

InLCA/LCM conference 2006

Washington, October 5th, 2006

How to provide LCA information of building materials in an efficient way

Marc Binder

www.pe-americas.com

Content

- 1. Introduction**
2. Integration into companies information management
3. Interface to EPD
4. Conclusions

Introduction

- ▶ **Myths: Life cycle analyses are ‘complicated’**
 - there are many stakeholders involved
 - LCAs are data intensive and time-consuming
 - their realisation is complex and expensive
 - the analysis is not simple due to multi-criteria decisions
- ▶ **Truth: Life cycle analyses are ‘feasible’**
 - LCAs are accepted, integrated, powerful and efficient
 - simple and not so time-consuming, depending on the problem in hand
 - principally extensive and systematic
- ▶ **Critical success factors:**
 - the right question and objective, capacity and tools...

Introduction

Requirements for efficient modelling

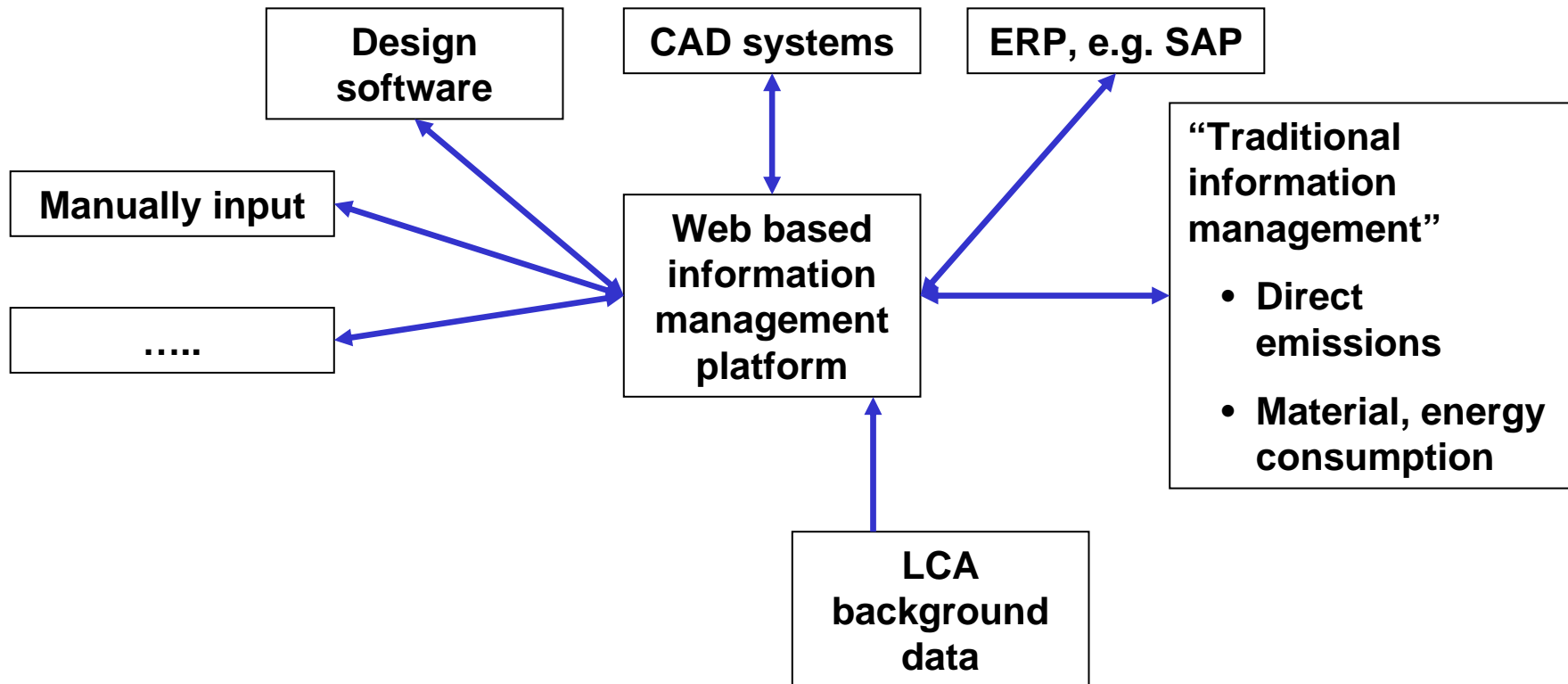
Model should be parameterized

- to be easily adjusted to changing boundary conditions
- to perform sensitivity analysis
- to be intergrated into internal documentation system (defined interface)

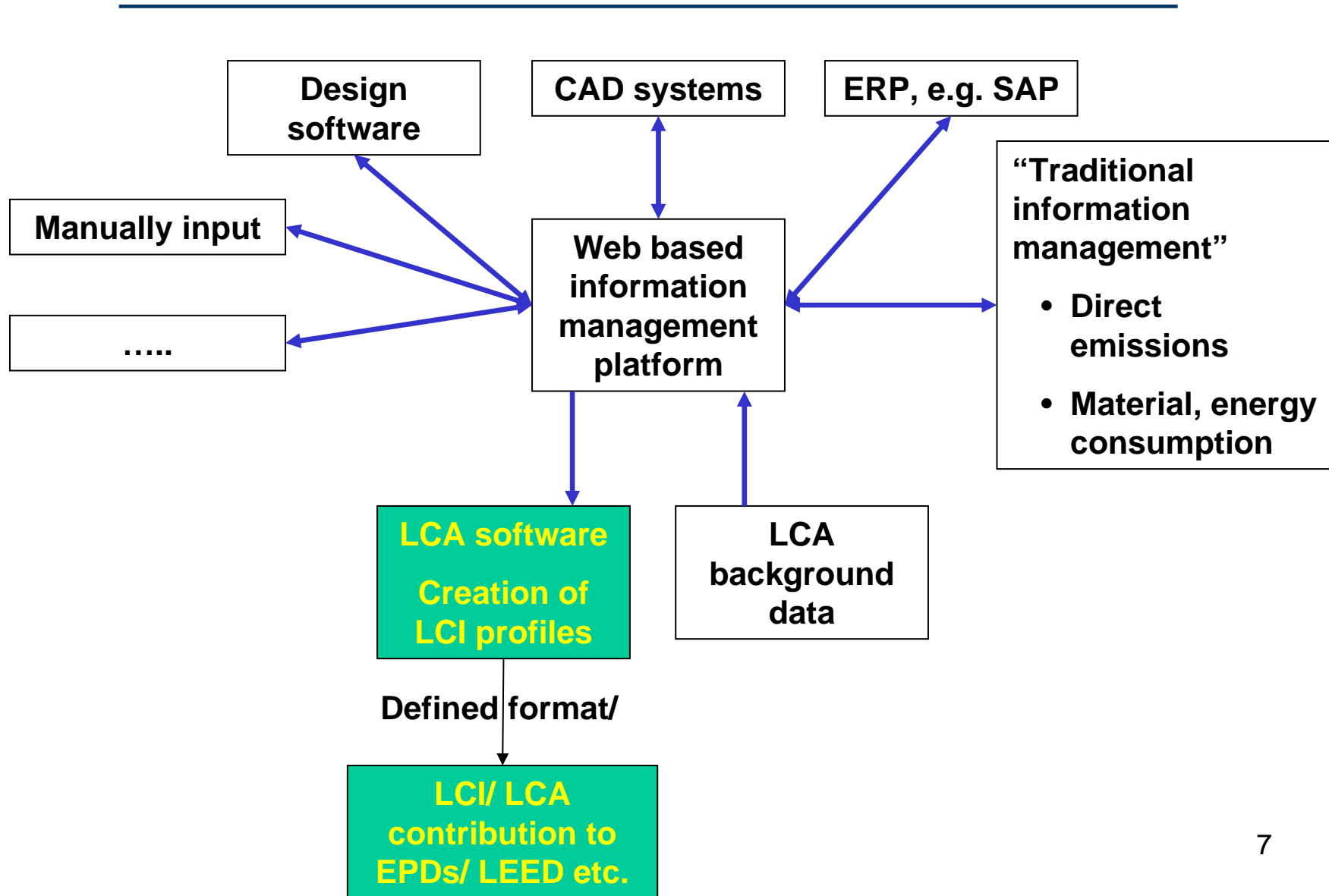
Content

1. Introduction
- 2. Integration into companies information management**
3. Interface to EPD
4. Conclusions

Integration of LCA into EMS



Integration into companies information management



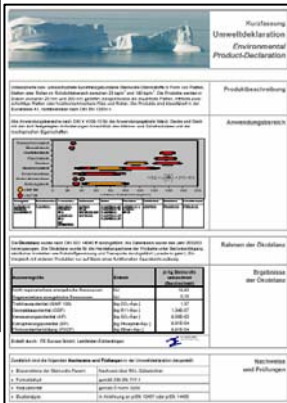
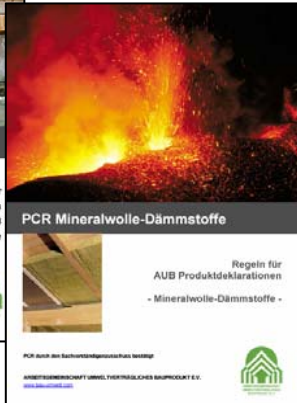
LCI model:

- Parameterized model is basis for
 - Status of environmental footprint of building material adjustable to changing process parameter
 - Internal comparison for future developments
 - Determination of influence of upstream materials/ energy on environmental footprint
 - Creation of LCI profiles of building materials as input to EPDs/ LEED or providing information to downstream customers

Content

1. Introduction
2. Integration into companies information management
- 3. EPD**
4. Conclusions

EPD



Documents with requirements :

- General guideline (program)
- Product Category Rules

Documents for the EPD:

- EPD short form (2 pages)
- EPD full document
- LCA background report (non-public; -> for verifier)

EPD



Summary

**Environmental
Product Declaration**



Summary

**Environmental
Product Declaration**

**ARBEITSGEMEINSCHAFT
UMWELTVERTRÄGLICHES
BAUPRODUKT E.V.**

www.bau-umwelt.com



Program holder

RHEINZINK GmbH & Co. KG
Bahnhofstraße 9D
45711 Datteln
Germany



Declaration holder

AUB-RHE-11105-E

Declaration number

RHEINZINK[®] – Titanium Zinc

Declared
building products

This declaration is an Environmental Product Declaration according to ISO 14025 and describes the environmental performance of the above mentioned building products.

All relevant environmental data are disclosed in this validated declaration.

This validated declaration authorizes the holder to bear the official stamp of the AUB. It only applies to the above mentioned products for three years from date of issue. The declaration holder is liable for the information and evidence on which the declaration is based.

Validity

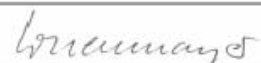
The declaration contains in detail:

Content of the declaration

- Product definition and physical data
- Information about raw materials and origin
- Specifications on manufacturing the product
- References for product processing
- Information on product use, singular effects and end of life
- LCA results
- Evidence and verifications

20th December 2005

Date of issue



Signatures

Prof. Dr.-Ing. Hans-J. Bosenmayer (Chairman of the AUB)

This declaration, and the rules which it is based on, have been verified by the Independent Advisory Board (SWA) according to ISO 14025.

Verification of the
declaration




Signatures

Prof. Dr.-Ing. Hans-Joachim Reinhardt (Chairman of the SWA)

Dr. Bär Schmincke (Member appointed by the SWA)

The material RHEINZINK[®] – Titanium Zinc is an alloy based on zinc with additives of copper, titanium and aluminium. All RHEINZINK[®] products are made of this alloy. The declaration applies to all three qualities of finishing: RHEINZINK[®]-bright coated and RHEINZINK[®]-preweathered "P" (black-grey) and RHEINZINK[®]-preweathered "PP" (graphite-grey).

Product description

The titanium zinc sheets are produced in different thicknesses. These vary according to the type of titanium zinc sheet from 0.7 mm (5 kg/m²) to 2.0 mm (14.4 kg/m²). The modulus of elasticity of zinc is 7.2 GPa.

Titanium zinc sheets are used for roofings and wall claddings as well as for roof drainage systems (roof gutters, pipes and equipment).

Applications

For roof drainage, the titanium zinc sheets are processed into roof gutters, down pipes, fascia boards, small parts or construction sheets.

A reduction of the wetted surface relating to the material is achieved for the roof drainage by using corrugated sheeting, gutters and pipes and also by overlapping with a putting together and joining with brazing as well as by mounting under a roof overhang.

For roofing applications, the wetted surface is reduced by using rebated joints, splay, cones, clippings etc. depending on the method of installation. A reduction of the wetted surface can be achieved for wall claddings through vertical assembly (roof overhang, or station and shadowing effects e.g. through facade at housing or trees).

The Life Cycle Assessment (LCA) was carried out according to DIN ISO 14040 and eqq. Specific data from the company RHEINZINK in Datteln, Germany, statistical data from the Wirtschaftswissenschaftliche Metallurgie as well as the data base "Gabi 4" were used. The LCA was carried out for the manufacturing phase of the products, taking into account all background data such as raw material exploitation and transport (cradle to gate).

Scope of the LCA

The use phase of the titanium zinc sheets is divided into several application areas: roofing applications, roof drainage and wall claddings. The treatment for the titanium zinc sheets was modelled in the lightboxes for the end of life phase. The thereby resulting credit for extracted zinc is counted as a replacement for primary zinc.

Results of the LCA

Titanium zinc sheet				
Parameter	Unit per kg	Sum of production and recycling potential	Production	Recycling potential
Primary energy, non-renewable	[MJ]	16.3	45.5	-29.2
Primary energy, renewable	[MJ]	0.9	3.8	-2.9
Global Warming Potential (GWP)	[kg CO ₂ eq]	0.96	2.62	-1.65
Ozone Depletion Potential (ODP)	[kg R11 eq]	0.18 * 10 ⁻⁶	0.96 * 10 ⁻⁶	-0.39 * 10 ⁻⁶
Acidification Potential (AP)	[kg SO ₂ eq]	3.32 * 10 ⁻²	13.5 * 10 ⁻²	-10.2 * 10 ⁻²
Eutrophication Potential (EP)	[kg PO ₄ eq]	0.28 * 10 ⁻²	1.03 * 10 ⁻²	-0.76 * 10 ⁻²
Potential Ozone Creation	[kg ethane eq]	0.28 * 10 ⁻²	1.10 * 10 ⁻²	-0.80 * 10 ⁻²

Issued by PE Europe GmbH, Leinfelden-Echterdingen, Germany



The following evidence and verifications are also described in the Environmental Product Declaration:

Evidence
and verifications

- Atmospheric corrosion and surface loss (g loss), measured as the rates of corrosion and the erosion of zinc loss due to precipitation over a 10 year period (1991 – 1998)

Content

1. Introduction
2. Integration into companies information management
3. EPD
4. **Conclusions**

Conclusions

Lessons learned

1. Defined format of EPDs enables companies to set up standardized procedure for providing information input
2. Generic parameterized model of production and interface to internal documentation system increases efficiency of providing environmental information
3. Defined format of communication of information supports the acceptance of Life Cycle related information by the community

Thank you for your attention!

For further information:

m.binder@pe-americas.com

www.pe-americas.com

EPD: <http://www.bau-umwelt.com/index.php?id=136&L=1>

