

Life cycle assessment (ISO 14040/44) as basis for environmental declarations and carbon footprint of products

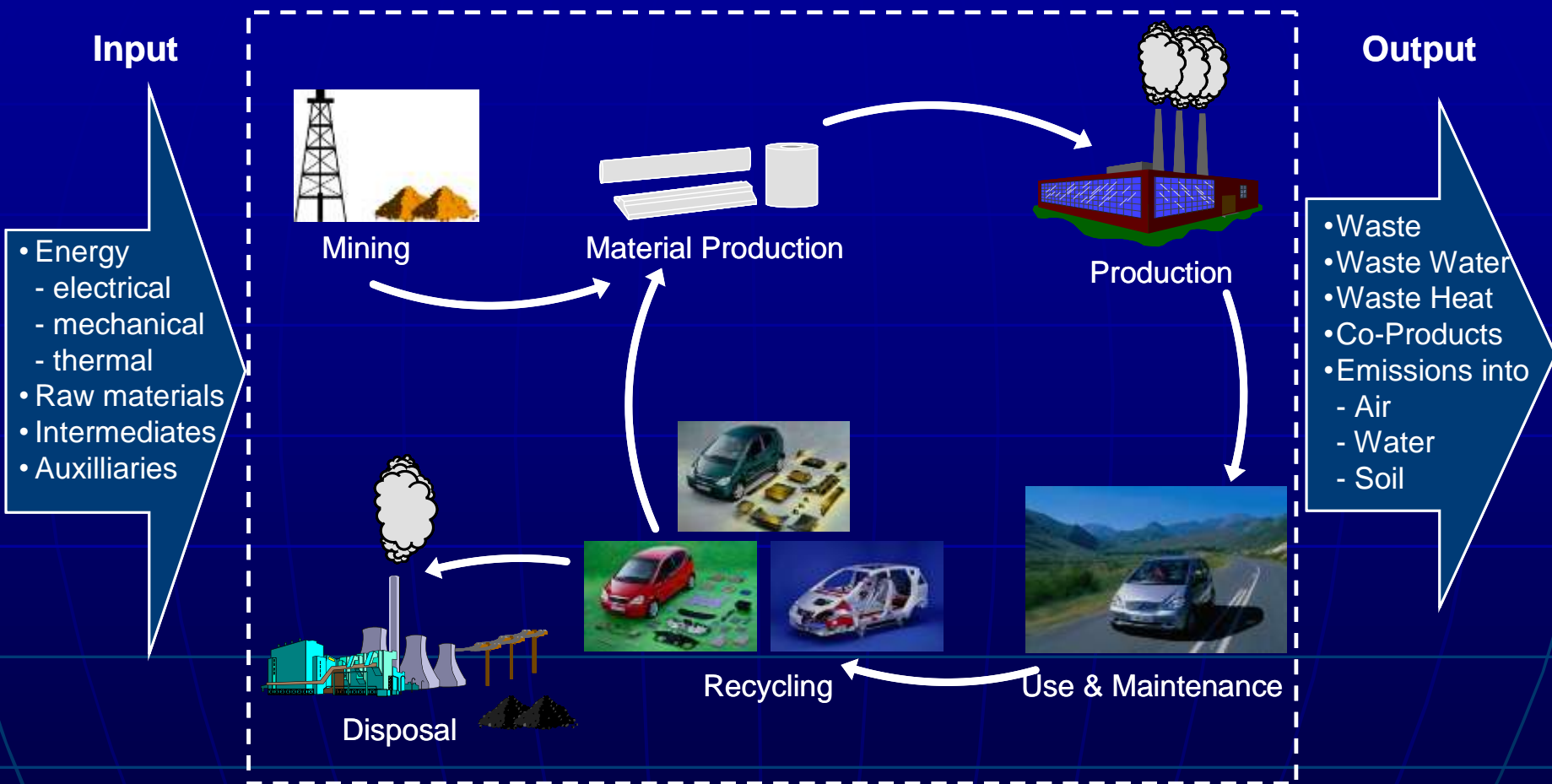
Matthias Finkbeiner
Reginald Tan
Melanie Raimbault



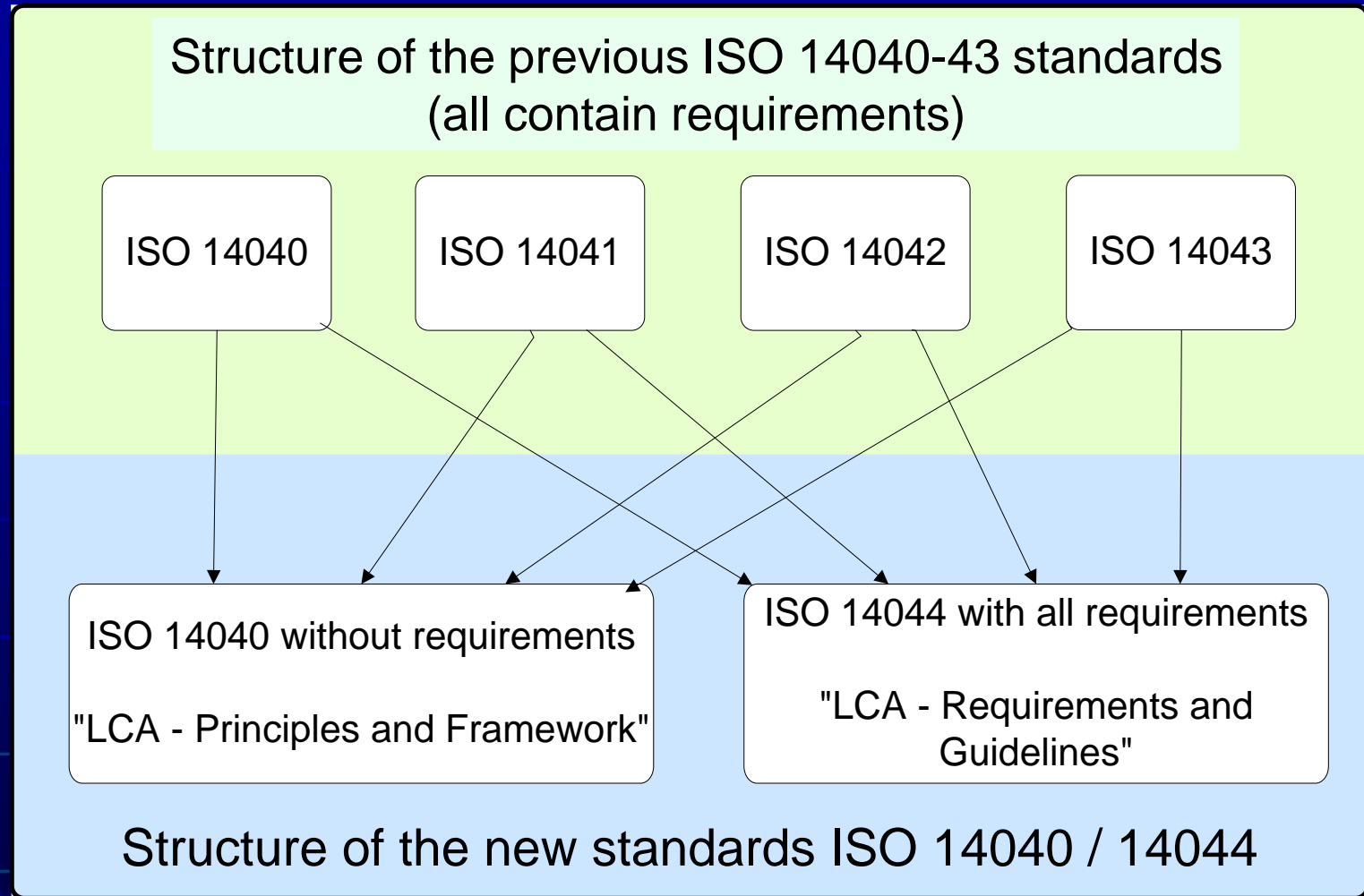
Agenda

1. What is LCA and ISO 14040/44?
2. Relation to EPDs (ISO 14025)
3. Relation to carbon footprint (ISO 14067)
4. Relation to other standards
5. Challenges
6. Outlook

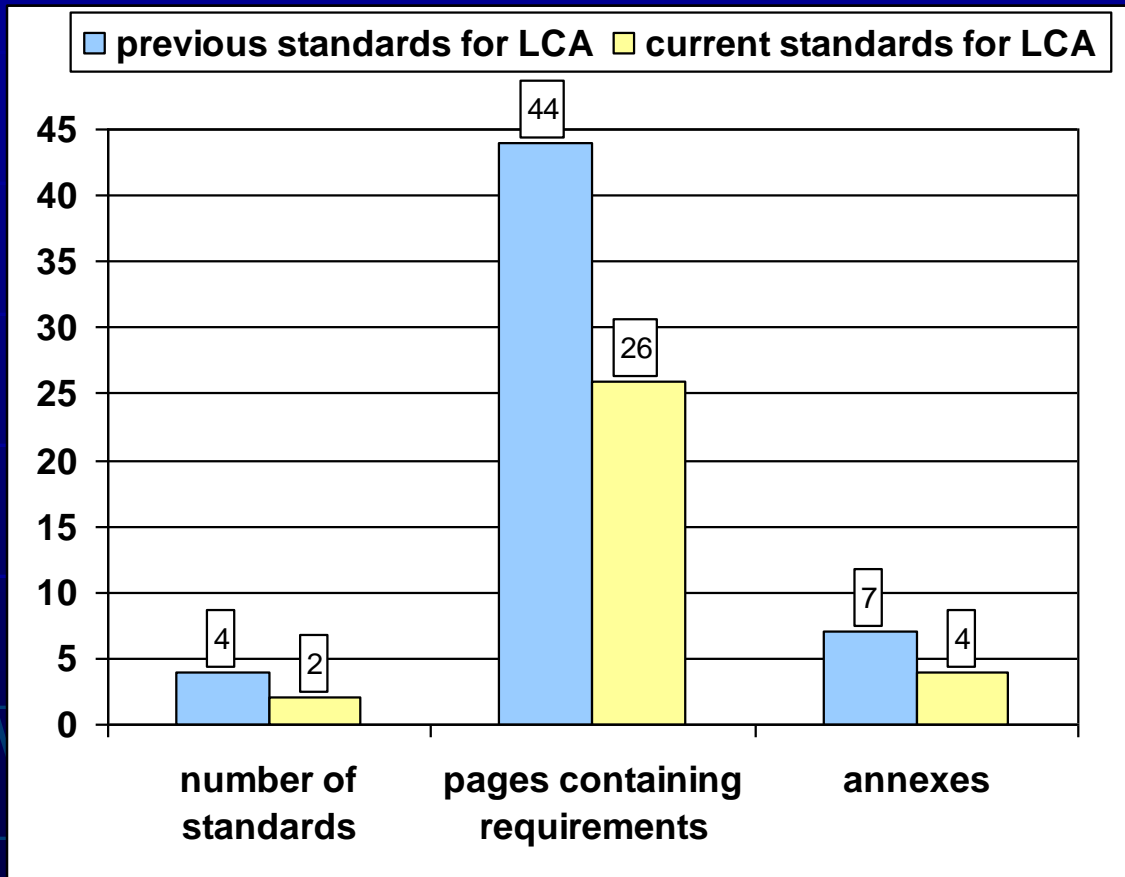
Life Cycle Assessment (LCA)



Outline of the last revision



Improved user-friendliness and efficiency of last revision



co-convenors:

Atsushi Inaba, Japan

Reginald Tan, Singapore

Matthias Finkbeiner, Germany

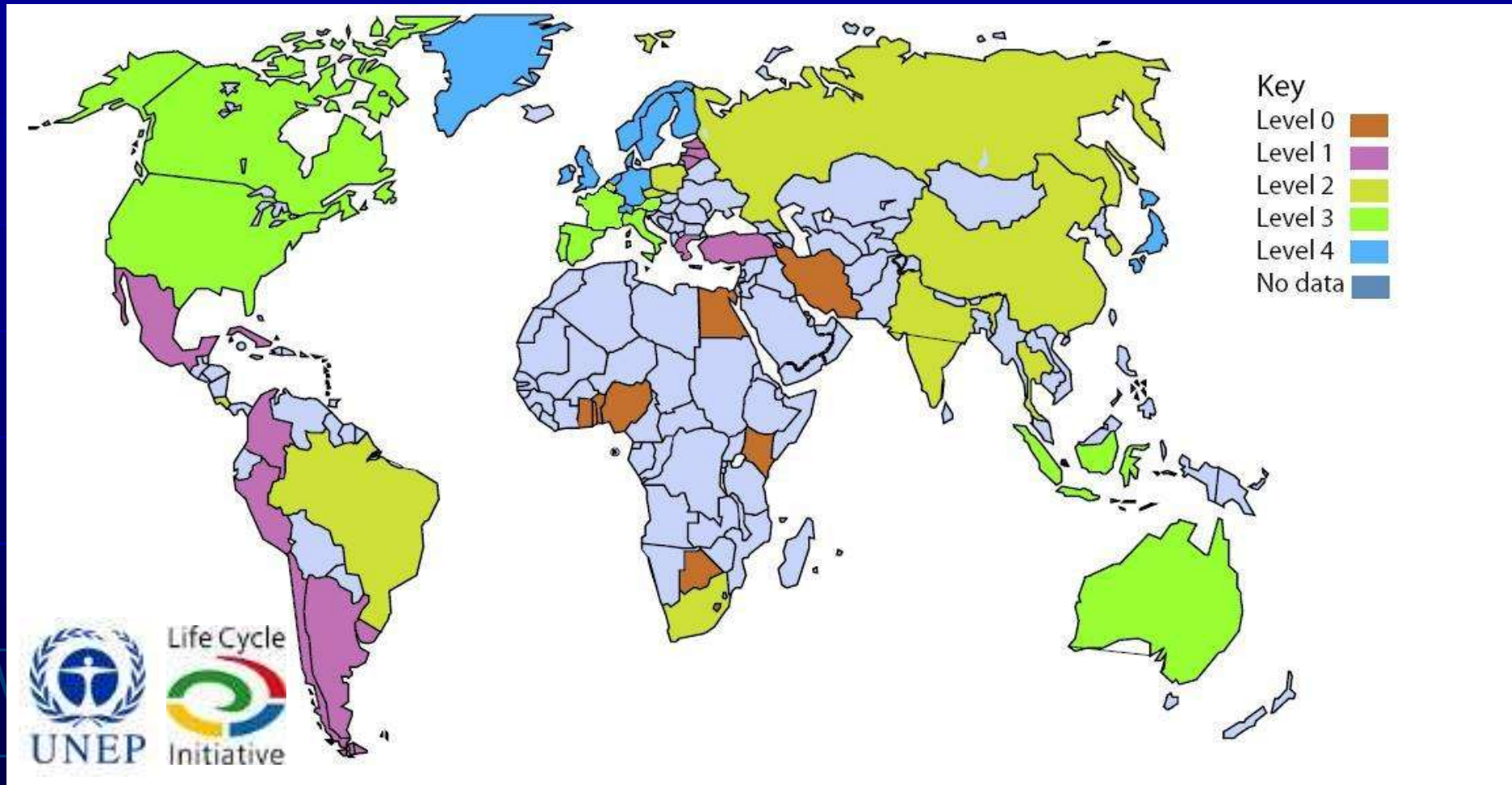
secretariat:

Kim Christiansen, Denmark

→ about 1900 comments

→ project completed with unanimous vote four months ahead of schedule.

Evolution of Life Cycle Thinking Worldwide and Capability Development in Non OECD Countries



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10 Ideas Changing the World Right Now

The global economy is being remade before our eyes. Here's what's on the horizon

•••

Ecological Intelligence

By **BRYAN WALSH** Thursday, Mar. 12, 2009

When it comes to going green, intention can be easier than action.
...
But what if we could seamlessly calculate the full lifetime effect of our actions on the earth and on our bodies?
...
Over the past couple of decades, industrial ecologists have been using a method called **life-cycle assessment (LCA)** to break down that web of connection.
...

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Relation LCA and EPD

- An EPD is an environmental declaration to communicate LCA results.
- LCAs are used to develop PCRs.
- PCRs are basically a predetermined Goal and Scope Definition for a particular product group.
- Alignment between 14040/44 and 14025 achieved in last revision.

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Relation LCA and CF

- A CF is an “LCA” with the limited focus on one impact category only, i.e. climate change.
- All methodological requirements and principles of LCA apply to CF (except for comprehensiveness).
- Current draft of ISO 14067 contains a good share of ISO 14040/44 content.

Relation LCA and CF

Example:

- pages 19-21 are basically 14040/44
- originally text boxes, now notes
- NOTE: The whole X.X.X was adapted from ISO 14040:2006, Y.Y.Y

ISO/CD 14047.2	
457	All relevant assumptions regarding any of its treatment, e.g. emissions and removals shall be covered in subsequent technical information, as applicable, and shall be documented in the report.
459	5.1 Inventory analysis for the carbon footprint of a product
460	5.1.1 General
461	After the goal and scope definition phase, the inventory analysis of a CF consists of the following steps, for which the following pertinent provisions, as noted below, shall apply.
463	5.1.2 Data collection
465	The quantitative and qualitative data for inclusion in the inventory shall be of that quality that is included within the system boundary. The collected data, when estimated, are utilized to quantify the inputs and outputs of a unit process.
466	When data have been collected from public sources, the source shall be noted and may be significant for the conclusions of the study. Details about the relevant data shall be recorded, if such
472	Since data collection is taken to reach units between them, for example, input and output data might be allocated between co-products in proportion to the economic value of the products.
474	NOTE 1 The ratio between co-products and waste since the inputs and outputs shall be allocated to the co-products just only.
475	NOTE 2 Some outputs may be partly co-products and partly waste. In such cases, it is necessary to identify the ratio between co-products and waste since the inputs and outputs shall be allocated to the co-products just only.
476	5.1.3 Validation
477	A check on data is essential to the data. Allocation procedures shall be uniformly applied to similar inputs and outputs of the system under consideration. For example, if allocation is made to usable products (e.g. intermediate or discarded products) leaving the system, then the allocation procedure shall be similar to the allocation procedure used for such products entering the system.
479	Validation may be done by comparing the inventory with the inventory of a similar system. Allocation procedures shall be verified as much as possible against fundamental input-output relationships and characteristics.
481	NOTE The whole 5.1.3 was adapted from ISO 14040:2006, 4.3.2.2.
482	NOTE The whole 5.1.3 was adapted from ISO 14040:2006, 4.3.2.2.
483	5.1.4 Reuse and recycling
484	An appropriate flow unit (functional unit) shall be used. Changes in the inherent properties of materials shall be taken into account, in addition, particularly for the recovery processes between the original and subsequent product system, the system boundary shall be identified and explained, ensuring that the allocation principles are observed as described in 5.1.2.2.
486	However, in these situations, additional allocation is needed for the following reasons:
488	— reuse and recycling (as well as composting, energy recovery and other processes that can be assimilated to re-manufacturing) may imply that the inputs and outputs associated with unit processes for extraction and processing of raw materials and final disposal of products are to be shared by more than one product system;
489	— reuse and recycling may change the inherent properties of materials in subsequent use;
490	— specific care should be taken when shifting system boundary with regard to recovery processes.
491	5.1.5 Several allocation procedures are applicable for reuse and recycling. The application of some procedures is distinguished in the following to illustrate how the above constraints can be addressed:
492	a) A closed-loop allocation procedure applies to closed-loop product systems. It also applies to open-loop product systems where no changes occur in the inherent properties of the recycled materials. In such cases, the need for allocation is avoided since the use of secondary materials displaces the use of virgin (primary) materials. However, the first use of virgin materials in applicable open-loop product systems may follow an open-loop allocation procedure outlined in b).
493	b) An open-loop allocation procedure applies to open-loop product systems where the material is recycled into other product systems and the material undergoes a change in its inherent properties.
494	5.1.5.1 The allocation procedure for the stated unit processes mentioned in 5.1.5 should use, as the basis for allocation, if feasible, the following order:
495	— physical properties (e.g. mass);
496	— in some countries and regions, recycling encompasses reuse, material recovery and energy recovery;



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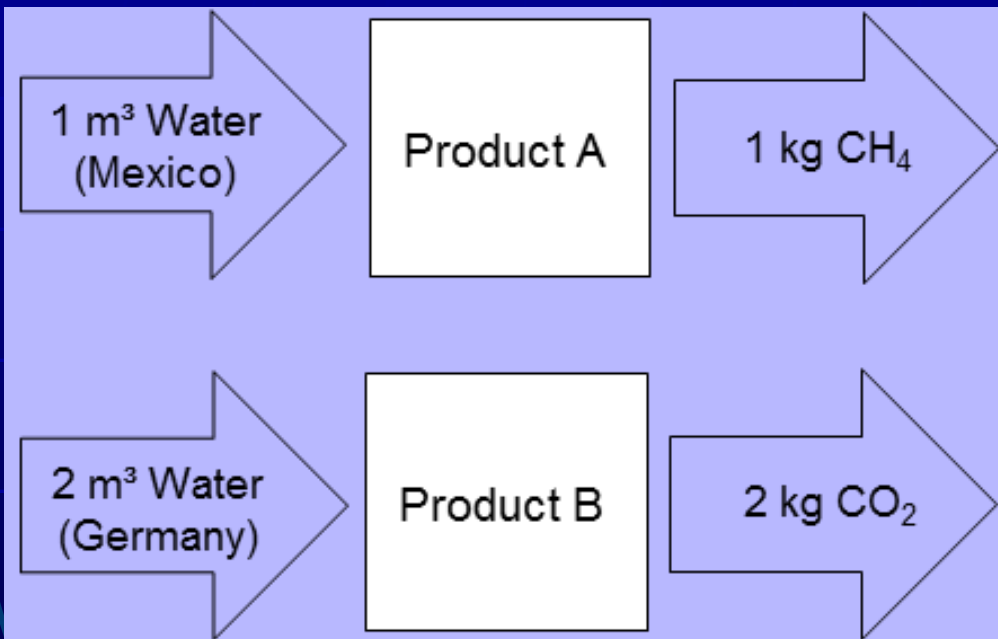
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Other Standards...(I)

- ISO 14045: Environmental management — Eco efficiency assessment of product systems — Principles, requirements and guidelines
- PWI ISO 14046: Water Footprint

Other Standards...(II)

■ Water Footprint: impact vs. volume



- GWP of 25 kg CO₂e vs. 2 kg CO₂e, not 1 kg GHG vs. 2 kg GHG
- To be consistent with CF, to avoid confusion and to ensure that a lower footprint is really "better" WF needs to address impacts, too.

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The two main challenges with regard to derivative standards in TC207?

1. Trade-off between proliferation of existing standards vs. market need for a particular derivative standard
→ addressed by CAG Markets and Portfolio Task Forces and Stakeholder Forum
2. Derivative standards as “Stand-alone”- or “Delta”- Standards, i.e. either including the necessary text of “parent” generic standard or just referencing “parent” generic standard text?
→ generally: ISO/TC 207 Sector, Aspect and Element Policy specifically: not yet (fully) addressed

ISO/TC 207 Sector, Aspect and Element Policy

- The policy aims to maintain alignment and consistency with ISO/TC 207's generic environmental management standards and to avoid the proliferation of unnecessary sector-, aspect-, or element-specific environmental management standards;
- ISO technical committees or subcommittees developing sector-, aspect- or element-specific environmental management standards shall:
 - Normative reference...
 - Distinguish ISO 14000 series text if it is reproduced;
 - Not interpret, change, or subtract from the requirements of the generic ISO 14000 series standards...



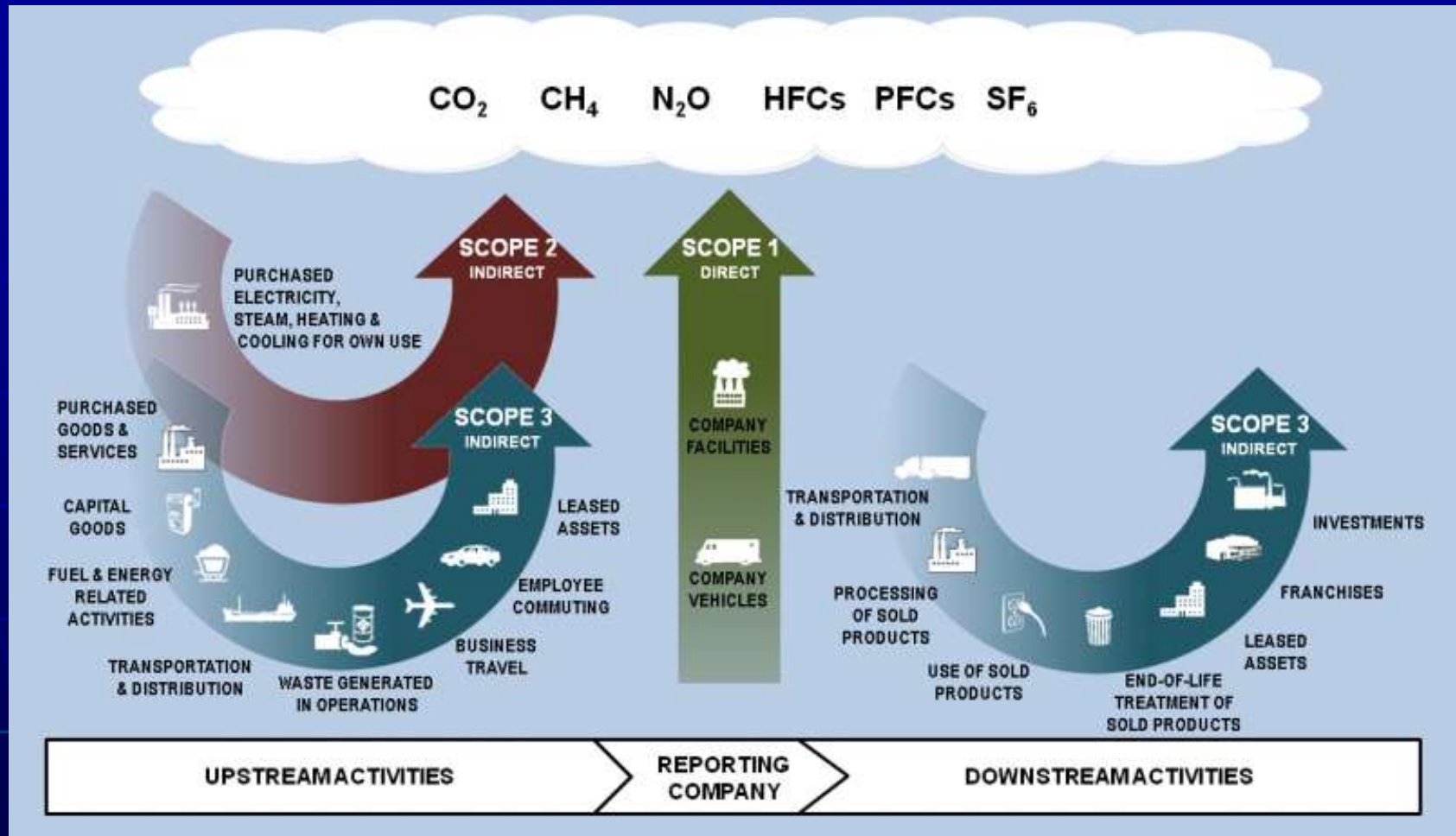
"Delta"-Standard vs."Stand-alone"-Standard

	"Delta"	"Stand-alone"
length of docs	short	long
process efficiency	high	low
time to market	short	long
consistency	built-in	risk
revision needs	case by case	automatic
"ownership"	TC	SC/WG
user friendliness	good for pros	good for rookies
no. docs for user	2	1

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From product towards organisations...



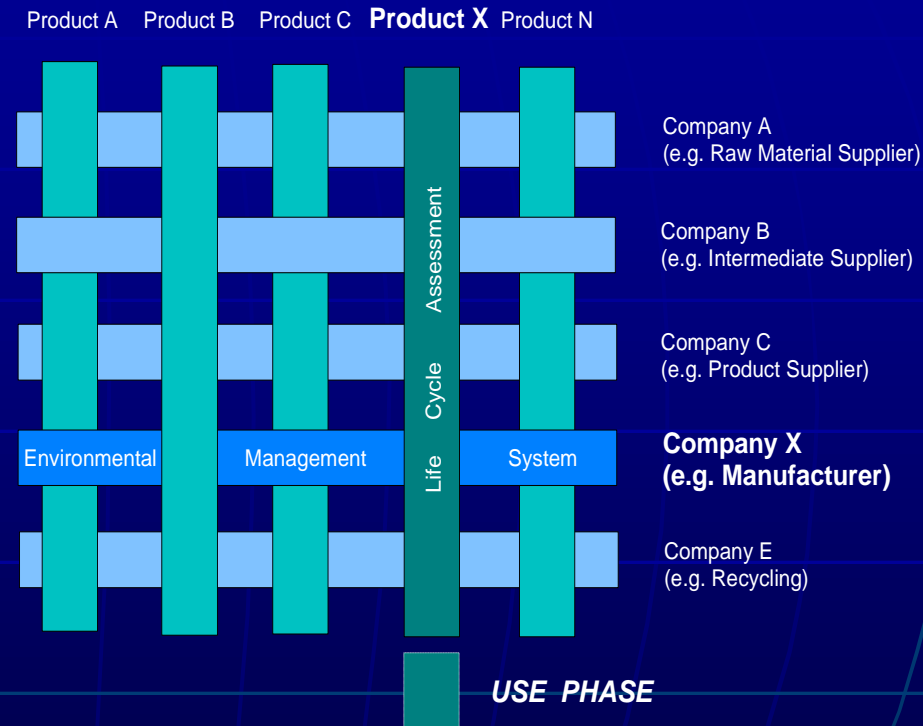
Source: GHG Protocol

TC207 / SC5

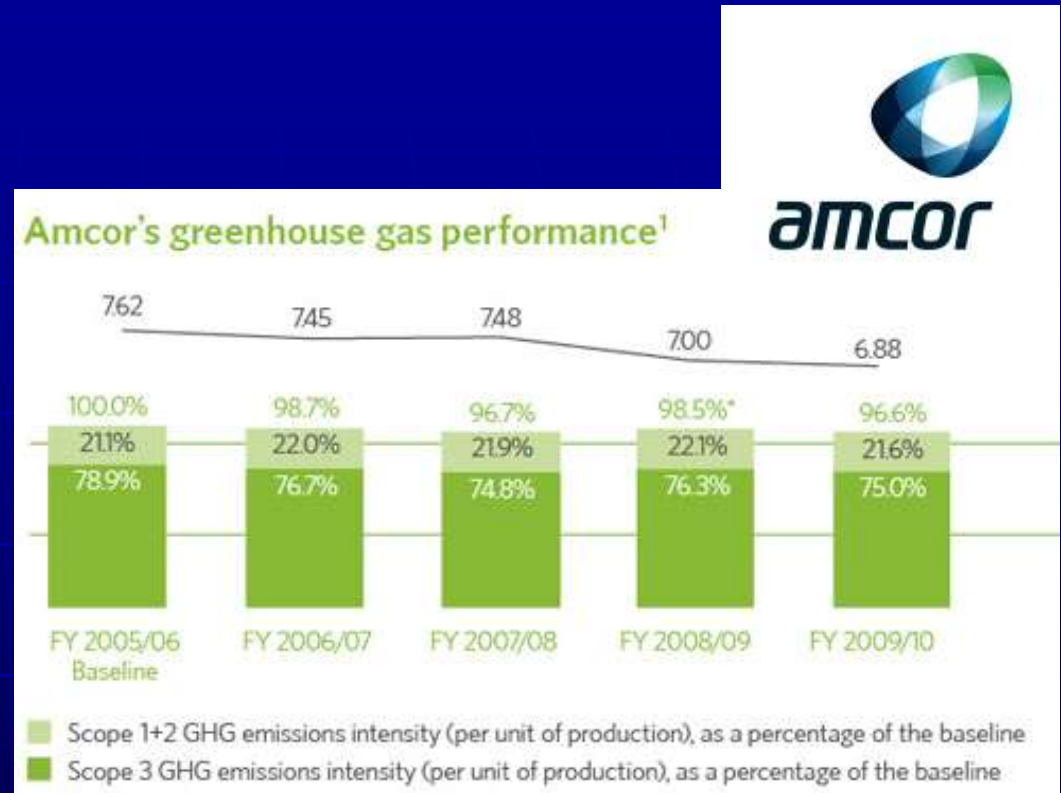
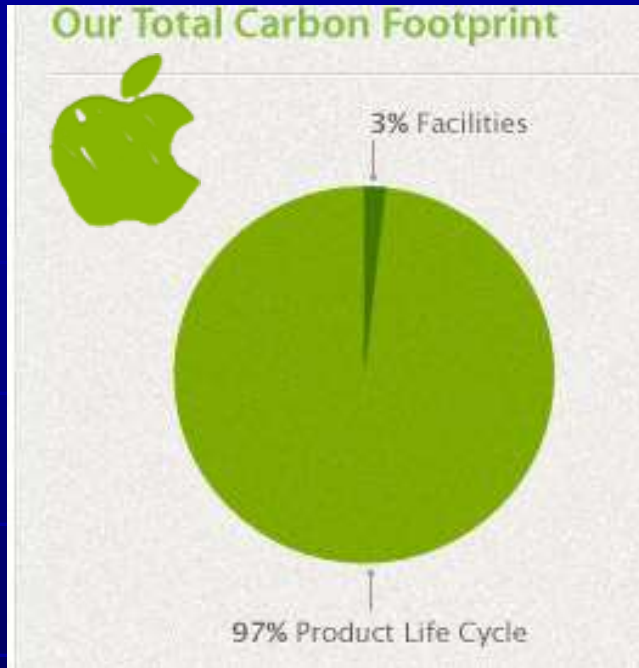
Life Cycle Assessment

Long history, but relevant just now...

- Braunschweig & Müller-Wenk: (1993): Ökobilanzen für Unternehmen Verlag Paul Haupt, Bern
- Unilever: Taylor & Postlethwaite (1996): Overall Business Impact Assessment (OBIA), SETAC Case Study Symposium, Brussels
- Finkbeiner, Wiedemann & Saur (1998): Comprehensive Approach Towards Product and Organisation Related Environmental Management Tools, Int. J. LCA 3 169–178



...address the big impacts and aspects...



- Task Group LCA for organisations
- Task Group Critical Review

Finally...

- ISO 14040/44 are THE globally accepted standards for life cycle based environmental assessments.
- We strive to keep this leading position as the only globally relevant standard in the field.
- We appreciate the growing use of ISO 14040/44 inside and outside TC207.
- We work towards applying, improving, deepening and broadening of our core standards.

