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Life Cycle Costing – a Code of Practice. Key messages and critical evaluation

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Outline

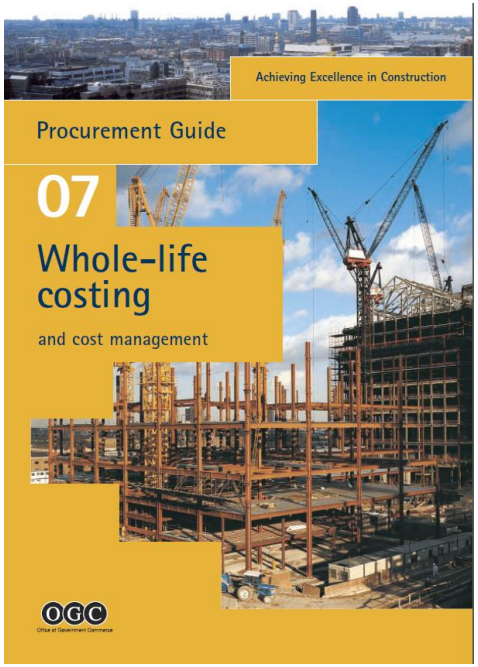
1. Background: Why „environmental LCC“, history
2. Key messages from the recent Code of Practice for Environmental LCC
3. (an attempt for a) Critical evaluation
4. What‘s next?

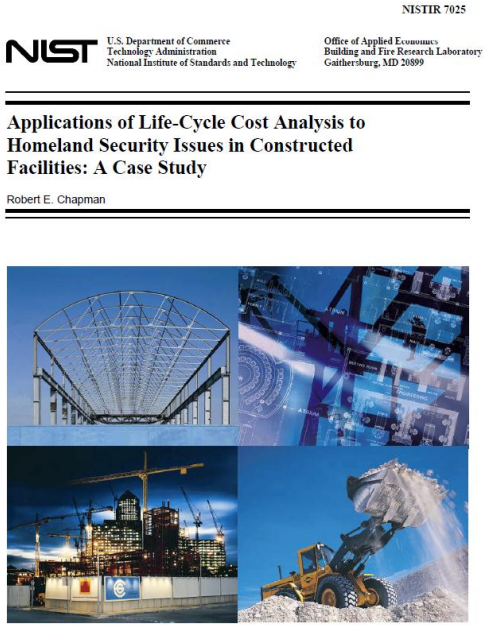
1. Environmental LCC, Background

LCC: Assessing all costs related to a product, over its entire life cycle

- Broadly used in industry
- Especially long living goods with an „interesting“ use phase
  - Railway vehicles
  - Buildings, chemical plants
  - Cars
  - …
- First reported use worldwide in the US, DoD, in a tractor delivery contract, 1930‘s

Examples for LCC application in industry





Why Environmental LCC?

- Cost information for the entire life cycle is often useful in combination with (environmental) LCA.

  → ecomomic and environmental impact of a product

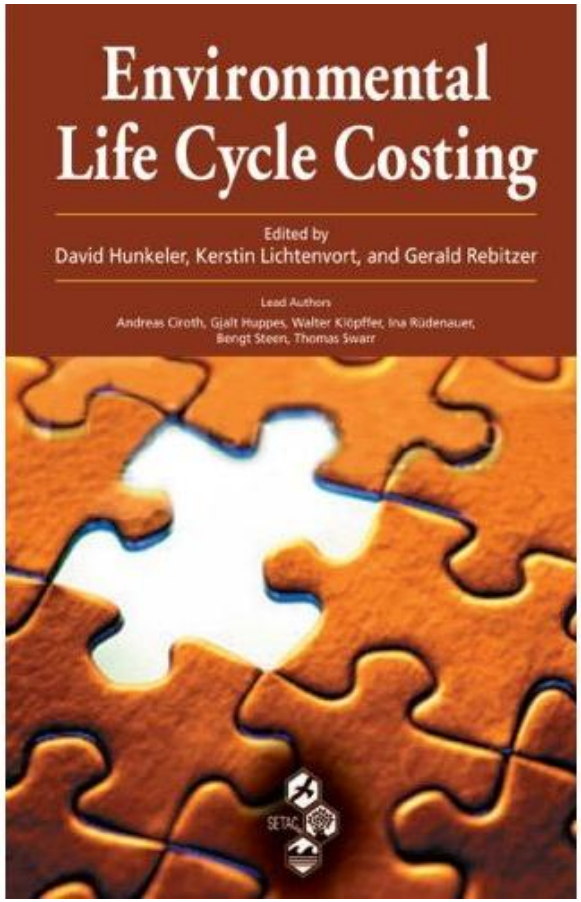
  → eco-efficiency approaches

  → …

- There are many different ways to perform an LCC; in combination with LCA
  - avoid double-work
  - avoid double counting, overlaps, gaps

  → Environmental LCC: A method designed to be used in parallel with (environmental) LCA efficiently and consistently.

History: SETAC LCC Working Group



Hunkeler, D., Rebitzer, G., Lichtenvort, K. (edts.): Environmental Life Cycle Costing. Lead authors: Ciroth, A.; Hunkeler, D.; Huppes, G.; Lichtenvort, K.; Rebitzer, G.; Rüdenauer, I.; Steen, B., Setac, Taylor & Francis 2008

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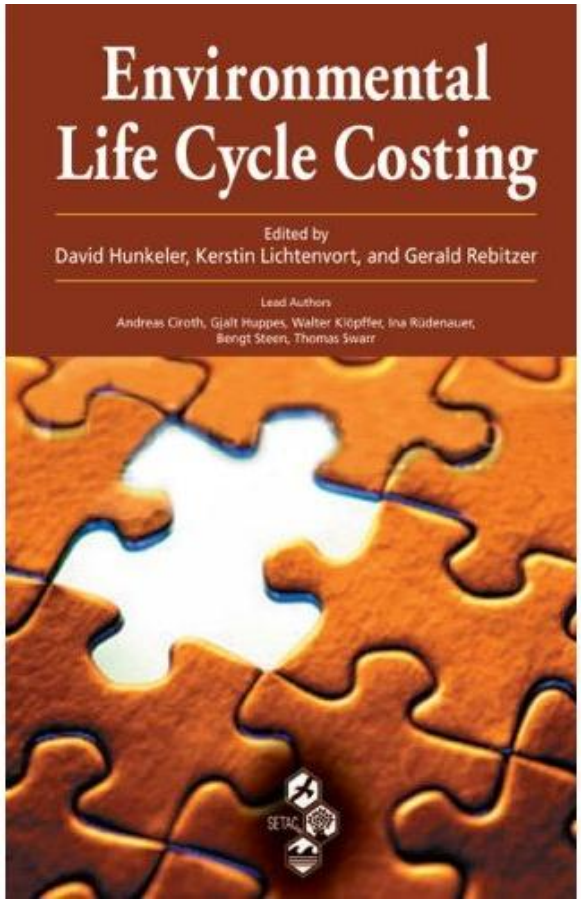

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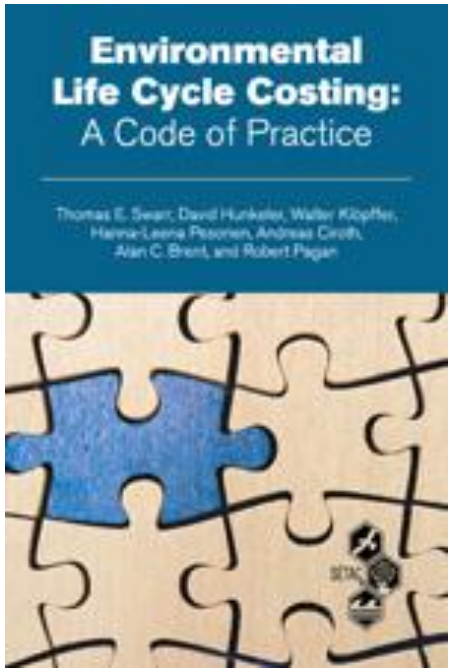
Working group started 2003; first complete version of document available 2006

History: SETAC LCC Task Force

- Aim:
  - Further condense the work of the Environmental LCC Working Group
  - Write a „Code of Practice“ similar to the SETAC LCA Code of Practice
- Members:
  Tom Swarr, David Hunkeler, Walter Klöpffer, Hanna Pesonen, Andreas Ciroth, Robert Pagan, Alan Brent



Swarr, T., Hunkeler, D., Klöpffer, W., Pesonen, H.-L., Ciroth, A., Brent, A. C., Pagan, R. (2011), ISBN 978-1-880611-87-6. SETAC press.
In the US 5$, in Europe ca. 30 € due to customs taxes (!)

2. Code of Practice for Environmental LCC: Key Messages

LCC CoP: Key Messages

- A definition for LCC, including a definition of what is assesssed as cost
- LCC modeling structure parallel to an LCA
- Functional unit
- System boundary
- Time and discounting
- Allocation

→ What is Environmental LCC

Life Cycle Costing summarizes all costs associated within the life cycle of a product that are directly covered by one, or more, of the actors in the product life cycle (e.g. supplier, producer, user/consumer, End-of-Life actor).

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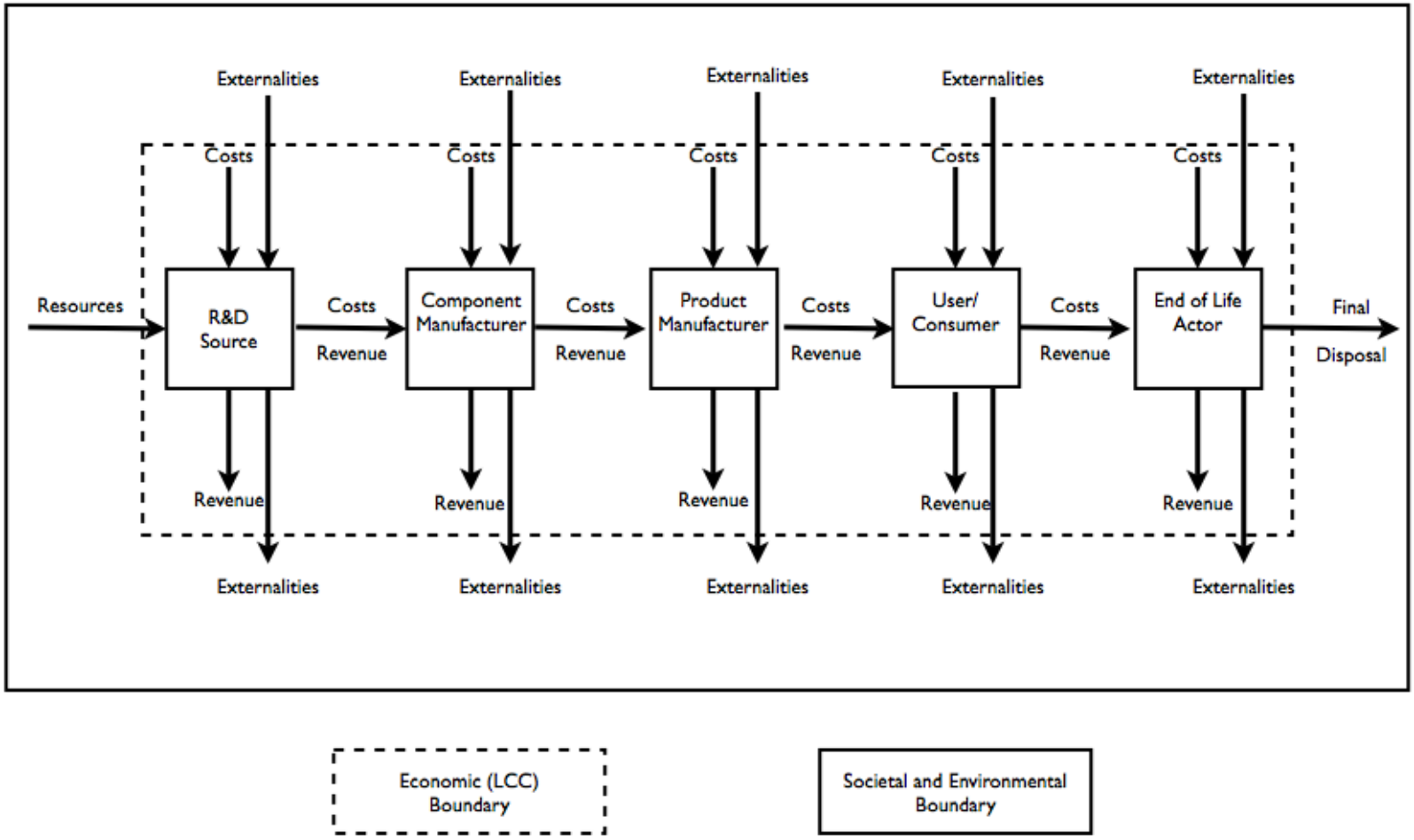
Costs are the monetary value of goods and services that producers and consumers purchase (real money flows)

→ What is Environmental LCC



Rebitzer, G., Hunkeler, D. 2003. Life cycle costing in LCM: Ambitions, opportunities, and limitations – Discussing a framework. Editorial, International Journal of Life Cycle Assessment 8(5):253-256.

→ LCC modeling structure parallel to an LCA

ISO 14040 as reference used when writing the CoP

Also the phases are the same:

- Goal and scope
- Life Cycle inventory & impact assessment
- Interpretation

(albeit a cost inventory usually is also the cost assessment)

→ Functional unit

- Functional unit is a central concept for Environmental LCC, just as in LCA.
- For an Env. LCC, the functional unit shall be defined in a similar manner as for an LCA
- When Env. LCC is meant to be conducted in parallel to an LCA, the functional unit needs to be identical.

  (otherwise, no consistent overall result)

→ System boundaries

- System boundaries need to be clearly defined and documented
- When Env. LCC is meant to be conducted in parallel to an LCA, system boundaries for both need to be equivalent.

  (NOT identical!)

  (e.g., R&D relevant for costs, EoL relevant for the environmental impacts)

→ Perspectives, and cost types

- An LCC reflects the perspective of one or several life cycle actors
- An LCC creates a Cost Breakdown Structure (CBS) for the product
- This CBS structures elements of the product under study, for each life cycle stage considered, in different cost types
- The cost types depend also on the perspective

→ Time, discounting

→ Time, discounting

- In (conventional) LCC, time is usually considered, especially for long-living goods
- If it is considered, then costs are usually discounted
- While in LCA, time is usually ignored

Application: $P(T) = 1/(1+r)^T$

With:

P(T): discount factor; a future cash flow multiplied with P yields the value of a present cash flow;

r: Discount rate (usually in [%])

T: Time units (usually years)

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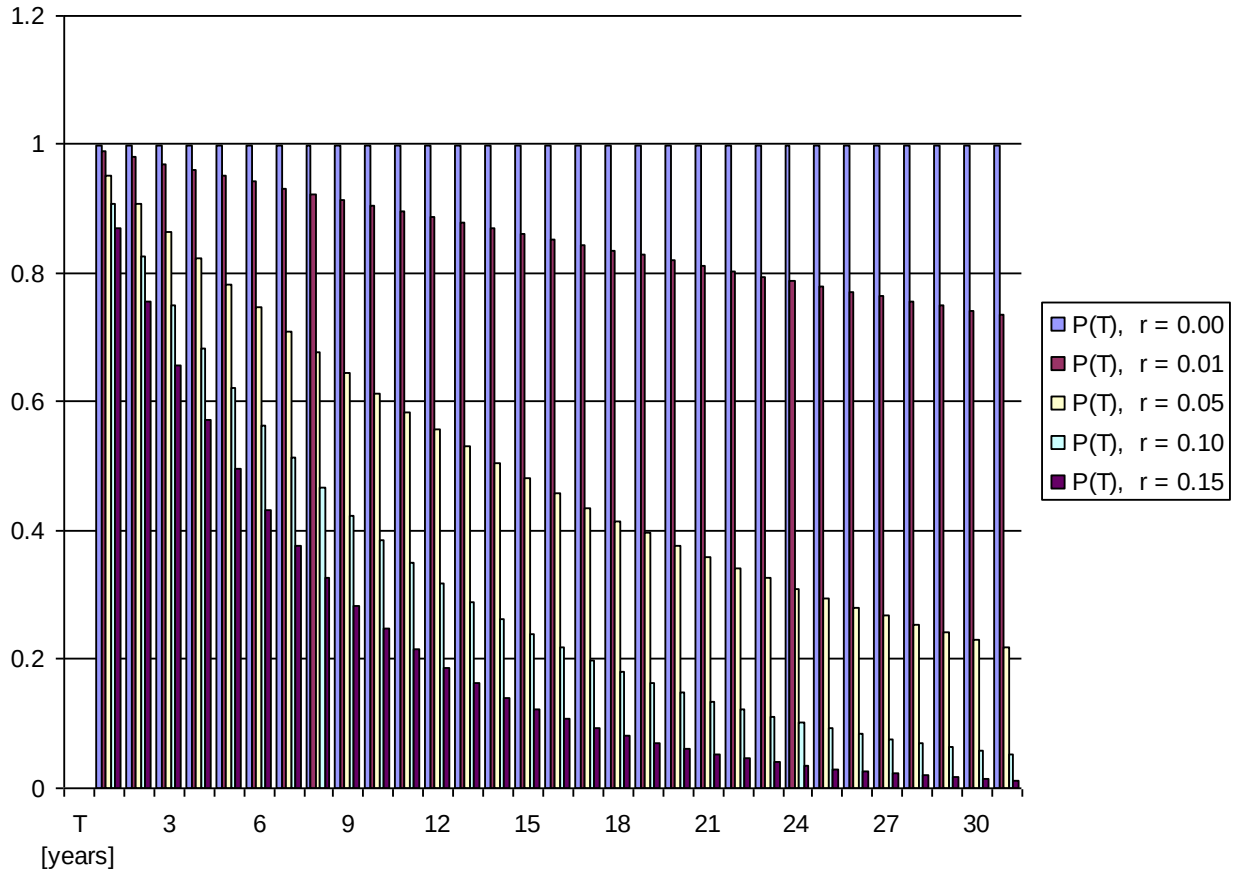
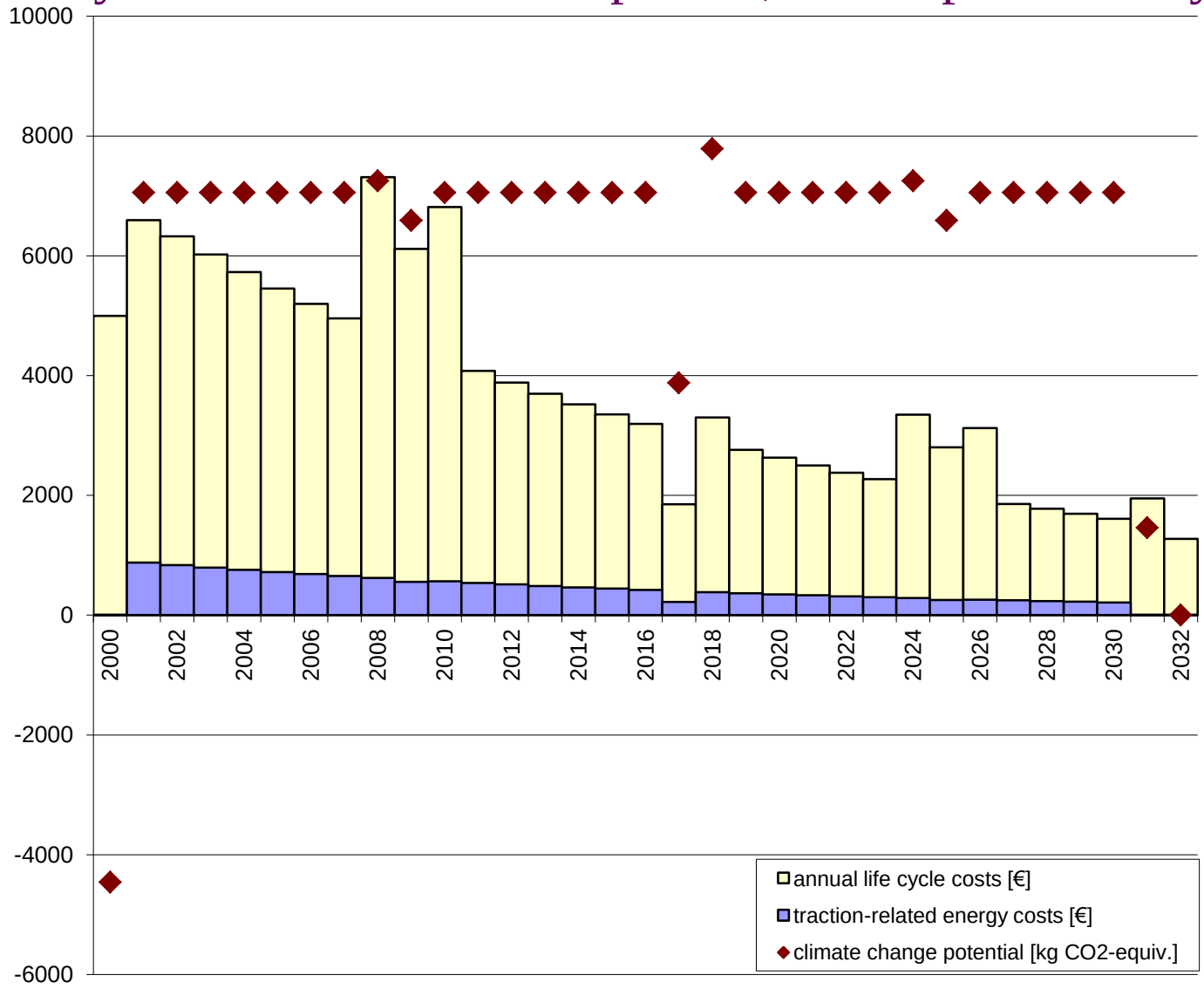


→ Time, discounting, example:

Study on German train component, to be operated 30 years



→ Allocation

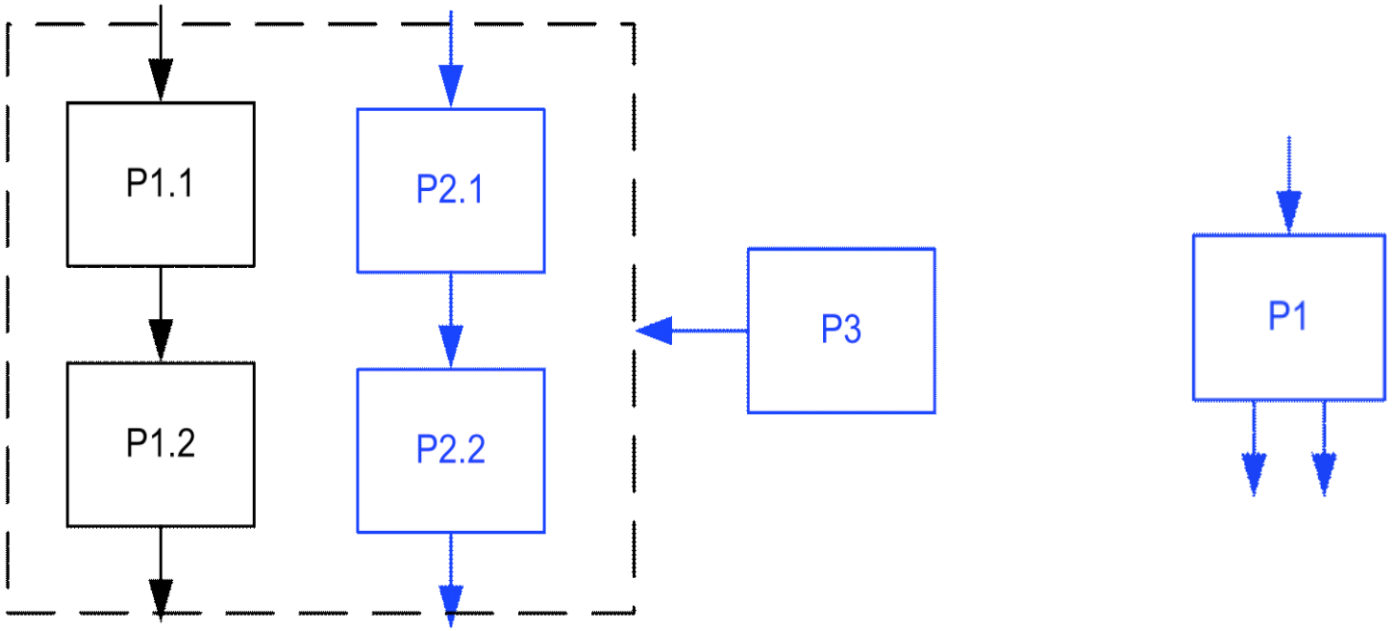
- Allocation (assignment of burdens to more than one product) is a very common problem in LCC, and often decisive

CoP:

- avoid allocation;
- reduce the amount that needs to be allocated (Activity based costing instead of other cost accounting methods);
- specialty: Often no direct material flow between processes that need to be considered in allocation (insurance rate for production building)

→ Allocation

- speciality: Often no direct material flow between processes that need to be considered in allocation (insurance rate for production building)



3. Attempt for a critical evaluation

CoP: Critical Evaluation, 1

- CoP proposes an LCC approach that fits to (environmental) LCA.
- This is a large step forward, and possible without „deforming“ LCC.
- It is needed since there are many LCC approaches, with often very different results when applied, and LCC is usually applied not in LCA-context
- The CoP is short and general. It tries to illustrate ist points by case studies, but often does not give a final recommendation
- This is good and fully justified (we think) since the final decision needs to be flexible and fit to a specific case

CoP: Critical Evaluation, 2

However,

- Costs are not natural science figures, but percieved value.
- When applied in the context of LCA, LCC results are often too easily accepted.
- Probably more guidance is needed on how to collect data for LCC, and how to quality-asssure, and review, an LCC study in the context of LCA

→ We invite everybody to apply the LCC CoP, and to report about the experiences!

4. Environmental LCC, what's next

What‘s next

- (some say that) the LCC Code of Practice is suitable for a standardisation
- Eco-efficiency standardisation is ongoing but almost complete; costs are one part but how to perform the cost assessment is not detailed in the draft standard → leaves room
- On the other side, more guidance on data collection and quality assurance, review for environmental LCC is needed

Many thanks.

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