

# Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021:

## Asphalt mixtures from the Šemša asphalt plant

Covering the **ACO**, **ACL** and **ACP** asphalt mixtures.



|                            |                                                                                                      |
|----------------------------|------------------------------------------------------------------------------------------------------|
| <b>Programme:</b>          | Czech Environmental Information Agency (CENIA), “National programme of environmental labelling” - CZ |
| <b>Programme operator:</b> | CENIA, Czech Environmental Information Agency, Executive body of NPEZ Agency                         |
| <b>EPD owner:</b>          | EUROVIA SK a.s.                                                                                      |
| <b>Author:</b>             | LCA Studio s.r.o.                                                                                    |
| <b>Publication date:</b>   | 30.04.2026                                                                                           |
| <b>Valid until:</b>        | 29.04.2031                                                                                           |

## GENERAL INFORMATION

| Followed standards and third-party verification        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standards</b>                                       | This EPD is carried out according to ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021.                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Third-party verification</b>                        | <p>Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:</p> <p><input checked="" type="checkbox"/> Individual EPD verification without a pre-verified LCA/EPD tool</p> <p>Third-party verifier: prof. Ing. Silvia Vilčeková, PhD., Silcert, s.r.o.</p> <p>Procedure for follow-up of data during EPD validity involves third party verifier:</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> |
| LCA practitioner, commissioned by the owner of the EPD |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Name</b>                                            | LCA Studio s.r.o.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Address</b>                                         | Šárecká 1962/5, 16000 Prague 6, Czech Republic, <a href="http://www.lcastudio.cz">www.lcastudio.cz</a>                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Contact</b>                                         | <p>Ing. Aleš Paulu, Ph.D. (<a href="mailto:ales.paulu@lcastudio.cz">ales.paulu@lcastudio.cz</a>)</p> <p>prof. Ing. Vladimír Kočí, Ph.D., MBA (<a href="mailto:vladimir.koci@lcastudio.cz">vladimir.koci@lcastudio.cz</a>)</p> <p>Ing. et Ing. Tatiana Trecáková, Ph.D. (<a href="mailto:tatiana.trecakova@lcastudio.cz">tatiana.trecakova@lcastudio.cz</a>)</p>                                                                                                            |

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

For further information about comparability, see EN 15804 and ISO 14025.

## COMPANY INFORMATION

| Owner of the EPD |                                                                                                                                               |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Name             | EUROVIA SK a.s.                                                                                                                               |
| Address          | Osloboditeľov 66, 040 17 Košice Slovak Republic, <a href="http://www.euroviask.vinci-construction.cz">www.euroviask.vinci-construction.cz</a> |
| Contact          | Ing. Pavol Kaleja, Ph.D. ( <a href="mailto:pavol.kaleja@vinci-construction.com">pavol.kaleja@vinci-construction.com</a> )                     |

### Description of the EPD owner organisation:

EUROVIA SK, a. s. is one of the leading construction companies in Slovakia, with a history spanning more than 70 years. The company is part of **VINCI Construction CS**, the largest construction group operating in the Czech Republic and Slovakia, which belongs to the international **VINCI** group — one of the world's largest concessions and construction groups. The VINCI Construction CS group employs approximately 4,300 people and delivers around 2,200 projects annually.

The company's core business is transport infrastructure — construction and reconstruction of motorways, roads and local communications, bridge structures, tramway lines and public transport stops, as well as cycle paths, revitalisation of public spaces and restoration of historic structures.

An integral part of its operations is its own material base. EUROVIA SK is among the largest producers of aggregates for transport construction in Slovakia and operates an extensive network of asphalt mixing plants, complemented by facilities for recycling reclaimed asphalt pavement. This vertical integration allows the material cycle of asphalt mixtures to be closed within the company's own operations.

Since 11 December 2017 the company has been registered under the **EMAS** scheme with registration number **SK-000012**, the scope of which covers twelve sites including the Šemša asphalt mixing plant. The environmental verifier is ASTRAIA Certification, s. r. o. EMAS registration entails regular publication of a verified environmental statement and evidences systematic management of the environmental aspects of production, including the production of asphalt mixtures.

### Location of the production site:

The declared asphalt mixtures are produced at the **Šemša asphalt mixing plant** (Košice-okolie district). The facility comprises two identical production units with an average output of 240 t/h and a maximum output of 270 t/h each (2 × 270 t/h in total), controlled by an automated system. The plant is equipped for dosing reclaimed asphalt pavement from milled road surfaces and, since 2025, covers part of its electricity consumption from shared photovoltaic generation.

## PRODUCT INFORMATION

|                                                      |                                                                                                                                                                                                          |
|------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>This EPD is valid for the following products:</b> | <ul style="list-style-type: none"> <li>• ACO 11-II 50/70 – wearing course mixture</li> <li>• ACL 16-II 50/70 R20 – binder course mixture</li> <li>• ACP 22-II 50/70 R20 – base course mixture</li> </ul> |
| <b>UN CPC code</b>                                   | 3794 - Bituminous mixtures based on natural asphalt, on natural bitumen, on petroleum bitumen, on mineral tar or on mineral tar pitch                                                                    |

The declared products are hot-mix asphalt concrete (AC) mixtures manufactured at the Šemša asphalt mixing plant in accordance with EN 13108-1, under factory production control according to EN 13108-21. They cover the three structural layers of a flexible pavement — wearing course, binder course and base course.

**Typical applications:** wearing, binder and base courses of motorways, first- to third-class roads, local and municipal roads, and trafficked areas such as parking areas, industrial yards and access roads. The mixtures are laid hot by paver and compacted by rollers.

**Packaging / delivery:** supplied in bulk, without any packaging. The hot mixture is loaded directly into insulated and sheeted tipper trucks and delivered to the construction site. No packaging materials are therefore associated with the declared unit.

## CONTENT DECLARATION

The asphalt mixtures produced at the Šemša plant consist of mineral constituents bound with paving-grade bitumen. None of the constituents of the declared products is classified as hazardous, nor is any of them listed on the Candidate List of Substances of Very High Concern (SVHC).

| Product content                  | %           | Post-consumer recycled material, mass-% of product | Biogenic material, mass-% of product | Biogenic material <sup>1</sup> , kg C/declared unit |
|----------------------------------|-------------|----------------------------------------------------|--------------------------------------|-----------------------------------------------------|
| Coarse crushed aggregate         | 42.6 – 48.3 | 0                                                  | 0                                    | 0                                                   |
| Fine crushed aggregate           | 25.4 – 43.6 | 0                                                  | 0                                    | 0                                                   |
| Limestone filler                 | 1.0 – 2.9   | 0                                                  | 0                                    | 0                                                   |
| Paving grade bitumen 50/70       | 3.0 – 5.4   | 0                                                  | 0                                    | 0                                                   |
| Reclaimed asphalt pavement (RAP) | 0 – 20.0    | 0 – 20.0                                           | 0                                    | 0                                                   |
| Adhesion promoter                | < 0.1       | 0                                                  | 0                                    | 0                                                   |
| <b>Total</b>                     | <b>100</b>  | <b>0 – 20.0</b>                                    | <b>0</b>                             | <b>0</b>                                            |

1 – 1 kg biogenic carbon is equivalent to 44/12 kg of CO<sub>2</sub>

The ranges given above cover all three declared mixtures. Reclaimed asphalt pavement is a post-consumer secondary material recovered by milling of existing road surfaces and processed at the company's own recycling facilities; it enters the product system free of environmental burden at the end-of-waste state in accordance with EN 15804+A2.

Asphalt mixtures are sold exclusively in bulk; thus, no packaging is included in the declared unit.

No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH regulations are present in the products either above the threshold for registration with the European Chemicals Agency or above 0.1 % weight.

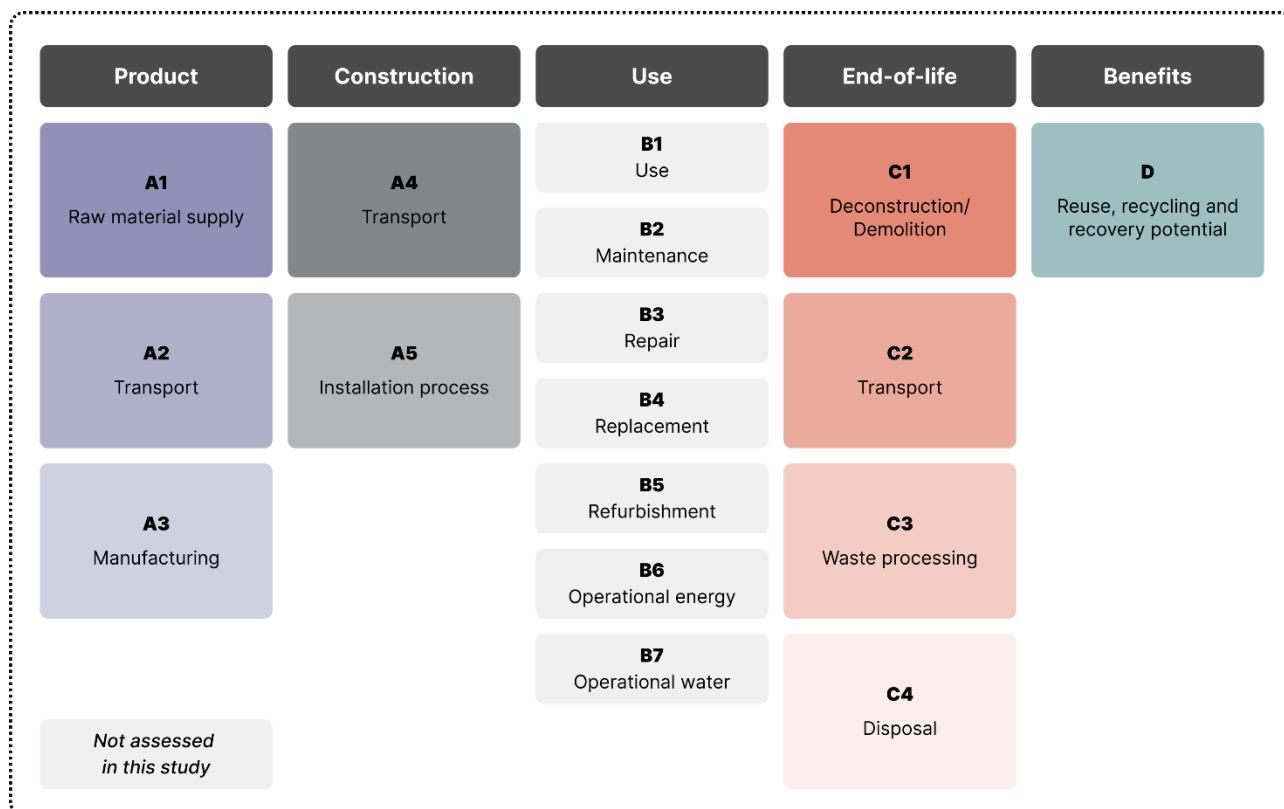
## LCA INFORMATION

|                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Functional/Declared unit</b>           | <p>1 tonne of an asphalt mixture (declared unit)</p> <p>The conversion factor to 1 kg of mass is 0.001. For the conversion of the declared unit to volume, the declared bulk density shall be used: 2 410 kg/m<sup>3</sup> for ACO 11-II 50/70, 2 473 kg/m<sup>3</sup> for ACL 16-II 50/70 R20 and 2 423 kg/m<sup>3</sup> for ACP 22-II 50/70 R20.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Time representativeness:</b>           | <p>Specific manufacturer data are based on a one-year average. For background data, a time scope of less than 10 years was applied.</p> <p><b>The reference year for all three declared products is 2025</b>, i.e. the same twelve-month accounting period used for the plant-level energy consumption, direct emissions and total production volume.</p> <p>The mixture ACP 22-II 50/70 R20 is a recipe held in the plant's production portfolio under a valid initial type test, but no batch of it was manufactured during the reference year. In accordance with the rules for products that are part of the declared portfolio but were not produced in the accounting period, the mixture was included in the reference-year production volume with a notional quantity of 1 tonne. The declared results for ACP 22-II 50/70 R20 therefore represent the mixture as it would be produced at the Šemša plant under the operating conditions of 2025.</p> |
| <b>Cut off rules:</b>                     | <p>No cut-off criteria was applied. All inputs and outputs of the unit processes for which data were available are included in the calculation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Database(s) and LCA software used:</b> | <p><b>Software:</b> OpenLCA 2.6.1</p> <p><b>Databases:</b> ecoinvent 3.12 database – “allocation, cut-off, EN15804” system model and TII Publication DN-PAV-03077.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Allocations:</b>                       | <p><b>Co-product allocation:</b> The Šemša asphalt mixing plant produces asphalt mixtures as its sole output; no co-products arise from the manufacturing process, thus no allocation according to EN 15804+A2 was required.</p> <p><b>Allocation of manufacturing data to individual products:</b> Consumption of electricity, natural gas and diesel, and the direct process emissions to air, are metered at plant level only and cannot be attributed to individual mixtures by</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | <p>direct measurement. These flows were therefore allocated to the declared products on a mass basis.</p> <p><b>Secondary material input allocation:</b> No allocation was applied to the input of reclaimed asphalt pavement (RAP). In accordance with EN 15804+A2 and the "polluter pays" principle, the system boundary between the product system under study and the preceding product system is set at the point where the reclaimed material reaches the end-of-waste state. All processes of de-construction, transport to the recycling site and crushing of the milled asphalt are therefore assigned to the modules C preceding product system, and the RAP enters modules A1–A3 free of environmental burden.</p> |
| <b>Geographical scope:</b>      | Slovakia, Europe, Global                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Electricity mix</b>          | Part of the electricity consumed by the plant is supplied from a photovoltaic installation shared across several sites of the company. The share attributed to the Šemša plant was taken from the metered energy-sharing records of the distribution system operator (1.44 % of the plant's annual electricity consumption in the reference year); the remaining consumption was modelled with the Slovak residual electricity mix.                                                                                                                                                                                                                                                                                           |
| <b>Characterization factors</b> | Characterisation factors are based on Environmental Footprint (EF) 3.1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## System boundary

The study is based on a 'Cradle to gate with options' system boundary (A1-A3 + C + D and additional modules A4-A5). It covers the extraction and production of raw materials, all relevant transport down to the factory gate, the manufacturing of the asphalt mixture, transport to the construction site and the paving process, and — at the end of life — milling of the pavement, transport of the milled material to processing, its processing into reclaimed asphalt, and disposal of any residues, as well as the benefits and loads beyond the system boundary arising from recycling.



**Module A1** covers the extraction and production of the raw materials entering the mixture: crushed coarse aggregate, crushed sand and limestone filler, paving-grade bitumen 50/70, and the adhesion promoter. Reclaimed asphalt pavement enters this module free of environmental burden at the end-of-waste state. The module also includes the production of the fuels and energy carriers consumed at the plant (electricity, natural gas, diesel).

**Module A2** covers the transport of all raw materials to the Šemša plant. Generic database transport processes were used with site-specific parameters for distances and vehicle categories, based on the actual sources of supply used in the reference year, including the transport of processed reclaimed asphalt from the company's own recycling facilities.

**Module A3** covers the on-site processes of asphalt production operated by EUROVIA SK, a. s. — storage and handling of raw materials, drying and heating of the aggregate, dosing of reclaimed asphalt, heating of the bitumen, mixing, and storage of the finished mixture in hot silos. It includes the consumption of electricity, natural gas and diesel, and the direct emissions to air from the plant stack. These are specific processes modelled on the basis of primary data collected at the plant for the reference year. No material losses arise at this stage; off-specification mixture is returned to production.

**Module A4** covers the transport of the hot mixture from the factory gate to the construction site in insulated tipper trucks, modelled on the basis of a representative average delivery distance for the plant's supply area.

**Module A5** covers the installation of the mixture into the pavement — laying by paver and compaction by rollers, including the fuel consumed by this equipment. No packaging waste arises, as the product is supplied in bulk, and no material losses are assumed at this stage.

**Module C1** covers the de-construction of the asphalt layer at the end of its service life by cold milling, including the diesel consumed by the milling machine and its combustion emissions. The scenario assumes a removal rate of 400 tonnes per day for the wearing course mixture and 1 000 tonnes per day for the binder and base course mixtures, using equipment of emission stage IIIB/IV.

**Module C2** covers the transport of the milled asphalt from the construction site to the processing facility over a distance of 30 km, i.e. 30 t·km per declared unit, by a lorry of more than 32 metric tons of the EURO 6 emission class.

**Module C3** covers the processing of the milled material, handling by excavator and crushing and screening into a fraction suitable for re-use in asphalt mixtures, with a diesel consumption of 0.185 l/t for the excavator and 0.185 l/t for the crusher. The whole of the declared unit, is collected separately and processed in this way; no part of it is collected with mixed construction waste, prepared for re-use or used for energy recovery. At the end of this process the material reaches the end-of-waste state as defined in EN 15804+A2, and leaves the system boundary. The scenario reflects the current practice of the manufacturer, which operates its own facilities for processing and dosing reclaimed asphalt.

**Module C4** is declared as zero. Under the end-of-life scenario applied, no part of the declared unit is landfilled or otherwise finally disposed of.

**Module D** covers the benefits and loads beyond the system boundary arising from the recycling of the reclaimed asphalt in a subsequent product system, where it substitutes primary bitumen and primary mineral aggregate in an asphalt mixture of the same type. In accordance with EN 15804+A2, module D is calculated for the net output flow only, i.e. the mass of the declared unit less the mass of reclaimed asphalt used as input to the product system: 1 000 kg for the wearing course mixture and 800 kg for the binder and base course mixtures, which contain 200 kg of reclaimed asphalt as input. A value-correction factor of 1.0 was applied, i.e. full functional equivalence between the reclaimed asphalt and the substituted primary materials was assumed, consistent with the current practice of re-using reclaimed asphalt in mixtures of the same type at the declared substitution rate.

|                                        |                                     |    |    |
|----------------------------------------|-------------------------------------|----|----|
| <b>A1 - A3</b><br>Product stage        | Raw material supply                 | A1 | X  |
|                                        | Transport                           | A2 | X  |
|                                        | Manufacturing                       | A3 | X  |
| <b>A4 - A5</b><br>Construction process | Transport from the gate to the site | A4 | X  |
|                                        | Assembly                            | A5 | X  |
| <b>B1 - B7</b><br>Use stage            | Use                                 | B1 | ND |
|                                        | Maintenance                         | B2 | ND |
|                                        | Repair                              | B3 | ND |
|                                        | Replacement                         | B4 | ND |
|                                        | Refurbishment                       | B5 | ND |
|                                        | Operational energy use              | B6 | ND |
|                                        | Operational water use               | B7 | ND |
| <b>C1 - C4</b>                         | De-construction                     | C1 | X  |

|                                                             |                                       |    |   |
|-------------------------------------------------------------|---------------------------------------|----|---|
| End of life stage                                           | Transport                             | C2 | X |
|                                                             | Waste processing                      | C3 | X |
|                                                             | Disposal                              | C4 | X |
| <b>D</b><br>Benefits and loads beyond the system boundaries | Reuse- Recycling - Recovery Potential | D  | X |

X = declared module, ND = not declared module

## ENVIRONMENTAL PERFORMANCE

### Impact contribution

The share of the primary/specific data on GWP-GHG indicator results of modules A1-A3 is 33.2 % for the wearing course mixture (**ACO**), 42.1 % for the binder course mixture (**ACL**) and 45.0 % for the base course mixture (**ACP**). The processes that contribute to more than 10% of the total GWP-GHG indicator results of modules A1-A3 are the production of the bituminous binder (57.7 %, 47.3 % and 44.8 % for the wearing, binder and base course mixture respectively) and the consumption of natural gas for the drying and heating of the aggregate (21.8 %, 28.5 % and 30.5 % respectively).

### Environmental indicators

Environmental indicator results per declared unit for each module are reported in the following tables.

Environmental indicator results are calculated according to ISO 14025 and EN 15804+A2:2019. Results are expressed per declared unit – 1 ton of an asphalt mixture.

### Data quality assessment

The data quality assessment has been carried out in accordance with EN 15941. The assessment covers geographical, technical, and temporal representativeness of the data and includes all relevant datasets contributing to at least 80% of the results for each declared environmental impact indicator. Primary data from the production process (including raw materials, auxiliary materials, and energy consumption) have been complemented with high-quality secondary data from recognized databases (Ecoinvent 3.12). Based on this evaluation, the overall data quality is considered good and compliant with EN 15941.

## Mandatory impact category indicators according to EN 15804 - ACO

| Indicator             | Unit                   | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-----------------------|------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-total             | kg CO <sub>2</sub> eq. | 8.28E+01 | 1.02E+01 | 2.56E+00 | 1.45E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -5.50E+01 |
| GWP-fossil            | kg CO <sub>2</sub> eq. | 8.27E+01 | 1.02E+01 | 2.56E+00 | 1.45E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -5.50E+01 |
| GWP-biogenic          | kg CO <sub>2</sub> eq. | 7.14E-02 | 5.67E-03 | 7.20E-04 | 4.10E-04 | 1.70E-03 | 4.60E-04 | 0.00E+00 | -1.97E-02 |
| GWP- luluc            | kg CO <sub>2</sub> eq. | 2.04E-02 | 3.70E-03 | 1.90E-04 | 1.10E-04 | 1.11E-03 | 1.20E-04 | 0.00E+00 | -1.58E-02 |
| ODP                   | kg CFC 11 eq.          | 5.93E-06 | 2.40E-07 | 4.09E-07 | 2.33E-07 | 7.20E-08 | 2.61E-07 | 0.00E+00 | -4.72E-06 |
| AP                    | mol H <sup>+</sup> eq. | 2.60E-01 | 2.40E-02 | 1.46E-02 | 5.55E-03 | 7.20E-03 | 7.88E-03 | 0.00E+00 | -2.18E-01 |
| EP-freshwater         | kg P eq.               | 6.39E-03 | 7.50E-04 | 6.35E-06 | 3.62E-06 | 2.30E-04 | 4.07E-06 | 0.00E+00 | -4.75E-03 |
| EP- marine            | kg N eq.               | 5.80E-02 | 6.67E-03 | 6.36E-03 | 2.17E-03 | 2.00E-03 | 3.30E-03 | 0.00E+00 | -4.45E-02 |
| EP-terrestrial        | mol N eq.              | 6.22E-01 | 7.19E-02 | 6.97E-02 | 2.38E-02 | 2.16E-02 | 3.63E-02 | 0.00E+00 | -4.79E-01 |
| POCP                  | kg NMVOC eq.           | 6.29E-01 | 4.25E-02 | 1.77E-02 | 6.29E-03 | 1.27E-02 | 9.32E-03 | 0.00E+00 | -5.47E-01 |
| ADP-minerals&metals * | kg Sb eq.              | 1.40E-04 | 3.07E-05 | 9.84E-07 | 5.60E-07 | 9.21E-06 | 6.29E-07 | 0.00E+00 | -1.10E-04 |
| ADP-fossil *          | MJ                     | 3.20E+03 | 1.54E+02 | 2.63E+01 | 1.49E+01 | 4.61E+01 | 1.68E+01 | 0.00E+00 | -2.77E+03 |
| WDP *                 | m <sup>3</sup>         | 3.94E+01 | 8.86E-01 | 4.09E-02 | 2.33E-02 | 2.66E-01 | 2.61E-02 | 0.00E+00 | -3.79E+01 |

\* The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicators.

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

## Additional mandatory and voluntary impact category indicators – ACO

| Indicator  | Unit                   | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|------------|------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-GHG ** | kg CO <sub>2</sub> eq. | 8.28E+01 | 1.02E+01 | 2.56E+00 | 1.45E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -5.50E+01 |

\*\* GWP-GHG is an additional indicator declared on a voluntary basis. It is derived from GWP-total by setting the characterisation factors for biogenic carbon dioxide uptake and biogenic carbon dioxide emissions to zero, while the characterisation factor for biogenic methane is retained. GWP-GHG is therefore equal to GWP-total less the contribution of biogenic carbon dioxide.

## Resource use indicators – ACO

| Indicator | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-----------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PERE      | MJ   | 2.12E+01 | 2.39E+00 | 1.50E-01 | 8.52E-02 | 7.17E-01 | 9.55E-02 | 0.00E+00 | -1.76E+01 |
| PERM      | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERT      | MJ   | 2.12E+01 | 2.39E+00 | 1.50E-01 | 8.52E-02 | 7.17E-01 | 9.55E-02 | 0.00E+00 | -1.76E+01 |
| PENRE     | MJ   | 1.03E+03 | 1.54E+02 | 2.79E+01 | 1.59E+01 | 4.61E+01 | 1.78E+01 | 0.00E+00 | -5.99E+02 |
| PENRM     | MJ   | 2.17E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -2.17E+03 |
| PENRT     | MJ   | 3.20E+03 | 1.54E+02 | 2.79E+01 | 1.59E+01 | 4.61E+01 | 1.78E+01 | 0.00E+00 | -2.77E+03 |
| SM        | kg   | 1.06E+00 | 1.40E-01 | 0.00E+00 | 0.00E+00 | 4.20E-02 | 0.00E+00 | 0.00E+00 | -8.09E-01 |
| RSF       | MJ   | 3.36E-01 | 2.95E-02 | 0.00E+00 | 0.00E+00 | 8.85E-03 | 0.00E+00 | 0.00E+00 | -2.62E-01 |
| NRSF      | MJ   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| FW        | m³   | 9.03E-01 | 2.03E-02 | 1.33E-03 | 7.60E-04 | 6.10E-03 | 8.50E-04 | 0.00E+00 | -8.69E-01 |

Acronyms: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.

## Waste indicators – ACO

| Indicator                    | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Hazardous waste disposed     | kg   | 5.70E+00 | 8.68E-01 | 7.19E-05 | 4.09E-05 | 2.61E-01 | 4.59E-05 | 0.00E+00 | -4.47E+00 |
| Non-hazardous waste disposed | kg   | 4.86E+01 | 1.80E+01 | 3.50E-02 | 1.99E-02 | 5.41E+00 | 2.24E-02 | 0.00E+00 | -3.00E+01 |
| Radioactive waste disposed   | kg   | 4.60E-04 | 3.99E-05 | 1.80E-04 | 1.00E-04 | 1.20E-05 | 1.20E-04 | 0.00E+00 | -3.30E-04 |

## Output flow indicators – ACO

| Indicator                     | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Components for re-use         | kg   | 1.51E-18 | 1.30E-19 | 0.00E+00 | 0.00E+00 | 3.91E-20 | 0.00E+00 | 0.00E+00 | -1.42E-18 |
| Material for recycling        | kg   | 9.79E-01 | 1.23E-01 | 0.00E+00 | 0.00E+00 | 3.68E-02 | 1.00E+03 | 0.00E+00 | -7.52E-01 |
| Materials for energy recovery | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| Exported energy, electricity  | MJ   | 2.33E-01 | 2.47E-02 | 0.00E+00 | 0.00E+00 | 7.41E-03 | 0.00E+00 | 0.00E+00 | -1.96E-01 |
| Exported energy, thermal      | MJ   | 3.73E-01 | 2.68E-02 | 0.00E+00 | 0.00E+00 | 8.05E-03 | 0.00E+00 | 0.00E+00 | -3.41E-01 |

## Mandatory impact category indicators according to EN 15804 - ACL

| Indicator             | Unit                   | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-----------------------|------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-total             | kg CO <sub>2</sub> eq. | 6.35E+01 | 1.02E+01 | 1.41E+00 | 3.39E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -3.66E+01 |
| GWP-fossil            | kg CO <sub>2</sub> eq. | 6.35E+01 | 1.02E+01 | 1.41E+00 | 3.39E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -3.66E+01 |
| GWP-biogenic          | kg CO <sub>2</sub> eq. | 5.62E-02 | 5.67E-03 | 4.00E-04 | 9.60E-04 | 1.70E-03 | 4.60E-04 | 0.00E+00 | -1.45E-02 |
| GWP-luluc             | kg CO <sub>2</sub> eq. | 1.62E-02 | 3.70E-03 | 1.00E-04 | 2.50E-04 | 1.11E-03 | 1.20E-04 | 0.00E+00 | -1.20E-02 |
| ODP                   | kg CFC 11 eq.          | 4.18E-06 | 2.40E-07 | 2.26E-07 | 5.44E-07 | 7.20E-08 | 2.61E-07 | 0.00E+00 | -2.99E-06 |
| AP                    | mol H <sup>+</sup> eq. | 1.89E-01 | 2.40E-02 | 7.72E-03 | 1.29E-02 | 7.20E-03 | 7.88E-03 | 0.00E+00 | -1.50E-01 |
| EP-freshwater         | kg P eq.               | 5.29E-03 | 7.50E-04 | 3.51E-06 | 8.44E-06 | 2.30E-04 | 4.07E-06 | 0.00E+00 | -3.75E-03 |
| EP-marine             | kg N eq.               | 4.39E-02 | 6.67E-03 | 3.33E-03 | 5.04E-03 | 2.00E-03 | 3.30E-03 | 0.00E+00 | -3.10E-02 |
| EP-terrestrial        | mol N eq.              | 4.74E-01 | 7.19E-02 | 3.65E-02 | 5.54E-02 | 2.16E-02 | 3.63E-02 | 0.00E+00 | -3.37E-01 |
| POCP                  | kg NMVOC eq.           | 4.32E-01 | 4.25E-02 | 9.31E-03 | 1.46E-02 | 1.27E-02 | 9.32E-03 | 0.00E+00 | -3.54E-01 |
| ADP-minerals&metals * | kg Sb eq.              | 1.10E-04 | 3.07E-05 | 5.43E-07 | 1.31E-06 | 9.21E-06 | 6.29E-07 | 0.00E+00 | -7.76E-05 |
| ADP-fossil *          | MJ                     | 2.19E+03 | 1.54E+02 | 1.45E+01 | 3.49E+01 | 4.61E+01 | 1.68E+01 | 0.00E+00 | -1.77E+03 |
| WDP *                 | m <sup>3</sup>         | 2.72E+01 | 8.86E-01 | 2.26E-02 | 5.43E-02 | 2.66E-01 | 2.61E-02 | 0.00E+00 | -2.59E+01 |

\* The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicators.

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

## Additional mandatory and voluntary impact category indicators – ACL

| Indicator  | Unit                   | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|------------|------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-GHG ** | kg CO <sub>2</sub> eq. | 6.35E+01 | 1.02E+01 | 1.41E+00 | 3.39E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -3.66E+01 |

\*\* GWP-GHG differs from GWP-total in biogenic carbon dioxide handling: This indicator accounts for all greenhouse gases but excludes biogenic CO<sub>2</sub> uptake and emissions from the calculation (biogenic CF = 0). Consequently, GWP-GHG is identical to GWP-total except for this biogenic carbon treatment.

## Resource use indicators – ACL

| Indicator | Unit           | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-----------|----------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PERE      | MJ             | 1.73E+01 | 2.39E+00 | 8.26E-02 | 1.99E-01 | 7.17E-01 | 9.55E-02 | 0.00E+00 | -1.39E+01 |
| PERM      | MJ             | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERT      | MJ             | 1.73E+01 | 2.39E+00 | 8.26E-02 | 1.99E-01 | 7.17E-01 | 9.55E-02 | 0.00E+00 | -1.39E+01 |
| PENRE     | MJ             | 8.19E+02 | 1.54E+02 | 1.54E+01 | 3.70E+01 | 4.61E+01 | 1.78E+01 | 0.00E+00 | -4.02E+02 |
| PENRM     | MJ             | 1.37E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.37E+03 |
| PENRT     | MJ             | 2.19E+03 | 1.54E+02 | 1.54E+01 | 3.70E+01 | 4.61E+01 | 1.78E+01 | 0.00E+00 | -1.77E+03 |
| SM        | kg             | 2.01E+02 | 1.40E-01 | 0.00E+00 | 0.00E+00 | 4.20E-02 | 0.00E+00 | 0.00E+00 | -6.17E-01 |
| RSF       | MJ             | 2.79E-01 | 2.95E-02 | 0.00E+00 | 0.00E+00 | 8.85E-03 | 0.00E+00 | 0.00E+00 | -2.08E-01 |
| NRSF      | MJ             | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| FW        | m <sup>3</sup> | 6.24E-01 | 2.03E-02 | 7.40E-04 | 1.77E-03 | 6.10E-03 | 8.50E-04 | 0.00E+00 | -5.93E-01 |

Acronyms: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.

## Waste indicators – ACL

| Indicator                    | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Hazardous waste disposed     | kg   | 4.39E+00 | 8.68E-01 | 3.97E-05 | 9.55E-05 | 2.61E-01 | 4.59E-05 | 0.00E+00 | -3.27E+00 |
| Non-hazardous waste disposed | kg   | 4.07E+01 | 1.80E+01 | 1.93E-02 | 4.65E-02 | 5.41E+00 | 2.24E-02 | 0.00E+00 | -2.38E+01 |
| Radioactive waste disposed   | kg   | 4.00E-04 | 3.99E-05 | 1.00E-04 | 2.40E-04 | 1.20E-05 | 1.20E-04 | 0.00E+00 | -2.60E-04 |

## Output flow indicators – ACL

| Indicator                     | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Components for re-use         | kg   | 1.55E-18 | 1.30E-19 | 0.00E+00 | 0.00E+00 | 3.91E-20 | 0.00E+00 | 0.00E+00 | -1.46E-18 |
| Material for recycling        | kg   | 7.81E-01 | 1.23E-01 | 0.00E+00 | 0.00E+00 | 3.68E-02 | 1.00E+03 | 0.00E+00 | -5.66E-01 |
| Materials for energy recovery | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| Exported energy, electricity  | MJ   | 1.91E-01 | 2.47E-02 | 0.00E+00 | 0.00E+00 | 7.41E-03 | 0.00E+00 | 0.00E+00 | -1.57E-01 |
| Exported energy, thermal      | MJ   | 3.65E-01 | 2.68E-02 | 0.00E+00 | 0.00E+00 | 8.05E-03 | 0.00E+00 | 0.00E+00 | -3.38E-01 |

## Mandatory impact category indicators according to EN 15804 - ACP

| Indicator             | Unit                   | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-----------------------|------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-total             | kg CO <sub>2</sub> eq. | 5.92E+01 | 1.02E+01 | 1.41E+00 | 3.39E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -3.24E+01 |
| GWP-fossil            | kg CO <sub>2</sub> eq. | 5.91E+01 | 1.02E+01 | 1.41E+00 | 3.39E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -3.24E+01 |
| GWP-biogenic          | kg CO <sub>2</sub> eq. | 4.67E-02 | 5.67E-03 | 4.00E-04 | 9.60E-04 | 1.70E-03 | 4.60E-04 | 0.00E+00 | -1.35E-02 |
| GWP- luluc            | kg CO <sub>2</sub> eq. | 1.46E-02 | 3.70E-03 | 1.00E-04 | 2.50E-04 | 1.11E-03 | 1.20E-04 | 0.00E+00 | -1.05E-02 |
| ODP                   | kg CFC 11 eq.          | 3.83E-06 | 2.40E-07 | 2.26E-07 | 5.44E-07 | 7.20E-08 | 2.61E-07 | 0.00E+00 | -2.64E-06 |
| AP                    | mol H <sup>+</sup> eq. | 1.71E-01 | 2.40E-02 | 7.72E-03 | 1.29E-02 | 7.20E-03 | 7.88E-03 | 0.00E+00 | -1.33E-01 |
| EP-freshwater         | kg P eq.               | 4.76E-03 | 7.50E-04 | 3.51E-06 | 8.44E-06 | 2.30E-04 | 4.07E-06 | 0.00E+00 | -3.23E-03 |
| EP- marine            | kg N eq.               | 4.05E-02 | 6.67E-03 | 3.33E-03 | 5.04E-03 | 2.00E-03 | 3.30E-03 | 0.00E+00 | -2.77E-02 |
| EP-terrestrial        | mol N eq.              | 4.37E-01 | 7.19E-02 | 3.65E-02 | 5.54E-02 | 2.16E-02 | 3.63E-02 | 0.00E+00 | -3.01E-01 |
| POCP                  | kg NMVOC eq.           | 3.91E-01 | 4.25E-02 | 9.31E-03 | 1.46E-02 | 1.27E-02 | 9.32E-03 | 0.00E+00 | -3.14E-01 |
| ADP-minerals&metals * | kg Sb eq.              | 9.87E-05 | 3.07E-05 | 5.43E-07 | 1.31E-06 | 9.21E-06 | 6.29E-07 | 0.00E+00 | -6.99E-05 |
| ADP-fossil *          | MJ                     | 1.98E+03 | 1.54E+02 | 1.45E+01 | 3.49E+01 | 4.61E+01 | 1.68E+01 | 0.00E+00 | -1.56E+03 |
| WDP *                 | m <sup>3</sup>         | 3.01E+01 | 8.86E-01 | 2.26E-02 | 5.43E-02 | 2.66E-01 | 2.61E-02 | 0.00E+00 | -2.87E+01 |

\* The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicators.

Acronyms: GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

## Additional mandatory and voluntary impact category indicators – ACP

| Indicator  | Unit                   | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|------------|------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| GWP-GHG ** | kg CO <sub>2</sub> eq. | 5.92E+01 | 1.02E+01 | 1.41E+00 | 3.39E+00 | 3.06E+00 | 1.63E+00 | 0.00E+00 | -3.24E+01 |

\*\* GWP-GHG differs from GWP-total in biogenic carbon dioxide handling: This indicator accounts for all greenhouse gases but excludes biogenic CO<sub>2</sub> uptake and emissions from the calculation (biogenic CF = 0). Consequently, GWP-GHG is identical to GWP-total except for this biogenic carbon treatment.

## Resource use indicators – ACP

| Indicator | Unit           | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-----------|----------------|----------|----------|----------|----------|----------|----------|----------|-----------|
| PERE      | MJ             | 1.50E+01 | 2.39E+00 | 8.26E-02 | 1.99E-01 | 7.17E-01 | 9.55E-02 | 0.00E+00 | -1.17E+01 |
| PERM      | MJ             | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| PERT      | MJ             | 1.50E+01 | 2.39E+00 | 8.26E-02 | 1.99E-01 | 7.17E-01 | 9.55E-02 | 0.00E+00 | -1.17E+01 |
| PENRE     | MJ             | 7.70E+02 | 1.54E+02 | 1.54E+01 | 3.70E+01 | 4.61E+01 | 1.78E+01 | 0.00E+00 | -3.55E+02 |
| PENRM     | MJ             | 1.21E+03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | -1.21E+03 |
| PENRT     | MJ             | 1.98E+03 | 1.54E+02 | 1.54E+01 | 3.70E+01 | 4.61E+01 | 1.78E+01 | 0.00E+00 | -1.56E+03 |
| SM        | kg             | 2.01E+02 | 1.40E-01 | 0.00E+00 | 0.00E+00 | 4.20E-02 | 0.00E+00 | 0.00E+00 | -5.00E-01 |
| RSF       | MJ             | 2.25E-01 | 2.95E-02 | 0.00E+00 | 0.00E+00 | 8.85E-03 | 0.00E+00 | 0.00E+00 | -1.55E-01 |
| NRSF      | MJ             | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| FW        | m <sup>3</sup> | 6.92E-01 | 2.03E-02 | 7.40E-04 | 1.77E-03 | 6.10E-03 | 8.50E-04 | 0.00E+00 | -6.61E-01 |

Acronyms: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.

## Waste indicators – ACP

| Indicator                    | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Hazardous waste disposed     | kg   | 4.04E+00 | 8.68E-01 | 3.97E-05 | 9.55E-05 | 2.61E-01 | 4.59E-05 | 0.00E+00 | -2.94E+00 |
| Non-hazardous waste disposed | kg   | 3.66E+01 | 1.80E+01 | 1.93E-02 | 4.65E-02 | 5.41E+00 | 2.24E-02 | 0.00E+00 | -1.99E+01 |
| Radioactive waste disposed   | kg   | 3.50E-04 | 3.99E-05 | 1.00E-04 | 2.40E-04 | 1.20E-05 | 1.20E-04 | 0.00E+00 | -2.10E-04 |

## Output flow indicators – ACP

| Indicator                     | Unit | A1-A3    | A4       | A5       | C1       | C2       | C3       | C4       | D         |
|-------------------------------|------|----------|----------|----------|----------|----------|----------|----------|-----------|
| Components for re-use         | kg   | 1.36E-18 | 1.30E-19 | 0.00E+00 | 0.00E+00 | 3.91E-20 | 0.00E+00 | 0.00E+00 | -1.28E-18 |
| Material for recycling        | kg   | 6.68E-01 | 1.23E-01 | 0.00E+00 | 0.00E+00 | 3.68E-02 | 1.00E+03 | 0.00E+00 | -4.55E-01 |
| Materials for energy recovery | kg   | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00  |
| Exported energy, electricity  | MJ   | 1.56E-01 | 2.47E-02 | 0.00E+00 | 0.00E+00 | 7.41E-03 | 0.00E+00 | 0.00E+00 | -1.22E-01 |
| Exported energy, thermal      | MJ   | 1.58E-01 | 2.68E-02 | 0.00E+00 | 0.00E+00 | 8.05E-03 | 0.00E+00 | 0.00E+00 | -1.32E-01 |

## **RELEASE OF DANGEROUS SUBSTANCES DURING THE USE STAGE**

As there are no harmonised horizontal testing standards for measuring the release of regulated hazardous substances, the EPD does not provide this information.

## REFERENCES

ISO 14020:2000 Environmental labels and declarations – General principles, 2000-09

ISO 14025: EN ISO 14025:2006-11: Environmental labels and declarations – Type III environmental declarations – Principles and procedures

ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework, 2006-07

ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines, 2006-07

EN 15804:2012 +A2:2019/AC:2021 European Committee for Standardization: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, 2021

DN-PAV-03077 - Complementary Product Category Rules for Bituminous Mixtures (c-PCR Bituminous Mixtures), Transport Infrastructure Ireland (TII), 2024

OpenLCA 2.6.1 software by Greendelta, [www.openlca.org](http://www.openlca.org)

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