# Welcome to One Click LCA EPD Training





#### **Agenda**



•	Session 1: 09:00-10:35	- About One Click LCA
		<ul> <li>Introduction to EPDs</li> </ul>
		- Summary of Klimatdeklaration
		- Q&A

Session 2: 11:20-12:20

 SBI Member example EPD
 Raw materials and manufacturing data
 Life-cycle scenarios
 Q&A

Session 3: 13:40-14:40

 EPD creation process
 EPD Onboarding with One Click LCA
 Software introduction
 Q&A

#### **About One Click LCA**



#### **SOFTWARE**



**BUILDING DESIGN** & CONSTRUCTION



INFRASTRUCTURE & CITY PLANNING

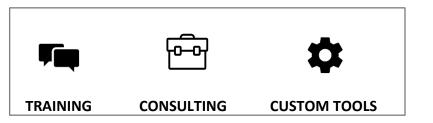


PRODUCT MANUFACTURERS



GHG REPORTING FOR COMPANIES

#### **SERVICES**



#### **POLICY**



## Introduction to EPDs





#### Introduction to EPDs



- Introduction to product carbon footprints and why we need to act now
- Basics of EPDs: what they are and why they are necessary
- How to benefit from EPDs and how to sell them
- Overview of the standards and rules that apply to construction product LCAs
- Use of EPDs in global certification schemes including LEED and BREEAM
- Summary of Klimatdeklaration

#### Construction sector carbon footprint



- Buildings are responsible for:
  - 50% of global resource consumption
  - 39% of global carbon emissions



28% from operational emissions



11% from materials and construction



#### Construction sector carbon footprint



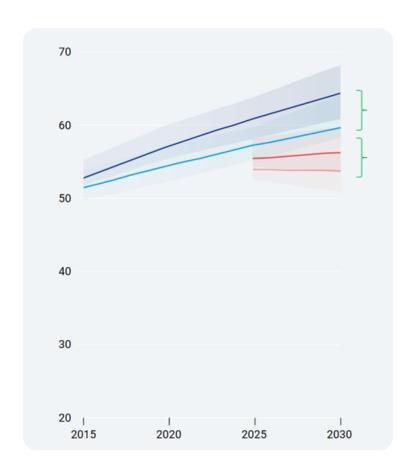




Embodied carbon = CO2e from manufacturing, transporting, installing, replacing and disposing of materials

#### Predicted global GHG emissions





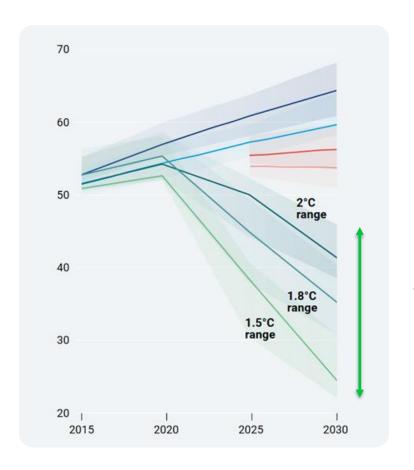
Already done climate actions

New agreed climate actions

- Current level 52 Gt CO2e per year
- With already agreed actions, emissions will rise to 55-60 Gt CO2e per year

#### Predicted global GHG emissions





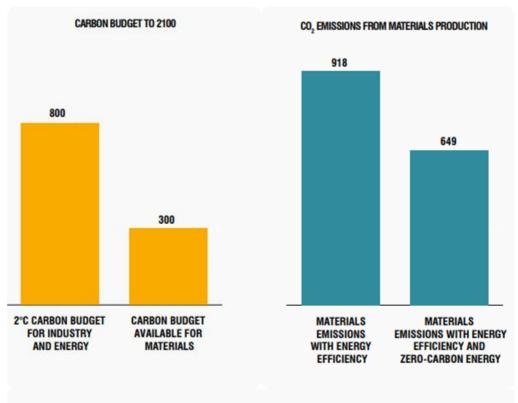
Reaching max 1.5 degrees warming will require approx. 35 Gt CO2e additional actions

## Emissions from material manufacturers alone risk exceeding the 2 degree scenario



#### 2 degrees aim:

Full carbon budget for industry and power generation and budget for 4 main materials (steel, plastics, concrete, aluminium)



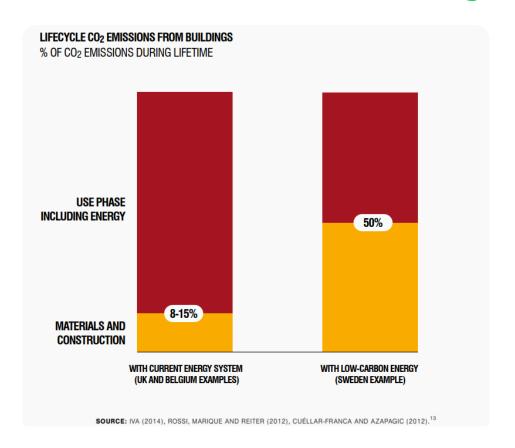
#### **Currently:**

Emissions of materials with reduction of energy emissions

SOURCE: MATERIAL ECONOMICS MODELLING AS DESCRIBED IN TEXT. MULTIPLE SOURCES, SEE ENDNOTES.9

## Materials will be the dominant source of CO2 emissions from buildings in the future





- Energy efficiency and cleaner production reduce the emissions from operational energy
- Material emissions already exceed emissions of operating energy within a 50-year time frame, for some countries

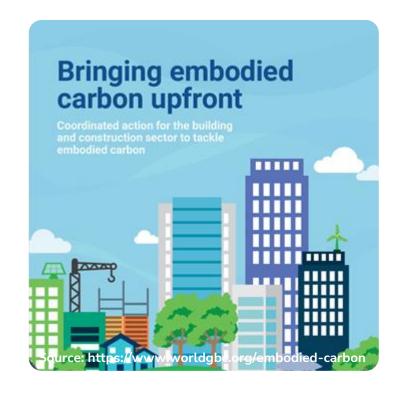
#### We need to cut embodied carbon now





All construction to create:

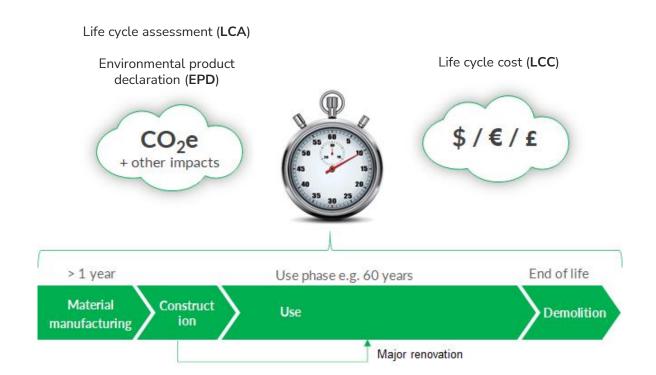
- at least 40 % less embodied carbon by 2030
- net zero embodied carbon by 2050



#### LCA gives the overall picture on impacts

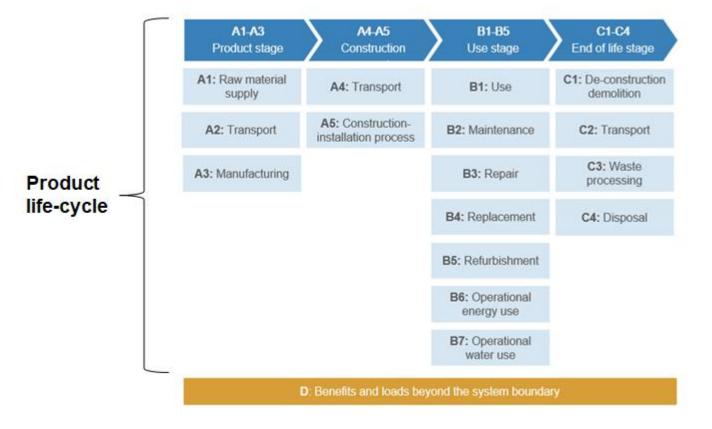


 Construction LCA standards use attributional approach, which assigns responsibility using allocation methodology



## LCA has a standardized, modular structure based on the CEN/TC 350 EN-Standards







- Building level:
   EN 15978 LCA standard for construction projects
- Building product level: EN 15804 (EPD data) and EN 15942 (EPD format)

#### What are EPDs?



• Externally verified and standardized description of the environmental profile of any product or material over its lifetime, based on standards









Standards:

ISO 14025 and EN 15804

#### EPDs are based on LCA calculations





#### **Characteristics of an EPD**



- Provide data on environmental performance, and are not a comparative claim
- Direct comparison of EPDs should only be done between very similar products
- Otherwise, compare products at the building level using LCA, considering:
  - Replacements during the building life-cycle
  - Demand for other products
  - o Life-cycle impacts due to maintenance, end of life processing, etc
  - Operational energy balance

#### **Characteristics of an EPD**



 Can represent one product and one plant, several products and several plants or several manufacturers





One product, one manufacturer, several plants. In case of one plant: PLANT-SPECIFIC EPD.



#### PRODUCT GROUP EPD

Average of (very) similar products.

One manufacturer. One or several plants.



#### **INDUSTRY-AVERAGE EPD**

One product, many manufacturers.

Requires developing a range of EPDs

#### **Characteristics of an EPD**



• Must be based on actual (historical) performance data, not forecasts

Usually valid for five years

- 3 main types of EPDs that cover different life-cycle stages:
  - Cradle-to-gate: harvesting of a material and manufacturing process
  - Cradle-to-grave: the whole life-cycle of a product
  - Cradle-to-gate with options: cradle-to-gate with additional information modules from cradle-to-grave

#### Life-cycle stages



All construction products and materials shall declare modules A1-A3, modules C1-C4 and module D.

Only products which fulfil all three of the conditions below shall be permitted to be exempt from this requirement:

- the product or material is physically integrated with other products during installation so they cannot be physically separated from them at end of life
- the product or material is no longer identifiable at end of life as a result of a physical or chemical transformation process
- the product or material does not contain biogenic carbon

#### Life-cycle stages



Depending on your PCR, there may be conditions where other modules are mandatory.

Example: RTS (Program Operator in Finland)

 A4 is mandatory if transport distance is over 1000 km or the GWP of the transport is over 20% of GWP of modules A1-A3

Note: The International EPD System does not have such condition for A4.

 A5 is mandatory if the atmospheric carbon dioxide uptake of packaging material is allocated to module A1

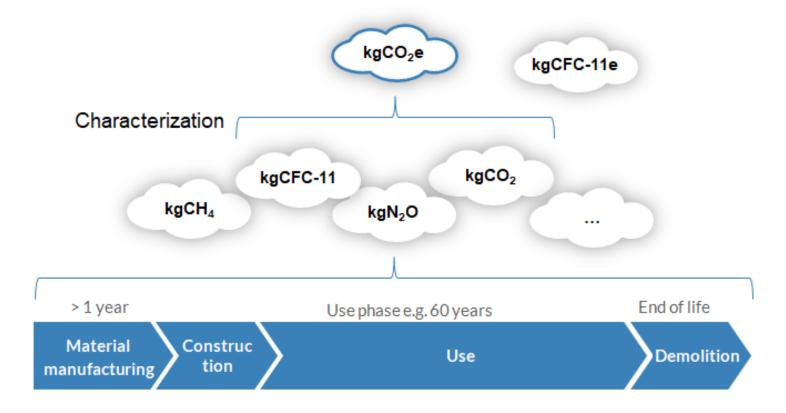
#### **Environmental impacts**



- Each indicator describes a particular category of environmental impacts.
  - Impacts are expressed as quantities of a matter that has the potential to cause such impacts – not the actual harm (final impact) eventually caused.
  - Example: Global warming potential represents the amount of CO2e gases released. But the final impact is the acceleration to the polar melt, for instance.
- Global Warming Potential describes how much a product contributes to climate change. When LCA concerns only this impact category, it's called the carbon footprint.

#### GWP results are represented as "equivalent One Click Chick impacts"





#### Other environmental impacts



- Acidification describes how much the product acidifies the environment, resulting in acid rain, for example.
- Eutrophication describes the flow of nutrients to ecosystems, resulting in algae growth, for example.
- Ozone Depletion describes damage caused to the Ozone Layer in the stratosphere.
- Tropospheric Ozone describes the quantity of summer smog causing gases emitted.
- Depletion of fossil resources describes how much fossil resources are withdrawn.

#### Why are EPDs useful?



- Objective: Based on internationally-accepted and valid methods for life cycle assessment (LCA)
- Credible & Neutral: Critically reviewed, approved, and maintained by an independent verifier and absent of claims of environmental preference
- Open: It has the widest range of applicability to all products and services, and easily accessible to all interested parties
- Environmental impact oriented: Through the possibility to include assessment of potential environmental impacts
- Instructive: Explains terms, definitions, and concepts, as well as general information on relevant environmental issues to help in the interpretation of the information

#### How are EPDs used in the market?





## Growing demand for low carbon construction







Stasbygg will work for a climateneutral property portfolio, deliver zero-emission buildings and contribute to reduced climate footprint for the state. (2016-20)

Group target of achieving net-zero carbon emissions by 2045, with a 50 percent reduction by 2030.





Cut emissions of own projects to half and enable carbon neutral use by 2030

CUT CARBON EMISSIONS ACROSS OUR VALUE CHAIN BY 50 % BY 2030





	Cities	Investors/Construction companies	Regulators
Target	Carbon Neutrality	Competitiveness, property value	State carbon neutrality
How	City planning / procurement	Low carbon design, certificates	Legislation

## Client expectations for choosing a construction product supplier



76%

of construction product clients

want suppliers to be transparent about environmental impacts of their products.

72%

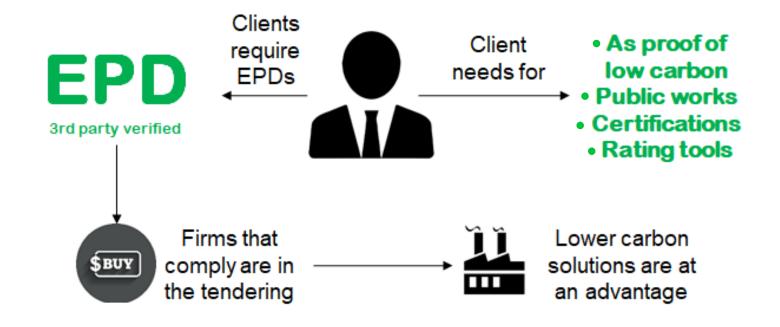
of construction product clients

want manufacturers to provide them with sustainable or green products.

Source: Saint-Gobain customer research

## Market for products is starting to require carbon transparency and performance





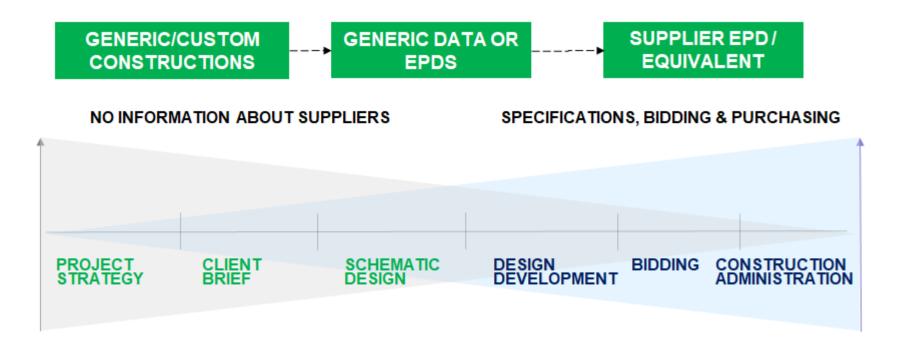
#### **Example: Buy Clean California Act**



- Jan 1st 2019, California started requesting EPDs
- Jan 1st 2020, California's AB 262, the "Buy Clean California Act" requires EPDs for certain materials being specified for state building projects
- Jan 1st 2021, a maximum acceptable global warming potential (GWP) established for four types of materials:
  - Carbon Steel Rebar
  - Structural Steel
  - Flat Glass
  - Mineral Wool Board Insulation
- First legislation in the U.S. that requires the use of EPDs, but other states are expected to follow

## EPDs typically used to make decisions or calculations in projects from design phase





#### EPDs are used for product comparison





Factor	Unit	Finland	Neighbouring countries	All
Products in area	product	61	74	886
80th percentile	kg CO2e/m3	80.0 - Use as benchmark	158.14 - Use as benchmark	85.0 - Use as benchmark
Average	kg CO2e/m3	53.018 - Use as benchmark	101.907 - Use as benchmark	59.56 - Use as benchmark
Median	kg CO2e/m3	38.0 - Use as benchmark	111.549 - Use as benchmark	32.183 - Use as benchmark

#### Marketing tool

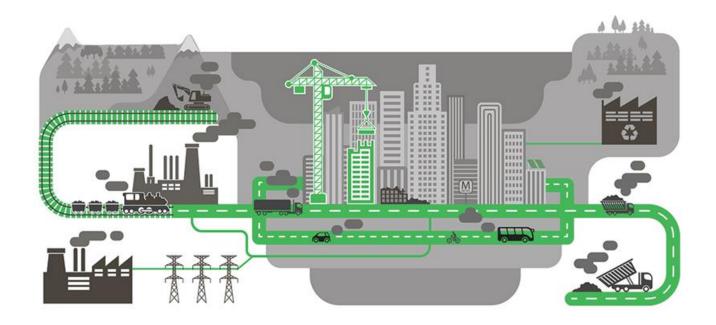


- EPDs can be used a Marketing tool, by enabling credible and verifiable environmental claims for your product.
- Creating EPDs will help you to differentiate your product, and can be the difference in winning (or not losing) business.
- By publishing an EPD, you are increasing the transparency of your product and processes, and thus increasing trustworthiness.
- And in many cases an EPD represents a commitment to fighting climate change.

#### Future product development



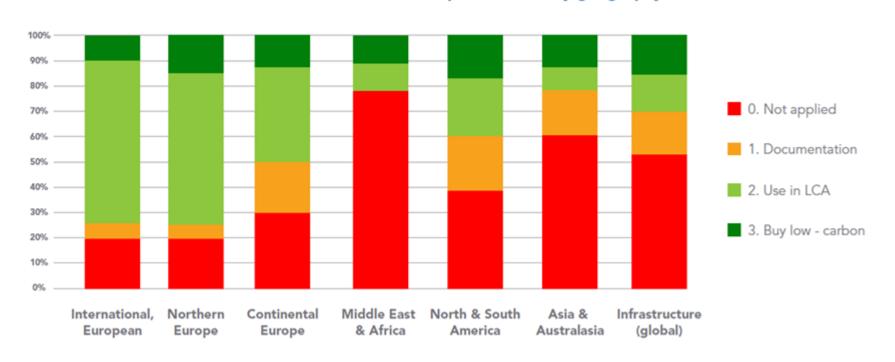
• EPDs also identify improvement opportunities in the Supply Chain, for example highlighting inefficiencies in the product manufacturing process.



## They are used in most green building systems globally



#### Relative share of different product EPD by geography



## How EPDs are used in commercial certifications?



 Schemes like LEED, BREEAM, DGNB, HQE, etc. give credits for specifying products with accompanying EPDs. This is easier and more cost-efficient when compared with achieving other credits' requirements.



# **LEED credits**



MRc1 Life-cycle impact reduction (up to 4 points + regional priority)

Credits awarded based on impact reduction, with particular focus on carbon. Minimum reduction is 5% from baseline building, maximum points need 20%.

MRc2 Environmental product declarations (2 points)

Part 1: use at least 20 permanently installed products from five manufacturers with an EPD. Points are weighted based on quality of the EPD.

Part 2: use at least 10 products from three manufacturers or specify for 10% of project materials cost from manufacturers with demonstrated impact reduction.

# LEED credits (cont'd)



Pilot credit: Procurement of Low Carbon Construction Materials (2 points)

Reduce embodied carbon intensity by 0-30% for 1 point, by 30%+ for 2 points.



LEE	O Scorecard		Gold	61/110
T N	MATERIAL & RESOUR	CES	2 OF 13	
Co	edit	Building life-cycle impact reduction	0/5	
E Cr	edit	Building product disclosure and optimization - environmental product d	0/2	
E Co	edit	Building product disclosure and optimization - sourcing of raw materia	0/2	
E Cr	edit	Building product disclosure and optimization - material ingredients	0/2	
Co	edit	Construction and demolition waste management	2/2	

# **BREEAM credits**



- Mat 01: Environmental product declarations (EPD), 1 credit + exemplary
  - 5 products with EPDs are specified and purchased
  - Exemplary level criteria: 10 products with EPDs are specified and purchased
  - However, no more than 2 EPDs per one material category are allowed for this credit
  - EPD certificates must be unexpired at the point of specification and be compliant with ISO 14025, ISO 21930 or EN 15804.

EPDs also contribute to the Mat 01 LCA credit. EPD credit varies in BREEAM-NOR.



# Certification compliance example



#### **LEED-CERTIFICATION**

Boston Valley utilizes recycled materials in its manufacturing process as part of its commitment to sustainability.

The below list of credits are those that may apply when using one of Boston Valley's products. The credits apply to the USGBC's LEED® Rating System v.3 for New Construction (LEED-NC) and LEED for Existing Buildings (LEED-EB). Please contact Boston Valley directly for specific LEED credit information as it relates to your project.

#### MRCredit 2.1, 2.2

#### Construction Waste Management Divert 50% & 75% from Landfill

INTENT: Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to the manufacturing process. Redirect reusable materials to appropriate sites.

REQUIREMENT: Recycle and/or salvage at least 50% or 75% of construction and demolition debris (by weight or volume). Boston Valley Terra Cotta will accept recovered terra cotta pieces from the project site to reuse in the manufacturing process. We will also receive back crates from the product shipment that are in good condition. These crates will be used to ship additional materials produced at our facility. Both the terra cotta product and the crates would need to be sent with the cooperation of the installation contractor.

#### MRCredit 4.1.4.2

#### Recycled Content

INTENT: Increase demand for building products that incorporate recycled content materials, therefore reducing impacts resulting from extraction and processing of new virgin materials.

REQUIREMENT: Use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10% or 20% of the total value of the materials in the project. Boston Valley Terra Cotta uses 12%–20% by weight recycled content in the manufacture of its terra cotta products.

#### MRCredit 5.1, 5.2

#### Regional Materials 10% Extracted, Processed & Manufactured Regionally

INTENT: Increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the regional economy and reducing the environmental impacts resulting from transportation.

REQUIREMENT: Use building products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for minimum of 10% of the total materials value (based on cost). If only a fraction of the product is extracted, harvested or recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value. Approximately 45% of the raw materials Boston Valley uses in the manufacture of our terra cotta products are harvested within 500 miles of our manufacturing facility in Orchard Park, NY.

#### EA Credit 1

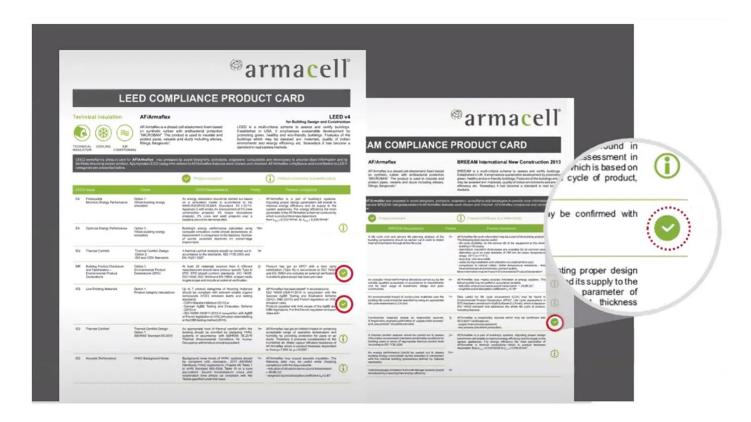
#### **Optimize Energy Performance**

INTENT: Achieve increasing levels of energy performance above the prerequisite standard to reduce environmental impacts associated with excessive energy use.

REQUIREMENT: Reduce design energy cost compared to the energy cost budget for energy systems regulated by ASHREA 90.1-2004 and Appendix G, as demonstrated by a whole building simulation using Energy Cost Budget Method described in Section 11 of the Standard. Boston Valley Terra Cotta's TerraClad® rain screen system incorporates a ventilated cavity and opportunity for insulation between the exterior terra cotta wall cladding and the structural wall system. This air space and insulation increase the thermal performance of the exterior wall system which positively effects the energy efficiency of the building envelope.

# Certification compliance example





"Green
Building
Compliance
Cards"

# Where are EPDs published?



# Environmental Product Declarations

Home » Environmental Product Declarations

An environmental product declaration (EPD) is a standardised and verified way of quantifying the environmental impacts of a product based on a consistent set of rules that

These impacts are based on the product's consumption of raw materials and energy, waste generation, and emissions to air, soil and water over its full life cycle. An EPD

# includes a carbon footprint alongside other environmental indicators.

How can you use EPDs in environmental ratings systems and tender documents? EPDs may be used by project teams to obtain Green Star points using the Design & As Built and Interiors rating tools under the following credits:

- маterials > Frocuse, напъравентсу апо завишнавшку, яз аптисизтучное ЕРО
   Materials > Life Cycle Assessment, By providing data for an EN 15978 compliant whole-of-building whole-of-life assessment. Materials > Life Cycle Assessment, by providing data for an EN 1997a compiliant whole-or-putting whole-or-rive assessment.

  Innovation Challenge > Responsible Carbon Impact, By providing embodied carbon impacts (i.e., data on Global Warming Potential) which can be used in the

The EPDs are also recognised for credits in the Infrastructure Sustainability (IS) rating scheme of the Infrastructure Sustainability Council of Australia (ISCA).

EPDs are also being required in increasing numbers of tender documents.

Updated EPDs for five Australian wood products and a new EPD for Glulam have been authored by thinkstep and Stephen Mitchell Associates. They are all independently Updated EPUs for the Australian wood products and a new EPU for Guiann have been authored by uninkstep and stephen Milchell Associates. They are all independently verified by Kimberley Robertson of Catalyst to ISO 14025 and EN 15804. The EPDs are registered by The Australasian EPD Programme Ltd which is part of the International

Note: to download documents please go to the base of this page. You must be a registered user to download documents – registration is fast and free.



# **Environmental Product Declaration: Softwood Timber**

This Environmental Product Declaration presents the industry-wide average performance of sawn timber from Australian grown softwood THE ENVIRONMENTAL PRODUCT DECISIONING PRESENTS THE INJUSTRY-WIDE WEIRIGE PERFORMANCE OF SAWIT LIMITER FOR AUSTRALIA DECISIONING THE INJUSTRY OF THE INJUSTRY O providing information on the raw materials, production and environmental impacts of Australian softwood.

#### Product groups included in this EPD:

- Rough-sawn, kiln-dried softwood

Data is presented for untreated and preservative treated softwood products. Please register and login (it's fast and free) to download this document from the base of this page.

# ENVIRONMENTAL PRODUCT DECLARATION

that communicates transparent and comparable information about the life-cycle environmental impact of products.



An EPD® is a certified Environmental Product Declaration, which reports environmental data over the life cycle of products We achieved the EPD® certification, which communicates our attention towards the life-cycle environmental impact of the products during their production.



Terramesh® Certification No. S-P-01468





Reno Mattress® Certification No. S-P-01466



MacMat Certification No. S-P-01469



MacDrain® M Certification No. S-P-01471

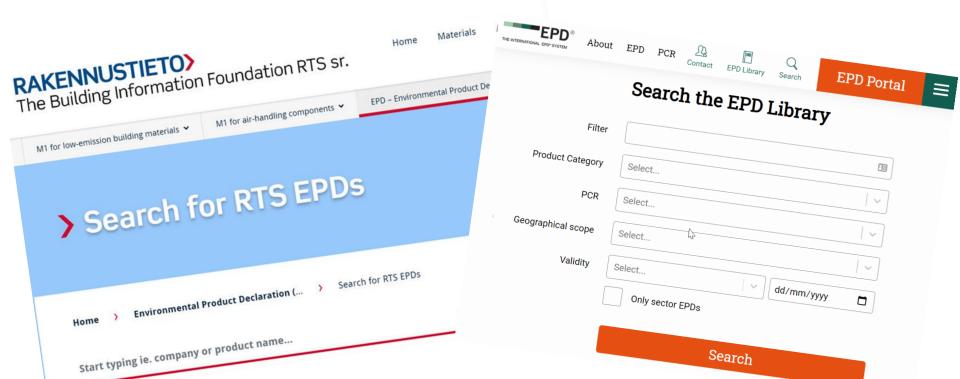
https://www.maccaferri.com/epd/

https://www.woodsolutions.com.au/articles/environmental-product-declarations

# Where are EPDs published?



- No central repository for EPDs published by each program operator
- Almost all EPDs in the world are in One Click LCA



# Where are EPDs published? (cont'd)



- ECO Platform association of European EPD program operators, eg. The International EPD System (Environdec), RTS
- Affiliated EPD Programs to ECO Platform members, eg. EPD Australasia
- Trade Association EPD Programme Operators, eg. Cembureau
- Manufacturing EPD Programme Operators, eg. Tata Steel or Stora Enso
- Other Programme Operators, eg. UL Environment
- EPD Programmes to ISO 21930 & ISO 14025, eg. CSA EPD or NRMCA

Many EPD programs provide digitised data for use within BIM and Building LCA tools, and some countries have produced national databases which provide generic data for products with and without EPDs.

# **Required documents**



1. Public EPD document

2. Private background report explains methodologies in detail, used in

verification





# What rules apply to the creation and acceptability of EPDs?



- EPDs governed by ISO 14025, and Product Category Rules are set out by EN 15804 which requires that EPDs are verified by a third party
- Program Operator oversees the EPD production, from identifying the applicable PCR to submitting the final EPD for certification and registration
- Product Category Rules PCRs develop the scope and methodology for the LCA data used in EPDs and ensure consistent data collection and analysis

# **Product Category Rules (PCR)**



Used to ensure that products with similar functions are assessed in the same way, using comparable measures.

Developed in accordance with ISO standards which require the formation of a consensus body backed by third-party validation.

Set out the key elements of how life-cycle assessments for a specific class of products needs to be done, including:

- declared/functional unit, including the service life for the product
- system boundary
- impact categories to be assessed

One Click LCA Pre-verified EPD Generator uses the respective Construction products PCR for both The International EPD System and RTS.

# EPDs allow using 95 % coverage and cutting of items <1 %



**BEST POSSIBLE DECISION?** 







# Klimatdeklaration



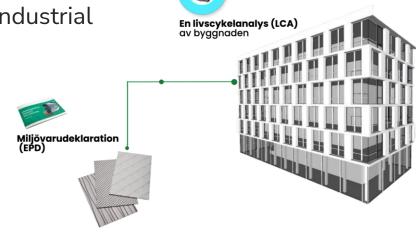


# Klimatdeklaration



#### Summary of Klimatdeklaration:

- 1 January 2022: The Act on Climate Declarations for Buildings (Klimatdeklaration vid uppförande av byggnad)
- Applies to new buildings that require a building permit, with some exceptions, e.g. industrial facilities and workshops
- 2027: Boverket proposal for climate emission limits for the construction phase of buildings



# Klimatdeklaration requirements



**Scope:** Climate impact during the construction phase

• A1-A5 for the building envelope, load-bearing structure and internal walls

Data: Both generic and specific

 Boverket's generic climate database or specific EPDs can be used in calculations

Responsibility: Client is responsible for submitting the climate declaration

Data saved in Boverket's register by the client for five years

# Klimatdeklaration consequences



## **Building Contractors/Developers:**

 Change planning of construction projects and procurement of building materials

### **Architects/Designers:**

Use data for design alternatives and optimization

#### Manufacturers:

- Adapt to changing requirements from builders for EPDs
- Increased competition

# Miljövarudeklaration (EPD)



#### Miljöpåverkan av byggprodukter är på väg att få större betydelse

Införandet av kravet på klimatdeklaration av byggnader från början av 2022 kommer ha konsekvenser för byggprodukttillverkarna. Kort sagt, lagen innebär att byggherren måste redovisa byggnadens klimatpåverkan. När en klimatdeklaration ska upprättas får klimatdata från Boverkets klimatdatabas eller specifika klimatdata (EPD:er) för byggprodukter användas. Att välja en tillverkare som tillhandahåller en EPD är oftast att föredra, eftersom EPD:er ofta har lägre CO2-värden än de generiska värdena i klimatdatabasen.

#### Vad är en Environmental Product Declaration?

För byggprodukttillverkare kan miljövarudeklaration (EPD) ge möjlighet att lätt kommunicera produkternas miljöprestanda för potentiella kunder eller inköpare och göra produkter mer synliga när efterfrågan på klimatdata ökar.

En Environmental Product Declaration eller på svenska miljövarudeklaration (EPD) är ett dokument som ger transparent och jämförbar information om produkters miljöpåverkan i ett livscykelperspektiv. EPD:er är tredjepartsgranskade och baseras på en livscykelanalys som är framtagen enligt de produktspecifika reglerna (PCR).



Skapa EPD:er på ett kostnadseffektivt och smidigt sätt

Att ta fram en EPD på "traditionellt sätt" kräver mycket resurser av företaget, tar tid och är kostsamt. One Click LCA erbjuder förverifierade EPD:er för att spara tid och kostnader och göra arbetet mindre komplext.

#### Publicera EPD:er i:



#### RAKENNUSTIETO)

THE INTERNATIONAL EPD\* SYSTEM

Med One Click LCA EPD-generator kan även de minsta tillverkarna skapa EPD:er på ett lätt och smidigt sätt, och ge information som inköpare och byggherrar efterfrågar. Tillverkare kan också jämföra sina produkter med andra motsvarande produkter.

#### Kampanjpris på onboarding för EPD generatorn

50% av priset på onboarding för EPD generatorn One Click LCA

Erbjudandet gäller alla företag som tecknar licens och deltar på seminariet om EPD:er för stålprodukter på Stålbyggnadsdagen 2021.

År ni intresserade av mer information? Hör av er på epd-sbi.se så berättar vi mer.

Skanna QR-koden och lär dig mer om EPD + läs vår EPD e-bok



<sup>\*</sup> Ordinarie kostnad för onboarding 10000kr

# Questions



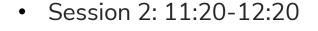


# **Agenda**

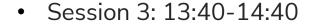


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- Introduction to EPDs
- Summary of Klimatdeklaration
- Q&A



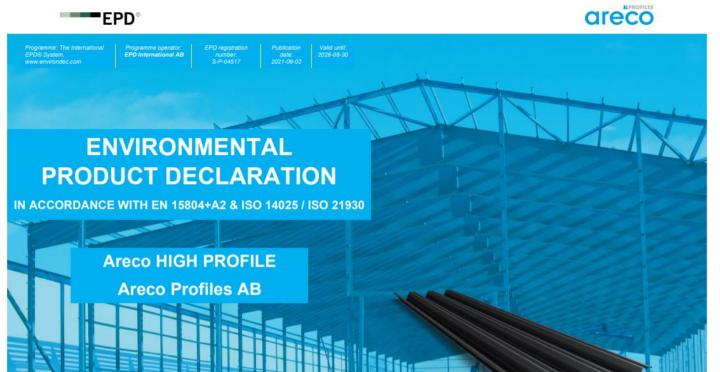
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# Example EPD – Areco High Profile







# **General Information**



#### **GENERAL INFORMATION**

#### MANUFACTURER INFORMATION

Manufacturer	Areco Profiles AB
Address	Vinkelgatan 13
Contact details	eva.strandberg@areco.se
Website	https://www.arecoprofiles.se/sv/

#### PRODUCT IDENTIFICATION

Product name	Areco High Profile
Additional label(s)	TP 131 and TP 200
Place(s) of production	Malmö, Sweden
CPC code	4219 - Other structures (except prefabricated buildings) and parts of structures, of iron, steel or aluminium; plates, rods, angles, shapes, sections, profiles, tubes and the like, prepared for use in structures, of iron, steel or aluminium; props and similar equipment for scaffolding, shuttering or pit propping.

#### **EPD INFORMATION**

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	EPD International AB
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the EPD International PCR 2019:2014 version 1.11 (2021-02-05) is used.
EPD author	Eva Strandberg, Areco Profiles AB
EPD verification	Independent verification of this EPD and data, according to ISO 14025:  ☐ Internal certification ☑ External verification
Verification date	31.8.2021
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD number	S-P-04517
Publishing date	2.9.2021
EPD valid until	30.8.2026

#### The International EPD System

EPDs within the same product category but from different programs may not be comparable.

## **Product Information**



#### PRODUCT INFORMATION

#### PRODUCT DESCRIPTION

Areco TP 131 and TP 200 are both strong profiles suitable for large spans in roof construction.

#### PRODUCT APPLICATION

Areco high profile is an important element in the roof construction. The profile is well suited for overlaying insulation and roof. The high profile is cantilevered up to 10 m. The profiles have a relatively low weight which makes assembly easy. Perforation with Pattern No. R3T6 is available when requested for noise reduction. The product is also available with pre-punched drainage holes.

#### **TECHNICAL SPECIFICATIONS**

Our technical department supplies calculations for both small and large projects and offer support throughout the building process.

#### **PRODUCT STANDARDS**

Areco Profiles has an approved FPC for EN 1090, EXC 3 and our products are CE-labelled.

#### PHYSICAL PROPERTIES OF THE PRODUCT

For a more detailed technical specification see our web site https://www.arecoprofiles.se/en/products/areco-high-profiles/

#### ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://www.arecoprofiles.se/sv/

#### PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post- cons umer %	Ren ewa ble %	Country Region of origin
Steel	0,97-0,99	20	-	Asia/Europe
Aluminium	0,007-0,016	-	-	Asia/Europe
Zinc	0,006-0,012	-	-	Asia/Europe
Silicon	0,0002-0,0004	-	-	Asia/Europe
Magnesium	0,0001-0,0004			Europe
Polyester	0,001-0,002			Europe

#### SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

# Product life-cycle



#### PRODUCT LIFE-CYCLE

#### **MANUFACTURING AND PACKAGING (A1-A3)**

The product is cold formed at our facility in Malmö. Production is powered and heated by electricity.

The product is packaged with wood bedding and plastic which is strapped in place.

#### TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

Average distance of transportation from production plant to building site is assumed as 600 km which is the distance from the production site to Stockholm, and the transportation method is assumed to be lorry. Vehicle capacity utilization volume factor is assumed to be 1 which means full load. In reality, it may vary but as role of transportation emissions in total results is small, the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by the transportation company to serve the needs of other clients. Transportation does not cause losses as products are packaged properly.

Density of the product is 7850 kg/m3, however bulk density varies depending on order size and thickness. Therefore, the average loss due to the nested products is assumed as 10%; accordingly, bulk density is calculated as an approximate 7000 kg/m3.

#### PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase. Air, soil and water impacts during the use phase have not been studied.

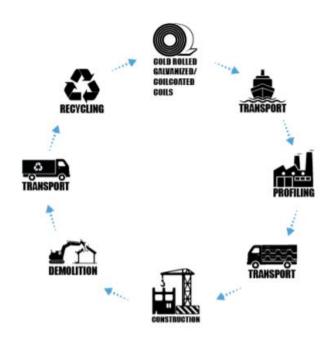
#### PRODUCT END OF LIFE (C1-C4, D)

Demolition is assumed to take 0,01 kWh/kg of product. It is assumed that 100% of the waste is collected (C1). Distance for transportation to treatment is assumed as 50 km and the transportation method is assumed to be lorry (C2). 95% of steel is assumed to be recycled based on World Steel Association, 2020 (C3). It is assumed that 5% of steel is taken to landfill for final disposal (C4). Due to the recycling process the end-of-life product is converted into a recycled steel (D).

# **Product life-cycle**



## **MANUFACTURING PROCESS**





# Life-cycle assessment



#### LIFE-CYCLE ASSESSMENT

#### LIFE-CYCLE ASSESSMENT INFORMATION

Period for Calendar year 2020 data

#### **DECLARED AND FUNCTIONAL UNIT**

Declared unit 1kg
Mass per declared unit 1kg

#### **BIOGENIC CARBON CONTENT**

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0,011

#### SYSTEM BOUNDARY

This EPD covers the *cradle to gate with options* scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included.

	roduc			embl tage			U	se sta	'	End ( sta	of life ige	Beyond the system boundarie s						
A1	A2	АЗ	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	СЗ	C4	D	D	D
х	х	х	х	x	MN D	MN D	MN D	MN D	MN D	MN D	MN D	x	x	x	x	x	x	x
Geo	grap	<b>hy</b> , b	y two-	-letter	ISO co	untry o	ode or	region	ıs.									
Asi a /EU	U	U	EU	EU	-	-	-	-	-	-	-	E U	E	E	E		EU	
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De constr./dem	Transport	Waste	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND.

#### **CUT-OFF CRITERIA**

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and EPD International PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. The alu-zinc coating contains 1,6% silicon constituting <0,001% of the final product and has therefore been excluded. All inputs and outputs of the unit processes which data are available for are included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass.

The life cycle analysis includes all industrial processes from raw material acquisition to production, distribution and end-of-life stages. There is no available data for alu-zinc-coating. Instead we have used data for zinc-coating and added the contribution from aluminium

# Allocations and assumptions



separately. The same is true for the A2-parts of magi-zinc and polyester coating where magnesium and polyester have been added separately. Packaging consists of PE film and wooden bedding strapped together with PET straps. PET straps have been excluded since they are considered negligible.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy and water use related to company management and sales activities are excluded.

#### **ALLOCATION, ESTIMATES AND ASSUMPTIONS**

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation. In this study, as per EN 15804, allocation is conducted in the following order;

- Allocation should be avoided.
- 2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
- Allocation should be based on economic values.

In the factory, several kinds of steel products are produced. The production processes of these products are similar, As it is impossible to collect raw material, ancillary material, energy consumption and waste production data separately for each product produced in the plant, data is allocated. Allocation is based on mass and calculated as the annual production percentage of either the

entire site (as for waste and internal transport) or for the specific building (as for energy) depending on the level of available data.

This LCA study is conducted in accordance with all methodological considerations, such as performance, system boundaries, data quality, allocation procedures, and decision rules to evaluate inputs and outputs. Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 - standard.

#### AVERAGES AND VARIABILITY

GWP-GHG varies with thickness of the material since thicker material has less corrosion protective metal (alu-zinc or magi-zinc) per kg product. The coil coated material also has a lower GWP-GHG, partly because it's sourced regionally and possibly because the A1-portion of the data there is specific rather than generic.

#### The International EPD System additional data requirements

Data specificity and GWP-GHG variability for GWP-GHG for A1-A3.

Supply-chain specific data for GWP- GHG	>85%
Variation in GWP-GHG between products	+17%, -9%
Variation in GWP-GHG between sites	<b>1</b>

# **Environmental impact data**



#### **ENVIRONMENTAL IMPACT DATA**

Note: ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930 are presented in annex.

#### CORE ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
GWP – total	kg CO2e	2,61E0	1,1E-1	-5,36E-2	2,66E0	1,04E-1	6,77E-2	MND	3,3E-3	4,55E-3	2,21E-2	2,64E-4	-1,09E0						
GWP – fossil	kg CO2e	2,6E0	1,1E-1	1,38E-2	2,72E0	1,05E-1	3,88E-3	MND	3,3E-3	4,54E-3	2,34E-2	2,63E-4	-1,1E0						
GWP - biogenic	kg CO2e	4,97E-3	-2,36E-5	-6,75E-2	-6,25E-2	4,06E-5	6,38E-2	MND	9,17E-7	3,3E-6	-1,34E-3	5,22E-7	8,04E-3						
GWP - LULUC	kg CO2e	2,65E-3	7,1E-5	7,6E-5	2,79E-3	3,95E-5	4,23E-7	MND	2,79E-7	1,37E-6	2,66E-5	7,82E-8	2,94E-5						
Ozone depletion pot.	kg CFC11e	1,69E-7	2,23E-8	3,18E-9	1,94E-7	2,27E-8	7,88E-10	MND	7,12E-10	1,07E-9	3,37E-9	1,08E-10	-3,14E-8						
Acidification potential	mol H+e	3,41E-2	3,24E-3	8,1E-5	3,74E-2	3,13E-4	3,94E-5	MND	3,45E-5	1,91E-5	2,84E-4	2,5E-6	-4,25E-3						
EP-freshwater <sup>2)</sup>	kg Pe	1.51E-4	5,35E~7	3,51E-7	1,52E-4	1,04E-6	1,99E~8	MND	1,33E-8	3,7E=8	1,62E-6	3,18E-9	~4,35E~5						
EP-marine	kg Ne	3,42E-3	7,99E-4	1,94E-5	4,24E-3	6,18E-5	1,74E-5	MND	1,52E-5	5,75E-6	6,27E-5	8,61E-7	-8,35E-4						
EP-terrestrial	mol Ne	1,21E-1	8,88E-3	2,06E-4	1,3E-1	6,89E-4	1,9E-4	MND	1,67E-4	6,35E-5	7,28E-4	9,48E-6	-8,83E-3						
POCP ("smog")	kg NMVOCe	1,2E-2	2,31E-3	6,3E-5	1,44E-2	2,58E~4	5,18E-5	MND	4,59E-5	2,04E-5	1,99€-4	2,75E-6	~5,72E~3						
ADP-minerals & metals	kg Sbe	1,66E-3	1,03E-6	9,27E-8	1,66E-3	2,8E-6	1,55E-8	MND	5,03E-9	7,75E-8	1,3E-6	2,41E-9	-1,08E-6						
ADP-fossil resources	MJ	2,97E1	1,43E0	3,31E-1	3,14E1	1,55E0	5,17E-2	MND	4,54E-2	7,07E-2	3,25E-1	7,36E-3	~8,16E0						
Water use <sup>1)</sup>	m3e depr.	1,5E0	3,18E-3	2,63E-3	1,5E0	6,02E-3	-1,87E-4	MND	8,46E-5	2,63E-4	4,61E-3	3,4E-4	-1,59E+1						

<sup>1)</sup> GWP = Global Warming Potential; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and lonizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e.

#### **USE OF NATURAL RESOURCES**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	2,06E0	1,09E-2	2,3E-1	2,3E0	1,76E-2	3,63€~4	MND	2,45E-4	8,9E-4	5,1E-2	5,96E-5	1,06E+1						
Renew. PER as material	MJ	9,78E-3	0E0	5,98E-1	6,08E-1	OEO	-5,98E-1	MND	0E0	0E0	0E0	0E0	0E0						
Total use of renew. PER	MJ	2,07E0	1,09E-2	8,28E-1	2,9E0	1,76E-2	-5,97E-1	MND	2,45E~4	8,9E~4	5,1E-2	5,956-5	1,06E-1						
Non-re. PER as energy	MJ	3,14E1	1,43E0	3,31E-1	3,32E1	1,55E0	5,17E-2	MND	4,54E-2	7,07E-2	3,25E-1	7,36E-3	-8,16E0						
Non-re. PER as material	MJ	4,3E-1	OEO	1,43E-4	4,3E-1	0E0	0E0	MND	0E0	OEO	0E0	0E0	OEO						
Total use of non-re. PER	MJ	3,1961	1,43E0	3,31E-1	3,36E1	1,55E0	5,17E-2	MND	4,54E-2	7,07E+2	3,25E-1	7,36E-3	-8,16E0						

# Use of Natural Resources and End of Life



| Secondary materials      | kg | 2,72E-1 | 0E0     | 1,32E-6 | 2,72E-1 | 0E0    | 0E0     | MND | 0E0     | 0E0     | 0E0     | 0E0     | 5,07E-1 |
|--------------------------|----|---------|---------|---------|---------|--------|---------|-----|-----|-----|-----|-----|-----|-----|---------|---------|---------|---------|---------|
| Renew. secondary fuels   | MJ | 5,69E-6 | 0E0     | 0E0     | 5,69E-6 | 0E0    | 0E0     | MND | 0E0     | 0E0     | 0E0     | 0E0     | 0E0     |
| Non-ren. secondary fuels | MJ | -4,5E-3 | 0E0     | 0E0     | -4,5E-3 | 0E0    | 0E0     | MND | 0E0     | 0E0     | 0E0     | 0E0     | 0E0     |
| Use of net fresh water   | m3 | 1,89€-2 | 1,47E-4 | 6,77E-5 | 1,91E-2 | 2,7E-4 | 1,09€-5 | MND | 4,01E-6 | 1,47E-6 | 1,33E-4 | 8,05E-6 | -7,2E-3 |

PER abbreviation stands for primary energy resources.

#### **END OF LIFE - WASTE**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	В6	B7	C1	C2	<b>C3</b>	C4	D
Hazardous waste	Kg	3,1E-1	1,64E-3	3,27E-4	3,12E-1	2,04E-3	1,88E-4	MND	4,88E-5	6,87E-5	0E0	6,87E-6	-1,3E-1						
Non-hazardous waste	Kg	3,36E0	3,03E-2	7,98E-3	3,4E0	1,14E-1	2,56E-2	MND	5,22E-4	7,6E-3	0E0	5E-2	-1,47E0						
Radioactive waste	Kg	4,01E~4	1E-5	2,91E-6	4,14E-4	1,02E-5	3,46E-7	MND	3,18E-7	4,86E+7	0E0	4,87E-8	4,68E-6						

#### **END OF LIFE - OUTPUT FLOWS**

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	В3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	Kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0						
Materials for recycling	Kg	4,56E-3	0E0	2,33E-5	4,58E-3	0E0	6E-6	MND	0E0	OEO	9,6E-1	0E0	0E0						
Materials for energy rec	Kg	9,06E-4	0E0	4,07E-6	9,1E-4	0E0	5E-2	MND	0E0	0E0	0E0	0E0	0E0						
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	0E0	0E0	0E0	0E0						

#### ENVIRONMENTAL IMPACTS - GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1	B2	В3	B4	B5	В6	B7	C1	C2	C3	C4	D
GWP-GHG	kg CO2e	2,6E0	1,1E-1	1,38E-2	2,72E0	1,06E-1	3,886~3	MND	3,3E-3	4,54E-3	2,34E-2	2,63E-4	-1,1E0						

This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013) This indicator is almost equal to the GWP indicator originally defined in EN 15804:2012+A1:2013.

# Scenario documentation and Bibliography



#### SCENARIO DOCUMENTATION

#### Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Electricity production,
	nuclear, pressure water
	reactor
Electricity CO2e / kWh	0.0113
Electricity data source and quality	Electricity production, oil
Electricity CO2e / kWh	0.83
Electricity data source and quality	Electricity production,
	hydro, reservoir, non-
	alpine region
Electricity CO2e / kWh	0.0487
District heating data source and quality	-
District heating CO2e / kWh	-

#### **BIBLIOGRAPHY**

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

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

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

Ecoinvent database v3.6 (2019) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

The CEN standard EN 15804+A2 serves as the core PCR. In addition, the EPD International PCR 2019:2014 version 1.11 (2021-02-05) is used.

EPD. General Programme Instructions of the international EPD® system. Version 4.0

Areco High Profile LCA background report 15.07.2021

#### ABOUT THE MANUFACTURER

Areco is a privately owned Swedish company founded in 1944 and today one of the leading players in the sheet metal industry. Areco's business activities are mainly aimed at the construction industry with a comprehensive range of building components in sheet metal for residential and commercial properties. We serve customers in 25 countries.

#### **EPD AUTHOR AND CONTRIBUTORS**

Manufacturer	Areco Profiles AB
EPD author	Eva Strandberg, Areco Profiles AB
EPD verifier	Silvia Vilčeková, Silcert, s.r.o.
EPD program operator	The International EPD System
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for Primary Steel and Aluminium and all Metal-Based Products

# **Verification statement**



#### VERIFICATION STATEMENT

#### **VERIFICATION PROCESS FOR THIS EPD**

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? Read more online.

#### VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier third-party verifier for EPD	Silvia Vilčeková, Silcert, s.r.o.
EPD verification started on	24.8.2021
EPD verification completed on	31.8.2021
Supply-chain specific data %	>85 % of A1-A3 GWP-GHG
Approver of the EPD verifier	The International EPD System

Author & tool verification	Answer
EPD author	Eva Strandberg, Areco Profiles AB
EPD author training completion	9.3.2021
EPD Generator module	Primary Steel and Aluminium and all Metal-Based Products

Independent software verifier	Ugo Pretato, Studio Fieschi & soci Srl.
Software verification date	11.5.2021

#### THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations.
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.



Silvia Vilčeková, Silcert, s.r.o.

# **Verification statement**



## **VERIFICATION AND REGISTRATION (ENVIRONDEC)**

ISO standard ISO 21930 and Category Rules (PCR)	CEN standard EN 15804 serves as the core Product
PCR	PCR 2019:14 Construction products, version 1.11
PCR review was conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	Independent verification of this EPD and data, according to ISO 14025:  ☐ Internal certification ☑ External verification
Third party verifier	Silvia Vilčeková, Silcert, s.r.o.
	Approved by: The International EPD® System Technical Committee, supported by the Secretariat
Procedure for follow-up during EPD validity involves third party verifier	□ yes ☑ no



EPD International AB, Box 210 60, SE-100 31 Stockholm, Sweden, E-mail: <a href="mailto:info@environdec.com">info@environdec.com</a>

# **Annex**



## ANNEX 1: ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	<b>B7</b>	C1	C2	C3	C4	D
Global Warming Pot.	kg CO2e	2,69E0	1,09E-1	1,37E-2	2,81E0	1,01E-1	3,84E-3	MND	3,27E-3	4,5E-3	2,31E-2	2,58E-4	-1,03E0						
Ozone depletion Pot.	kg CFC11e	7,69E-8	1,77E-8	3,09E-9	9,77E-8	1,76E-8	6,26E-10	MND	5,63E=10	8,49E-10	2,86E-9	8,59E-11	-2,55E-8						
Acidification	kg SO2e	1,5E-2	2,57E-3	6,23E-5	1,76E-2	2,33E-4	B,13E-6	MND	4,87E-6	9,25E-6	1,77E-4	1,04E-6	-3,28E-3						
Eutrophication	kg PO4 3e	4,18E-3	2,88E-4	1,22E-5	4,48E-3	5,09E+5	4,15E-6	MND	B,57E-7	1,87E-6	7,21E-5	2,02E-7	-1,82E-3						
POCP ("smog")	kg C2H4e	9,96E-4	6,81E-5	2,93E-6	1,07E-3	1,23E-5	5,88E-7	MND	5,01E-7	5,86E-7	8,28E-6	7,64E-8	-8,49E-4						
ADP-elements	kg Sbe	1,66E-3	1,03E-6	9,27E-8	1,66E-3	2,73E-6	1,55E-8	MND	5,03E-9	7,75E-8	1,3E-6	2,41E-9	-1,07E-6						
ADP-fossil	MJ	2,97E1	1,43E0	3,31E-1	3,14E1	1,51E0	5,17E-2	MND	4,54E-2	7,07E-2	3,25E-1	7,36E-3	-8E0						

# Additional language versions





# Raw materials and manufacturing data



# Raw materials and manufacturing data



During this section we'll outline some questions you need to ask to establish:

- the required information for starting raw material and manufacturing data collection and reporting
- what information needs to be gathered from your product-chain and how it needs to be examined to conduct life cycle assessment
- what material flows you need to account for
- how to include waste and energy use into your calculations

# **Production process**



- Are there multiple products being produced in the same facility?
  - Do they differ in their manufacturing processes?
  - o If different, is it possible to find different production lines?
- If production lines cannot be separated, allocation needs to be conducted based on:
  - o mass, or
  - o price

### Raw materials



- What are your raw materials, including packaging and ancillary materials?
- Are there several suppliers of raw materials?
  - In what proportions do the materials from different suppliers come?
  - o Where are the supplier locations?
- Is there recycled content?
  - How much of the product's raw materials are incorporated from recycled material(s)?

## **Energy use**



- What kind of electricity is used average or renewable?
- What kind of heating is used district, electric, heat pump?
- Is there any of your own heat production?
  - o If so, what kind?
- What direct fuel use do you have from vehicles, equipment, etc.?
  - For example, excavators, drill rigs, dump trucks

## Waste production and management



- What kind of waste is produced?
  - Only waste related to the production process
- How is waste managed?
  - Recycled
  - Incinerated
  - Landfilled
  - o Re-used

# Raw materials and manufacturing calculation



In summary, key information needs to be collected on the following topics:

- Production process
- Raw materials
- Energy use
- Waste production and management

As you gather this data, it can be input to the data collection form, and in One Click LCA software.

# Data collection form





## Data collection form



In this section we'll introduce:

- how to fill in the data collection form
  - what information is needed
  - where it needs to be reported
  - in what form it needs to be reported

## Questionnaire



Representativeness

2020

Reference year	2020
Reference year	2019

Declared unit	
Declared unit	
Mass of declared unit (kg)	

**INPUT RAW MATERIAL** 

PRODUCTION	UNITS	2019	2020	Representativeness
	ton			
	ton			
	ton			

UNITS

2019

Function

	steel	reinforcement	ton		
			ton		
			ton		
			ton		
Paw materials			ton		
Kaw Illaterials			ton		
[			ton		
1			ton		
[			ton		
			ton		
	S				
Ancillary (materials used in			ton		
into the product e.g. expended			ton		
tools and support structures)			ton		
			ton		
	Raw materials  Raw materials  Control  Control	ton			
Packaging (plastic wrapping, pallets			ton		
etc.)			ton		
			ton		

## Questionnaire



Energy consumption	Source	Function	Unit	2019	2020	Representativeness
Electricity	please specify provider	e.g. mixing, pumping, facility (lighting)	kWh			
Heat	please specify provider (also specify if district heat or own production)	e.g. heating the plant (production, warehouse etc.)	kWh			
Natural gas		burning in industrial furnace	kWh			
Diesel		fueling machinery (forklifts etc.)				
LPG						
other ( please specify)						

WASTE	HAZARDOUS	DESTINATION	Source	UNITS	2019	2020	Representativeness
Paper and cartonbox	Non-Hazardous	Recovery	e.g. packaging of the raw mateials used in production	tons			
Sludges	Non-Hazardous	Disposal	production processes	tons			
Iron	Non-Hazardous	Recovery	raw materials (production loss)	tons			
Wood	Non-Hazardous	Recovery		tons			
Exhausted Liquids	Non-Hazardous	Recovery		tons			

			TRANSPORT INFORMATI	ON				
			1st leg		2nd leg	3rd leg		
Input material	Quantity transported	distance	modality	distance	modality	distance	modality	
		[km]	e.g. ROAD	[km]	e.g. RAIL	[km]	e.g. SEA	
steel	-		Road					
0	-		Road					
0	-		Road					
0	-		Road					
0	-		Road					
0	-		Road					
0	-		Road					

# Life-cycle scenarios





## Life-cycle scenarios



In this section we'll cover:

- what kind of life-cycle scenarios you can use
  - A4: Transportation to the construction site
  - A5: Installation
  - o B1-B7: Operation
  - o C1-C4: End-of-life
  - D: Environmental benefits
- how they need to be implemented in the calculations
- how they need to be reported

## A4: Transportation to the construction site



- An estimate of typical transport distances for the product to the place of use needs to be made
- Alternatively, a common or high place of consumption can be used as an estimate (a capital city for example)

Destination	Distribution (Export) Rate [%]	Distance [km]
Destination#1	23%	100
Destination#2	19%	80
Destination#3	7%	120
Destination#4	17%	50
Destination#5	9%	120
Destination#6	10%	230
Destination#7	15%	420
Average distance [km]		152

## **A5: Installation**



- What is the material and energy expenditure in installation?
- A rough estimate based on experience or an industry average can be used for installation in:
  - Use of materials
  - Energy consumption
  - o Waste

## **B1-B7: Operation**



- If the operation phase is included in the scope of the study, then the service life of the product needs to be established. This service life needs to be referenced.
  - An example reference would be the Finnish building information group (RTS), that publishes an information document that gives service lives for construction materials
- Energy consumption can be established using an energy efficiency rating or a similar document for a similar product
- Consumption of materials can be established by the need for maintenance or repairs declared by the manufacturer of a similar product

## C1-C4: End-of-life



- A rough estimate based on experience or an industry average can be used for end-of-life in:
  - Demolition/disassembly phase
  - Transportation distance
  - Treatment method

## D: Environmental benefits



- What are the additional recycling processes done to make the recycled material available as a secondary raw material?
- What is the material and/or energy production that is avoided by the recycled materials after end of waste?
- Environmental benefits after service life and end-of-life processes need to be based on well-established information or documented common industry practices
  - For example, the amounts of waste product going to recycling or re-use and the environmental benefits gained need to be well supported

## Life-cycle scenarios



### Summary:

- the life-cycle scenarios you use is up to you
- it is important to follow the Product Category Rules
- you can use real data, estimates, industry averages, or other documented information

# Questions





## **Agenda**



•	Ses	ssion	1:	09:	00	-1	0:3	5
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- About One Click LCA
- Introduction to EPDs
- Summary of Klimatdeklaration
- Q&A

• Session 2: 11:20-12:20

- SBI Member example EPD
- Raw materials and manufacturing data
- Life-cycle scenarios
- Q&A

Session 3: 13:40-14:40

- EPD creation process
- EPD Onboarding with One Click LCA
- Software introduction
- Q&A

# **EPD Creation**





### How to create an EPD





## 6 steg för att skapa en EPD



#### Skapa din EPD-strategi

Vilken typ av EPD:er vill du skapa? Granska ditt produktsortiment för att se om det finns potential att gruppera mer än en produkt tillsammans och utforska vilka EPD:er som redan finns inom din produktkategori?

### Datainsamling

Nästa steg är att samla in produktens livscykeldata, vilket vanligtvis omfattar materialutvinning, tillverkning, transport och uttjänta produkter.

### Livscykelanalys

Livscykelanalys (LCA) är grunden för alla EPD:er. I en livscykelanalys ingår olika miljönyckeltal och systemanalyser i ett antal emissioner till, luft, vatten och mark.

### Bakgrundsrapport

En bakgrundsrapport ska beskriva detaljer om den LCA-metod som du har använt, dina antaganden och det tillvägagångssätt som du har använt för tredjepartsverifiering.

### Verifiering

Varje EPD måste verifieras av en oberoende tredje part innan den kan publiceras. Detta säkerställer noggrannhet, tillförlitlighet och att EPD:en uppfyller kraven i relevanta PCR:er.

### Publicering

När din EPD har verifierats av en oberoende tredje part är den redo för publicering.



## Key parameters for your EPD creation



There are four key parameters to consider:

- 1. Define the goal and scope of the assessment in accordance with the PCR
- 2. Collect and analyse the data
- 3. Assess/calculate the impacts
- 4. Use the assessment results to develop your EPD

## Important decisions



- 1. Choosing PCR and publishing method
- 2. Which product(s) the EPD is calculated for
- 3. Declared unit
- 4. Choosing life cycle stages
- 5. Scenarios for Installation and EOL
- 6. Which background information to use for the EPD, and allocations

# Onboarding





## **Onboarding agenda**



- 1. Introduction to EPDs (covered today)
- 2. Data collection and life-cycle scenarios (covered today)
- 3. Software introduction (covered today)
- 4. BG Report Documentation & Key LCA Concepts Tutorial video (1 hour)
- 5. EPD Project kick-off and Software session Workshop (2 hours)
- 6. Data collection/early project review Workshop (1 hour)
- 7. Mid project review Workshop (1 hour)
- 8. Final project review Workshop (1 hour)
- 9. Complete LCA Model Review and feedback (Offline)
- 10. Sales/Marketing training Workshop/Tutorial video (1 hour)

## Onboarding timeline example



- W1: Intro to EPDs, Data collection and Software
- W2: BG report and Key LCA concepts tutorial videos
- W3: EPD Project kick-off and Software workshop
- W6: Data collection/early project workshop
- W8: Mid project workshop
- W10: Final project workshop
- W12: Complete LCA Model review and feedback
- W13: First EPD sent for checking, verification and publication
- Anytime: Sales/Marketing Team training, Ad hoc questions to Support

# Software Introduction





# World's leading construction LCA, EPD software





**100+ COUNTRIES** 

**40+ CERTIFICATIONS** 

**100 000+ DATASETS** 

**15+ INTEGRATIONS** 

**60+ INHOUSE STAFF** 

**10+ YEARS AAA-RATED** 



## How we decarbonize the global construction



### **SOFTWARE**



**BUILDING DESIGN**& CONSTRUCTION



INFRASTRUCTURE & CITY PLANNING

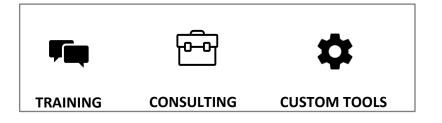


PRODUCT MANUFACTURERS



GHG REPORTING FOR COMPANIES

### **SERVICES**



### **POLICY**







# Ready to go sectoral tools for most construction product types and more coming





#### Cementitious Products

Ready-mix concrete, precast concrete, concrete products and cementious mortars and screeds. See certificate



#### Metal-Based Products

Primary steel and aluminium and all metalbased products. See certificate



#### Wood & Plant Fiber based Products

Wood, wood-based boards and elements, including composites. See certificate



#### Asphalt, Aggregates & Stone products

Asphalt, aggregates and soils and natural stone products. See certificate



#### Bitumen membranes

Bitumen membranes and roofing products. See certificate



#### Paints, Coatings, Sealants and Adhesives

Paints, coatings, sealants and adhesives. See certificate



### Plumbing Products

Plumbing products, equipment, components and systems. See certificate



#### Plastic-based Products and Systems

Plastic-based products and systems. See certificate



#### Ceramic and Claybased Products

Ceramic and clay based products. See certificate



#### Gypsum, Limestone and Porcelainbased Products

Gypsum, limestone and porcelain based products.

See certificate

New product categories are being constantly added and we can create them on request!

# We arrange training and EPD verification & publishing for our EPD Generator customers



### **ONBOARDING**

We provide a comprehensive training



### **EPD REVIEW**

One Click LCA reviews EPD before the 3<sup>rd</sup> party



### **VERIFICATION**

We arrange for the third party verification



### **PUBLISHING**

We arrange for the EPD publishing for you



## Standardize documentation, vary and repeat



## START FROM A TEMPLATE

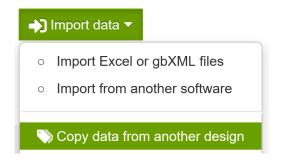
## LEVERAGE AUTOMATION

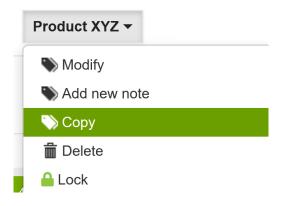
**COPY AND VARY** 

Verified entities - 18 results

My entities - 176 results

My colleague entities - 34 results

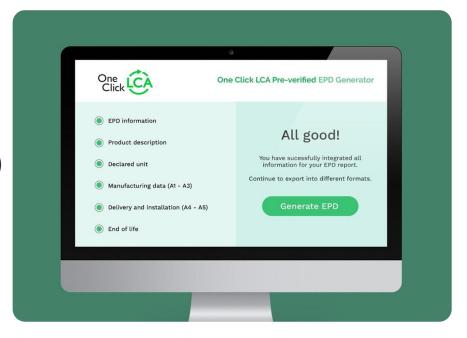




## Using the software



- Product description
- Declared unit
- Materials (A1-A3)
- Manufacturing (A3)
- Construction (A4-A5)
- Use stage, whole life-cycle (B1-B7)
- End of life (C-D)
- EPD description
- Background report
- EPD generation
- Results



# Highly automated, template-based EPD generator



The software is based on product category templates. When a new manufacturer comes on board, the sectoral template is adapted for the manufacturer to be the basis of all future EPDs and is documented. This process is also called EPD process certification.

LIFE-CYCLE ASSESSMENT processing) and C4 (Disposal). In addition, module D - benefits and loads beyond the system boundary is included LIFE-CYCLE ASSESSMENT INFORMATION Period for data DECLARED AND FUNCTIONAL UNIT Modules not declared = MND Modules not relevant = MNRDeclared unit Mass per declared unit **CUT-OFF CRITERIA** Functional unit And here is all the detail that we put in this report using . BIOGENIC CARBON CONTENT ALLOCATION, ESTIMATES AND ASSUMPTIONS Product's biogenic carbon content at the factory gate And here is all the detail that we put in this report using. Biogenic carbon content in product, kg C AVERAGES AND VARIABILITY Biogenic carbon content in packaging, kg C And here is all the detail that we put in this report using. SYSTEM BOUNDARY This EPD covers cradle to gate with options scope with following modules; A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Transport), A5 (Assembly) as well as C1

(Deconstruction). C2 (Transport at end-of-life). C3 (Waste

EPD program logo here

#### **ENVIRONMENTAL IMPACT DATA**

#### **ENVIRONMENTAL IMPACTS - EN 15804+A1, CML**

Impact category	Unit	A1	A2	А3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Global warming potential	kg CO2e							MND					
Depletion of stratospheric ozone	kg CFC11e							MND					
Photochemical ozone formation	kg C2H4e							MND					
Acidification	kg SO2e							MND					
Eutrophication	kg PO4 3e							MND					
Abiotic depletion of non-fossil res.	kg She.							MND					
Abiotic depletion of fossil resources	MJ							MND					
									MND at	breviation	stands for	Module N	ot Declar

#### CORE ENVIRONMENTAL IMPACT INDICATORS - EN 15804+A2. PEP

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
Climate change – total	kg CO2e							MND					_
Climate change – fossil	kg CO2e							MND					
Climate change – biogenic	kg CO2e							MND					
Climate change - LULUC	kg CO2e							MND					
Ozone depletion	kg CFC11e							MND					
Acidification	mol Hae							MND					
Eutrophication, aquatic freshwater	kg PO4e							MND					
Eutrophication, aquatic marine	kg Ne							MND					
Eutrophication, terrestrial	mol Ne							MND					_
Photochemical ozone formation	kg NMXQQq							MND					
Abiotic depletion, minerals & metals	kg Sbe							MND					
Abiotic depletion of fossil resources	MJ							MND					
Water use	m3e depr.							MND					

Client logo

# Questions





## Free eBook



NY E-BOK

Hur man kan skapa en

# Environmental Product Declaration

Hur kan företag dra nytta av EPD:er?

En guide för byggprodukttillverkare

LÄS E-BOK NU



# Thank you



One Click LCA