

**Environmental
Product
Declaration**

according to ISO 14025 and EN 15804



This declaration is for:
**Furnace bottom ash (transported -
Eemshaven & Rotterdam.v2)**

Provided by:
Vliegasunie B.V.



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SCOPE OF DECLARATION

This MRPI®-EPD certificate is verified by **Harry van Ewijk, SGS**.
The LCA study has been done by **Pieter Stadhouders, EcoReview**.
The certificate is based on an LCA-dossier according to ISO14025 and NEN-EN15804+A1. It is verified according to the 'EPD-MRPI® verification protocol May 2017.v3.1'. EPDs of construction products may not be comparable if they do not comply with NEN-EN15804+A1. Declaration of SVHC that are listed on the 'Candidate List of Substances of Very High Concern for authorisation' when content exceeds the limits for registration with ECHA.

VISUAL PRODUCT



PRODUCT

Furnace bottom ash (transported - Eemshaven & Rotterdam.v2)

MRPI® REGISTRATION

1.1.00097.2020

EPD REGISTRATION

00001106

DATE OF ISSUE

28-01-2020

EXPIRY DATE

28-01-2025

DECLARED UNIT/FUNCTIONAL UNIT

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DESCRIPTION OF PRODUCT

Furnace bottom ash is a byproduct of power generation using coal and biomass as fuels. It's a construction material applied in a.o. road foundations and concrete building blocks.

MORE INFORMATION

<https://www.vliegasunie.nl/en/products/bottom-ash>

DEMONSTRATION OF VERIFICATION

CEN standard EN15804 serves as the core PCR[a]

Independent verification of the declaration and data,
according to EN ISO 14025:2010:

internal: external: X

(where appropriate[b]) Third party verifier:

Harry van Ewijk, SGS Search

[a] Product Category Rules [b] Optional for B-to-B communication, mandatory for B-to-C communication (see EN ISO 14025:2010, 9.4).

DETAILED PRODUCT DESCRIPTION

Product name: Furnace bottom ash

Bottom ash is a byproduct of power generation using coal and biomass as fuels. It can directly be used as an intermediate product for construction materials.

COMPONENT (> 1%)	[kg / %]
SiO ₂ + Al ₂ O ₃ + Fe ₂ O ₃	70-100%
CaO	0-10%
P ₂ O ₅	0-5%

(*) > 1% of total mass

SCOPE AND TYPE

This product is produced in the Netherlands. It is applied as an intermediate product for construction materials.

Ecoinvent V3.4 was used for the analysis.

It is an intermediate product and therefore end-of-life scenarios are not clear. The specific EPD only covers A1-A3.

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE			USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport gate to site	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	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	

X = Module assessed

MNA = Module not assessed

REPRESENTATIVENESS

The data in this EPD is representative for bottom ash produced in the power plants of Eemshaven and Rotterdam.

ENVIRONMENTAL IMPACT per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
ADPE	kg Sb-eq.	0.00	6.07 E -7	3.78 E -7	9.85 E -7	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
ADPF	MJ	0.00	9.54 E +0	2.23 E +1	3.19 E +1	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
GWP	kg CO2-eq.	0.00	7.07 E -1	1.63 E +0	2.33 E +0	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
ODP	kg CFC11-eq.	0.00	1.08 E -7	2.01 E -7	3.09 E -7	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
POCP	kg ethene-eq.	0.00	4.11 E -4	1.62 E -3	2.03 E -3	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
AP	kg SO2-eq.	0.00	4.82 E -3	1.24 E -2	1.72 E -2	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
EP	kg (PO4)3--eq.	0.00	1.05 E -3	2.80 E -3	3.86 E -3	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Toxicity indicators (Dutch market)																			
HTP	kg DCB-eq.	0.00	1.73 E -1	1.25 E +0	1.42 E +0	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
FAETP	kg DCB-eq.	0.00	4.60 E -3	2.03 E -2	2.49 E -2	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
MAETP	kg DCB-eq.	0.00	1.48 E +1	1.10 E +2	1.25 E +2	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
TETP	kg DCB-eq.	0.00	8.32 E -4	2.04 E -3	2.87 E -3	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
Environmental Cost Indicator (Dutch market)																			
ECI	Euro	0.00	8.29 E -2	2.85 E -1	3.68 E -1	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

INA = Indicator Not Assessed

ADPE = Abiotic Depletion Potential for non-fossil resources

ADPF = Abiotic Depletion Potential for fossil resources

GWP = Global Warming Potential

ODP = Depletion potential of the stratospheric ozone layer

POCP = Formation potential of tropospheric ozone photochemical oxidants

AP = Acidification Potential of land and water

EP = Eutrophication Potential

HTP = Human Toxicity Potential

FAETP = Fresh water aquatic ecotoxicity potential

MAETP = Marine aquatic ecotoxicity potential

TETP = Terrestrial ecotoxicity potential

ECI = Environmental Cost Indicator

RESOURCE USE per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
PERM	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
PERT	MJ	0.00	1.91 E -1	9.33 E -2	2.84 E -1	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
PENRE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
PENRM	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
PENRT	MJ	0.00	1.01 E +1	2.44 E +1	3.45 E +1	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
SM	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
RSF	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
NRSF	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
FW	m3	0.00	2.05 E -3	5.53 E -1	5.55 E -1	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

INA = Indicator Not Assessed

PERE = Use of renewable energy excluding renewable primary energy resources

PERM = Use of renewable energy resources used as raw materials

PENRE = Use of non-renewable primary energy resources excluding non-renewable energy resources used as raw materials

PENRM = Use of non-renewable primary energy resources used as raw materials

SM = Use of secondary materials

NRSF = Use of non renewable secondary fuels

PERT = Total use of renewable primary energy resources

PENRT = Total use of non-renewable primary energy resources

RSF = Use of renewable secondary fuels

FW = Use of net fresh water

OUTPUT FLOWS AND WASTE CATEGORIES per functional unit or declared unit

	UNIT	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	0.00	6.89 E -5	2.23 E -1	2.23 E -1	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
NHWD	kg	0.00	1.12 E -1	9.67 E -3	1.22 E -1	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
RWD	kg	0.00	6.16 E -5	0.00	6.16 E -5	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
CRU	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
MFR	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
MER	kg	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
EEE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA
ETE	MJ	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA	INA

INA = Indicator Not Assessed

HWD = Hazardous Waste Disposed

RWD = Radioactive Waste Disposed

MFR = Materials for recycling

EEE = Exported Electrical Energy

NHWD = Non Hazardous Waste Disposed

CRU = Components for reuse

MER = Materials for energy recovery

ETE = Exported Thermal Energy



CALCULATION RULES

Data quality

Data flows have been modeled as realistically as possible. Data quality assessment is based on the principle that the primary data used for processes occurring at the production site is selected in the first instance. Where this is not available, other reference data is selected from appropriate sources.

Data collection period

The dataset is representative for the production processes used in 2018.

Methodology and reproducibility

The process descriptions and quantities in this study are reproducible in accordance to the reference standards that have been used. The references of all sources, both primary and public sources and literature, have been documented.



SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

A1. Raw materials supply

The input material is free of burden. No emissions from the power generation are allocated onto the bottom ash. This approach is in accordance with CEN/TC 51 PCR for cement and building lime, 2015.

A2. Transport of raw materials to manufacturer

Incoming transports of the sourced material are done by barge and truck. The material coming from power plant RWE Eemshaven is moved to storage facility TPE Eemshaven by truck. The material coming from Engie Rotterdam is moved to storage facility ZHD in Dordrecht by barge.

The material coming from Hemweg Nuon Amsterdam and Amercentrale Geertruidenberg go directly to the customers and are covered by another EPD called "Vliegassunie bottom ash (zero impact version - Amsterdam & Geertruidenberg)".

A3. Manufacturing

No manufacturing is needed for this product. However, some diesel is used for internal transport and some occasional breaking and sieving of the product. This is allocated to A3.



DECLARATION OF SVHC

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the threshold with the European Chemicals Agency.



REFERENCES

- EN 15804:2012+A1:2013 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products, of 11/2013.
- ISO 14040/14044 on Life Cycle Assessments.
- CEN/TC 51 PCR for cement and building lime, 2015



REMARKS

None