Environmental Product Declaration for asphalt mixtures from Uddevalla asphalt plant – Porsen

.

According to EN 15804:2012+A1:2013, ISO 14025, ISO 14040 and ISO 14044
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This is a "cradle-to-gate" EPD based on an LCA model described in the background report and in the corresponding annex (see list of references). The asphalt mixtures declared are manufactured at the asphalt plant Porsen in Uddevalla, a medium-sized plant of NCC Industry, Division Asphalt in Sweden. The asphalt mixtures declared are:

- ABT11 100/150
- ABS11 70/100
- ABS 16 Viacobit 60 an7
- ABS 16 70/100 an7
- ABb16 70/100 Green
- AG16 100/150 Green
- ABb16 70/100
- AG16 100/150
- MJOG16 V12000
- MJAG16 V12000

EPD INFORMATION	
Declared unit / Functional unit:	1000 kg of product at the factory gate/construction
RSL:	Not specified
PCR:	Product Category Rules PCR 2018:04 Asphalt mixtures, version 1.03 of 2019-09-06.
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ECO PLATFORM EPD EN 15804 VERIFIED

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Asphalt plants manufacture asphalt mixtures for paving purposes. The asphalt mixtures that can be produced at the declared plant are hot mix asphalt (HMA), warm mix asphalt (WMA), soft bitumen asphalt (SA) and polymer modified asphalt (PMB).

The main components in asphalt mixtures are mineral rock aggregates and bitumen. Other materials are added, and the content varies depending on the asphalt type. These include for instance amines, hydraulic adhesives and fibre and normally constitute less than 0,5 weight-% of the product. In addition, Recycled Asphalt Pavement (RAP) is usually added to the asphalt mixture, replacing virgin aggregate and virgin bitumen. The content declaration of the asphalt mixtures declared is shown in Table 1. It is presented in ranges, since the exact content varies depending on recipe and type.

The temperature class and the share of RAP in the asphalt mixtures declared are given in Table 2, both the annual mean share and the annual maximum possible share.

Table 1: Content declaration of the asphalt mixtures declared.

Raw material	Content (weight-%)
Recycled Asphalt Pavement (RAP)	0 – 40*
Aggregates 0/2	13.5 – 23.2
Aggregates 2/4	3.1 – 18.4
Aggregates 4/8	0 – 11.0
Aggregates 8/11	0 – 40.5
Aggregates 11/16	0 – 23.4
Quality aggregates 4/8	0 – 8.0
Quality aggregates 8/11	0 – 20.0
Quality aggregates 11/16	0 – 36.1
Bitumen, virgin	0 – 6.3
Polymer modified bitumen (PMB), virgin	0 – 6.3
Fibre	0 – 0.3
Hydraulic adhesion	0 – 1.0
Liquid adhesion (Amine)	0 – 0.04

* See Table 2.

Table 2: Temperature class and actual annual mean share/ annual maximum possible share of Recycled Asphalt Pavement (RAP) in the asphalt mixtures declared.

Asphalt mixture	Temperature class	Share of RAP (actual annual mean) weight-%	Share of RAP (annual max) weight-%
ABT11 100/150	HMA	30	40
ABS11 70/100	HMA	20	30
ABS 16 Viacobit 60 an7	PMB	0	20
ABS 16 70/100 an7	HMA	0	20
ABb16 70/100 Green	WMA	30	40
AG16 100/150 Green	WMA	30	40
ABb16 70/100	HMA	30	40
AG16 100/150	HMA	30	40
MJOG16 V12000	SA	0	0
MJAG16 V12000	SA	40	40

At the asphalt plant, the manufacture of a typical asphalt mixture is managed from the onsite control room where adjustments are made to individual raw materials.

A schematic illustration of an asphalt plant is shown in Figure 1.

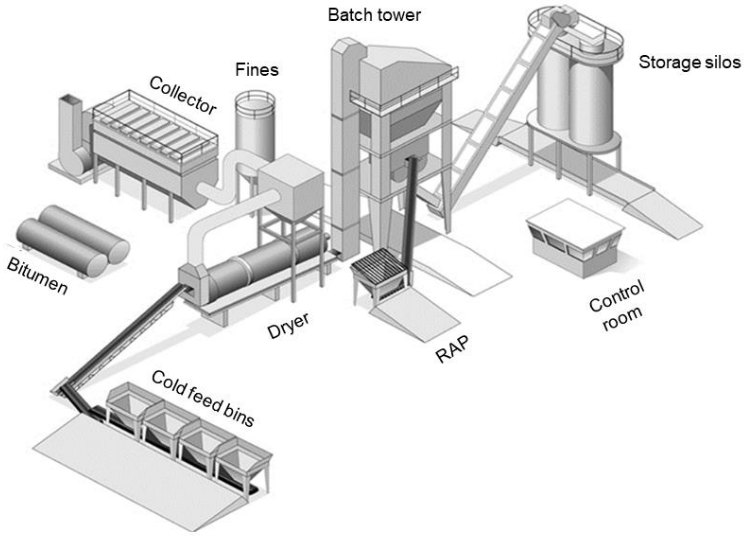

Figure 1: Schematic illustration of an asphalt plant.

Aggregates, which are either obtained from the quarry on site or purchased from external suppliers, are stored in stockpiles of different fractions (e.g. 0/4, 4/8 and 8/11 etc). The aggregates in an individual stockpile are hauled to a cold feed bin of the asphalt plant before transported further, together with the other aggregate fractions of a given recipe, by a conveyor belt running below the bins. The mixed aggregates enter a rotating dryer drum, where the material is dried and heated to desired temperature. The heated material continues to an elevator and is further transported up to the batch tower.

The next step comprises screening using a hot screen were the heated aggregates are separated according to grain size and put into a weigh hopper. The material is mixed with bitumen, filler, fibres and other additives, such as adhesive agents (amines or cement), in the mixing chamber. When a homogeneous asphalt mixture is obtained it is transferred with a skip hoist to an insulated storage silo before being retrieved by a truck.

A schematic illustration of the production process of asphalt in general is presented in Figure 2. The dashed lines illustrate the six different methods of adding RAP to an asphalt mixture. The Uddevalla asphalt plant uses the methods recycling ring and direct to mixer.

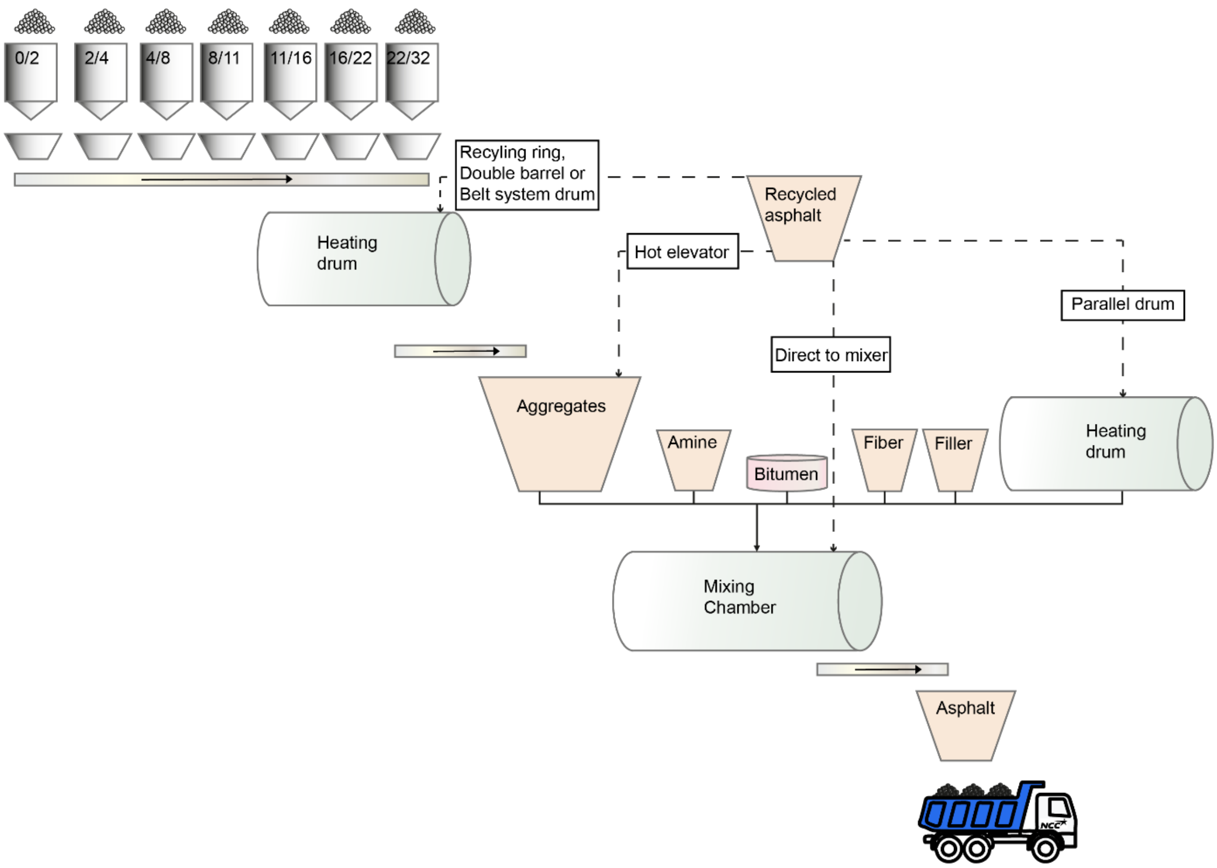

Figure 2: Illustration of the general production process of asphalt.

It is important to avoid or treat emissions generated in the dryer drum. Such emissions largely depend on production temperature, fuel type, amount and type of technique used for adding RAP. Depending on technique used, any PAHs is collected at the drying drum or the top of the batch tower and transported for filtering at the collector.

Warm Mix Asphalt is a production method used by NCC for manufacturing of any type of asphalt but at a lower temperature compared to conventionally produced asphalt mixtures. To obtain the temperature reduction a foaming technique is used. Water is injected into the bitumen, which expands and form a foam of bitumen in a foaming chamber. The bitumen is mechanically foamed inside the chamber where the binder increases roughly 20 times in volume before it is mixed with the heated aggregates and the recycled asphalt. The procedure reduces the binder viscosity and the compatibility of the asphalt mixture thus allowing it to be laid at a lower temperature (typically 30 °C) than conventionally produced asphalt. All other raw materials are added following the same principle as described for conventional asphalt production.

The products declared are classified as the United Nations Central Product Classification (UN CPC) code 15330. The products declared follow the technical standards SS EN SS-EN 13108-1, SS-EN 13108-3, SS-EN 13108-5 and SS-EN 13108-7. The products do not contain any substances of very high concern (SVHC) according to REACH.

The geographical location of Uddevalla asphalt plant is shown in Figure 3.

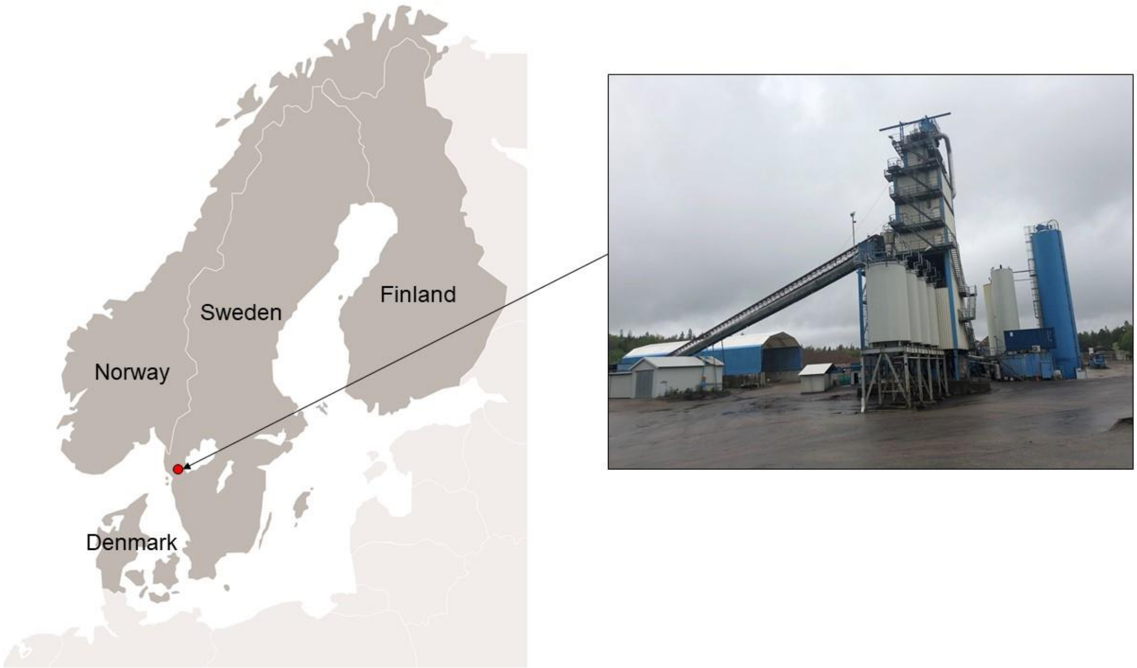

Figure 3: Map and aerial view showing the geographical location of the declared plant.

1. Declared unit and reference flow

The declared unit is 1 tonne (1000 kg) of manufactured asphalt mixture. The reference flow in the LCA is defined at the factory gate.

2. System boundary

The system boundaries cover several aspects such as temporal, geographical and which unit processes to include in the system model. The setting of system boundaries follows two principles according to EN 15804: (1) The "modularity principle" entails that the environmental impacts are declared in the life cycle stage where they appear, (2) the "polluter pays principle" means that waste processing shall be assigned to the flow diagram that generates the waste until the end-of-waste state is reached (i.e. until a new user pays for it as a raw material).

The EPD is a cradle-to-gate, declaring the modules A1-A3, see Figure 4.

Data that represent the current situation production process at the plant is used. All input data for the core module and for raw materials that NCC Industry has influence over are site specific data for the production year 2018.

The environmental impact from infrastructure, construction, production equipment, and tools that are not directly consumed in the production process are not accounted for in the LCI. Personnel-related impacts, such as transportation to and from work, are neither accounted for in the LCI.

Upstream	Core		Downstream														Other environmental information
Product stage			Construction process stage		Use stage							End of life stage					Resource recovery stage
Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal		Future reuse, recycling or energy recovery potentials
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4		D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND		MND

Figure 4: The system boundaries of the LCA. Modules of the production life cycle included in the EPD (X = declared module; MND = module not declared).

3. Assumptions and approximations

It is possible to vary the share of RAP in the asphalt mixtures. Results are presented for asphalt mixtures containing the mean share and for mixtures containing the maximum possible share of RAP. The mean is the annual average RAP share in the asphalt mixtures at the plant. The maximum is the annual maximum possible RAP share for the given product at the plant. By doing so, the environmental improvement potential is shown which can drive the development to demand asphalts mixtures with a higher share of RAP.

The content of aggregate and bitumen in RAP is assumed to 95% aggregates and 5% bitumen on average.

The RAP replacing virgin aggregates is assumed to have the same fraction sizes (0/2, 2/4 etc) as the fractions of virgin aggregates in the asphalt mixtures. This is a conservative assumption since RAP is normally replacing small size-fractions of aggregates which have a higher environmental impact than larger fractions.

PAH emitted to air during production is approximately 40 mg per tonne asphalt produced. This is based on that bitumen heated to about 150°C emits PAH less than 10 mg/kg*h heated (The German BITUMEN Forum 2016). The hot bitumen is contained in a closed system so no direct emission to air occurs at the asphalt plant, except when the asphalt is transported in contact with outside air. According to measurements and expertise judgments on site, the time during which the asphalt mixture is exposed to air is about five minutes. This time frame is a very conservative estimate. This means that the total direct PAH emission to air during production is on average 40 mg/tonne asphalt produced.

In the assessment, all available data from the production process are considered, i.e. all raw materials used, utilised ancillary materials, and energy consumption using the best available LCI GaBi datasets. All raw materials and energy used in the asphalt manufacture are included.

4. Allocation

The asphalt manufacturing process does not produce any co-products.

During normal production in an asphalt plant, steady-state in terms of mass flow or temperatures rarely exists. Instead there are numerous transients with varying extensions and time delays. In addition, there are ad-hoc adjustments within a specific asphalt mixture because of e.g. weather and transport distance. Therefore, the heat required for specific asphalt mixtures cannot simply be inferred from statistical production data. Instead, allocation between mixtures are based on yearly sums of produced amounts of asphalts and used energy, which is subsequently allocated to mixtures according to a thermodynamic model of asphalt heating described in Ekblad and Lundström (2013). The allocation model is described in the background documentation to this EPD.

Concerning the manufacture of various mixtures, four temperature classes are defined with respect to their annual average production temperature as summarized in Table 3. The average temperature for each class is based on local experience and requirements in standards. Production temperatures can vary slightly between sites.

Table 3: Temperature classes and corresponding average production temperatures.

Temperature class	Annual average production temperature [°C]
Polymer modified (PMB)	175
Conventional hot mix asphalt (HMA)	160
Reduced temperature, warm mix asphalt (WMA)	130
Soft asphalt (SA)	100

5. Cut-offs

The cut-off criteria are 1% of the renewable and non-renewable primary energy usage, 1% of the total mass input of the manufacture process (according to the EN 15804 standard).

The following cut-offs have been made:

- Packaging materials from raw materials.
- Oils used in the asphalt plant production.

6. Software and database

The LCA software GaBi Professional and its integrated database from thinkstep has been used in the LCA modelling. See the list of references.

7. Data quality

The primary data collected by the manufacturer are based on the required materials and energy to manufacture the product to create a general model. The data of the raw materials are collected per declared unit. All necessary life cycle inventories for the basic materials are available in the GaBi database or via EPDs. No generic selected datasets (secondary data) used are older than ten years. There is one exception for the raw material liquid adhesion (Amine). The only appropriate dataset representing the raw material could be found in the CPM database, published in 2001 (see http://cpmdatabase.cpm.chalmers.se). No specific data collected is older than five years and represent a period of about one year (2018). The representativeness, completeness, reliability and consistency are considered good.

8. Comparability

EPDs of construction products may not be comparable if they do not comply with EN 15804. Neither may EPD within the same product category from different programs be comparable.

A comparison of EPDs is only possible if all the data sets to be compared are created according to ISO 14025 and EN 15804, and the building context, particularly the product-specific characteristics of performance, is taken into account.

The environmental performance results are presented both for asphalt mixtures containing the actual annual mean share of RAP *and* for the same asphalt mixtures containing the potential maximum share of RAP. It is important to emphasize that actual results are shown in tables for mixtures containing the mean share of RAP. Result tables for asphalt mixtures containing the maximum potential share of RAP only shows the result which is possible to obtain by adding the maximum share of RAP in the mixtures.

Note that for the asphalt mixture MJAG16 V12000, the maximum share of RAP is equal to the mean share.

The results of the life cycle assessment based on the declared unit for asphalt mixtures containing the actual mean share of RAP are presented in Table 4 (potential environmental impact), Table 5 (resource use) and Table 6 (waste categories).

The results of the life cycle assessment based on the declared unit for asphalt mixtures containing the annual maximum possible share of RAP are presented in Table 7 (potential environmental impact), Table 8 (resource use) and Table 9 (waste categories).

Table 4: Results of the LCA –Potential environmental impact per declared unit of specific asphalt mixtures. The table presents results for asphalt mixtures containing the actual annual mean share of Recycled Asphalt Pavement (RAP).

Potential environmental impact			ABT11 100/150	ABS11 70/100	ABS 16 Viacobit 60 an7	ABS 16 70/100 an7	ABb16 70/100 Green	AG16 100/150 Green	ABb16 70/100	AG16 100/150	MJOG16 V12000	MJAG16 V12000
Parameter		Unit	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3
Global warming potential (GWP100)	Fossil	kg CO_2 eq	20	24	39	31	19	18	18	17	17	12
	Biogenic	kg CO_2 eq	0.05	0.05	0.05	0.05	0.04	0.04	0.05	0.05	0.03	0.03
	Land use / land transformation	kg CO_2 eq	0.08	0.08	0.15	0.16	0.07	0.07	0.07	0.07	0.04	0.04
	TOTAL	kg CO_2 eq	20*	24*	39***	31*	19*	18*	18*	17*	17**	12**
Ozone depletion potential (ODP)		kg CFC 11 eq	5.2E-08	5.8E-08	2.6E-08	2.6E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	7.4E-08	4.7E-08
Acidification potential of land and water (AP)		kg SO_2 eq	0.12	0.13	0.23	0.15	0.11	0.10	0.10	0.10	0.10	0.07
Eutrophication potential (EP)		kg PO_4^{3-} eq	0.04	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.05	0.04
Photochemical ozone creation potential (POCP)		kg C_2H_2 eq	0.02	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Depletion of abiotic resources (elements) (ADPE)		kg Sb eq	4.5E-06	4.9E-06	4.4E-06	4.3E-06	8.3E-06	8.3E-06	4.6E-06	4.6E-06	8.4E-06	7.3E-06
Depletion of abiotic resources (fossil) (ADPF)		MJ, net calorific value	2310	2640	3140	3040	1790	1700	1770	1680	1940	859

* The default value in the Swedish Transport Administration´s tool Klimatkalkyl is 36.1 kg per tonne asphalt mixture (6.5% bitumen) for A1-A3 (Trafikverket, Klimatkalkyl version 6.1, 2019)

** The default value in Klimatkalkyl is 21.1 kg per tonne asphalt mixture (called "halvvarm asfalt") for A1-A3 (Trafikverket, Klimatkalkyl version 6.1, 2019)

*** There is no default value in Klimatkalkyl for this type of asphalt mixture (polymer modified bitumen based). It is however expected to give higher impacts than other asphalt mixtures.

Table 5: Results of the LCA – Resource use per declared unit of specific asphalt mixtures. The table presents results for asphalt mixtures containing the actual annual mean value of Recycled Asphalt Pavement (RAP) share.

Use of resources		ABT11 100/150	ABS11 70/100	ABS 16 Viacobit 60 an7	ABS 16 70/100 an7	ABb16 70/100 Green	AG16 100/150 Green	ABb16 70/100	AG16 100/150	MJOG16 V12000	MJAG16 V12000
Parameter	Unit	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3
Use of renewable primary energy (PERE)	MJ, net calorific value	454	464	467	450	424	424	455	455	356	334
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	0	4.3	4.3	4.3	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ, net calorific value	454	468	472	454	424	424	455	455	356	334
Use of non-renewable primary energy (PENRE)	MJ, net calorific value	2319	2647	3154	3048	1794	1703	1775	1685	1948	862
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	1921	2196	2471	2471	1451	1372	1451	1372	1608	667
Total use of non-renewable primary energy resources (PENRT)	MJ, net calorific value	4240	4843	5625	5519	3245	3075	3226	3057	3556	1529
Use of secondary material (SM)	kg	305	207	7.0	7.0	305	305	305	305	3.5	404
Use of renewable secondary fuels (RSF)	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	0.09	0.09	0.56	0.12	0.08	0.08	0.09	0.09	0.06	0.05

Table 6: Results of the LCA – Waste categories per declared unit of specific asphalt mixtures. The table presents results for asphalt mixtures containing the actual annual mean value of Recycled Asphalt Pavement (RAP) share.

Waste		ABT11 100/150	ABS11 70/100	ABS 16 Viacobit 60 an7	ABS 16 70/100 an7	ABb16 70/100 Green	AG16 100/150 Green	ABb16 70/100	AG16 100/150	MJOG16 V12000	MJAG16 V12000
Parameter	Unit	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3
Hazardous waste disposed (HWD)	kg	5.4E-03	6.0E-03	2.9E-03	2.9E-03	8.0E-03	8.0E-03	5.5E-03	5.5E-03	1.0E-02	7.4E-03
Non-hazardous waste disposed (NHWD)	kg	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.0
Radioactive waste disposed (RWD)	kg	2.3E-05	2.6E-05	1.6E-04	1.6E-04	2.4E-05	2.4E-05	2.3E-05	2.4E-05	3.5E-05	2.1E-05

Note that Table 7 – 9 present the results for asphalt mixtures containing the annual maximum possible share of Recycled Asphalt Pavement (RAP).

Table 7: Results of the LCA –Potential environmental impact per declared unit of specific asphalt mixtures. This table presents results for asphalt mixtures containing the annual maximum possible share of Recycled Asphalt Pavement (RAP).

Potential environmental impact			ABT11 100/150	ABS11 70/100	ABS 16 Viacobit 60 an7	ABS 16 70/100 an7	ABb16 70/100 Green	AG16 100/150 Green	ABb16 70/100	AG16 100/150	MJOG16 V12000	MJAG16 V12000
Parameter		Unit	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3
Global warming potential (GWP100)	Fossil	kg CO_2 eq	19	22	34	28	18	17	17	16	17	12
	Biogenic	kg CO_2 eq	0.05	0.05	0.05	0.05	0.04	0.04	0.05	0.05	0.03	0.03
	Land use / land transformation	kg CO_2 eq	0.08	0.08	0.13	0.14	0.07	0.07	0.07	0.07	0.04	0.04
	TOTAL	kg CO_2 eq	19	22	34	28	18	17	17	16	17	12
Ozone depletion potential (ODP)		kg CFC 11 eq	4.5E-08	5.2E-08	2.2E-08	2.2E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	7.4E-08	4.7E-08
Acidification potential of land and water (AP)		kg SO_2 eq	0.11	0.12	0.20	0.13	0.10	0.10	0.09	0.09	0.10	0.07
Eutrophication potential (EP)		kg PO_4^{3-} eq	0.04	0.04	0.04	0.03	0.04	0.04	0.04	0.04	0.05	0.04
Photochemical ozone creation potential (POCP)		kg C_2H_2 eq	0.02	0.02	0.03	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Depletion of abiotic resources (elements) (ADPE)		kg Sb eq	4.3E-06	4.6E-06	4.0E-06	3.9E-06	8.0E-06	8.0E-06	4.3E-06	4.3E-06	8.4E-06	7.3E-06
Depletion of abiotic resources (fossil) (ADPF)		MJ, net calorific value	2090	2410	2660	2570	1560	1470	1540	1450	1940	859

Table 8: Results of the LCA – Resource use per declared unit of specific asphalt mixtures. This table presents results for asphalt mixtures containing the annual maximum possible share of Recycled Asphalt Pavement (RAP).

Use of resources		ABT11 100/150	ABS11 70/100	ABS 16 Viacobit 60 an7	ABS 16 70/100 an7	ABb16 70/100 Green	AG16 100/150 Green	ABb16 70/100	AG16 100/150	MJOG16 V12000	MJAG16 V12000
Parameter	Unit	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3
Use of renewable primary energy (PERE)	MJ, net calorific value	449	458	462	444	419	419	449	449	356	334
Use of renewable primary energy resources used as raw materials (PERM)	MJ, net calorific value	0	4.3	4.3	4.3	0	0	0	0	0	0
Total use of renewable primary energy resources (PERT)	MJ, net calorific value	449	463	466	448	419	419	449	449	356	334
Use of non-renewable primary energy (PENRE)	MJ, net calorific value	2092	2419	2670	2580	1570	1480	1550	1460	1948	862
Use of non-renewable primary energy resources used as raw materials (PENRM)	MJ, net calorific value	1725	2000	2079	2079	1255	1176	1255	1176	1608	667
Total use of non-renewable primary energy resources (PENRT)	MJ, net calorific value	3817	4419	4749	4659	2825	2656	2805	2636	3556	1529
Use of secondary material (SM)	kg	405	307	207	207	405	405	405	405	3.5	404
Use of renewable secondary fuels (RSF)	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0
Use of non-renewable secondary fuels (NRSF)	MJ, net calorific value	0	0	0	0	0	0	0	0	0	0
Use of net fresh water (FW)	m^3	0.09	0.09	0.48	0.11	0.08	0.08	0.09	0.09	0.06	0.05

Table 9: Results of the LCA – Waste categories per declared unit of specific asphalt mixtures. This table presents results for asphalt mixtures containing the annual maximum possible share of Recycled Asphalt Pavement (RAP).

Waste		ABT11 100/150	ABS11 70/100	ABS 16 Viacobit 60 an7	ABS 16 70/100 an7	ABb16 70/100 Green	AG16 100/150 Green	ABb16 70/100	AG16 100/150	MJOG16 V12000	MJAG16 V12000
Parameter	Unit	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3	A1-A3
Hazardous waste disposed (HWD)	kg	4.7E-03	5.4E-03	2.5E-03	2.5E-03	7.3E-03	7.3E-03	4.8E-03	4.8E-03	1.0E-02	7.4E-03
Non-hazardous waste disposed (NHWD)	kg	1.2	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.1	1.0
Radioactive waste disposed (RWD)	kg	2.0E-05	2.3E-05	1.2E-04	1.2E-04	2.1E-05	2.1E-05	2.0E-05	2.0E-05	3.5E-05	2.1E-05

ADDITIONAL ENVIRONMENTAL INFORMATION

Components in asphalt, such as aggregates and bitumen, are finite resources. Bitumen is a fossil resource. To extract aggregates or oil will affect the environment.

The production of asphalt mixtures requires equipment and vehicles running on fossil and renewable energy. The operations, including transports, cause mainly emissions and dust to air and disturbances such as noise.

Asphalt production is, depending on size, country and activities, regulated through specific legislation or site- specific decisions from authorities.

The stationary plants in Denmark, Finland and Sweden are certified according to ISO 14001. The Business Management System in NCC Industry, including Norway, contains routines corresponding to this standard.

In the Nordic countries (Iceland excluded) approximately 1 ton of asphalt mixtures per capita and year is produced and paved at our roads (EAPA, 2017). No asphalt is disposed during manufacture, application, maintenance or in the end-of life.

Since asphalt is a valuable resource, it is recycled into new asphalt mixtures. In NCC, Division Asphalt, more than 20% - as an average – of the produced asphalt mixtures originates from recycled asphalt pavements (RAP) during 2018.

Explanatory material is given in the background report to this EPD.

To read more about NCCs general sustainability work, please refer to our webpage; https://www.ncc.group/sustainability/

VERIFICATION DETAILS

Table 10: Verification details.

CEN standard EN 15804 served as the core PCR	
PCR:	Product Category Rules PCR 2018:04 Asphalt mixtures, version 1.03 of 2019-09-06
PCR review was conducted by:	The Technical Committee of the International EPD® System. Chair: Massimo Marino Contact via info@environdec.com.
Independent verification of the declaration and data, according to ISO 14025:	☒ EPD process certification (Internal) □ EPD verification (External)
Third party verifier:	Bureau Veritas
Accredited or approved by:	SWEDAC
Procedure for follow-up of data during EPD validity involves third party verifier:	☒ Yes □ No

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ABOUT THE EPD

This environmental product declaration (EPD) describes, from a life cycle perspective, the environmental impact of asphalt mixtures from Uddevalla asphalt plant – Porsen, produced by NCC Industry AB.

The EPD is drawn up in accordance with Product Category Rules (PCR) PCR 2018:04 Asphalt mixtures, version 1.03 of 2019-09-06. The program operator is the International EPD® System (see www.environdec.com for more information).

The aim of this EPD is that it should provide objective and reliable information on the environmental impact of the production of the declared product.

This EPD is developed by NCC. It is a result from an EPD certification process verified by Bureau Veritas. The EPD is valid for five years (after which it can be revised and reissued). NCC Industry AB is the declaration owner.

ABOUT NCC

NCC is one of the leading construction and property development companies in the Nordic region, with sales of SEK 57 billion and approximately 16 500 employees in 2018. With the Nordic region as its home market, NCC is active throughout the value chain – developing commercial properties and constructing housing, offices, industrial facilities and public buildings, roads, civil engineering structures and other types of infrastructure. NCC also offers input materials used in construction and accounts for paving and road services.

NCC's vision is to renew our industry and provide superior sustainable solutions. NCC aims to be the leading society builder of sustainable environments and will proactively develop new businesses in line with this.

NCC works to reduce both our own and our customers' environmental impact and continues to further refine our offerings with additional products and solutions for sustainability. In terms of the environment, this entails that NCC, at every step of the supply chain, is to offer resource and energy-efficient products and solutions to help our customers reduce their environmental impact and to operate more sustainably.

NCC's sustainability work is based on a holistic approach with all three dimensions of sustainability – social, environmental and economical. In NCC's new sustainability framework, our focus areas with regards to sustainability are defined; Climate and Energy, Materials & Waste, Social Inclusion, Health & Safety, Compliance and Portfolio Performance. Our sustainability strategy includes the aim of being both a leader and a pioneer in these areas.

NCC reports on its sustainability progress each year and the report has been included in NCC's Annual Report since 2010. NCC applies Global Reporting Initiative (GRI) Standards, the voluntary guidelines of the GRI for the reporting of sustainability information. In addition to GRI, NCC also reports the Group's emission of greenhouse gases to the CDP each year. NCC is a member in BSCI (Business Social Compliance Initiative), which is the broadest business-driven platform for the improvement of social compliance in the global supply chain and has been a member of the UN Global Compact since 2010. The UN Global Compact is a strategic policy initiative for businesses that are committed to aligning their operations and strategies with 10 defined and universally accepted principles in the areas of human rights, labour, environment and anti-corruption.

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