

# Environmental Product Declaration



In accordance with ISO 14025 and EN 15804 for:

## 1 m<sup>2</sup> of partition wall

from

### Aluminios Eibar S. L.



Programme:

Programme operator:

EPD registration number:

Publication date:

Valid until:

Product category rules (PCR):

Geographical validity:

The International EPD<sup>®</sup> System, [www.environdec.com](http://www.environdec.com)

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PCR 2012:01 "Construction Products and construction services" v2.3

Global



## Programme information

| CEN Standard EN 15804 served as the core PCR   |  |
|--|--|
| <b>Programme:</b>  | The International EPD® System<br><br>EPD International AB<br>Box 210 60<br>SE-100 31 Stockholm<br>Sweden<br><br><a href="http://www.environdec.com">www.environdec.com</a><br><a href="mailto:info@environdec.com">info@environdec.com</a> |
| Product category rules (PCR):  | <i>PCR 2012:01 "Construction Products and construction services" (Version 2.3)</i>   |
| PCR review was conducted by:   | <i>The Technical Committee of the International EPD ® System</i><br><i>Review chair: Maurizio Fieschi</i><br><i>Contact via <a href="mailto:info@environdec.com">info@environdec.com</a></i>   |
| Independent third-party verification of the declaration and data, according to ISO 14025:2006: | <input type="checkbox"/> EPD process certification<br><input checked="" type="checkbox"/> EPD verification   |
| Third party verifier:  | <i>Tecnalia R&amp;I Certificacion, SL</i><br><i>Auditor: Elisabet Amat</i><br><i><a href="mailto:eli.amat@tecnaliacertificacion.com">eli.amat@tecnaliacertificacion.com</a></i><br><i>Accredited by: ENAC nº125/C-PR283 accreditation</i>  |
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| EPD valid within the following geographical area   | International  |

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.

## Company information

### Owner of the EPD:

Aluminios Eibar S.L.  
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Aluminios Eibar S. L., Avda. Euskalerría, s/n 48250 Zaldibar, Biscay (Spain).

### Description of the organisation:

Aluminios Eibar is a company that focuses its activity on the development, extrusion and marketing of aluminium products for the building sector and industry, composed of more than 40 professionals. It has been developing solutions demanded by the market for more than 25 years with aluminium as a raw material. Aluminium is 100% recyclable and is an environmentally and economically sustainable material.

With more than 20,000 m<sup>2</sup> of facilities, our warehouses are located in Asturias, Cantabria, Biscay, Gipuzkoa, Álava and La Rioja-Navarre where we make our wide range of products available to customers, maintaining a strong commitment to quality and safeguarding the environment.

Its mission is to generate value for its customers and collaborators on a daily basis under the slogan "because your value is ours".

It should be noted that Aluminios Eibar has three different lines of business among which it distributes its efforts: aluminium carpentry (Itesal), composite panel (Albond) and partition walls (Rauman).

It should be noted that the products to be studied in this EPD will be related to the Rauman area.

### Product-related or management system-related certifications:

ISO 9001 Quality Management Systems and 14001 Environmental Management Systems (in process of updating).

Qualanod for anodised coatings and Qualicoat for lacquered coatings.

### Name and location of production site:

Aluminios Eibar S. L., Avda. Euskalerría, s/n 48250 Zaldibar, Biscay (Spain).

Through the development of an EPD, Aluminios Eibar aims to contribute to a positive change and greater transparency when it comes to environmental impact, being the first company in our sector to do it including transport to the site and installation of the product.

With six own factories in the North of Spain and sales in 16 countries, there are many people all over the world working for us and we care for each and every one of them. We work hard to exert our influence wherever our products are made.

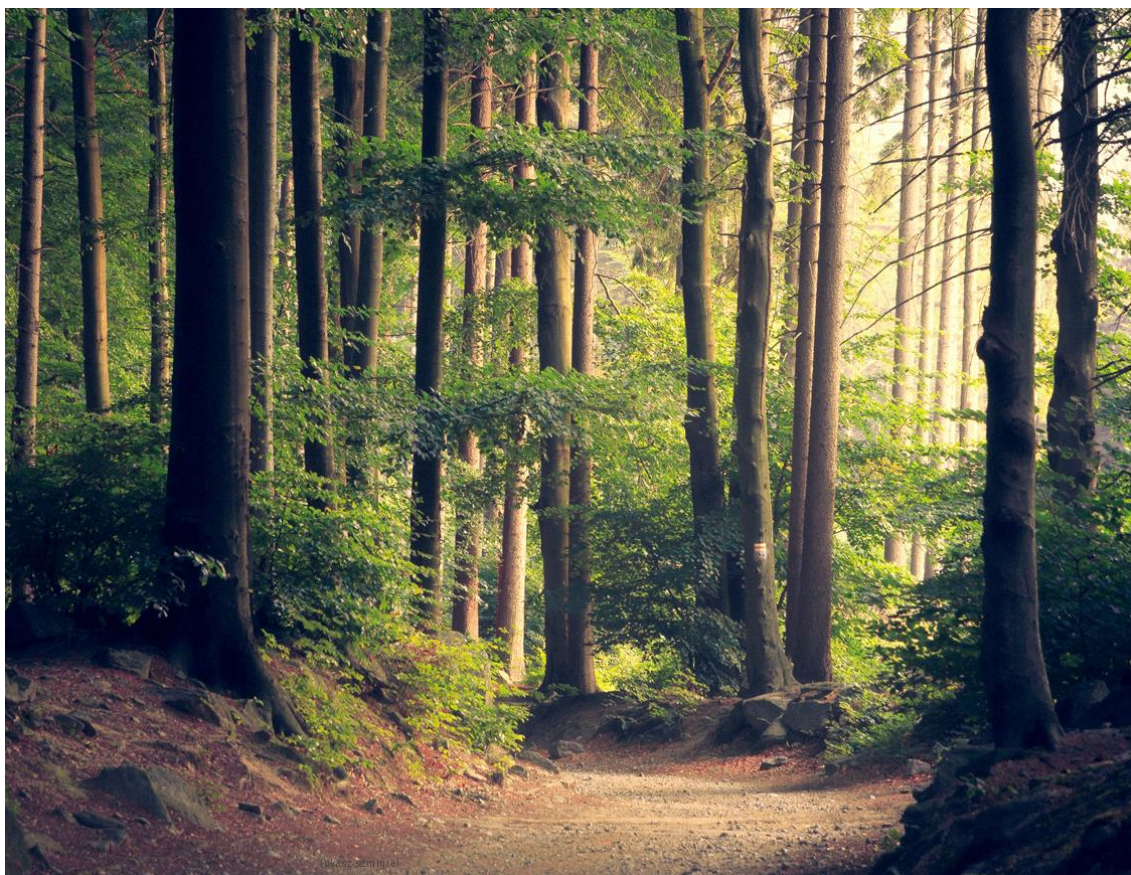
In this way, we have set high requirements for companies that want to be our suppliers, at all stages.



Jason Blackeye







An Environmental Product Declaration (EPD) is an independently verified and registered document that communicates transparent and comparable information about the life cycle environmental impact of products. The relevant standard for Environmental Product Declarations is ISO 14025, where they are referred to as "Type III environmental declarations". A Type III environmental declaration is created and registered in the framework of a programme, such as the International EPD® System.

The International EPD® System has, as a main objective, the ambition to enable and support organisations in any country to communicate quantified environmental information on the life cycle of their products in a credible, comparable, and understandable way. All EPDs registered in the International EPD® System are publically available and free to download on this website: [www.environdec.com](http://www.environdec.com).

All EPDs are based on Product Category Rules providing rules, requirements, and guidelines for a defined product category. The overall goal of an EPD is to provide relevant and verified information to meet the communication needs in the various applications: procurement, ecodesign or environmental management systems. An important aspect of EPD is to provide the basis of a fair comparison of products and services by its environmental performance. EPDs can reflect the continuous environmental improvement of products and services over time and are able to communicate and add up relevant environmental information along a product's supply chain.

Our branch of partition wall:





## Product information

All the partition wall products (partitions and doors) produced by Aluminios Eibar S.L. are classified CPC 42120 under the UN CPC classification system v2.1.

This EPD applies to partition walls consisting of the following Rauman product ranges:

### - Partitions:

Product name: Single glazed linear partition system.

Product identification: S1.

Product description: 110 mm thick continuous single glazed linear partition system made by universal internal structure in galvanised steel, covered with aluminium profiles. The glass can be joined with double-sided adhesive tapes, polycarbonate profiles and/or aluminium profiles. Glass up to 12.8 mm thick can be installed in the system.

- Sound reduction up to 36 dB Rw.
- CTE compliance in structural safety up to H4000 mm.



Geographical scope: Global

Product name: Double glazed linear partition system.

Product identification: S3.

Product description: Double glazed linear partition system of 110 mm thickness realized by universal internal structure of galvanized steel, covered with aluminium profiles. The glass can be joined using double-sided adhesive tapes, polycarbonate profiles and/or aluminium profiles. Glass up to 12.8 mm thick can be installed in the system.

- Sound reduction up to 43 dB Rw
- CTE compliance in structural safety up to H4000 mm.



Geographical scope: Global

Product name: Double glazed linear partition system.

Product identification: S13.

Product description: Double glazed linear partition system of 110 mm thickness realized by universal internal structure of galvanized steel, covered with aluminium profiles. The glass can be joined using double-sided adhesive tapes, polycarbonate profiles and/or aluminium profiles. Glass up to 12.8 mm thick can be installed in the system.

- Sound reduction up to 47 dB Rw.
- CTE compliance in structural safety up to H4000 mm.



Geographical scope: Global

Product name: Double glazed modular partition system.

Product identification: S7 / S8.

Product description: 110 mm thick double-glazed modular office partition system made by universal internal structure in galvanised steel, covered with aluminium profiles. Glass up to 6.8 mm thick can be installed in the system.

- Sound reduction up to 42 dB Rw.
- CTE compliance in structural safety up to H5500 mm.



Geographical scope: Global

Product name: Double universal blind module.

Product identification: SU.

Product description: Double universal blind module made by universal internal structure in galvanised steel, covered with agglomerate panels 19 mm thick.

- Sound reduction up to 48 dB Rw.
- CTE compliance in structural safety up to H5500 mm.



Geographical scope: Global

## - Doors:

Product name: Glass swinging single door module.

Product identification: Glass e10 door.

Product description: Swinging door module with tempered glass leaf made by universal internal structure in galvanised steel covered by an aluminium door frame. Tempered glass leaf 10 mm thick.

- Compliance with CTE DB SE-AE and DB SE-A in structural capacity up to H3600 mm.



Geographical scope: Global

Product name: Glass framed swinging single door module.

Product identification: Glass e30 door.

Product description: Swinging door module with framed glass leaf made by universal internal structure in galvanised steel covered by an aluminium door frame. Door leaf framed with 3+3 laminated glass and 30 mm thick.

- Compliance with CTE DB SE-AE and DB SE-A in structural capacity up to H3700 mm.



Geographical scope: Global



Product name: Blind swinging single door module.

Product identification: Blind e38 door.

Product description: Swinging door module with blind leaf made by universal internal structure in galvanised steel covered by an aluminium door frame. Melamine blind door leaf 38 mm thick.

- Sound reduction 37 dB Rw.
- Compliance with CTE DB SE-AE and DB SE-A in structural capacity up to H3600 mm.

Geographical scope: Global



Product name: Glass framed swinging single door module.

Product identification: Glass e40 door.

Product description: Swinging door module with framed glass leaf made by universal internal structure in galvanised steel covered by an aluminium door frame. Door leaf framed with double tempered glass of 4 mm and thickness 40 mm.

- Compliance with CTE DB SE-AE and DB SE-A in structural capacity up to H3600 mm.

Geographical scope: Global



Product name: Glass framed swinging single door module.

Product identification: Glass e110 door.

Product description: Swinging door module with framed glass leaf made by universal internal structure in galvanised steel covered by an aluminium door frame. Door leaf framed with double tempered glass of 6 mm and thickness 110 mm. It has a guillotine at the bottom for greater acoustic comfort.

- Sound reduction 39 dB Rw.
- Compliance with CTE DB SE-AE and DB SE-A in structural capacity up to H3000 mm.

Geographical scope: Global



Product name: Single glazed sliding door.

Product identification: Glass sliding S1 door.

Product description: Single glazed continuous sliding door module 110 mm thick, made by universal internal structure in galvanised steel, covered with aluminium profiles. The glass can be joined with double-sided adhesive tapes, polycarbonate profiles and/or aluminium profiles. In the fixed part of the system, glass up to 12.8 mm thick can be installed. The sliding door leaf is made of 10 mm thick tempered glass. The door leaf can be self-closing during opening and closing.

Geographical scope: Global



Product name: Double glazed sliding door.

Product identification: Glass sliding S3 door.

Product description: 110 mm thick continuous double glazed sliding door module made by universal internal structure in galvanised steel, covered with aluminium profiles. The glass can be joined using double-sided adhesive tapes, polycarbonate profiles and/or aluminium profiles. Glass up to 12.8 mm thick can be installed in the fixed part of the system. The sliding door leaf is made of tempered glass 10 mm thick. The door leaf can be self-closing during opening and closing.



Geographical scope: Global

Therefore, in the case of this study, the combinations analysed will be:

- S1 + e10 system.
- S1 + e30 system.
- S1 + e38 system.
- S1 + Sliding S1 system.
- S3 + e40 system.
- S3 + e110 system.
- S3 + Sliding S3 system.
- S13 + e40 system.
- S13 + e110 system.
- S7 + e10 / S8 + e10 system.
- S7 + e30 / S8 + e30 system.
- S7 + e38 / S8 + e38 system.
- S7 + e110 / S8 + e110 system.
- SU + e38 system.
- SU + e110 system.

## LCA information

**Functional unit / declared unit:** The declared units are 1 m<sup>2</sup> of partition wall consisting of a partition unit and a door unit. The partition unit has a dimension of 2,700 x 3,000 mm, in other words, 8.1 m<sup>2</sup>. In contrast, the size of the door unit will always have a height of 2,700 mm, but the width will vary depending on the type of door used. Thus, in the case of a single glazed swinging door the width will be 1,000 mm (2.7 m<sup>2</sup>) and in the case of a sliding door the width will be 3,000 mm (8.1 m<sup>2</sup>).

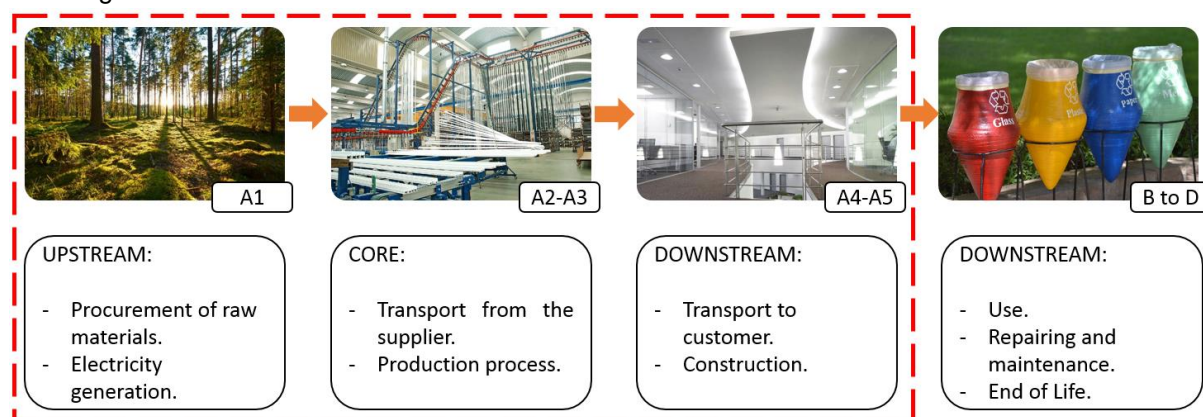
Thus, even if the declared functional unit as a whole exceeds 1 m<sup>2</sup> (10.8 or 16.2 m<sup>2</sup> depending on the type of door used) all calculations will be made for 1 m<sup>2</sup> of partition wall consisting of a partition unit and a door unit.

**Time representativeness:** January 1, 2018 to December 31, 2018.

**Database(s) and LCA software used:** Ecoinvent 3.4 and SimaPro 8.5.2.0.

**Environmental assessment methods:** all the impact categories selected are those indicated in PCR 2012:01 "Construction Products and construction services" (Version 2.3), using the environmental assessment methods CML-IA baseline (Version 4.1), EDIP (for the calculation of waste production) and ReCiPe MidPoint, Cumulative Energy Demand and the Lower Calorific Value (LCV) of each material used (for the calculation of use of resources).

**System diagram:** For this EPD, all the processes that have taken place from the obtaining of raw materials to the installation of the product on site have been taken into account. This can be seen in the following illustration:



**Figure 1 - System boundaries applied to the products analysed.**

Therefore, for a cradle-to-gate with options analysis the system will include the Product STAGE modules corresponding to stages A1, A2, A3, A4 and A5. The following table indicates with an "X" the modules that have been included in the analysis carried out, and the undeclared module (MND) those that have not been included.



| Product stage |           |               | Construction process stage |                           | Use stage |             |        |             |               |                        |                       |                            | End of life stage |                  |          |                                    | Resource recovery stage |
|---------------|-----------|---------------|----------------------------|---------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|----------------------------|-------------------|------------------|----------|------------------------------------|-------------------------|
| Raw materials | Transport | Manufacturing | Transport                  | Construction installation | Use       | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | De-construction demolition | Transport         | Waste processing | Disposal | Reuse-Recovery-Recycling-potential |                         |
|               |           |               |                            |                           |           |             |        |             |               |                        |                       |                            |                   |                  |          |                                    |                         |
| A1            | A2        | A3            | A4                         | A5                        | B1        | B2          | B3     | B4          | B5            | B6                     | B7                    | C1                         | C2                | C3               | C4       | D                                  |                         |
| X             | X         | X             | X                          | X                         | MND       | MND         | MND    | MND         | MND           | MND                    | MND                   | MND                        | MND               | MND              | MND      | MND                                |                         |

**Figure 2** - General system limits indicated in the PCR. The modules included in the scope of this study are highlighted.

In this way, everything that is included within the limits of the "cradle-to-gate with options" boundaries will be analysed. Therefore, the life cycle phases included are as detailed below:

### INCLUDED STAGES:

#### - UPSTREAM PROCESSES

##### A1) Raw material supply

- Extraction and processing of raw materials, biomass production and processing and recycling processes of secondary materials from a previous product system, but not including those processes that are part of the waste processing in the previous product system, referring to the polluter pays principle.
- Generation of electricity, steam and heat from primary energy resources, also including their extraction, refining and transport. This also includes energy needed for raw material supply and energy for manufacturing in core process.
- Energy recovery and other recovery processes from secondary fuels, but not including those processes that are part of waste processing in the previous product system.

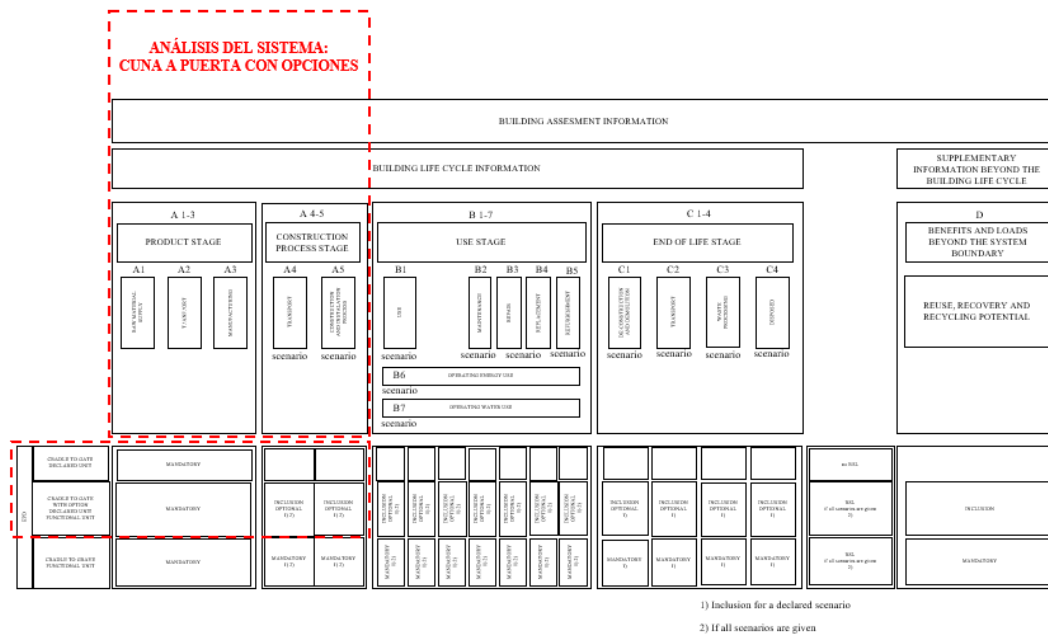
#### - CORE PROCESSES

##### A2) Transportation

- External transportation to the core processes and internal transport.

##### A3) Manufacturing

- Manufacture of the product under analysis: consumption of energy and materials.
- Packaging materials (if relevant)
- Treatment of waste generated during the manufacturing process.



**Figure 3 - General system limits given in EN 15804. The modules included in the scope of this study are highlighted.**

## - DOWNSTREAM PROCESSES

### A4) Transport

- Transportation from the production gate to the construction site.
- Storage of products, including the provision of heating, cooling, humidity control etc.
- Transport of waste generated from the construction site.

### A5) Construction installation

- Processes within the installation of the material in the building/construction.

### Main assumptions:

A number of points need to be clarified concerning the scope and limits of the system:

- The time horizon of validity granted to the data collected is 1 year.
- The environmental impact of external transport has been calculated using trucks from the Ecoinvent 3.4 database.
- Various indicators have been generated in the database used for the SimaPro program, which are related to the different materials used to manufacture the systems analysed in this study and which do not exist in the database and with the products analysed. These will be the different recycled materials (aluminium, steel and panels), the galvanised and anodised products and the systems studied together with their life cycle phases.
- Due to the fact that only one profile of the S7 partition is different from that of the S8 partition (weighing that of the S7 38 grams/meter more) they are going to be unified as if they were the same product taking the partition that has a higher weight profile.
- It has been estimated that in those products that are framed, the glass will be purchased from the trusted supplier of Aluminios Eibar (as they are assembled from factory) and for the rest of the cases the glass and panels will be asked to the trusted supplier closest to the work.

- The electricity production mix for Aluminios Eibar corresponds to Viesgo España, S.L. (2018) and for the work location the production mix corresponds to Spain (Red Eléctrica de España, 2018).
- Due to the fact that we are not going to work on a fixed work location, we are going to estimate the distances between Aluminios Eibar, glassmakers and panel makers with the location taking into account the production volume of 2018.

Cut-off rules: The ISO 14025 standard and the PCR 2012:01 for Construction Products and construction services says that Life Cycle Inventory data for a minimum of 95% of total inflows (mass and energy) to the upstream and core module shall be included. Inflows not included in the LCA shall be documented in the EPD.

Thus, for the present study, the only data left out of the analysis were two of the locations to which the product was distributed in 2018, but which, due to the distance between the factory and the construction site, significantly increased the weighted construction distances. It should be noted that the material quantity sent to these locations does not exceed 0.662%, therefore the cutting rule is complied with.

Data quality: The data used for this EPD were collected following the guidelines of ISO 14044:2006 and the most current available data were used in accordance with EN 15804. The manufacturer specific data that are used in the LCA calculations cover a period of 1 year from January 1, 2018 to December 31, 2018. They are therefore based on one-year averaged data and have been updated in the five years preceding the EPD publication. These data were verified to ensure that sufficient materials and water were included in the inputs to account for all outputs, including products and wastes. Their technological coverage reflects also the physical reality of the declared product.

Other (generic) datasets used for calculations have been updated within the last 10 years.

Allocation: The consumption of electricity in the plant, consumption of lubricant for the maintenance of the machines and production of waste in the plant will be assigned through economic allocation and mass allocation depending on the case. All assignments have been made for the Zaldibar factory and in accordance with Section 7.7 for PCR 2012:01 "Construction Products and construction services".



## Content declaration

### Product

In this section we will present the percentages of raw material used to build each of the systems, but without taking into account those used for packaging. These are shown below:

| MATERIAL INPUT        | Aluminium | Steel | Glass  | Wooden panel | Others |
|-----------------------|-----------|-------|--------|--------------|--------|
| S1 + e10              | 4.63%     | 3.76% | 90.39% | 0.00%        | 1.23%  |
| S1 + e30              | 9.28%     | 4.97% | 85.51% | 0.00%        | 0.24%  |
| S1 + e38              | 4.56%     | 4.00% | 70.58% | 20.60%       | 0.26%  |
| S1 + Sliding S1       | 4.45%     | 3.77% | 91.59% | 0.00%        | 0.18%  |
| S3 + e40              | 10.64%    | 3.50% | 85.65% | 0.00%        | 0.21%  |
| S3 + e110             | 10.62%    | 3.03% | 86.08% | 0.00%        | 0.27%  |
| S3 + Sliding S3       | 4.43%     | 2.32% | 93.08% | 0.00%        | 0.17%  |
| S13 + e40             | 10.70%    | 3.50% | 85.59% | 0.00%        | 0.21%  |
| S13 + e110            | 10.68%    | 3.03% | 86.02% | 0.00%        | 0.27%  |
| S7 + e10 / S8 + e10   | 7.46%     | 7.29% | 84.92% | 0.00%        | 0.33%  |
| S7 + e30 / S8 + e30   | 14.32%    | 9.01% | 76.32% | 0.00%        | 0.35%  |
| S7 + e38 / S8 + e38   | 9.60%     | 8.05% | 61.39% | 20.60%       | 0.37%  |
| S7 + e110 / S8 + e110 | 14.64%    | 8.23% | 76.71% | 0.00%        | 0.41%  |
| SU + e38              | 2.97%     | 9.21% | 0.00%  | 87.65%       | 0.18%  |
| SU + e110             | 8.01%     | 9.40% | 15.32% | 67.05%       | 0.22%  |

Among the different materials used to build the different systems, there will be three of them that will be recycled. These products are the steel, aluminium and panels and the distributor of each one supplies together with the product a document that proves the amount of recycled material (in percentage) used to manufacture it. The amount of recycled material used for each will be at least 39% for aluminium, 95% for steel and 30% for wooden panels.

The proper use of the described products is not-hazardous to water, air and soil. It is inert in its proper use. No damage to health is expected under normal use. In this way, Aluminios Eibar is REACH compliant since it does not contain any substance listed in the "Candidate List of Substances of Very High Concern (SVHC) for authorization" in a content exceeding 0.1% of the weight of the product.

### Packaging

For this study, depending on the stage of manufacture in which the product is located, different types of packaging have been considered. These will be differentiated between the packaging of the supplier of materials, Aluminios Eibar packaging, glass packaging and panel packaging. All of them are going to be carried out with the same procedure for each one of the systems trying to ensure the quality of the product in its destiny.

## Construction process stage

The technical data for phases A4 and A5 will then be displayed. That is to say, the transports used to take the product to work and the consumptions and residues in its installation will be shown.

### - S1 + e10 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.443                         |
|   | PVC (kg)                   | 0.016                         |
|   | Board (kg)                 | 41.3                          |
|   | Wood (kg)                  |                               |

### - S1 + e30 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.469                         |
|   | PVC (kg)                   | 0.012                         |
|   | Board (kg)                 | 41.4                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.

## - S1 + e38 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.406                         |
|   | PVC (kg)                   | 0.012                         |
|   | Board (kg)                 | 34.6                          |
|   | Wood (kg)                  |                               |

## - S1 + Sliding S1 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 6.440                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.585                         |
|   | PVC (kg)                   | 0.024                         |
|   | Board (kg)                 | 50.2                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.



### - S3 + e40 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.389                         |
|   | PVC (kg)                   | 0.024                         |
|   | Board (kg)                 | 46.3                          |
|   | Wood (kg)                  |                               |

### - S3 + e110 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.528                         |
|   | PVC (kg)                   | 0.024                         |
|   | Board (kg)                 | 65.2                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.

### - S3 + Sliding S3 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 6.440                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.516                         |
|   | PVC (kg)                   | 0.044                         |
|   | Board (kg)                 | 59.0                          |
|   | Wood (kg)                  |                               |

### - S13 + e40 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.499                         |
|   | PVC (kg)                   | 0.024                         |
|   | Board (kg)                 | 46.5                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.

## - S13 + e110 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.638                         |
|   | PVC (kg)                   | 0.024                         |
|   | Board (kg)                 | 65.4                          |
|   | Wood (kg)                  |                               |

## - S7 + e10 / S8 + e10 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.764                         |
|   | PVC (kg)                   | 0.004                         |
|   | Board (kg)                 | 96.9                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.



## - S7 + e30 / S8 + e30 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.764                         |
|   | PVC (kg)                   | 0                             |
|   | Board (kg)                 | 97.0                          |
|   | Wood (kg)                  |                               |

## - S7 + e38 / S8 + e38 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.984                         |
|   | PVC (kg)                   | 0                             |
|   | Board (kg)                 | 90.2                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.

## - S7 + e110 / S8 + e110 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 1.169                         |
|   | PVC (kg)                   | 0                             |
|   | Board (kg)                 | 114.8                         |
|   | Wood (kg)                  |                               |

## - SU + e38 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.556                         |
|   | PVC (kg)                   | 0                             |
|   | Board (kg)                 | 48.8                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.

## - SU + e110 system

| PARÁMETER   | UNIT                       | VALUE                         |
|---|----------------------------|-------------------------------|
| <b>A4 – TRANSPORT TO SITE (*)</b>   |                            |                               |
| Vehicle type used   | Lorry 3.5 – 7.5 metric ton |                               |
| Type of fuel used and consumption   | L/100 km                   | Diesel (30-40)                |
| Distance to site  | km                         | Variable depending on product |
| Bulk density of transported products  | %                          | 100                           |
| <b>A5 – CONSTRUCTION INSTALLATION</b>   |                            |                               |
| Ancillary materials for installation  | kg                         | Not applicable                |
| Water use   | m <sup>3</sup>             | Not applicable                |
| Quantitative description of energy type and consumption during the installation process             | kWh                        | 4.293                         |
| Direct emissions to ambient air, soil and water   | kg                         | Not applicable                |
| Waste materials on the building site before waste processing, generated by the product installation | Plastic (kg)               | 0.741                         |
|   | PVC (kg)                   | 0                             |
|   | Board (kg)                 | 73.4                          |
|   | Wood (kg)                  |                               |

(\*) Due to the variety of products and to the fact that depending on the component, this transport can be from Aluminios Eibar to the construction site or from supplier to construction site, these tables are shown as a summary and the complete information is found in the verified LCA report.

## Environmental performance

- S1 + e10 system

### Potential environmental impact

| PARAMETER  | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|--|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP<br>(kg CO <sub>2</sub> eq.)             | 3.02E+01 | 7.30E-01 | 5.86E-03 | 5.35E+00 | 1.31E-01 | 3.64E+01 |
| Ozone depletion<br>(kg CFC-11 eq.)                                     | 3.02E-06 | 1.22E-07 | 2.92E-09 | 9.20E-07 | 1.66E-08 | 4.08E-06 |
| Acidification of land and water<br>(kg SO <sub>2</sub> eq.)            | 2.60E-01 | 2.96E-03 | 3.72E-05 | 1.68E-02 | 1.11E-03 | 2.80E-01 |
| Eutrophication<br>(kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 3.71E-02 | 8.31E-04 | 9.51E-06 | 4.07E-03 | 2.48E-04 | 4.23E-02 |
| Photochemical ozone creation<br>(kg C <sub>2</sub> H <sub>4</sub> eq.) | 9.44E-03 | 2.49E-04 | 2.23E-06 | 9.27E-04 | 4.07E-05 | 1.07E-02 |
| Depletion of abiotic resources<br>(elements) - (kg Sb eq.)             | 8.81E-04 | 2.80E-06 | 4.98E-08 | 2.92E-05 | 2.81E-07 | 9.13E-04 |
| Depletion of abiotic resources<br>(fossil) - (MJ)                      | 3.37E+02 | 1.05E+01 | 2.78E-01 | 7.75E+01 | 1.38E+00 | 4.26E+02 |

### Use of resources

| PARAMETER  | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|--|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy<br>excluding renewable primary<br>energy resources used as raw<br>materials (MJ)           | 3.31E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.31E-01 |
| Use of renewable primary energy<br>resources used as raw materials<br>(MJ)   | 1.27E+02 | 2.35E-01 | 5.68E-03 | 1.30E+00 | 1.39E+00 | 1.30E+02 |
| Total use of renewable primary<br>energy resources (MJ)  | 1.28E+02 | 2.35E-01 | 5.68E-03 | 1.30E+00 | 1.39E+00 | 1.31E+02 |
| Use of non- renewable primary<br>energy excluding non- renewable<br>primary energy resources used as<br>raw materials (MJ) | 1.70E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.70E-02 |
| Use of non- renewable primary<br>energy resources used as raw<br>materials (MJ)  | 3.87E+02 | 1.15E+01 | 3.09E-01 | 8.42E+01 | 2.79E+00 | 4.86E+02 |
| Total use of non- renewable primary<br>energy resources (MJ)   | 3.87E+02 | 1.15E+01 | 3.09E-01 | 8.42E+01 | 2.79E+00 | 4.86E+02 |
| Use of secondary material (kg)   | 8.90E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.90E+00 |
| Use of renewable secondary fuels<br>(MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary<br>fuels (MJ)   | 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> )   | 2.01E-01 | 1.86E-03 | 3.29E-05 | 1.35E-02 | 6.76E-04 | 2.17E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 1.43E-03 | 1.37E-04 | 1.23E-07 | 6.30E-05 | 3.87E-06 | 1.63E-03 |
| Non-hazardous waste disposed (kg) | 2.57E+00 | 3.70E-01 | 4.50E-04 | 2.40E+00 | 1.19E-02 | 5.35E+00 |
| Radioactive waste disposed (kg)   | 1.31E-03 | 7.03E-05 | 1.66E-06 | 5.20E-04 | 1.95E-05 | 1.92E-03 |

## - S1 + e30 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 2.81E+01 | 6.52E-01 | 6.90E-03 | 7.15E+00 | 1.31E-01 | 3.60E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 2.78E-06 | 1.11E-07 | 3.44E-09 | 1.23E-06 | 1.66E-08 | 4.14E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 2.39E-01 | 2.45E-03 | 4.38E-05 | 2.25E-02 | 1.11E-03 | 2.65E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 3.54E-02 | 6.58E-04 | 1.12E-05 | 5.44E-03 | 2.48E-04 | 4.18E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 8.79E-03 | 1.85E-04 | 2.63E-06 | 1.24E-03 | 4.07E-05 | 1.03E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.05E-03 | 2.68E-06 | 5.86E-08 | 3.90E-05 | 2.81E-07 | 1.09E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 3.14E+02 | 9.46E+00 | 3.27E-01 | 1.04E+02 | 1.38E+00 | 4.28E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 3.32E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.32E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 1.26E+02 | 1.95E-01 | 6.69E-03 | 1.74E+00 | 1.39E+00 | 1.30E+02 |
| Total use of renewable primary energy resources (MJ)  | 1.27E+02 | 1.95E-01 | 6.69E-03 | 1.74E+00 | 1.39E+00 | 1.30E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 1.78E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.78E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 3.61E+02 | 1.04E+01 | 3.64E-01 | 1.13E+02 | 2.79E+00 | 4.87E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 3.61E+02 | 1.04E+01 | 3.64E-01 | 1.13E+02 | 2.79E+00 | 4.87E+02 |
| Use of secondary material (kg)  | 9.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 9.00E+00 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 1.97E-01 | 1.71E-03 | 3.88E-05 | 1.81E-02 | 6.76E-04 | 2.17E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 1.88E-03 | 8.46E-05 | 1.45E-07 | 8.42E-05 | 3.87E-06 | 2.05E-03 |
| Non-hazardous waste disposed (kg) | 2.43E+00 | 3.65E-01 | 5.30E-04 | 3.22E+00 | 1.19E-02 | 6.03E+00 |
| Radioactive waste disposed (kg)   | 1.21E-03 | 6.38E-05 | 1.96E-06 | 6.96E-04 | 1.95E-05 | 1.99E-03 |



## - S1 + e38 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 2.60E+01 | 4.54E-01 | 4.83E-03 | 8.16E+00 | 1.31E-01 | 3.47E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 2.63E-06 | 7.68E-08 | 2.41E-09 | 1.40E-06 | 1.66E-08 | 4.13E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 2.21E-01 | 1.81E-03 | 3.07E-05 | 2.56E-02 | 1.11E-03 | 2.50E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 3.72E-02 | 5.00E-04 | 7.84E-06 | 6.21E-03 | 2.48E-04 | 4.42E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 8.71E-03 | 1.47E-04 | 1.84E-06 | 1.41E-03 | 4.07E-05 | 1.03E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 9.31E-04 | 1.74E-06 | 4.10E-08 | 4.45E-05 | 2.81E-07 | 9.78E-04 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 3.02E+02 | 6.57E+00 | 2.29E-01 | 1.18E+02 | 1.38E+00 | 4.28E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 6.28E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.28E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 1.62E+02 | 1.44E-01 | 4.68E-03 | 1.99E+00 | 1.39E+00 | 1.66E+02 |
| Total use of renewable primary energy resources (MJ)  | 1.63E+02 | 1.44E-01 | 4.68E-03 | 1.99E+00 | 1.39E+00 | 1.66E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 1.66E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.66E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 3.49E+02 | 7.21E+00 | 2.55E-01 | 1.28E+02 | 2.79E+00 | 4.87E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 3.49E+02 | 7.21E+00 | 2.55E-01 | 1.28E+02 | 2.79E+00 | 4.87E+02 |
| Use of secondary material (kg)  | 1.35E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.35E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 1.73E-01 | 1.18E-03 | 2.71E-05 | 2.06E-02 | 6.76E-04 | 1.96E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 1.40E-03 | 7.81E-05 | 1.01E-07 | 9.61E-05 | 3.87E-06 | 1.58E-03 |
| Non-hazardous waste disposed (kg) | 2.32E+00 | 2.48E-01 | 3.71E-04 | 3.67E+00 | 1.19E-02 | 6.25E+00 |
| Radioactive waste disposed (kg)   | 1.16E-03 | 4.42E-05 | 1.37E-06 | 7.94E-04 | 1.95E-05 | 2.02E-03 |

## - S1 + Sliding S1 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 3.05E+01 | 4.64E-01 | 6.00E-03 | 4.83E+00 | 1.31E-01 | 3.59E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 3.06E-06 | 7.87E-08 | 2.99E-09 | 8.31E-07 | 1.66E-08 | 3.98E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 2.63E-01 | 1.84E-03 | 3.81E-05 | 1.52E-02 | 1.11E-03 | 2.81E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 3.71E-02 | 5.08E-04 | 9.74E-06 | 3.68E-03 | 2.48E-04 | 4.16E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 9.44E-03 | 1.49E-04 | 2.28E-06 | 8.37E-04 | 4.07E-05 | 1.05E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 8.41E-04 | 1.78E-06 | 5.10E-08 | 2.63E-05 | 2.81E-07 | 8.70E-04 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 3.39E+02 | 6.73E+00 | 2.85E-01 | 7.00E+01 | 1.38E+00 | 4.17E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 4.74E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.74E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 1.07E+02 | 1.47E-01 | 5.82E-03 | 1.18E+00 | 1.39E+00 | 1.10E+02 |
| Total use of renewable primary energy resources (MJ)  | 1.07E+02 | 1.47E-01 | 5.82E-03 | 1.18E+00 | 1.39E+00 | 1.10E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 2.05E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.05E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 3.89E+02 | 7.38E+00 | 3.16E-01 | 7.61E+01 | 2.79E+00 | 4.76E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 3.89E+02 | 7.38E+00 | 3.16E-01 | 7.61E+01 | 2.79E+00 | 4.76E+02 |
| Use of secondary material (kg)  | 1.16E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.16E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 2.00E-01 | 1.21E-03 | 3.37E-05 | 1.22E-02 | 6.76E-04 | 2.14E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 1.39E-03 | 7.82E-05 | 1.26E-07 | 5.69E-05 | 3.87E-06 | 1.53E-03 |
| Non-hazardous waste disposed (kg) | 2.49E+00 | 2.55E-01 | 4.61E-04 | 2.17E+00 | 1.19E-02 | 4.93E+00 |
| Radioactive waste disposed (kg)   | 1.32E-03 | 4.52E-05 | 1.70E-06 | 4.70E-04 | 1.95E-05 | 1.86E-03 |

## - S3 + e40 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 5.22E+01 | 7.33E-01 | 8.72E-03 | 9.84E+00 | 1.31E-01 | 6.29E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 5.20E-06 | 1.26E-07 | 4.35E-09 | 1.69E-06 | 1.66E-08 | 7.04E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 4.50E-01 | 2.71E-03 | 5.54E-05 | 3.09E-02 | 1.11E-03 | 4.84E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 6.70E-02 | 7.19E-04 | 1.42E-05 | 7.49E-03 | 2.48E-04 | 7.55E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.62E-02 | 1.99E-04 | 3.32E-06 | 1.71E-03 | 4.07E-05 | 1.81E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.53E-03 | 2.95E-06 | 7.41E-08 | 5.37E-05 | 2.81E-07 | 1.58E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 5.80E+02 | 1.07E+01 | 4.14E-01 | 1.43E+02 | 1.38E+00 | 7.35E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 4.63E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.63E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 1.56E+02 | 2.17E-01 | 8.46E-03 | 2.40E+00 | 1.39E+00 | 1.60E+02 |
| Total use of renewable primary energy resources (MJ)  | 1.56E+02 | 2.17E-01 | 8.46E-03 | 2.40E+00 | 1.39E+00 | 1.60E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 2.34E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.34E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 6.66E+02 | 1.17E+01 | 4.60E-01 | 1.55E+02 | 2.79E+00 | 8.36E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 6.66E+02 | 1.17E+01 | 4.60E-01 | 1.55E+02 | 2.79E+00 | 8.36E+02 |
| Use of secondary material (kg)  | 1.12E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.12E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 3.54E-01 | 1.96E-03 | 4.90E-05 | 2.48E-02 | 6.76E-04 | 3.82E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 3.04E-03 | 8.62E-05 | 1.83E-07 | 1.16E-04 | 3.87E-06 | 3.25E-03 |
| Non-hazardous waste disposed (kg) | 4.22E+00 | 4.45E-01 | 6.70E-04 | 4.42E+00 | 1.19E-02 | 9.10E+00 |
| Radioactive waste disposed (kg)   | 2.24E-03 | 7.24E-05 | 2.48E-06 | 9.58E-04 | 1.95E-05 | 3.29E-03 |

## - S3 + e110 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 5.53E+01 | 9.76E-01 | 8.97E-03 | 1.23E+01 | 1.31E-01 | 6.87E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 5.49E-06 | 1.68E-07 | 4.47E-09 | 2.11E-06 | 1.66E-08 | 7.79E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 5.03E-01 | 3.59E-03 | 5.70E-05 | 3.85E-02 | 1.11E-03 | 5.47E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 6.89E-02 | 9.51E-04 | 1.46E-05 | 9.33E-03 | 2.48E-04 | 7.94E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.84E-02 | 2.62E-04 | 3.42E-06 | 2.12E-03 | 4.07E-05 | 2.08E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.70E-03 | 4.00E-06 | 7.62E-08 | 6.68E-05 | 2.81E-07 | 1.77E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 6.16E+02 | 1.42E+01 | 4.26E-01 | 1.78E+02 | 1.38E+00 | 8.09E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 4.97E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.97E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 2.04E+02 | 2.87E-01 | 8.70E-03 | 2.99E+00 | 1.39E+00 | 2.09E+02 |
| Total use of renewable primary energy resources (MJ)  | 2.04E+02 | 2.87E-01 | 8.70E-03 | 2.99E+00 | 1.39E+00 | 2.09E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 2.54E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.54E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 7.07E+02 | 1.56E+01 | 4.73E-01 | 1.93E+02 | 2.79E+00 | 9.19E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 7.07E+02 | 1.56E+01 | 4.73E-01 | 1.93E+02 | 2.79E+00 | 9.19E+02 |
| Use of secondary material (kg)  | 1.18E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.18E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 3.85E-01 | 2.59E-03 | 5.05E-05 | 3.09E-02 | 6.76E-04 | 4.19E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 3.65E-03 | 1.11E-04 | 1.89E-07 | 1.44E-04 | 3.87E-06 | 3.91E-03 |
| Non-hazardous waste disposed (kg) | 4.70E+00 | 5.82E-01 | 6.89E-04 | 5.51E+00 | 1.19E-02 | 1.08E+01 |
| Radioactive waste disposed (kg)   | 2.36E-03 | 9.63E-05 | 2.55E-06 | 1.19E-03 | 1.95E-05 | 3.67E-03 |

## - S3 + Sliding S3 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 5.53E+01 | 5.55E-01 | 6.42E-03 | 7.17E+00 | 1.31E-01 | 6.31E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 5.55E-06 | 9.49E-08 | 3.20E-09 | 1.23E-06 | 1.66E-08 | 6.90E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 4.78E-01 | 2.17E-03 | 4.08E-05 | 2.25E-02 | 1.11E-03 | 5.04E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 6.57E-02 | 5.92E-04 | 1.04E-05 | 5.46E-03 | 2.48E-04 | 7.20E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.69E-02 | 1.72E-04 | 2.44E-06 | 1.24E-03 | 4.07E-05 | 1.84E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.17E-03 | 2.08E-06 | 5.46E-08 | 3.91E-05 | 2.81E-07 | 1.21E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 6.12E+02 | 8.07E+00 | 3.04E-01 | 1.04E+02 | 1.38E+00 | 7.26E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 5.56E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.56E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 1.37E+02 | 1.74E-01 | 6.23E-03 | 1.75E+00 | 1.39E+00 | 1.41E+02 |
| Total use of renewable primary energy resources (MJ)  | 1.38E+02 | 1.74E-01 | 6.23E-03 | 1.75E+00 | 1.39E+00 | 1.41E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 2.78E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.78E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 7.02E+02 | 8.85E+00 | 3.39E-01 | 1.13E+02 | 2.79E+00 | 8.27E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 7.02E+02 | 8.85E+00 | 3.39E-01 | 1.13E+02 | 2.79E+00 | 8.27E+02 |
| Use of secondary material (kg)  | 1.35E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.35E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 3.58E-01 | 1.47E-03 | 3.61E-05 | 1.81E-02 | 6.76E-04 | 3.78E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 2.32E-03 | 8.71E-05 | 1.35E-07 | 8.45E-05 | 3.87E-06 | 2.49E-03 |
| Non-hazardous waste disposed (kg) | 4.30E+00 | 3.33E-01 | 4.93E-04 | 3.22E+00 | 1.19E-02 | 7.87E+00 |
| Radioactive waste disposed (kg)   | 2.40E-03 | 5.46E-05 | 1.82E-06 | 6.98E-04 | 1.95E-05 | 3.18E-03 |



## - S13 + e40 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 5.24E+01 | 7.34E-01 | 8.78E-03 | 1.20E+01 | 1.31E-01 | 6.53E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 5.22E-06 | 1.27E-07 | 4.38E-09 | 1.52E-06 | 1.66E-08 | 6.89E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 4.52E-01 | 2.72E-03 | 5.58E-05 | 7.26E-02 | 1.11E-03 | 5.28E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 6.74E-02 | 7.20E-04 | 1.43E-05 | 1.77E-02 | 2.48E-04 | 8.61E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.63E-02 | 2.00E-04 | 3.34E-06 | 3.30E-03 | 4.07E-05 | 1.98E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.54E-03 | 2.96E-06 | 7.46E-08 | 6.99E-04 | 2.81E-07 | 2.24E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 5.84E+02 | 1.07E+01 | 4.16E-01 | 1.53E+02 | 1.38E+00 | 7.50E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 4.66E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.66E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 1.56E+02 | 2.17E-01 | 8.52E-03 | 7.57E+01 | 1.39E+00 | 2.34E+02 |
| Total use of renewable primary energy resources (MJ)  | 1.57E+02 | 2.17E-01 | 8.52E-03 | 7.57E+01 | 1.39E+00 | 2.34E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 2.70E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.70E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 6.70E+02 | 1.17E+01 | 4.63E-01 | 1.72E+02 | 2.79E+00 | 8.57E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 6.70E+02 | 1.17E+01 | 4.63E-01 | 1.72E+02 | 2.79E+00 | 8.57E+02 |
| Use of secondary material (kg)  | 1.13E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.13E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 3.56E-01 | 1.96E-03 | 4.94E-05 | 7.83E-02 | 6.76E-04 | 4.37E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 3.08E-03 | 8.60E-05 | 1.85E-07 | 1.40E-03 | 3.87E-06 | 4.57E-03 |
| Non-hazardous waste disposed (kg) | 4.24E+00 | 4.47E-01 | 6.74E-04 | 3.09E+00 | 1.19E-02 | 7.79E+00 |
| Radioactive waste disposed (kg)   | 2.25E-03 | 7.26E-05 | 2.50E-06 | 7.61E-04 | 1.95E-05 | 3.10E-03 |

## - S13 + e110 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 5.56E+01 | 9.77E-01 | 9.03E-03 | 1.23E+01 | 1.31E-01 | 6.90E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 5.52E-06 | 1.69E-07 | 4.50E-09 | 2.12E-06 | 1.66E-08 | 7.82E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 5.06E-01 | 3.60E-03 | 5.74E-05 | 3.87E-02 | 1.11E-03 | 5.49E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 6.92E-02 | 9.51E-04 | 1.47E-05 | 9.36E-03 | 2.48E-04 | 7.98E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.85E-02 | 2.62E-04 | 3.44E-06 | 2.13E-03 | 4.07E-05 | 2.09E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.72E-03 | 4.01E-06 | 7.68E-08 | 6.71E-05 | 2.81E-07 | 1.79E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 6.19E+02 | 1.43E+01 | 4.28E-01 | 1.78E+02 | 1.38E+00 | 8.14E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 5.00E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 2.05E+02 | 2.87E-01 | 8.76E-03 | 3.00E+00 | 1.39E+00 | 2.09E+02 |
| Total use of renewable primary energy resources (MJ)  | 2.05E+02 | 2.87E-01 | 8.76E-03 | 3.00E+00 | 1.39E+00 | 2.10E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 2.90E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.90E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 7.11E+02 | 1.56E+01 | 4.76E-01 | 1.94E+02 | 2.79E+00 | 9.24E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 7.11E+02 | 1.56E+01 | 4.76E-01 | 1.94E+02 | 2.79E+00 | 9.24E+02 |
| Use of secondary material (kg)  | 1.18E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.18E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 3.87E-01 | 2.60E-03 | 5.08E-05 | 3.11E-02 | 6.76E-04 | 4.21E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 3.69E-03 | 1.11E-04 | 1.90E-07 | 1.45E-04 | 3.87E-06 | 3.95E-03 |
| Non-hazardous waste disposed (kg) | 4.72E+00 | 5.84E-01 | 6.94E-04 | 5.53E+00 | 1.19E-02 | 1.08E+01 |
| Radioactive waste disposed (kg)   | 2.37E-03 | 9.65E-05 | 2.57E-06 | 1.20E-03 | 1.95E-05 | 3.69E-03 |

## - S7 + e10 / S8 + e10 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 3.41E+01 | 2.03E+00 | 1.16E-02 | 2.07E+01 | 1.31E-01 | 5.69E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 3.34E-06 | 3.45E-07 | 5.80E-09 | 3.56E-06 | 1.66E-08 | 7.28E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 2.82E-01 | 7.36E-03 | 7.39E-05 | 6.51E-02 | 1.11E-03 | 3.56E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 4.57E-02 | 1.95E-03 | 1.89E-05 | 1.58E-02 | 2.48E-04 | 6.37E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.09E-02 | 5.32E-04 | 4.43E-06 | 3.59E-03 | 4.07E-05 | 1.51E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.88E-03 | 9.12E-06 | 9.88E-08 | 1.13E-04 | 2.81E-07 | 2.00E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 3.82E+02 | 2.93E+01 | 5.51E-01 | 3.00E+02 | 1.38E+00 | 7.14E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 1.11E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.11E+00 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 2.68E+02 | 5.81E-01 | 1.13E-02 | 5.05E+00 | 1.39E+00 | 2.75E+02 |
| Total use of renewable primary energy resources (MJ)  | 2.69E+02 | 5.81E-01 | 1.13E-02 | 5.05E+00 | 1.39E+00 | 2.76E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 3.90E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.90E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 4.41E+02 | 3.20E+01 | 6.13E-01 | 3.26E+02 | 2.79E+00 | 8.03E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 4.41E+02 | 3.20E+01 | 6.13E-01 | 3.26E+02 | 2.79E+00 | 8.03E+02 |
| Use of secondary material (kg)  | 2.41E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.41E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 2.54E-01 | 5.19E-03 | 6.54E-05 | 5.23E-02 | 6.76E-04 | 3.12E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 2.90E-03 | 2.16E-04 | 2.44E-07 | 2.44E-04 | 3.87E-06 | 3.36E-03 |
| Non-hazardous waste disposed (kg) | 3.34E+00 | 1.02E+00 | 8.93E-04 | 9.32E+00 | 1.19E-02 | 1.37E+01 |
| Radioactive waste disposed (kg)   | 1.45E-03 | 1.97E-04 | 3.30E-06 | 2.02E-03 | 1.95E-05 | 3.69E-03 |

## - S7 + e30 / S8 + e30 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 3.19E+01 | 1.95E+00 | 1.27E-02 | 2.25E+01 | 1.31E-01 | 5.65E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 3.11E-06 | 3.34E-07 | 6.32E-09 | 3.88E-06 | 1.66E-08 | 7.34E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 2.61E-01 | 6.85E-03 | 8.05E-05 | 7.08E-02 | 1.11E-03 | 3.40E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 4.40E-02 | 1.78E-03 | 2.06E-05 | 1.71E-02 | 2.48E-04 | 6.32E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.03E-02 | 4.69E-04 | 4.82E-06 | 3.90E-03 | 4.07E-05 | 1.47E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 2.04E-03 | 8.99E-06 | 1.08E-07 | 1.23E-04 | 2.81E-07 | 2.18E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 3.59E+02 | 2.83E+01 | 6.01E-01 | 3.26E+02 | 1.38E+00 | 7.16E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 1.11E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.11E+00 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 2.68E+02 | 5.41E-01 | 1.23E-02 | 5.49E+00 | 1.39E+00 | 2.75E+02 |
| Total use of renewable primary energy resources (MJ)  | 2.67E+02 | 5.41E-01 | 1.23E-02 | 5.49E+00 | 1.39E+00 | 2.74E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 3.98E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.98E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 4.15E+02 | 3.09E+01 | 6.68E-01 | 3.55E+02 | 2.79E+00 | 8.04E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 4.15E+02 | 3.09E+01 | 6.68E-01 | 3.55E+02 | 2.79E+00 | 8.04E+02 |
| Use of secondary material (kg)  | 2.42E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.42E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 2.50E-01 | 5.04E-03 | 7.13E-05 | 5.69E-02 | 6.76E-04 | 3.13E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 3.35E-03 | 1.63E-04 | 2.66E-07 | 2.65E-04 | 3.87E-06 | 3.78E-03 |
| Non-hazardous waste disposed (kg) | 3.21E+00 | 1.02E+00 | 9.73E-04 | 1.01E+01 | 1.19E-02 | 1.44E+01 |
| Radioactive waste disposed (kg)   | 1.35E-03 | 1.90E-04 | 3.60E-06 | 2.19E-03 | 1.95E-05 | 3.75E-03 |

## - S7 + e38 / S8 + e38 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 2.98E+01 | 1.75E+00 | 1.06E-02 | 2.35E+01 | 1.31E-01 | 5.52E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 2.96E-06 | 2.99E-07 | 5.28E-09 | 4.05E-06 | 1.66E-08 | 7.33E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 2.44E-01 | 6.21E-03 | 6.73E-05 | 7.39E-02 | 1.11E-03 | 3.25E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 4.58E-02 | 1.62E-03 | 1.72E-05 | 1.79E-02 | 2.48E-04 | 6.56E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.02E-02 | 4.31E-04 | 4.03E-06 | 4.08E-03 | 4.07E-05 | 1.48E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.93E-03 | 8.05E-06 | 9.00E-08 | 1.28E-04 | 2.81E-07 | 2.06E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 3.47E+02 | 2.54E+01 | 5.03E-01 | 3.41E+02 | 1.38E+00 | 7.15E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 6.28E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.28E-01 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 3.02E+02 | 4.90E-01 | 1.03E-02 | 5.73E+00 | 1.39E+00 | 3.10E+02 |
| Total use of renewable primary energy resources (MJ)  | 3.01E+02 | 4.90E-01 | 1.03E-02 | 5.73E+00 | 1.39E+00 | 3.11E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 1.66E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.66E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 4.03E+02 | 2.77E+01 | 5.59E-01 | 3.71E+02 | 2.79E+00 | 8.04E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 4.03E+02 | 2.77E+01 | 5.59E-01 | 3.71E+02 | 2.79E+00 | 8.04E+02 |
| Use of secondary material (kg)  | 2.86E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.86E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 2.26E-01 | 4.51E-03 | 5.96E-05 | 5.94E-02 | 6.76E-04 | 2.91E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 2.87E-03 | 1.56E-04 | 2.23E-07 | 2.77E-04 | 3.87E-06 | 3.31E-03 |
| Non-hazardous waste disposed (kg) | 3.10E+00 | 8.98E-01 | 8.14E-04 | 1.06E+01 | 1.19E-02 | 1.46E+01 |
| Radioactive waste disposed (kg)   | 1.30E-03 | 1.71E-04 | 3.01E-06 | 2.29E-03 | 1.95E-05 | 3.78E-03 |



## - S7 + e110 / S8 + e110 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 3.67E+01 | 2.18E+00 | 1.32E-02 | 2.54E+01 | 1.31E-01 | 6.44E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 3.56E-06 | 3.75E-07 | 6.59E-09 | 4.37E-06 | 1.66E-08 | 8.32E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 3.31E-01 | 7.67E-03 | 8.40E-05 | 7.97E-02 | 1.11E-03 | 4.20E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 5.14E-02 | 1.98E-03 | 2.15E-05 | 1.93E-02 | 2.48E-04 | 7.29E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 1.31E-02 | 5.23E-04 | 5.03E-06 | 4.40E-03 | 4.07E-05 | 1.81E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 2.35E-03 | 1.00E-05 | 1.12E-07 | 1.38E-04 | 2.81E-07 | 2.50E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 4.14E+02 | 3.17E+01 | 6.27E-01 | 3.68E+02 | 1.38E+00 | 8.15E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 1.19E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.19E+00 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 3.15E+02 | 6.06E-01 | 1.28E-02 | 6.18E+00 | 1.39E+00 | 3.23E+02 |
| Total use of renewable primary energy resources (MJ)  | 3.16E+02 | 6.06E-01 | 1.28E-02 | 6.18E+00 | 1.39E+00 | 3.24E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 4.20E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.20E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 4.77E+02 | 3.46E+01 | 6.97E-01 | 4.00E+02 | 2.79E+00 | 9.15E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 4.77E+02 | 3.46E+01 | 6.97E-01 | 4.00E+02 | 2.79E+00 | 9.15E+02 |
| Use of secondary material (kg)  | 2.48E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.48E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 2.93E-01 | 5.66E-03 | 7.44E-05 | 6.41E-02 | 6.76E-04 | 3.64E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 4.16E-03 | 1.80E-04 | 2.78E-07 | 2.99E-04 | 3.87E-06 | 4.64E-03 |
| Non-hazardous waste disposed (kg) | 3.82E+00 | 1.16E+00 | 1.02E-03 | 1.14E+01 | 1.19E-02 | 1.64E+01 |
| Radioactive waste disposed (kg)   | 1.53E-03 | 2.14E-04 | 3.76E-06 | 2.47E-03 | 1.95E-05 | 4.23E-03 |

## - SU + e38 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 1.09E+01 | 5.34E-01 | 6.88E-03 | 1.94E+01 | 1.31E-01 | 3.10E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 1.24E-06 | 9.00E-08 | 3.43E-09 | 3.34E-06 | 1.66E-08 | 4.69E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 6.82E-02 | 2.14E-03 | 4.37E-05 | 6.09E-02 | 1.11E-03 | 1.32E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 2.61E-02 | 5.96E-04 | 1.12E-05 | 1.48E-02 | 2.48E-04 | 4.18E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 5.60E-03 | 1.77E-04 | 2.62E-06 | 3.36E-03 | 4.07E-05 | 9.18E-03 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.34E-03 | 2.04E-06 | 5.85E-08 | 1.06E-04 | 2.81E-07 | 1.45E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 1.72E+02 | 7.71E+00 | 3.26E-01 | 2.81E+02 | 1.38E+00 | 4.62E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 3.89E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.89E+00 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 3.61E+02 | 1.71E-01 | 6.68E-03 | 4.73E+00 | 1.39E+00 | 3.67E+02 |
| Total use of renewable primary energy resources (MJ)  | 3.65E+02 | 1.71E-01 | 6.68E-03 | 4.73E+00 | 1.39E+00 | 3.71E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 1.43E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.43E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 2.07E+02 | 8.47E+00 | 3.63E-01 | 3.05E+02 | 2.79E+00 | 5.24E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 2.07E+02 | 8.47E+00 | 3.63E-01 | 3.05E+02 | 2.79E+00 | 5.24E+02 |
| Use of secondary material (kg)  | 7.21E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.21E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 7.31E-02 | 1.38E-03 | 3.87E-05 | 4.90E-02 | 6.76E-04 | 1.24E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 1.26E-03 | 9.52E-05 | 1.45E-07 | 2.28E-04 | 3.87E-06 | 1.59E-03 |
| Non-hazardous waste disposed (kg) | 1.83E+00 | 2.85E-01 | 5.29E-04 | 8.72E+00 | 1.19E-02 | 1.08E+01 |
| Radioactive waste disposed (kg)   | 6.09E-04 | 5.18E-05 | 1.96E-06 | 1.89E-03 | 1.95E-05 | 2.57E-03 |

## - SU + e110 system

### Potential environmental impact

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Global Warming Potential - GWP (kg CO <sub>2</sub> eq.)             | 1.78E+01 | 9.65E-01 | 9.51E-03 | 2.12E+01 | 1.31E-01 | 4.01E+01 |
| Ozone depletion (kg CFC-11 eq.)                                     | 1.84E-06 | 1.65E-07 | 4.74E-09 | 3.65E-06 | 1.66E-08 | 5.68E-06 |
| Acidification of land and water (kg SO <sub>2</sub> eq.)            | 1.55E-01 | 3.60E-03 | 6.04E-05 | 6.67E-02 | 1.11E-03 | 2.27E-01 |
| Eutrophication (kg PO <sub>4</sub> <sup>3-</sup> eq.)               | 3.17E-02 | 9.60E-04 | 1.54E-05 | 1.62E-02 | 2.48E-04 | 4.91E-02 |
| Photochemical ozone creation (kg C <sub>2</sub> H <sub>4</sub> eq.) | 8.52E-03 | 2.68E-04 | 3.62E-06 | 3.68E-03 | 4.07E-05 | 1.25E-02 |
| Depletion of abiotic resources (elements) - (kg Sb eq.)             | 1.77E-03 | 4.01E-06 | 8.08E-08 | 1.16E-04 | 2.81E-07 | 1.89E-03 |
| Depletion of abiotic resources (fossil) - (MJ)                      | 2.39E+02 | 1.40E+01 | 4.51E-01 | 3.08E+02 | 1.38E+00 | 5.62E+02 |

### Use of resources

| PARAMETER   | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|---|----------|----------|----------|----------|----------|----------|
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials (MJ)           | 3.68E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.68E+00 |
| Use of renewable primary energy resources used as raw materials (MJ)  | 3.74E+02 | 2.86E-01 | 9.22E-03 | 5.18E+00 | 1.39E+00 | 3.80E+02 |
| Total use of renewable primary energy resources (MJ)  | 3.77E+02 | 2.86E-01 | 9.22E-03 | 5.18E+00 | 1.39E+00 | 3.84E+02 |
| Use of non- renewable primary energy excluding non- renewable primary energy resources used as raw materials (MJ) | 1.76E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 1.76E-02 |
| Use of non- renewable primary energy resources used as raw materials (MJ)   | 2.82E+02 | 1.54E+01 | 5.02E-01 | 3.34E+02 | 2.79E+00 | 6.35E+02 |
| Total use of non- renewable primary energy resources (MJ)   | 2.82E+02 | 1.54E+01 | 5.02E-01 | 3.34E+02 | 2.79E+00 | 6.35E+02 |
| Use of secondary material (kg)  | 6.83E+01 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.83E+01 |
| Use of renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of non-renewable secondary fuels (MJ)   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Use of net fresh water (m <sup>3</sup> )  | 1.40E-01 | 2.53E-03 | 5.35E-05 | 5.36E-02 | 6.76E-04 | 1.97E-01 |

### Waste production

| PARAMETER                         | (A1)     | (A2)     | (A3)     | (A4)     | (A5)     | TOTAL    |
|-----------------------------------|----------|----------|----------|----------|----------|----------|
| Hazardous waste disposed (kg)     | 2.55E-03 | 1.19E-04 | 2.00E-07 | 2.50E-04 | 3.87E-06 | 2.92E-03 |
| Non-hazardous waste disposed (kg) | 2.55E+00 | 5.44E-01 | 7.30E-04 | 9.55E+00 | 1.19E-02 | 1.27E+01 |
| Radioactive waste disposed (kg)   | 8.35E-04 | 9.46E-05 | 2.70E-06 | 2.07E-03 | 1.95E-05 | 3.02E-03 |

## References

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More information about the certification system on the Environdec website: [www.environdec.com](http://www.environdec.com)

