3ʳᵈ PARTY **VERIFIED**

EPD

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | **ISO 14025 & EN 15804**

Owner of declaration
BontexGeo
Industriestraat 39
9240 Zele
Belgium
VAT no. BE0421053442

Programme
EPD Danmark
www.epddanmark.dk

☐ Industry EPD
☒ Product EPD

Declared product(s)
Geosynthetics

Number of declared datasets/product variations: 1

Production site
BontexGeo Kft
Huszár Andor utca 5
3580 Tiszaujvaros
Hungary

Product use

Bontexgeo provides high quality geosynthetics. The product is used in civil engineering applications such as roads, railways, landfills, tunneling, coastal protection with the main functions filtration, separation, reinforcement, drainage, and protection.

Declared or functional unit
1 ton of geosynthetics

Year of data
2020

Issued:
21-06-2021

Valid to:
21-06-2026

Basis of calculation
This EPD is developed in accordance with the European standard EN 15804+A2.

Comparability
EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804 and if the background systems are not based on the same database.

Validity
This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

Use
The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

EPD type
☐ Cradle-to-gate with modules C1-C4 and D
☐ Cradle-to-gate with options, modules C1-C4 and D
☒ Cradle-to-grave and module D
☐ Cradle-to-gate
☐ Cradle-to-gate with options

CEN standard EN 15804 serves as the core PCR
Independent verification of the declaration and data, according to EN ISO 14025
☐ internal   ☒ external
Third party verifier:
Charlotte B. Merlin

Henrik Fred Larsen
EPD Danmark

Life cycle stages and modules (MND = module not declared)

Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Product information

Product description

The main product components are shown in the table below.

Material	Weight-% of declared product
PP	98.7%
Additives	1.3%

Representativity

This declaration, including data collection and the modeled foreground system including results, represents the production of geosynthetics on the production site located in Belgium. Product specific data are based on average values collected in the period January 2020 to December 2020. Background data are based on GaBi Professional 2020 and ecoinvent 3.7 databases. Generally, the applied background datasets are of high quality, and are only a couple of years old. The purchased PP is high-temperature PP. PP datasets from the GaBi database, representing technology mixes, are applied in the EPDs.

Hazardous substances

The geosynthetics does not contain substances listed in the "Candidate List of Substances of Very High Concern for Authorisation"

(http://echa.europa.eu/candidate-list-table)

Essential characteristics (CE)

The geosynthetics have CE marking in place, in line with the Construction Products Regulation (CPR) No 305/2011. The CE marking provides the guarantee that the geosynthetics comply with the relevant harmonized standards for geosynthetics.

The product complies with European application standards for geotextiles and geotextile-related products, which specifies the characteristics required for different usages (earthworks, erosion control works, solid waste disposals, etc.).

Further technical information can be obtained at the company website:

https://bontexgeo.com/about-bontexgeo/quality-and-certification/

Reference Service Life (RSL)

100 years (based on a standardized test protocol from application standards, which is described in the background LCA report).

Picture of product(s)

LCA background

Declared unit

The LCI and LCIA results in this EPD relates to impacts caused by the production of 1 ton of BontexGeo geosynthetics.

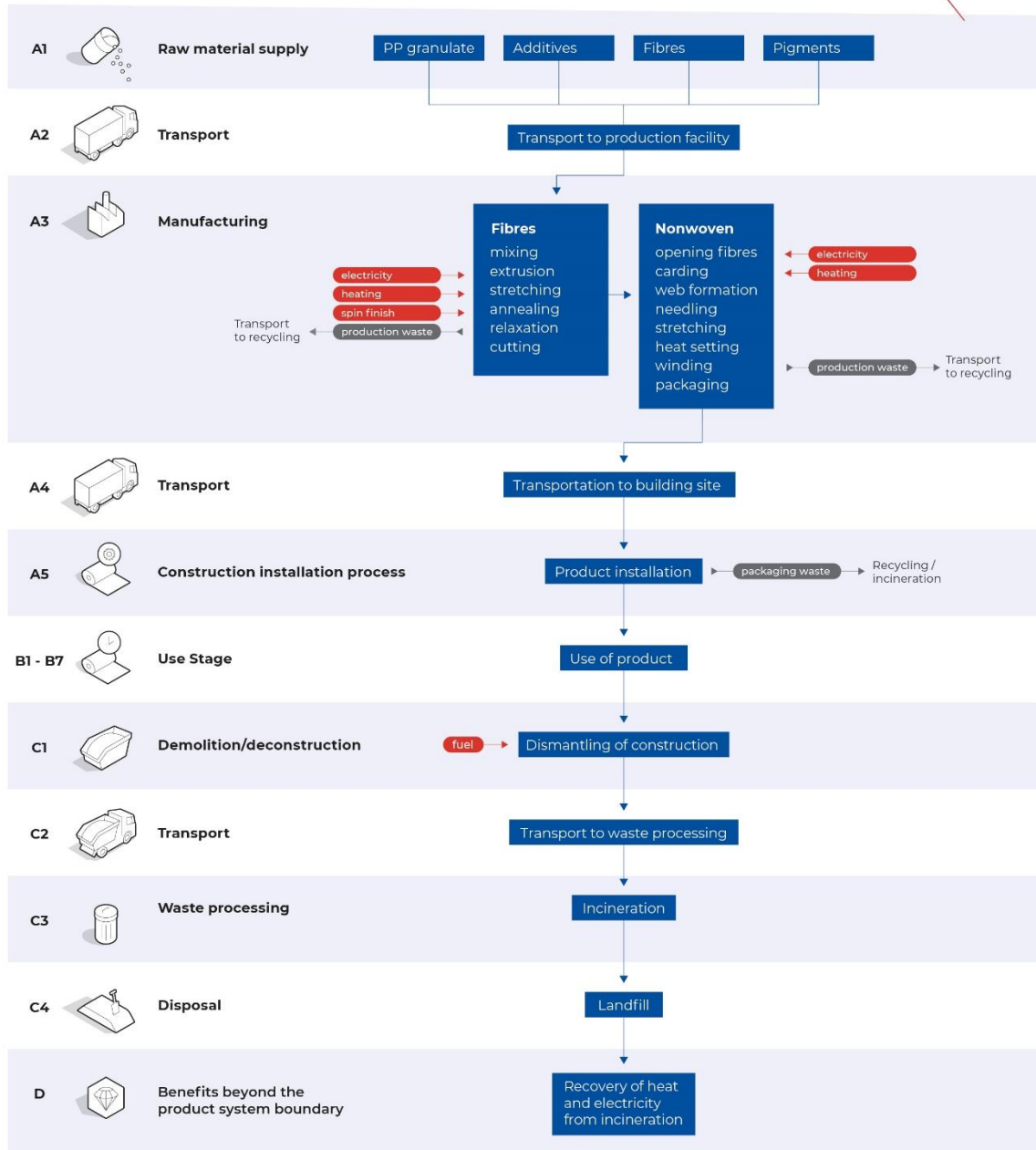| Name	Value	Unit
Declared unit	1	ton
Density	0.91	kg/dm^3
Conversion factor to 1 kg.	0.001	-

Functional unit

Not defined.

PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2:2019.

BontexGeo
Leading in Geosynthetics

The lifecycle of BontexGeo Geosynthetics

A1 Raw material supply

| PP granulate | Additives | Fibres | Pigments |

A2 Transport

Transport to production facility

A3 Manufacturing

Fibres
mixing
extrusion
stretching
annealing
relaxation
cutting

electricity
heating
spin finish

Transport to recycling ← production waste

Nonwoven
opening fibres
carding
web formation
needling
stretching
heat setting
winding
packaging

electricity
heating

production waste → Transport to recycling

A4 Transport

Transportation to building site

A5 Construction installation process

Product installation → packaging waste → Recycling / incineration

B1 - B7 Use Stage

Use of product

C1 Demolition/deconstruction

fuel → Dismantling of construction

C2 Transport

Transport to waste processing

C3 Waste processing

Incineration

C4 Disposal

Landfill

D Benefits beyond the product system boundary

Recovery of heat and electricity from incineration

System boundary

This EPD is based on a cradle-to-grave LCA.

The general rules for the exclusion of inputs and outputs follow the requirements in EN 15804, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass, and 1 % of energy usage and mass for unit processes.

Product stage (A1-A3) includes:

A1 – Extraction and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the production site and packaging. The LCA results are declared in aggregated form for the product stage, which means that the sub-modules A1, A2 and A3 are declared as one module A1-A3.

Production of PP fibres:

PP granulate and additives are gravimetrically dosed and mixed in the extruder feeder hopper. This composition is molten and blended in an extruder to a homogeneous polymer melt. After filtration and metering, the liquid polymers are extruded through die plates where the filaments are created. To increase the mechanical strength of the filaments, they are drawn and annealed in multiple steps. Filaments are treated with a spin finish and are cut to a pre-set length for further processing resulting in staple fibres.

Production of textiles:

The fibres made in the first step are brought from the silos (where the product is mixed) to an opener to untangle the fibres. Next step is the fibres are brought in the carding unit to align the fibres and create layers of fleece. These separate fleeces are then brought together to one layer which is further processed through the needling and is stretched to obtain the properties of the product. This fleece can also be heat set in the oven. The product is rolled on to the cores up until the desired length is reached.

Final packaging & storage:

In the last process step, the rolls are automatically transported to a packaging unit where the items are packed with plastic foil, which is ultrasonically closed, and where individual rolls can be combined into packs.

Construction process stage (A4-A5) includes:

A4 – Transportation from the BontexGeo factory to a construction site in Europe or outside of Europe.

A5 – Accounts for the environmental impacts related to incineration of the packaging waste. No impacts are associated with installation of the geosynthetics.

Use stage (B1-B7) includes:

There are no environmental impacts associated with the entire use stage.

End of Life (C1-C4) includes:

C1 – Accounts for the impacts from dismantling of the geosynthetics at the site of application.

C2 – Transportation to a disposal site.

C3 – No waste processing is taking place.

C4 – Accounts for the impacts from landfilling.

Re-use, recovery, and recycling potential (D) includes: Refers to potential benefits and loads from the end-of-life of the product, and electricity and heat credits.

LCA results

ENVIRONMENTAL IMPACTS PER DECLARED UNIT (1 TON)									
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-total	[kg CO_2 eq.]	2.25E+03	1.01E+02	1.09E+02	0.00E+00	6.22E-01	8.39E+00	0.00E+00	7.02E+01	-5.03E+01
GWP-fossil	[kg CO_2 eq.]	2.34E+03	9.91E+01	3.64E+01	0.00E+00	6.45E-01	8.23E+00	0.00E+00	7.24E+01	-5.02E+01
GWP-biogenic	[kg CO_2 eq.]	-9.38E+01	1.07E+00	7.22E+01	0.00E+00	-2.83E-02	8.95E-02	0.00E+00	-2.20E+00	4.24E-02
GWP-luluc	[kg CO_2 eq.]	6.61E-01	8.09E-01	4.34E-03	0.00E+00	5.01E-03	6.74E-02	0.00E+00	5.88E-02	-6.82E-02
ODP	[kg CFC 11 eq.]	9.20E-09	1.84E-14	2.40E-08	0.00E+00	1.14E-16	1.53E-15	0.00E+00	1.64E-13	-8.43E-13
AP	[mol H^+ eq.]	8.23E+00	3.68E-01	2.49E-02	0.00E+00	3.16E-03	3.00E-02	0.00E+00	2.19E-01	-1.07E-01
EP-freshwater	[kg PO_4 eq.]	5.39E-02	3.04E-04	1.13E-05	0.00E+00	1.89E-06	2.54E-05	0.00E+00	1.32E-02	-1.50E-04
EP-marine	[kg N eq.]	1.66E+00	1.66E-01	8.28E-03	0.00E+00	1.46E-03	1.37E-02	0.00E+00	4.86E-02	-2.55E-02
EP-terrestrial	[mol N eq.]	1.78E+01	1.85E+00	1.10E-01	0.00E+00	1.62E-02	1.53E-01	0.00E+00	5.33E-01	-2.67E-01
POCP	[kg NMVOC eq.]	6.97E+00	3.26E-01	2.20E-02	0.00E+00	4.10E-03	2.67E-02	0.00E+00	1.58E-01	-6.93E-02
ADPm[1]	[kg Sb eq.]	1.85E-04	8.09E-06	3.29E-07	0.00E+00	5.01E-08	6.73E-07	0.00E+00	4.89E-06	-1.17E-05
ADPf[1]	[MJ, net calorific value]	8.72E+04	1.34E+03	4.11E+01	0.00E+00	8.27E+00	1.11E+02	0.00E+00	1.04E+03	-8.03E+02
WDP[1]	[m^3 world eq. deprived]	1.56E+03	9.75E-01	1.25E+01	0.00E+00	6.04E-03	8.12E-02	0.00E+00	-8.12E-01	-9.32E+00
Caption	GWP-total = Globale Warming Potential - total; 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 = Ozone Depletion; AP = Acidifcation; EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use									
Disclaimer	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									

Additional environmental impacts, as declared in the project report of this EPD, are declared in this EPD:

ADDITIONAL ENVIRONMENTAL IMPACTS PER DECLARED UNIT (1 TON)									
Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PM	[Disease incidence]	9.77E-05	2.20E-06	1.78E-07	0.00E+00	3.56E-08	1.72E-07	0.00E+00	2.14E-06	-8.92E-07
IRP[2]	[kBq U235 eq.]	1.79E+02	3.64E-01	2.21E-01	0.00E+00	2.26E-03	3.03E-02	0.00E+00	1.78E+00	-1.67E+01
ETP-fw[1]	[CTUe]	1.87E+04	1.00E+03	2.24E+01	0.00E+00	6.19E+00	8.31E+01	0.00E+00	1.02E+03	-3.18E+02
HTP-c[1]	[CTUh]	2.03E-06	2.07E-08	1.29E-09	0.00E+00	1.28E-10	1.72E-09	0.00E+00	4.63E-08	-9.44E-09
HTP-nc[1]	[CTUh]	1.74E-05	1.20E-06	1.02E-07	0.00E+00	7.49E-09	1.00E-07	0.00E+00	3.70E-06	-3.80E-07
SQP[1]	-	8.96E+03	4.68E+02	9.25E+00	0.00E+00	2.90E+00	3.90E+01	0.00E+00	7.25E+01	-4.22E+02
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality (dimensionless)									
Disclaimers	[1] The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator.									
	[2] 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.									

RESOURCE USE PER TON

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
PERE	[MJ]	3.97E+03	7.71E+01	6.31E+00	0.00E+00	4.78E-01	6.42E+00	0.00E+00	7.29E+01	-3.42E+02
PERM	[MJ]	6.33E+02	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]	4.60E+03	7.71E+01	6.31E+00	0.00E+00	4.78E-01	6.42E+00	0.00E+00	7.29E+01	-3.42E+02
PENRE	[MJ]	8.72E+04	1.34E+03	4.11E+01	0.00E+00	8.30E+00	1.12E+02	0.00E+00	1.04E+03	-8.04E+02
PENRM	[MJ]	4.44E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.32E+05	1.34E+03	4.11E+01	0.00E+00	8.30E+00	1.12E+02	0.00E+00	1.04E+03	-8.04E+02
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
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	0.00E+00
FW	[m³]	3.84E+01	8.99E-02	2.94E-01	0.00E+00	5.57E-04	7.48E-03	0.00E+00	1.27E-02	-3.73E-01
Caption	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 resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Net use of fresh water									

WASTE CATEGORIES AND OUTPUT FLOWS PER DECLARED UNIT (1 TON)

Parameter	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
HWD	[kg]	1.88E-05	6.19E-05	2.41E-07	0.00E+00	3.84E-07	5.16E-06	0.00E+00	3.79E-06	-4.43E-07
NHWD	[kg]	9.56E+00	2.12E-01	5.55E+00	0.00E+00	1.32E-03	1.77E-02	0.00E+00	9.96E+02	-1.00E+00
RWD	[kg]	1.91E+00	2.47E-03	1.87E-03	0.00E+00	1.53E-05	2.06E-04	0.00E+00	1.25E-02	-1.02E-01
CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	1.09E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	6.41E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EE	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported energy									

BIOGENIC CARBON CONTENT PER DECLARED UNIT (1 TON)

Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	23.2
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2	

Additional information
Technical information on scenarios

Transport to the building site (A4)

Scenario information	Value	Unit
Fuel type and consumption	10	L diesel
Transport distance	1,100	km
Capacity utilisation (including empty runs)	50	%
Gross density of products transported	0.91	kg/dm^3
Capacity utilisation volume factor	0.55	-

[1] For truck

Installation of the product in the building (A5)

Scenario information	Value	Unit
Ancillary materials	0	kg
Water use	0	m^3
Other resource use	0	kg
Energy type and consumption (diesel fuel)	0	L
Cardboard packaging waste	39	kg
Plastic packaging waste	14.6	kg
Wood packaging waste	11.9	
Direct emissions to air, soil or water	0	kg

Reference service life

RSL information	Years
Reference service Life	100

Use (B1-B7)
There are no environmental impacts associated with the entire use stage.

End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	1000	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	0	kg
For energy recovery	0	kg
For final disposal	1000	kg

Re-use, recovery, and recycling potential (D)
Electricity and heat credits from incineration of packaging waste in A5.

Scenario information/Materiel	Value	Unit
Credit for electricity recovery	356	MJ
Credit for heat recovery	191	MJ

Indoor air

The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

Soil and water

The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on measurement of release of regulated dangerous substances from construction products using harmonised test methods according to the provisions of the respective technical committees for European product standards are not available.

References

Publisher	epddanmark www.epddanmark.dk
Programme operator	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup www.teknologisk.dk
LCA practitioner	Trine Henriksen and Julie Rønholt COWI A/S Parallelvej 2 2800 Kgs. Lyngby
LCA software /background data	GaBi Professional 2020 and ecoinvent 3.7
3ʳᵈ party verifier	Charlotte Merlin Force Technology Park Allé 345 2605 Brøndby

General programme instructions
Version 2.0
www.epddanmark.dk

EN 15804
DS/EN 15804 + A2:2019 - "Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products"

EN 15942
DS/EN 15942:2011 – "Sustainability of construction works – Environmental product declarations – Communication format business-to-business"

ISO 14025
DS/EN ISO 14025:2010 – "Environmental labels and declarations – Type III environmental declarations – Principles and procedures"

ISO 14040
DS/EN ISO 14040:2008 – "Environmental management – Life cycle assessment – Principles and framework"

ISO 14044
DS/EN ISO 14044:2008 – "Environmental management – Life cycle assessment – Requirements and guidelines"