

General information

Product:

12549 SL11 Hólabrú

Program operator:

The Norwegian EPD Foundation
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Declaration number:

NEPD-6095-5358-EN

This declaration is based on Product Category Rules:

NPCR 025:2022 Part B for Asphalt ver. 1.1-2022 that complement the core rules defined in NPCR Part A for Construction products and services and EN 15804:2012+A2:2019.

Statement of liability:

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

Declared unit:

1 tonne 12549 SL11 Hólabrú

Declared unit with option:

A1, A2, A3, A4, C1, C2, C3, C4, D

Functional unit:

The declared unit is used in this EPD since the system boundary does not include all information modules.

Verification:

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

internal

external

Sign



Silje Wærp, Asplan Viak

Independent verifier approved by EPD Norway

Owner of the declaration:

Colas Ísland ehf.
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Manufacturer:

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Phone: 565 2030
e-mail: colas@colas.is

Place of production:

Colas Ísland ehf.
Gullhella 1
221 Hafnarfjörður, Iceland

Management system:

ISO 14001:2015 and ISO 9001:2015

Organisation no:

420187-1499

Issue date:

14.02.2024

Valid to:

14.02.2029

Year of study:

2023

Comparability:

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

The EPD has been worked out by:

Ása Rut Benediktsdóttir, EFLA

Approved



Manager of EPD Norway

Product

Product description:

The product under study is 12549 SL11 Hólábrú, a traditional hot-mix asphalt used as a construction material for pedestrian pavements and roads where traffic is light (less than 8.000 AADT (Annual Average Daily Traffic)).

Product specification:

Materials	Value [kg]	%
Hólábrú aggregates	666,00	66,6
RAP	285,75	28,575
Bitumen	48,00	48,0
Evotherm	0,25	2,50E-04
Total	1000,00	100,0

Technical data:

About 30% of the aggregates that 12549 SL11 Hólábrú consists of are replaced with recycled asphalt pavement/product (RAP) and the product is 100% recyclable. Colas Ísland operates a Quality Management System which complies with the requirements of ISO 9001:2015 for the production, sale and laying of asphalt for roads, car parks and airfields to prepared formulations to meet customer specifications, including the sale of bitumen and emulsion.

Market:

Iceland

LCA: Calculation rules

Declared unit:

1 tonne of manufactured 12549 SL11 Hólábrú delivered to the construction site (A1-A4) including end-of-life treatment (C1-C4) and potential benefits/loads outside the product system (D).

Cut-off criteria:

All important raw materials and energy demand are included.

Allocation:

The asphalt manufacturing process does not produce any co-products, such that no impacts had to be allocated to any products other than the asphalt products.

Allocation by mass was used where applicable in foreground processes, i.e. the total mass of raw materials (e.g. aggregates, RAP, bitumen) and water used in the production of 12549 SL11 Hólábrú was divided by the production mass to derive the mass required per tonne of asphalt product.

The individual energy and fuel demand in the production of the asphalt mixture was allocated by mass, assuming that the specific heat capacity of different hot-mix asphalt products is similar. The allocation is based on data on monthly electricity and marine gas oil (MGO) demand to produce the hot-mix asphalt products. Similarly, Colas Ísland was also able to approximate the energy required to keep the bitumen hot in storage tanks.

In 2021, 200 tonnes of asphalt waste from asphalt production, was used as input for asphalt production through a closed loop of recycling. This asphalt was allocated between different asphalt mixtures based on mass.

Data quality:

Information about the production of 12549 SL11 Hólabrú was provided by the employees of Colas Ísland and their raw material suppliers. The inventory data used for the assessment is geographically and technically representative for the products it covers because they are all produced in the factory that the data is retrieved from. For this study, it was decided that the data should be based on a one-year average, using data from 2022. The composition of the product remains constant, which is consequently temporally representative for the asphalt product. However, the average transport distance to construction site (A4) and to disposal (C2), was estimated based on data from 2021. Additionally, in 2023, Colas Ísland purchased new equipment used in the processing of RAP (A1) in 2023. Thus, to use representative data for this equipment, the reference year is 2023. In conclusion, the quality of the data is considered very good.

The Sphera LCA FE was used in the assessment. The international databases from Sphera Managed LCA Content (MLC) (Sphera Professional and construction database 2022) were used for generic background data. The data quality of the raw materials in A1 is given in the table below. Specific data from raw material suppliers was used, when available. Specific data was used for the asphalt manufacturing itself. All appropriate processes, both background and foreground, were included in the asphalt production model.

Most of the unit processes used are from the Sphera Professional database. According to its website, Sphera publishes “one of the largest high-quality, internally consistent Life Cycle Inventory (LCI) databases [...]” The databases offer “around 18,500 high-quality LCI datasets” and is largely built on high quality industry data, confirming its technical representativeness. The MLC is updated every year and are therefore “Always up-to-date” according to the developer. It follows that the temporal representativeness of the Sphera data is high.

Materials	Source	Data quality	Year
Hólabrú aggregates	Sphera Professional and Construction database	Generic	2022
Bitumen	Sphera Professional and Construction database	Generic	2019
Evotherm	Sphera Professional and Construction database	Generic	2022

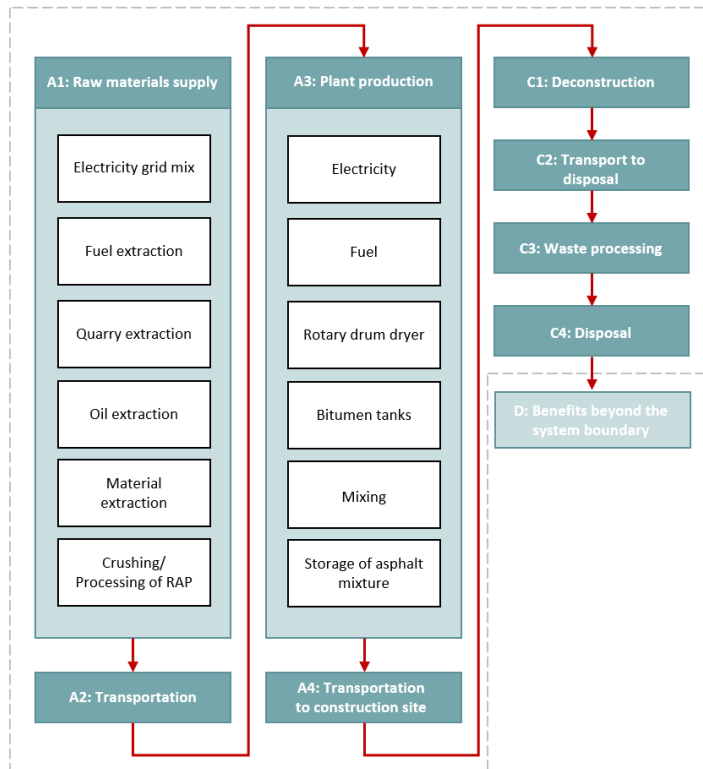
System boundaries (X=included, MND=module not declared, MNR=module not relevant)

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

System boundary:

This assessment is a cradle to gate EPD. Asphalt is a construction material and according to EN 15804+A2 and NPCR for asphalt by EPD-Norge, modules A1-A3, A4, C and D are included in the assessment.

A technical flowchart of the main production processes included in the LCA is shown below.



LCA: Scenarios and additional technical information

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

Transport from production place to assembly/user (A4)

Transport from production place to building place (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption	Unit	Value
Truck, Euro 4, 34-40t gross weight	50,0	35	0,028	L/t	1,0

End of Life (C1, C3, C4)

	Unit	Value
Hazardous waste disposed	kg	0
Collected as mixed construction waste	kg	0
Reuse	kg	0
Recycling	kg	1000
Energy recovery	kg	0
To landfill	kg	0

Transport to waste processing (C2)

Transport from production place to assembly/user (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption	Unit	Value
Truck, Euro 4, more than 32t gross weight	50,0	17	0,085	L/t	1,45

Benefits and loads beyond the system boundaries (D)

Benefits and loads beyond the system boundaries (D)	Unit	Value
Substitution of primary asphalt with net recycled asphalt	kg	1000

LCA: Results

Core environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO2 eq	3,98E+01	3.07E+00	5,23E-01	4.17E+00	NR	0	-3,72E+01
GWP - fossil	kg CO2 eq	3,98E+01	3.08E+00	5,25E-01	4.19E+00	NR	0	-3,72E+01
GWP - biogenic	kg CO2 eq	-1,13E-02	-4.56E-02	-7,13E-03	-6.20E-02	NR	0	2,44E-03
GWP - luluc	kg CO2 eq	3,54E-02	2.86E-02	4,77E-03	3.89E-02	NR	0	-2,81E-02
ODP	kg CFC11 eq	2,88E-11	4.02E-13	6,70E-14	5.47E-13	NR	0	-2,73E-11
AP	molc H+ eq	3,64E-01	2.24E-02	2,69E-03	2.64E-02	NR	0	-3,42E-01
EP- freshwater	kg P eq	4,50E-05	1.13E-05	1,88E-06	1.54E-05	NR	0	-4,06E-05
EP -marine	kg N eq	1,45E-01	1.11E-02	1,26E-03	1.29E-02	NR	0	-1,37E-01
EP - terrestrial	molc N eq	1,61E+00	1.23E-01	1,40E-02	1.43E-01	NR	0	-1,51E+00
POCP	kg NMVOC eq	4,79E-01	2.12E-02	3,53E-03	2.50E-02	NR	0	-4,51E-01
ADP-M&M ²	kg Sb-Eq	2,77E-06	2.05E-07	3,42E-08	2.79E-07	NR	0	-2,59E-06
ADP-fossil ²	MJ	2,48E+03	4.21E+01	7,02E+00	5.73E+01	NR	0	-2,35E+03
WDP ²	m ³	2,16E+00	3.73E-02	6,23E-03	5.08E-02	NR	0	-2,04E+00

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

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

Additional environmental impact indicators

Indicator	Unit	A1-A3	A4	C1	C2	C3	C4	D
PM	Disease incidence	2,65E-06	8,02E-08	3,05E-08	9,99E-08	NR	0	-2,49E-06
IRP ¹	kBq U235 eq.	5,88E-01	1,18E-02	1,97E-03	1,60E-02	NR	0	-5,56E-01
ETP-fw ²	CTUe	1,21E+03	3,02E+01	5,03E+00	4,10E+01	NR	0	-1,15E+03
HTP-c ²	CTUh	1,56E-08	6,12E-10	1,02E-10	8,33E-10	NR	0	-1,47E-08
HTP-nc ²	CTUh	4,91E-07	2,72E-08	4,55E-09	3,70E-08	NR	0	-4,61E-07
SQP ²	Dimensionless	3,50E+01	1,76E+01	2,93E+00	2,39E+01	NR	0	-2,99E+01

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

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

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

Resource use

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
RPEE	MJ	1,45E+02	3,06E+00	5,11E-01	4,17E+00	NR	0	-1,37E+02
RPEM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00
TPE	MJ	1,45E+02	3,06E+00	5,11E-01	4,17E+00	NR	0	-1,37E+02
NRPE	MJ	2,50E+03	4,23E+01	7,05E+00	5,75E+01	NR	0	-2,36E+03
NRPM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00
TRPE	MJ	2,50E+03	4,23E+01	7,05E+00	5,75E+01	NR	0	-2,36E+03
SM	kg	2,86E+02	0,00E+00	0,00E+00	0,00E+00	NR	0	-2,71E+02
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00
W	m ³	9,80E-02	3,36E-03	5,60E-04	4,56E-03	NR	0	-9,18E-02

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

End of life – Waste

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
HW	kg	5,07E-10	1,31E-10	2,18E-11	1,78E-10	NR	0	-4,57E-10
NHW	kg	2,79E+01	6,44E-03	1,07E-03	8,76E-03	NR	0	-2,65E+01
RW	kg	4,51E-03	7,91E-05	1,32E-05	1,08E-04	NR	0	-4,27E-03

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

End of life – output flow

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00
MR	kg	0,00E+00	0,00E+00	1,00E+03	0,00E+00	NR	0	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	NR	0	0,00E+00

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

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in the accompanying packaging	kg C	0,00E+00

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

National production mix from import, low voltage (production of transmission lines, in addition to direct emissions and losses in grid) of applied electricity for the manufacturing process (foreground/core) per functional unit.

National electricity grid	Data source	GWP _{total} [g CO ₂ -eq/kWh]
Electricity grid mix, Iceland	Sphera LCA FE	40,3

Additional environmental impact indicators required for construction products

In order to increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC is required as it declares climate impacts calculated according to the principle of instantaneous oxidation. GWP-IOBC is also referred to as GWP-GHG in context to Swedish public procurement legislation.

Parameter	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP-IOBC	kg	3,99E+01	3,11E+00	5,30E-01	4,23E+00	NR	0	-3,72E+01

GWP-IOBC Global warming potential calculated according to the principle of instantaneous oxidation.

Hazardous substances

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

The product contains no substances given by the REACH Candidate list.

Bibliography

ISO 14025:2010 Environmental labels and declarations - Type III environmental declarations Principles and procedures

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

EN 15804:2012+A2:2019 Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products

Emission Factor Documentation for AP-42, Section 11.1 Hot Mix Asphalt Plants-Final Report, U.S. EPA, 2004






ISO 21930:2007 Sustainability in building construction - Environmental declaration of building products

Life cycle assessment of asphalt (2023). EFLA Consulting Engineers

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Sphera, [Online], <https://sphera.com>

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