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# LCI/LCA REPORT

ISO14025 ISO14044 EN15804

Report no : <XX>  
Commissioner of the study : <XXXXXXXXXXXXXXXXXX>  
Practitioner of the study : <XXXXXXXXXXXXXXXXXX>  
Date of report : <XX.XX.201X>

<XXXXXXXXXXXXXXXXXX>

**Manufacturer**

<XXXXXXXXXXXXXXXXXXXX>

**Product**

## 1. Introduction/general aspects

This study has been conducted according to the requirements of ISO 14044:2006, NS-EN 15804:2012, ISO 14025:2006 and PCR <XX>

## 2. Goal and scope

### 2.1 Goal of the study

The goal of the study has been to provide necessary data and documentation to produce an EPD according to the requirements of PCR <XX>, and to gain insight into the environmental impacts related to <process/service/product to be declared>

*(Describe additional purposes of the study if relevant)*

Results from the study will be published in an environmental product declaration type III for the product.

*(Describe additional intended application of the results from the study if relevant)*

Target audiences of the study are customers and other parties with an interest in the environmental impacts of <process/service/product>. The internal audience is <describe if relevant>.

*(Describe additional target audiences if relevant)*

This analysis <shall/shall not> support comparative assertions intended to be disclosed to the public.

### 2.2 Functional unit and declared unit

#### 2.2.1 Functional unit and declared unit

*(Define and describe functional and declared unit and include relevant technical specifications. Copy information from relevant PCR or refer to chapters in PCR providing said definitions. For construction works, additional technical and functional characteristics shall be described, in addition to area of application in the building).*

#### 2.2.2 Calculation rules for averaging data

*(Describe calculation rules for averaging data when the functional/declared unit is defined for a group of similar products produced by different suppliers or the same product is produced at different locations).*

## 2.3 System boundaries

### 2.3.1 System boundaries

(This chapter shall describe life cycle stages, processes, material- and energy flows or data that are included and excluded in the analysis.

Use figure 1 to specify which life cycle stages that are included and excluded. In the white area, type X for modules included in the analysis, MND for modules not declared but relevant and MNR for modules not relevant. The grey area in the table describes which modules are mandatory (M) and optional (O) for various types of declarations.

		Product stage			Construction / installation stage		Use stage						End of life stage				Benefits and loads beyond the system boundary		
		Raw material supply	Transportation	Manufacturing	Transportation	Construction / installation / assembly	Use	Maintenance (incl. transportation)	Repair (incl. transportation)	Replacement (incl. transportation)	Refurbishment (incl. transportation)	Operational energy use	Operational water use	De-installation / demolition / disassembly	Transportation	Waste processing	Disposal	Reuse / recovery / recycling potential	
		A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Type of EPD	Cradle to gate																		
	Cradle to gate with options	M			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
	Cradle to grave	M			M	M	M	M	M	M	M	M	M	M	M	M	M	M	O

Figure 1: Types of EPD with respect to life cycle stages covered and modules for the assessment

- If module C3 is included, the end of waste state must be justified through description of existing market or demand and compliance with technical and legal requirements and guidelines.
- If the entire life cycle (modules A1-C4) is covered in the study, documentation for calculating the reference service life (RSL) must be provided).

### 2.3.2 Technical flowchart

Provide a technical flowchart for the product system, with main production processes and system boundaries. Selected processes included in the study should be according to provisions of relevant PCR and any deviance from the PCR shall be stated and justified.

### 2.3.3 Scenarios for analyses beyond cradle to gate

*(Use information from relevant PCR or refer to chapters in PCR providing this information).*

### 2.3.4 Assumptions about electricity consumption and other relevant background data

*(Use information from relevant PCR or refer to chapters in PCR providing this information. The electricity shall be clearly specified in terms of electricity mix, year of data and with reference to the data source. The CO<sub>2</sub>-factor connected to the electricity mix shall be presented as kg/kWh).*

### 2.3.5 Cut-off criteria for initial inclusion of inputs and outputs

*(Copy information from relevant PCR or refer to chapters in PCR providing this information. Specify whether cut-off is based on mass, energy or environmental significance).*

**Table 1: List of excluded processes**

<b>Process excluded from study</b>	<b>Cut-off criteria</b>	<b>Quantified contribution from process</b>

### 2.3.6 Data quality requirements

*(Define data quality according to geographical, technological or temporal relevance. Use information from relevant PCR or refer to chapters in PCR providing this information).*

## 3. Life cycle inventory analysis

### 3.1 Data collection procedures

*(Describe how specific and generic data is collected, e.g. via questionnaire, personal contact, literature or other. Selection and use of generic data must be described and justified and relevant databases must be referred to).*

### 3.2 Quantitative and qualitative descriptions of unit processes necessary to model life cycle stages of the functional or declared unit

*(For every process, the following information shall be included:*

- *Description of unit processes. The module system in figure 1 in chap 2.3 in this document provides a structure for naming and classifying processes.*
- *Quantification of energy and material inputs and outputs, taking into account how plant-level data is allocated to declared products*
- *Description of all numerical data for inputs and outputs and their relation to reference functions and reference flows, divided by the data categories chosen for the study).*
- *Life cycle models should be presented either in this chapter of the report or as an appendix. The presentation should be transparent.*

### 3.3 Sources of data and literature used to conduct LCA

Table 2: List of data sources

Submodule (cf fig. 1 chap. 2.3)	Material/ energy flow	Data description	Source	Data quality (specific/ generic)	Year of data (Y) and representative- ness (R) (year/month average etc)
Main module (cf fig. 1 chap. 2.3)					
					Y: R:
					Y: R:

### 3.4 Validation of data

#### 3.4.1 Data quality assessment

*(Consider and describe data quality and fulfillment of requirements for geographical, technological and temporal relevance).*

#### 3.4.2 Treatment of missing data

*(Explain whether goals are met according to the threshold criteria, and describe qualitative and quantitative considerations about missing data. If there are missing data in the inventory, it shall be described how this was handled).*

#### 3.4.3 Procedures for quality insurance of data

*(Describe quality control procedures, procedures for identification, correction and monitoring of missing data securing appropriate modeling and quantification of both specific and generic data).*

### 3.5 Allocation principles and procedures

#### 3.5.1 Documentation and justification of allocation procedures

*(In this paragraph, a description and justification of allocation procedures must be provided. Any allocation shall be in accordance with the provisions of the relevant PCR document. If the PCR is developed from the Norwegian PCR template, this will be explained in section 6.4.1 of the PCR. Allocation factors and relevant references of these should be described).*

#### 3.5.2 Uniform application of allocation procedures

*(Where unit-based allocation is used, relevant processes must be listed and procedures for allocation must be described).*

## 4. Life cycle impact assessment

### 4.1 LCIA procedures, calculations and results of the study

*(List relevant results from the impact assessment in tabular form and describe any deviance from the relevant PCR with regards to calculation or evaluation procedures)*

### 4.2 Relationship of the LCIA results to the LCI results

*(Briefly comment the results and describe significant or unexpected impacts with reference to inventory data. Identify processes, material and energy flows central for the results).*

### 4.3 Characterization models, factors and methods

*(Refer to and describe characterization models, characterization factors and methods used. Copy from the current PCR document or refer to the applicable section of the PCR. In a PCR developed from the Norwegian PCR template, this will be section 6.5.).*

**Table 3: Parameters describing environmental impacts (NS-EN15804 2012)**

<b>Impact Category</b>	<b>Parameter</b>	<b>Unit (expressed per functional unit or per declared unit)</b>
Global Warming	Global warming potential, GWP	Kg CO <sub>2</sub> - equiv 100 yr
Ozone Depletion	Depletion potential of the stratospheric ozone layer, ODP	Kg CFC-11- equiv 20 yr
Acidification for soil and water	Acidification potential of soil and water, AP	Kg SO <sub>2</sub> - equiv
Eutrophication	Eutrophication potential, EP	Kg PO <sub>4</sub> - equiv
Photochemical ozone creation	Formation potential of tropospheric ozone, POCP	Kg C <sub>4</sub> H <sub>4</sub> - equiv
<p>The abiotic depletion potential is calculated and declared in two different indicators:</p> <ul style="list-style-type: none"> <li>• ADP-elements (kg Sb equiv): include all non-renewable, abiotic material resources (i.e. excepting fossil resources)</li> <li>• ADP-fossil fuels (MJ net calorific value): include all fossil resources</li> </ul>		

**Table 4: Parameters describing resource use**

<b>Parameter</b>	<b>Unit (expressed per functional unit or per declared unit)</b>
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ net calorific value
Use of renewable primary energy resources used as raw materials	MJ net calorific value
Total use of renewable primary energy resources (primary energy and primary energy resources used as materials)	MJ net calorific value
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ net calorific value
Use of non-renewable primary energy resources used as raw materials	MJ net calorific value
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as materials)	MJ net calorific value
Use of secondary material	Kg
Use of renewable secondary fuels	MJ net calorific value
Use of non-renewable secondary fuels	MJ net calorific value
Net use of fresh water	m <sup>3</sup>

**Table 5: Other environmental information describing waste categories**

<b>Parameter</b>	<b>Unit (expressed per functional unit or per declared unit)</b>
Hazardous waste disposed*	Kg
Non hazardous waste disposed	Kg
Radioactive waste disposed	Kg
Components for re-use	Kg
Materials for	Kg
Materials for energy recovery	Kg
Exported energy	MJ per energy carrier

\*The characteristics that render waste hazardous are described in existing applicable legislation, e.g. in the European Waste Framework Directive

The estimated impact results are only relative statements which do not indicate the end points of the impact categories, exceeding threshold values, safety margins or risks.

#### **4.4 Value based choices related to decisions regarding characterization models, factors and methods**

*(Describe the value choices made regarding impact categories, characterization models, characterization factors, normalization, grouping and weighting. Include a justification for their use and impact on the results).*

### **5. Life cycle interpretation**

#### **5.1 Interpretation of results**

*(Present a brief interpretation of the results and comment on the performance of the product or declared unit throughout its lifecycle. Relate impact results to the inventory assessment. Consider the fraction of the identified impacts that can be controlled by the owner of the EPD and how. Variance from the means of LCIA results must be presented if generic data is provided from several sources or [the results] refer to a number of similar products.).*

#### **5.2 Assumptions and limitations associated with the interpretation**

*(Describe the assumptions and limitations related to the interpretation of the results described in the EPD, both related to the method and the data inputs)*

#### **5.3 Data quality assessment**

*(Consider quantitative and / or qualitative sensitivity and uncertainty of the data, and the reliability of the final results. Also consider the conclusions as a result of uncertainty in the data and allocation methods. Guidelines for such considerations can be found in ISO 14044:2006 chapter 4.5.3.).*

#### **5.4 Value based choices, rationales and judgements**

*(Describe and comment on any value based choices that might have influenced the results).*

### **6. Critical review**

*(Internal or external critical review should be accompanied by a report from the review, and any responses to recommendations should her be described).*

#### **6.1 Name and affiliation of reviewers**

*(Present name and affiliation of reviewers)*

#### **6.2 Reports from critical review**

*(Present the most central feedback from the critical review)*



### **6.3 Responses to recommendations**

*(If recommendations from the critical review has been used to improve the study, this shall be shortly described and commented).*

## **7. References**

*(List all references from the study)*

## **8. Appendices**

*The following appendices are mandatory:*

### **APPENDIX 1: PCR**

*(Relevant PCR for the study)*

### **APPENDIX 2: EPD**

*(EPD from the study)*

### **APPENDIX 3: MASS BALANCE**

*(Mass balance from the inventory analysis in tabular form)*

### **APPENDIX 4: REPORTS FROM CRITICAL REVIEW**

*(Reports from internal and external reviews)*