EPD Global principles and European application

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Agenda

- ISO 14025:2006 EPD principles and procedures
- TC 350/WG3 EPD building products
- Future product information needs in a SCP and IPP context

Type III environmental declarations

- present **quantified environmental information** on the life cycle of a product
- to **enable comparisons** between products fulfilling the same function.
- are provided by one or more **organizations**,
- are based on **independently verified**
  - life cycle assessment **(LCA) data**,
  - life cycle inventory analysis **(LCI) data** or
  - **information modules**
- in accordance with
  - **the ISO 14040 series of standards** and, where relevant,
  - **additional environmental information,**
- are developed using **predetermined parameters identified in the Product Category Rule (PCR**, and
- are subject to the administration of a **programme operator**

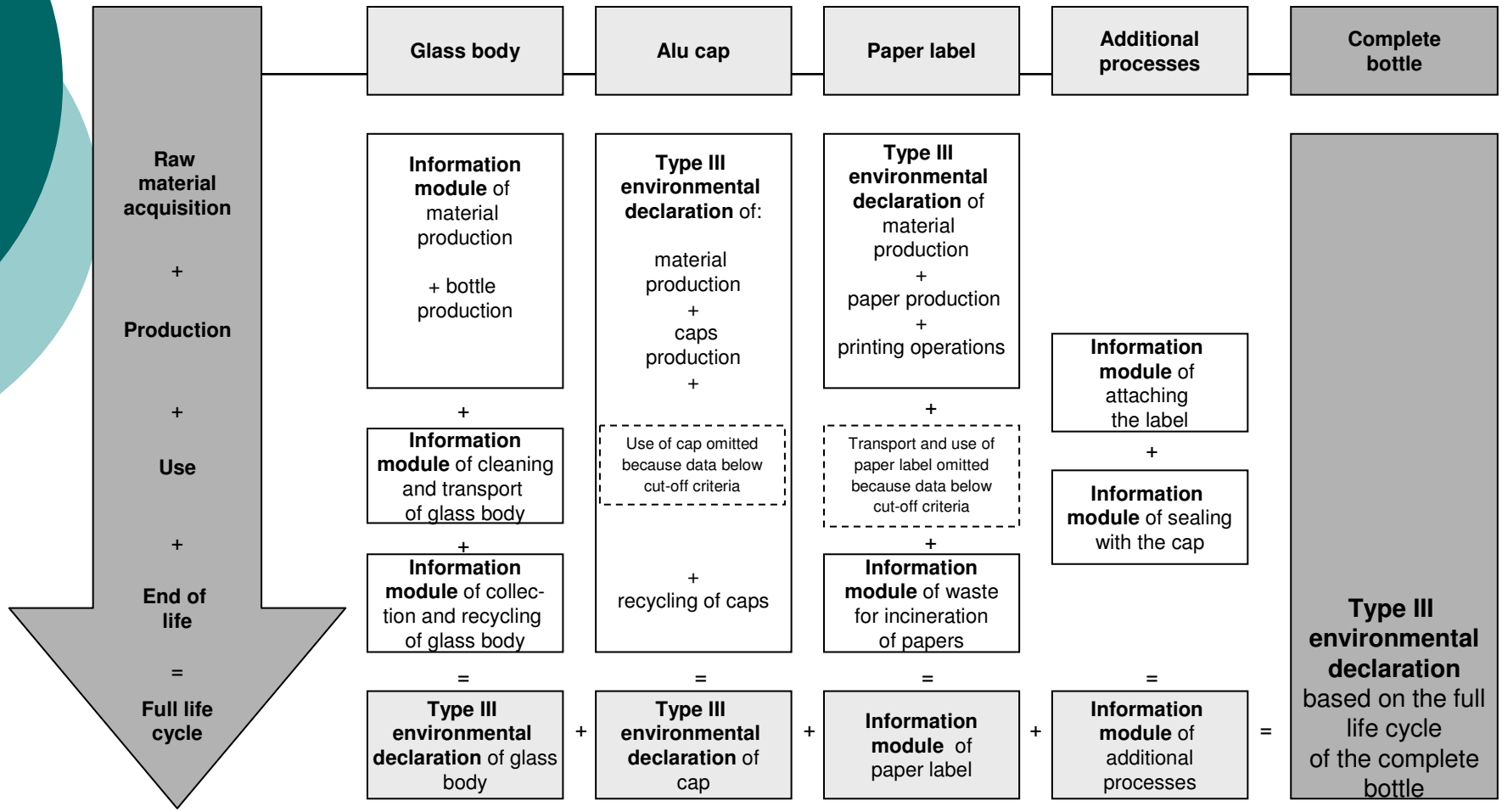
ISO014025:2006: Main steps

1. The programme operator establish a programme with programme instructions
2. Develop a Product Category Rules (PCR) verified by third party review panel
3. The organization use the PCR to fill in the content of the EPD
4. Have the EPD and the data independently verified
5. Publish the EPD

ISO 14025; Information modules

- compilation of data to be used as a basis for a Type III environmental declaration , covering a unit process or a combination of unit processes that are part of the life cycle of a product

Information modules – many ”Lego bricks” make an EPD



Note : Information module may be but do not have to be a Type III environmental declaration

Figure B.1 - Diagrammatic simplified representation of the development of a Type III environmental declaration from information modules

Parts of the window

Life Cycle

Aluminium profile	Aluminium sheet	Aluminium casting	Glass	Plastics - gaskets	Plastics – barriers	Access-ories - steel	Access-ories – heavy NF metals	Sealing material	Assembly/ dismantling
Homogenis-ation of ingots	Homogenis-ation of ingots	Die casting	Glass production	Production of gaskets from granules	Production of granules	Production of accessories	Production of accessories	Production of sealing material	Transport of aluminium composite
Extrusion	Hot rolling				Production of barrier material				Transport of glass
Heat treatment of profiles	Cold rolling				Production of composite profile				Transport of accessories (all materials
Anodizing and finishing	Chemical treatment and finising								Fabrication of window
Powder coating and finishing	Mechanical treatment and finishing								Transport to building site
Use of the window									
Recovery operations before remelting	Recovery operations before remelting	Recovery operations before remelting	Recovery operations before remelting	Incineration	n.a.	Remelting	Remelting	Incineration	Removal from building and transport
Remelting	Remelting	Remelting	Remelting	Substitution of lost material		Substitution of lost steel	Substitution of lost NF metal	Substitution of lost material	Shredding and magnetic sorting
Substitution of lost aluminium	Substitution of lost aluminium	Substitution of lost aluminium	Substitution of lost material						Additional sorting (electromagneti c or sink-float)

Environmental Product Declaration

This environmental declaration applies for a functional unit of:
Industrial use of 1 kg of average MELITEK compound in EU. The life cycle includes raw materials and production at Melitek, excludes manufacturing of final product and use of final product, but includes waste disposal of compound materials.

Photo of the product

Functional Unit

Product ,Use and Disposal

Product specifications and recommendations for use and disposal

MELIFLEX is a unique polyolefin-based alloy (compound) that is designed and produced specially for pharmaceutical packaging and medical devices by MELITEK. The chemical nature of MELIFLEX TPE and TPO alloys makes them ideal and safe for medical applications as they are both PVC- and latex free while containing no plasticisers, including phthalate.

The product is sold in Denmark (2%), across the rest of Europe (78%) and also in Asia (20%) (approx. percentages).

Some of the key product characteristics and benefits of *MELIFLEX* are:

- Halogen free and plasticizer free
- High purity with no significant leaching
- Good chemical resistance
- Low specific gravity (0,9 g/cm^3)
- Good water vapour barrier properties
- Good resistance to puncture and tearing
- Film thickness reduction up to 50% compared to flexible PVC
- Excellent clarity
- Kink resistant tubing
- Sterilizable by autoclave at 121°C, EO, gamma and E-beam
- Good impact properties and flexibility at low temperatures
- Shore hardness from 50A to 60D
- Easy and safe processing
- Easy multiple recycling

MELIFLEX grades are available for tubing extrusion, films produced by blown or cast extrusion, for injection moulding and for blow moulding (including BFS) applications.

MELIFLEX meets Class VI tests of the United States Pharmacopeia and is designed to meet ISO 10993.
MELIFLEX fulfils the requirements on materials used for articles or components of European Pharmacopoeia, 5th edition (2004) monograph 3.2.2. Plastic containers and closures for pharmaceutical use.
MELIFLEX use only European Pharmacopoeia approved additives. Further *MELIFLEX* complies with food and toy additive regulations of both FDA and EU directives.
NOTE: Customers are liable and must ensure compatibility and suitability in their intended final application and use.

There are no special disposal instructions required for MELIFLEX products as they are to be disposed in same way as standard polyethylene and polypropylene materials.

Life Cycle

Product life cycle information

The life cycle comprises only "before our gate" and "our production" as *MELIFLEX* products are used by very different producers of final products for healthcare; also "End-of-life" is modelled assuming that the final products are all disposed as clinical waste for incineration which is incinerated as MSW but at special designated plants (synthetic rubber, polyamid and paraffin are modelled as PUR). The goal of the EPD is to get an overview of the environmental impacts of raw materials used and processing of *MELIFLEX* materials.

The functional unit is based on one years production of an average reciept.

Data for the life cycle are taken from EcoInvent database supplemented with specific modelling of SBS using the same methodology.

Transport of raw materials is modelled as USA to Rotterdam by transoceanic freighter for 33% of raw materials and 67% of raw materials by lorry from Europe.

Material & Substances

List of materials and chemical substances (above 0,1% of weight of the product)

	kg	Weight %
Materials, substances and preparations		
Polypropylene	0.651	65%
Synthetic rubber	0.333	33%
Polyethylene	0.018	2%
Organic chemical additives	0.001	0%
Substances classified according to EU legislation		
None		
Total	1.0	100%

Environmental Impacts

Environmental impacts

Impact category	Before our gate	Our production	Use	End-of-Life	Total
Nature occupation [m^2 eq arable land]	0.00	0.00	0.00	-0.01	0.00
Global warming [kg eq CO_2]	2.75	0.25	0.17	0.43	3.43
Acidification [m^2 unprotected ecosystem]	0.41	-0.01	0.02	-0.04	0.36
Eutrophication [g eq NO_3 -]	0.01	0.00	0.00	0.00	0.01
Photochemical ozone formation [m2*hr*ppm ozone]	32.46	0.42	3.21	-3.87	29.01
Human toxicity (into air, only carcino-genic effects) [kg chloroethylene-eq]	1.05	-0.02	0.10	-0.16	0.88
Supplementary impact categories	**Before our gate**	**Our production**	**Use**	**End-of-Life**	**Total**
Non-renewable energy [MJ primary]	88.29	3.41	2.85	-18.55	73.16
Mineral extraction [MJ extra in future]	0.01	0.00	0.01	0.00	0.01

Additional Environmental Information

Additional environmental information

In 1998 MELITEK started the manufacturing of specialised MELIFLEX polyolefin based TPE and TPO alloys (compounds). Our products are designed to offer unique combinations of physical properties and meet the increase in regulatory demandsput on plastic raw materials used for pharmaceutical packaging and medical devices.

MELIFLEX resins have over the resent years proven to be a very viable alternative to plasticized PVC and polyurethane in film, tubing and moulding applications as it offers both medical and environmental benefits over said materials.

As our MELIFLEX materials, that are phthalate and halogen free, are selected by customers for health and environmental reasons, MELITEK have an interest to document and benchmark the real environmental benefits of our MELIFLEX products by using e.g. environmental product declarations.

MELITEK wishes to identify process and product improvements by making environmental impact assessment to investigate marketing opportunities using environmental information in the EPD format.

The Enterprise

The company

MELITEK has over 25 years of experience in selling state-of-the-art technologies to the pharmaceutical and medical device industry. Our objective is to supply new innovative technology of high quality, which offers our customers value and advantages within areas of product and process improvements, higher safety, and enhanced profitability.

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Date &Validity

Date of publication and period of validity

2006.09.01
The EPD is valid until the end of 2006.

Verification

Verification (not applicable in the Stepwise EPD project)

PCR[a] review[b], was conducted by:
< name and organization of the chair, and information on how to contact the chair through the programme operator >
Independent verification of the declaration and data, according to ISO 14025:
☐ internal ☐ external
(Where appropriate [c]) Third party verifier:
<name of the third party verifier>

References

References

Stepwise EPD guidelines - http://extra.ivf.se/StepwiseEPD/

EcoInvent database - httt://www.ecoinvent.ch

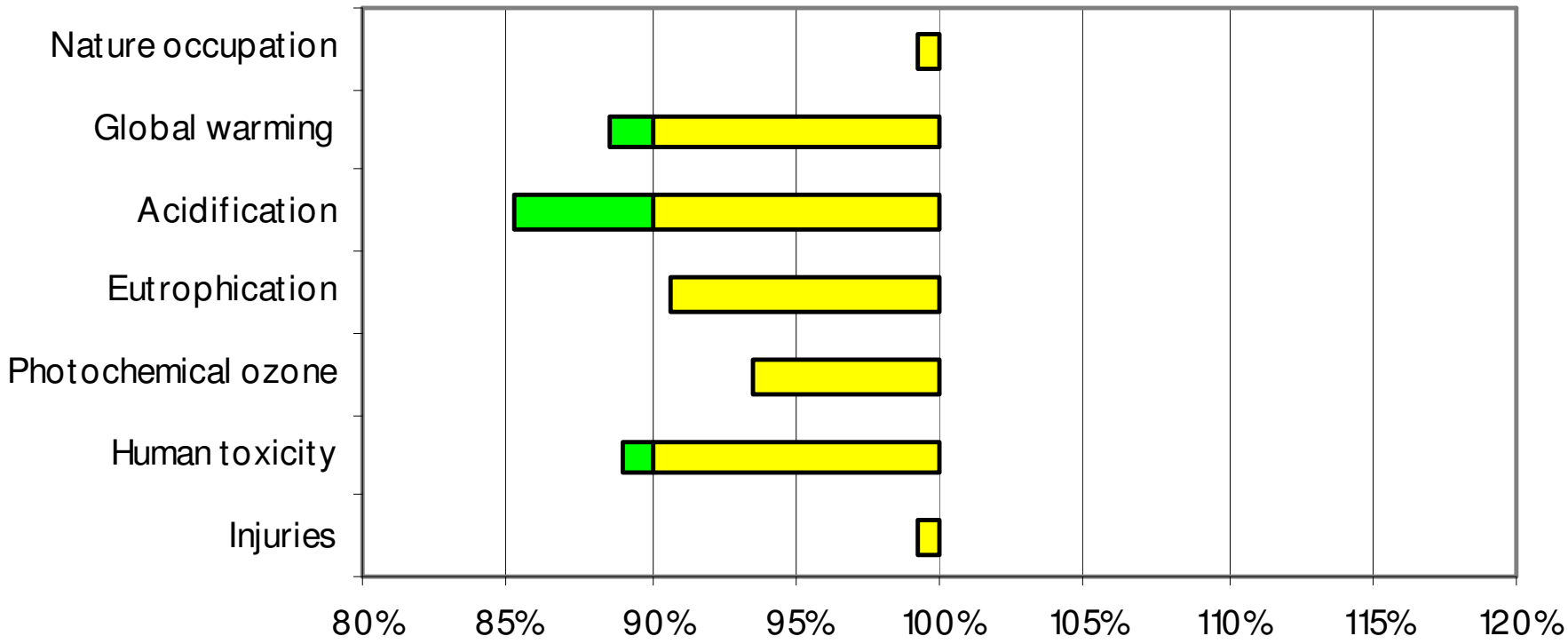
EIPRO-database; 2.-0 LCA consultants internal version; the EIPRO project report can be found at http://europa.eu.int/comm/environment/ipp/pdf/eipro_draft_report2.pdf

Boustead I, D L Cooper (1998) Eco-profile of SBS. A report for The International Institute of Synthetic Rubber Producers

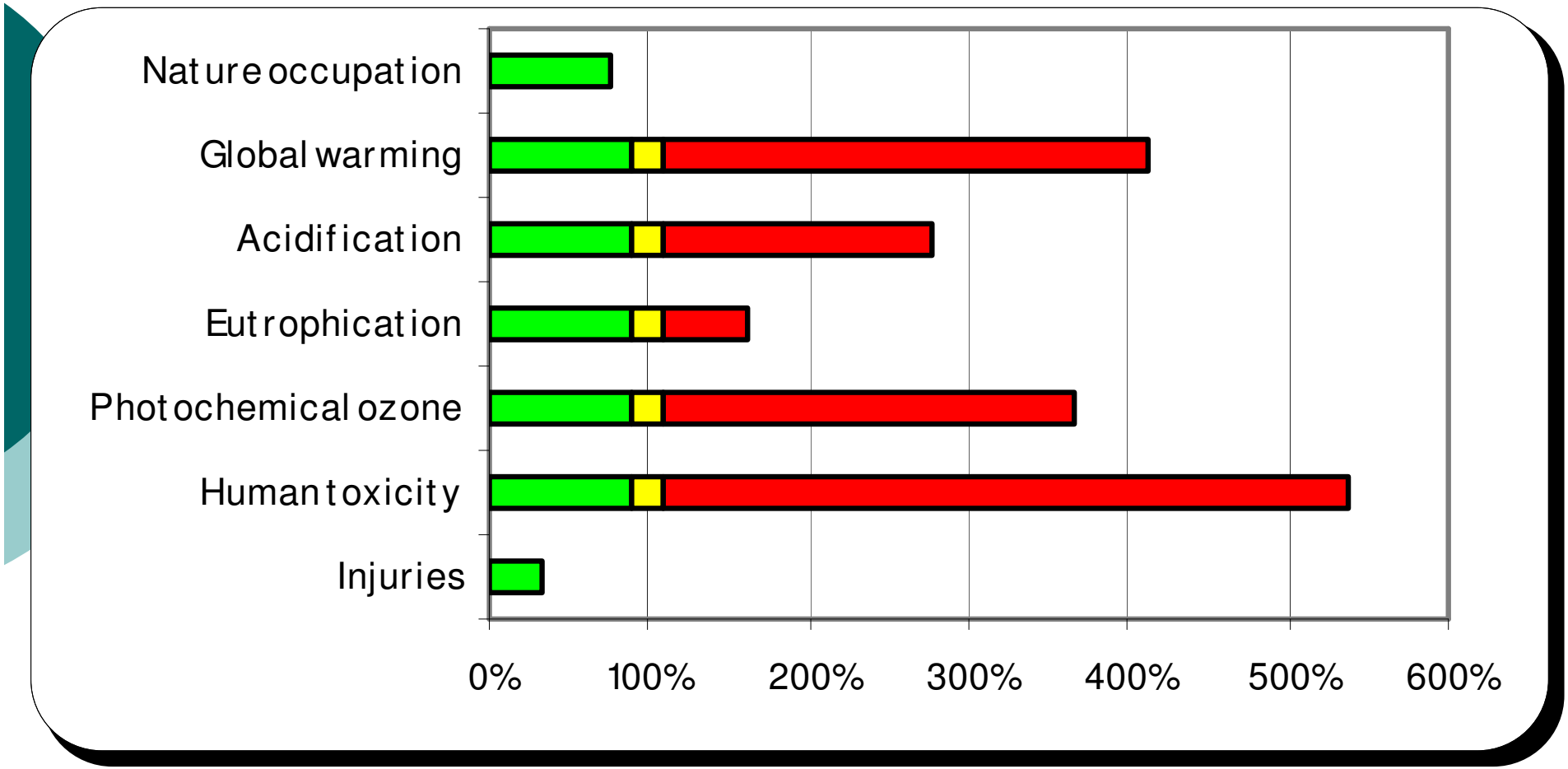
The SimaPro LCA for MELITEK can be requested from 2.-0 LCA consultants after approval from Melitek;
contact Kim Christiansen, kc@lca-net.com

ISO 14025 ANEC Report (2006)

- Comprehensibility and comparability of the environmental information
- Reliability of data
- Completeness of the environmental information
- Adequate stakeholder involvement



Impacts from Product A relative to the impacts of spending the same amount of money on ”an average product from the product group”.



Impacts from Product A relative to the impacts of spending the same amount of money on ”average consumer goods”.

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

CEN/TC350 – Sustainability of Construction Works
The mandated work and the linked areas

Building Description & the Requirements (incl. Regulations) for Building Performance and Functionality

	Environmental	Social	Economic	*Technical and Functional Performance*
Framework for Assessment of Buildings	Environmental Performance	Health & Comfort Performance	Life Cycle Cost Performance	
	Description of Building Life Cycle			
Calculation methods for Building level	Assessment of Environmental Performance (Local, Regional & Global)	Assessment of Indoor Environment	Assessment of Life Cycle Costs	← *Assessment of Energy Performance of Buildings (CEN/TC89, TC156, TC169, TC228, TC247)* ← *Service Life Estimation of Buildings (ISO/TC59/SC14)*
	Use of EPD			
Rules for Product level	PCR and Communication Format for Environmental Product Declarations			← *Service Life Declarations (ISO/TC59/SC14)* ← *Assessment of Release of Dangerous Substances (CEN/TC351)* ← *Harmonized Product Standards*
	Generic Data			

PCR for Construction Products

- **Content of PCR built on ISO (F)DIS 21930**
  1. **Scope**
  2. **Normative References**
  3. **Terms And Definitions**
  4. **Symbols And Abbreviations**
  5. **General Aspects For Product Category Rules (PCR) For EPD Of Building Products And Services.**
  6. **Product Category Rules**
  7. **Reporting**
  8. **Content Of The EPD**
  9. **Review Of PCR**

- **Around 225 product groups**
- **Time schedule 36 months**
- **PCR Review Panel**

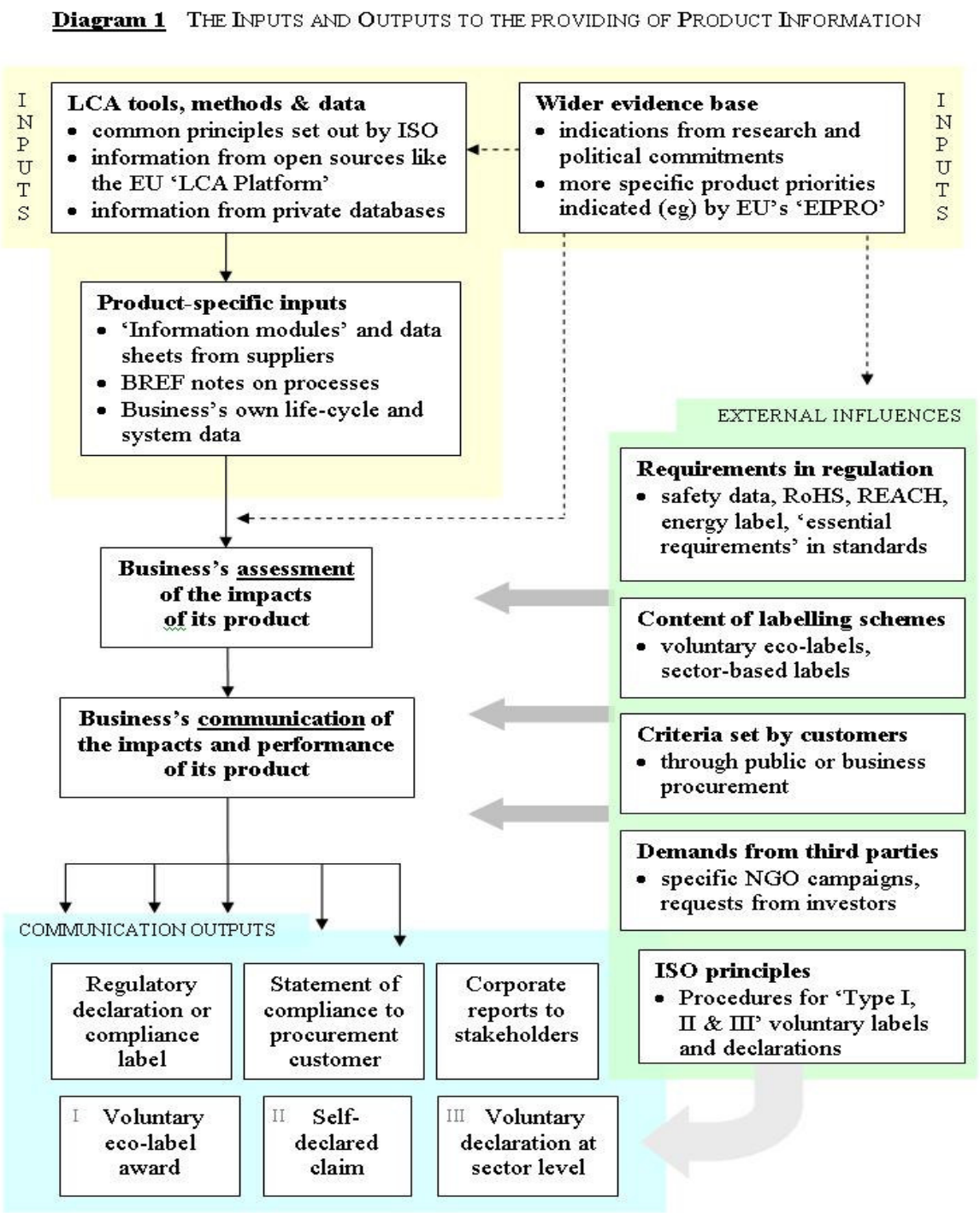
	Environ Profile - UK	Green Guide - UK	UK Envest	Environ … - N	Miljöprogram – N	France (NF XP 020-01	Eco Quantum - NL	MRPI - NL	GreenCalc+ - UK	LEGEP - D	Building Solutions - SP	LIDER A - SP
Environmental Impacts												
Climate change GWP	X	X	X	X		X	X	X	X	X	X	X
Depletion of natural resources (ADP)		X	X			X	X	X	X	X		X
Fossil fuel depletion (toe)	X	X	X								X	
Ozone Layer Depletion (kg CFC11)	X	X	X	X		X	X	X	X	X	X	X
Ground level ozone creation (summer smog – C_2H_4 POCP factors)	X	X	X			X	X	X	X	X	X	X
Acidification of land	?		X					?	?	?	X	X
Acidification of water sources	?		X					?	?	?	X	X
Acid deposition (kg SO_2)	X	X	X	X		X	X	X	X	X	X	X
Eutrophication of water (PO_4)	X	X	X	X		X	X	X	X	X	X	X

The PIN group's objectives

- Set up by IPP Regular Meeting (November 2004) - to report to the Commission
- 12 members appointed by the Commission
  - Identify the needs for environmental product information
  - examine the tools
  - identify the gaps and opportunities
  - propose how things should be improved
- "*how governments and stakeholders can act to make life-cycle-based product information a real force for environmental improvement, working in combination with the tool-box of other IPP measures and activities.*

Analysis

C. A bigger 'system' view



PIN new “framework” approach

- **Overall approach**
  - More effective use of green public procurement
  - Better application of eco-design
  - Encourage sector-specific (‘vertical’) approaches
- **Inputs**
  - Bring research and industry together and built capacity
  - strengthening ability of the market to use e.g LCA platform and EIPRO
- **External influences**
  - Better coherence/integration of IPP toolbox
  - focus “market” interest in assessing and communicating environmental product performance
  - Legislative framework
    - ensuring a good baseline data quality
    - power to require information on key impacts
    - requirement to promote national awareness
- **Communication outputs**
  - promoting standards for declarations
  - ensure fair competition on environmental product performance
  - Prevent misleading claims

Inspiration

- Stepwise EPD - http://extra.ivf.se/StepwiseEPD/
- ANEC study: Consumer demands on Type III environmental declarations , February 2006
- GedNet www.gednet.org