dioxide	Amount	Unit
Situation A	0.003779	kg CO2 (biogenic)
Situation C	0.003636	kg CO2 (biogenic)
Situation E	0.003702	kg CO2 (biogenic)

5.4 Environmental Cost Indicator (ECI) NL

Tabel 2: ECI based on EcoInvent 3.6

Module EN15804	Situation A	Situation C	Situation E
A1 Raw Materials Supply	€ 2,11	€ 7,68	€ 1,90
A2 Transport	€ 0,14	€ 0,17	€ 0,13
A3 Manufacturing	€ 0,29	€ 0,42	€ 0,27
A4 Transport from the gate to the site	€ 0,01	€ 0,01	€ 0,01
A5 Construction - Installation process	€ 0,15	€ 0,45	€ 0,14
B1 Use	€ 0,00	€ 0,00	€ 0,00
B2 Maintenance	€ 0,00	€ 0,00	€ 0,00
B3 Repair	€ 0,00	€ 0,00	€ 0,00
C1 De-construction / demolition	€ 0,00	€ 0,00	€ 0,00
C2 Transport	€ 0,01	€ 0,01	€ 0,01
C3 Waste processing	€ 0,42	€ 0,51	€ 0,38
C4 Disposal	€ 0,01	€ 0,01	€ 0,00
D Benefits and loads beyond the product system boundary	-€ 0,14	-€ 2,91	-€ 0,12
Total	**€ 3,00**	**€ 6,35**	**€ 2,71**

Tabel 3: ECI based on EcoInvent 3.9.1

Module EN15804	Situation A	Situation C	Situation E
A1 Raw Materials Supply	€ 2,18	€ 3,37	€ 1,96
A2 Transport	€ 0,15	€ 0,16	€ 0,12
A3 Manufacturing	€ 0,42	€ 0,49	€ 0,39
A4 Transport from the gate to the site	€ 0,02	€ 0,02	€ 0,01
A5 Construction - Installation process	€ 0,23	€ 0,30	€ 0,21
B1 Use	€ -	€ -	€ -
B2 Maintenance	€ -	€ -	€ -
B3 Repair	€ -	€ -	€ -
C1 De-construction / demolition	€ -	€ -	€ -
C2 Transport	€ 0,01	€ 0,02	€ 0,01
C3 Waste processing	€ 0,87	€ 1,04	€ 0,78
C4 Disposal	€ 0,01	€ 0,01	€ 0,01
D Benefits and loads beyond the product system boundary	€ -0,26	€ -0,61	€ -0,23
Total	**€ 3,63**	**€ 4,81**	**€ 3,26**

Appendix 1

Set 1 Situation C

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Depletion of abiotic resources-elements	Kg Sb	6,33E-04	3,51E-05	3,31E-05	7,01E-04	2,59E-06	3,49E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,07E-06	1,14E-05	9,46E-08	-5,90E-05	6,93E-04
Depletion of abiotic resources-fossil fuels	Kg Sb	1,44E-01	8,18E-03	1,41E-02	1,66E-01	7,45E-04	8,79E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,97E-04	3,38E-03	1,03E-04	-2,63E-02	1,54E-01
Global warming	Kg CO2 Equiv.	1,77E+01	1,17E+00	2,11E+00	2,10E+01	1,01E-01	1,55E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,12E-02	8,50E+00	8,79E-02	-3,41E+00	2,79E+01
Ozone layer depletion	Kg CFC-11 Equiv.	1,49E-06	2,05E-07	1,38E-07	1,83E-06	1,80E-08	1,06E-07	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,44E-08	2,61E-07	2,20E-09	-2,92E-07	1,94E-06
Photochemical oxidants creation	Kg Ethene Equiv.	5,69E-02	7,74E-04	2,39E-03	6,01E-02	6,11E-05	3,00E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,90E-05	2,92E-04	2,11E-05	-1,40E-03	6,21E-02
Acidification of soil and water	Kg SO2 Equiv.	8,68E-02	1,80E-02	8,00E-03	1,13E-01	4,46E-04	5,76E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,57E-04	3,10E-03	5,97E-05	-9,58E-03	1,13E-01
Eutrophication	Kg PO43- Equiv.	1,62E-02	1,02E-03	1,25E-03	1,85E-02	8,75E-05	1,01E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,01E-05	4,90E-04	2,94E-05	-9,40E-04	1,92E-02
Human toxicity	kg 1.4 DB	6,84E+01	4,82E-01	1,80E+00	7,07E+01	4,27E-02	3,61E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,42E-02	5,79E-01	6,99E-03	-2,97E+01	4,52E+01
Ecotoxicity. fresh water	kg 1.4 DB	4,36E-01	1,18E-02	3,74E-02	4,85E-01	1,25E-03	2,58E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,98E-04	3,23E-02	4,24E-03	-1,53E-02	5,35E-01
Ecotoxicity. marine water	kg 1.4 DB	7,02E+02	4,64E+01	7,54E+01	8,24E+02	4,48E+00	4,85E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,59E+00	9,39E+01	4,37E+00	-9,05E+01	8,89E+02
Ecotoxicity. terrestric	kg 1.4 DB	1,57E-01	1,76E-03	1,17E-02	1,71E-01	1,51E-04	8,64E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,21E-04	1,45E-03	1,83E-05	1,02E-02	1,91E-01

Set 2 - Situation C

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Global Warming Potential total (GWP-	kg CO2 eqv.	1,85E+01	7,27E-01	2,98E+00	2,22E+01	1,02E-01	1,92E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,04E-02	8,51E+00	8,87E-02	-3,83E+00	2,91E+01
Global Warming Potential fossil fuels	kg CO2 eqv.	1,83E+01	7,26E-01	2,95E+00	2,20E+01	1,02E-01	1,57E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,00E-02	8,51E+00	8,86E-02	-3,81E+00	2,85E+01
Global Warming Potential biogenic	kg CO2 eqv.	3,97E-01	1,77E-04	3,79E-02	4,35E-01	4,12E-05	3,53E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,93E-05	1,30E-03	4,74E-05	-4,17E-03	7,85E-01
Global Warming Potential land use and	kg CO2 eqv.	1,62E-01	8,72E-04	7,42E-03	1,70E-01	3,75E-05	8,62E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,20E-04	8,39E-04	7,60E-06	-9,76E-03	1,70E-01
Depletion potential of the stratosperic ozon	kg CFC 11 eq.	8,96E-07	1,19E-08	1,18E-07	1,03E-06	2,26E-08	6,53E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,65E-09	2,32E-07	2,34E-10	-1,52E-07	1,20E-06
Acidification potential, Accumulated	mol H+ eq.	1,06E-01	1,59E-02	1,28E-02	1,35E-01	5,93E-04	7,09E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,31E-04	3,79E-03	7,28E-05	-1,16E-02	1,35E-01
Eutrophication potential, fraction of	kg P eq.	1,96E-03	4,07E-06	1,31E-04	2,09E-03	1,03E-06	1,06E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,95E-07	2,48E-05	1,55E-07	-7,14E-05	2,15E-03
Eutrophication potential, fraction of	kg N eq.	1,89E-02	4,06E-03	2,79E-03	2,58E-02	2,09E-04	1,40E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,64E-04	1,04E-03	6,21E-05	-2,21E-03	2,65E-02
Eutrophication potential, Accumulated	mol N eq.	2,06E-01	4,49E-02	2,90E-02	2,80E-01	2,30E-03	1,52E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,75E-03	1,17E-02	2,85E-04	-2,49E-02	2,86E-01
Formation potential of tropospheric ozone	kg NMVOC	7,53E-02	1,25E-02	8,89E-03	9,66E-02	6,57E-04	5,20E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,96E-04	3,33E-03	1,18E-04	-9,76E-03	9,68E-02
Abiotic depletion potential for non fossil	kg Sb-eq.	7,25E-04	1,23E-06	3,96E-05	7,65E-04	2,59E-06	3,88E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,88E-07	5,63E-06	2,14E-08	-3,60E-05	7,77E-04
Abiotic depletion for fossil resources	MJ	2,89E+02	9,33E+00	3,50E+01	3,33E+02	1,54E+00	1,74E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E+00	6,25E+00	2,16E-01	-5,05E+01	3,09E+02
Water (user) deprication potential,	m3 world eq.	8,74E+00	2,93E-02	6,60E-01	9,43E+00	5,51E-03	4,95E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,03E-03	3,89E-01	8,70E-03	-3,20E-01	1,00E+01
Potential incidence of disease due to PM emissions (PM)	disease incidence	1,11E-06	3,43E-08	1,40E-07	1,29E-06	9,16E-09	6,87E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,88E-09	3,44E-08	1,52E-09	-1,78E-07	1,23E-06
Potential Human exposure efficiency	kBq U235 eq.	3,99E-01	2,78E-03	5,94E-02	4,61E-01	6,46E-03	2,48E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,18E-04	2,15E-02	1,32E-04	-4,52E-02	4,69E-01
Potential Comparative Toxic Unit for	CTUe	2,30E+02	5,04E+00	1,90E+01	2,54E+02	1,37E+00	1,82E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,52E-01	9,83E+01	1,02E+00	-1,33E+01	3,60E+02
Potential Comparative Toxic Unit for humans	CTUh	3,50E-08	3,38E-10	1,88E-09	3,72E-08	4,46E-11	1,98E-09	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,77E-11	1,56E-09	6,34E-12	-4,14E-09	3,67E-08
Potential Comparative Toxic Unit for humans	CTUh	4,60E-07	4,15E-09	4,39E-08	5,08E-07	1,51E-09	2,67E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,04E-09	1,78E-08	2,38E-10	-3,64E-08	5,19E-07
Potential soil quality idex (SQP)	Pt	6,41E+01	2,70E+00	4,30E+01	1,10E+02	1,34E+00	4,81E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,02E+00	2,26E+00	4,85E-01	-2,12E+01	9,85E+01

Additional impact indicators – Situation C

Parameters describing resource usage

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Renew. PER as energy	MJ	2,36E+01	9,32E-02	6,57E+00	3,03E+01	1,93E-02	1,57E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,82E-02	7,46E-01	4,60E-03	-9,50E+00	2,31E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	9,33E-04	9,33E-04	0,00E+00	4,66E-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	9,79E-04
Total use of renew. PER	MJ	2,36E+01	9,32E-02	6,57E+00	3,03E+01	1,93E-02	1,57E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,82E-02	7,46E-01	4,60E-03	-9,50E+00	2,31E+01
Non-re. PER as energy	MJ	2,79E+02	9,33E+00	3,45E+01	3,23E+02	1,64E+00	1,69E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E+00	6,25E+00	2,16E-01	-5,07E+01	2,98E+02
Non-re. PER as material	MJ	1,03E+01	0,00E+00	4,71E-01	1,08E+01	0,00E+00	5,39E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,38E-03	1,13E+01
Total use of non-re. PER	MJ	2,89E+02	9,33E+00	3,50E+01	3,34E+02	1,64E+00	1,74E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,29E+00	6,25E+00	2,16E-01	-5,07E+01	3,10E+02
Secondary materials	kg	1,46E-01	0,00E+00	9,04E-03	1,55E-01	0,00E+00	7,74E-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	1,63E-01
Renew. 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
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
Use of net fresh water	m^3	2,35E-01	1,13E-03	1,97E-02	2,56E-01	1,88E-04	1,36E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,11E-04	1,17E-02	2,23E-04	-2,68E-02	2,55E-01

Parameters describing waste categories

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Hazardous waste	kg	1,42E-03	5,34E-05	2,67E-04	1,74E-03	3,91E-06	1,30E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,21E-06	9,01E-04	1,06E-06	1,06E-03	3,84E-03
Non-hazardous waste	kg	5,32E+00	2,02E-01	4,59E-01	5,98E+00	9,78E-02	5,93E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,52E-02	3,37E+00	8,37E-01	-2,10E+00	8,86E+00
Radioactive waste	kg	2,67E-04	1,62E-06	4,57E-05	3,15E-04	1,01E-05	1,72E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,20E-07	1,52E-05	8,02E-08	-3,36E-05	3,24E-04

Parameters describing output flows

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
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
Materials for recycling	kg	1,94E-01	0,00E+00	4,93E-02	2,43E-01	0,00E+00	1,95E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,89E-01	0,00E+00	1,40E-01	1,37E+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
Exported energy	MJ	0,00E+00	0,00E+00	8,34E-01	8,34E-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	2,28E+01	2,36E+01
Exported energy – Thermic	MJ	0,00E+00	0,00E+00	5,28E-01	5,28E-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	1,44E+01	1,49E+01
Exported energy – Electric	MJ	0,00E+00	0,00E+00	3,06E-01	3,06E-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	8,36E+00	8,67E+00

Set 1 Situation E

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Depletion of abiotic resources-elements	Kg Sb	1,17E-04	5,03E-06	8,05E-06	1,30E-04	1,71E-06	2,13E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,46E-06	7,81E-06	6,88E-08	1,09E-06	1,64E-04
Depletion of abiotic resources-fossil fuels	Kg Sb	2,83E-02	1,59E-03	5,50E-03	3,54E-02	4,91E-04	5,80E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,19E-04	2,44E-03	7,41E-05	-1,43E-02	3,03E-02
Global warming	Kg CO2 Equiv.	3,27E+00	2,38E-01	8,16E-01	4,33E+00	6,68E-02	1,04E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,70E-02	6,38E+00	6,59E-02	-1,62E+00	1,03E+01
Ozone layer depletion	Kg CFC-11 Equiv.	2,83E-07	4,04E-08	3,94E-08	3,63E-07	1,18E-08	7,02E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,01E-08	1,94E-07	1,58E-09	-1,84E-07	4,66E-07
Photochemical oxidants creation	Kg Ethene Equiv.	1,39E-02	2,16E-04	6,52E-04	1,47E-02	4,03E-05	2,33E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,44E-05	2,07E-04	1,56E-05	-3,97E-04	1,70E-02
Acidification of soil and water	Kg SO2 Equiv.	1,58E-02	4,52E-03	3,06E-03	2,34E-02	2,93E-04	3,59E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,51E-04	2,19E-03	4,32E-05	-1,46E-03	2,83E-02
Eutrophication	Kg PO43- Equiv.	3,55E-03	3,81E-04	4,27E-04	4,35E-03	5,79E-05	7,19E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,94E-05	3,51E-04	2,18E-05	-2,01E-04	5,35E-03
Human toxicity	kg 1.4 DB	3,35E+00	1,11E-01	2,93E-01	3,75E+00	2,81E-02	6,24E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,40E-02	4,18E-01	5,05E-03	-3,06E-01	4,54E+00
Ecotoxicity. fresh water	kg 1.4 DB	9,40E-02	2,36E-03	8,83E-03	1,05E-01	8,21E-04	1,82E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,01E-04	2,38E-02	3,13E-03	-1,36E-04	1,52E-01
Ecotoxicity. marine water	kg 1.4 DB	1,15E+02	9,84E+00	2,23E+01	1,47E+02	2,95E+00	2,87E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,52E+00	6,91E+01	3,27E+00	-5,51E+00	2,48E+02
Ecotoxicity. terrestric	kg 1.4 DB	2,20E-02	3,70E-04	3,63E-03	2,60E-02	9,93E-05	4,14E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	8,48E-05	1,04E-03	1,32E-05	1,54E-03	3,29E-02

Set 2 - Situation E

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Global Warming Potential total (GWP-	kg CO2 eqv.	1,08E+01	5,40E-01	2,40E+00	1,38E+01	6,74E-02	1,39E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,35E-02	6,38E+00	6,64E-02	-1,68E+00	2,01E+01
Global Warming Potential fossil fuels	kg CO2 eqv.	1,07E+01	5,39E-01	2,37E+00	1,36E+01	6,73E-02	1,04E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,33E-02	6,38E+00	6,64E-02	-1,68E+00	1,95E+01
Global Warming Potential biogenic	kg CO2 eqv.	2,87E-01	1,34E-04	3,43E-02	3,22E-01	2,71E-05	3,50E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,06E-05	9,00E-04	3,51E-05	-7,22E-04	6,72E-01
Global Warming Potential land use and	kg CO2 eqv.	1,54E-01	6,05E-04	7,26E-03	1,62E-01	2,47E-05	8,15E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,26E-04	6,04E-04	5,61E-06	-4,07E-03	1,67E-01
Depletion potential of the stratosperic ozon	kg CFC 11 eq.	5,61E-07	8,82E-09	1,04E-07	6,75E-07	1,49E-08	4,44E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,13E-09	1,74E-07	1,67E-10	-9,81E-08	8,11E-07
Acidification potential, Accumulated	mol H+ eq.	6,29E-02	1,19E-02	9,60E-03	8,44E-02	3,91E-04	4,48E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,03E-04	2,68E-03	5,27E-05	-1,57E-03	9,07E-02
Eutrophication potential, fraction of	kg P eq.	1,70E-03	3,05E-06	1,18E-04	1,82E-03	6,79E-07	9,20E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,29E-07	1,79E-05	1,13E-07	-1,34E-06	1,93E-03
Eutrophication potential, fraction of	kg N eq.	1,13E-02	3,03E-03	2,16E-03	1,65E-02	1,38E-04	9,13E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,15E-04	7,47E-04	4,59E-05	-5,06E-04	1,80E-02
Eutrophication potential, Accumulated	mol N eq.	1,21E-01	3,34E-02	2,20E-02	1,76E-01	1,52E-03	9,74E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,23E-03	8,35E-03	2,05E-04	-5,79E-03	1,91E-01
Formation potential of tropospheric ozone	kg NMVOC	4,53E-02	9,29E-03	6,86E-03	6,14E-02	4,33E-04	3,36E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,19E-04	2,37E-03	8,55E-05	-2,91E-03	6,52E-02
Abiotic depletion potential for non fossil	kg Sb-eq.	4,61E-04	9,58E-07	3,08E-05	4,93E-04	1,71E-06	2,49E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,98E-07	3,26E-06	1,54E-08	5,03E-06	5,28E-04
Abiotic depletion for fossil resources	MJ	1,84E+02	6,92E+00	2,93E+01	2,20E+02	1,02E+00	1,15E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,06E-01	4,46E+00	1,56E-01	-2,53E+01	2,13E+02
Water (user) deprication potential,	m3 world eq.	5,79E+00	2,16E-02	5,32E-01	6,34E+00	3,63E-03	3,35E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,95E-03	2,90E-01	6,51E-03	-2,19E-01	6,76E+00
Potential incidence of disease due to PM emissions (PM)	disease incidence	6,01E-07	2,53E-08	1,00E-07	7,26E-07	6,04E-09	3,96E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,25E-09	2,33E-08	1,10E-09	-2,28E-08	7,80E-07
Potential Human exposure efficiency	kBq U235 eq.	2,12E-01	2,11E-03	5,07E-02	2,65E-01	4,25E-03	1,45E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,54E-04	1,56E-02	8,91E-05	-4,81E-03	2,95E-01
Potential Comparative Toxic Unit for	CTUe	1,54E+02	3,70E+00	1,49E+01	1,72E+02	9,06E-01	1,28E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	6,69E-01	7,38E+01	5,39E-01	-3,47E+00	2,58E+02
Potential Comparative Toxic Unit for humans	CTUh	1,05E-08	2,60E-10	1,07E-09	1,19E-08	2,94E-11	5,85E-10	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,35E-11	1,15E-09	4,45E-12	-2,93E-10	1,34E-08
Potential Comparative Toxic Unit for humans	CTUh	2,69E-07	3,06E-09	3,44E-08	3,07E-07	9,93E-10	1,63E-08	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,28E-10	1,23E-08	1,57E-10	9,16E-10	3,38E-07
Potential soil quality idex (SQP)	Pt	3,45E+01	1,93E+00	4,41E+01	8,05E+01	8,81E-01	3,13E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,15E-01	1,34E+00	3,49E-01	-1,21E+01	7,48E+01

Additional impact indicators – Situation E

Parameters describing resource usage

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Renew. PER as energy	MJ	1,04E+01	7,05E-02	6,09E+00	1,66E+01	1,27E-02	8,67E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,28E-02	5,27E-01	3,00E-03	-3,56E+00	1,44E+01
Renew. PER as material	MJ	0,00E+00	0,00E+00	1,40E-03	1,40E-03	0,00E+00	7,00E-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	1,47E-03
Total use of renew. PER	MJ	1,04E+01	7,05E-02	6,09E+00	1,66E+01	1,27E-02	8,67E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,28E-02	5,27E-01	3,00E-03	-3,56E+00	1,44E+01
Non-re. PER as energy	MJ	1,74E+02	6,93E+00	2,88E+01	2,09E+02	1,08E+00	1,10E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,08E-01	4,46E+00	1,56E-01	-2,54E+01	2,02E+02
Non-re. PER as material	MJ	1,07E+01	0,00E+00	4,51E-01	1,11E+01	0,00E+00	5,57E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-5,50E-03	1,17E+01
Total use of non-re. PER	MJ	1,84E+02	6,93E+00	2,93E+01	2,21E+02	1,08E+00	1,16E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,08E-01	4,46E+00	1,56E-01	-2,54E+01	2,13E+02
Secondary materials	kg	7,10E-02	0,00E+00	4,40E-03	7,54E-02	0,00E+00	3,77E-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	7,92E-02
Renew. 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
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
Use of net fresh water	m^3	1,48E-01	8,23E-04	1,68E-02	1,66E-01	1,24E-04	8,86E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,19E-04	8,66E-03	1,59E-04	-1,10E-02	1,72E-01

Parameters describing waste categories

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
Hazardous waste	kg	7,48E-04	4,17E-05	1,68E-04	9,57E-04	2,57E-06	6,99E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,78E-06	4,44E-04	7,65E-07	4,91E-04	1,97E-03
Non-hazardous waste	kg	1,16E+00	1,43E-01	3,18E-01	1,62E+00	6,44E-02	3,16E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	5,99E-02	2,50E+00	6,04E-01	-7,10E-02	5,09E+00
Radioactive waste	kg	1,43E-04	1,24E-06	3,98E-05	1,84E-04	6,69E-06	1,03E-05	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,07E-07	1,10E-05	5,45E-08	-5,39E-06	2,07E-04

Parameters describing output flows

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	C1	C2	C3	C4	D	Total
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
Materials for recycling	kg	9,45E-02	0,00E+00	1,57E-02	1,10E-01	0,00E+00	1,55E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,24E-01	0,00E+00	6,83E-02	4,57E-01
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
Exported energy	MJ	0,00E+00	0,00E+00	6,70E-01	6,70E-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	1,81E+01	1,87E+01
Exported energy – Thermic	MJ	0,00E+00	0,00E+00	4,24E-01	4,24E-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	1,14E+01	1,19E+01
Exported energy – Electric	MJ	0,00E+00	0,00E+00	2,46E-01	2,46E-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	0,00E+00	6,64E+00	6,89E+00