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Higher education and sustainability

sustainable development

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The (minimum) context of sustainable development.

	Planet	People	Profit/Prosperity
Externalities (costs or benefits)			
Private costs or benefits			

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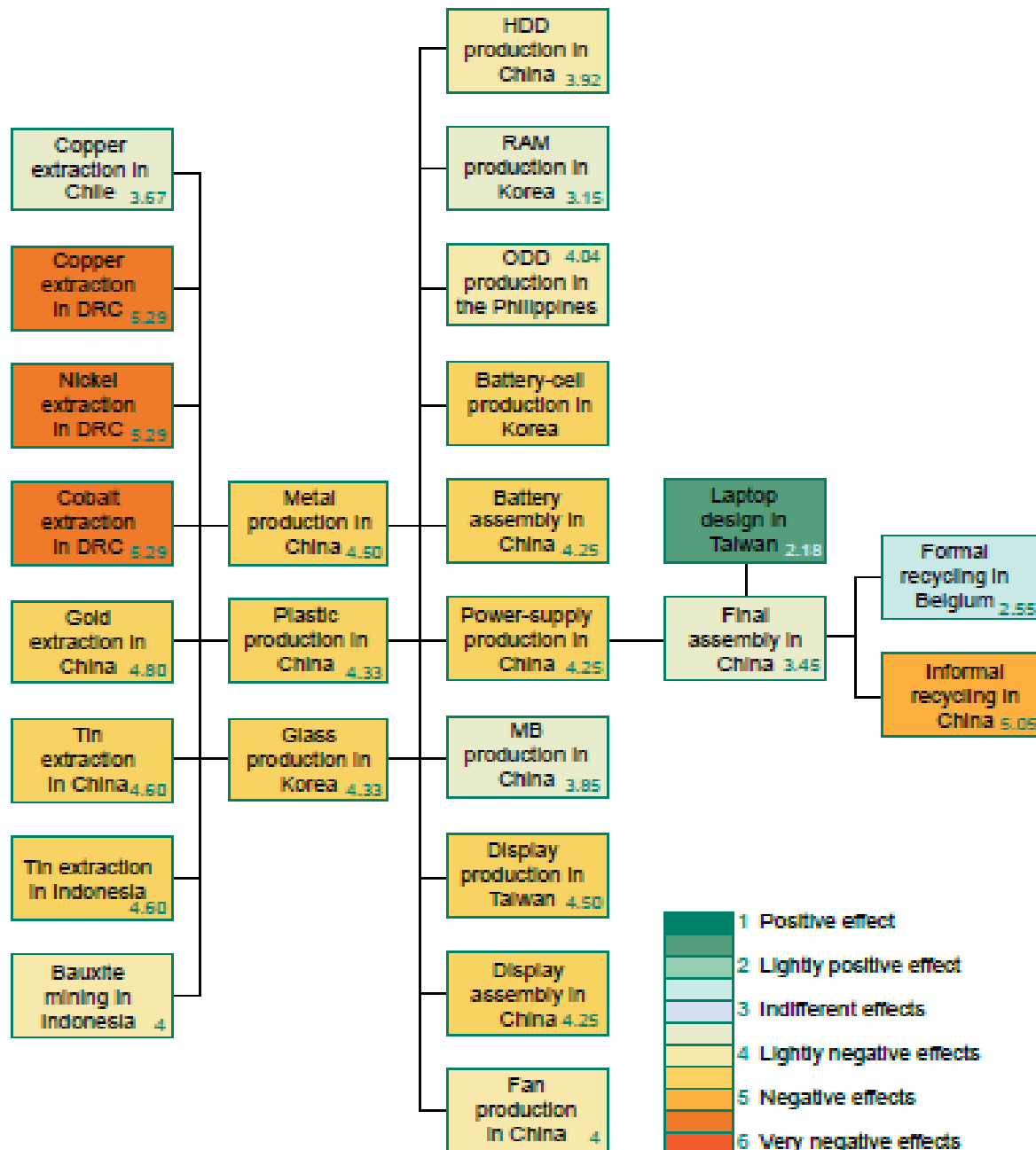
First input for the panel discussion:

(Higher) Education is not neutral, is not free from values.

IDO vzw choses for 'Education *__for__* sustainable development'

Sustainable development > sustainability (i.e. 'planet')

Sustainable development is about 'wicked problems' (1)

Therefore a student in higher education should be learning ...

- how to ask critical questions;
- which values he or she stands for;
- how to develop more positive and sustainable futures;
- how to think systematically;
- how to reacting through applied learning;
- how to explore the tension between tradition and innovation.

Source: Tillbury D. (2011), Van Dam-Mieras R. (2012)

Sustainable development is about 'wicked problems' (2)

… but there is more. At the 2nd Conference on 'Engineering Education for Sustainable Development' (EESD 2004) the Barcelona Declaration was drafted.

The preamble underlines the challenges to achieve " *a more just society based on respect for nature and human rights, and demands a fairer economy and greater solidarity towards different cultures and future generations.*"

The declaration itself describes the (future) abilities of an engineer, the way engineering education and the educational process is organised.

"*Incorporate disciplines of the social sciences and humanities.*" is one of the 8 goals of organising engineering education.

**Engineering Education for *Sustainable Development,*
as outlined in the Declaration of Barcelona ?**

"*It seems little progress has been made at universities, including inter
alia engineering faculties, over the last ten years
to cope with the cited challenges
by stimulating interdisciplinarity and setting up multidisciplinary teams.*"

Cited from the paper for EESD 2013 (Mazijn B. et al).

Engineering Education for *Sustainable Development*. A couple of observations in that regard.

- One of the main reasons is that disciplinary 'silos' (faculties, departments …) at universities are not a stimulating environment for communicating with experts who speak different 'languages'.

- Note that within this context 'interdisciplinarity' should go beyond working together in a team of people all with an engineering background and/or coming from natural sciences.

- It should be about setting up interaction between engineering and social sciences.

"Are we really educating about sustainability?"
(Koppelman, 2013)

Second input for the panel discussion:

There are almost no opportunities in higher education …

- to educate about sustainable development;

- to train the required competencies;

- to work in a inter- and multidisciplinary setting.

An example of a possible course/setting: Life Cycle Sustainability Assessment (LCSA)

Life Cycle Sustainability Assessment (LCSA)

is a technique that aims to assess

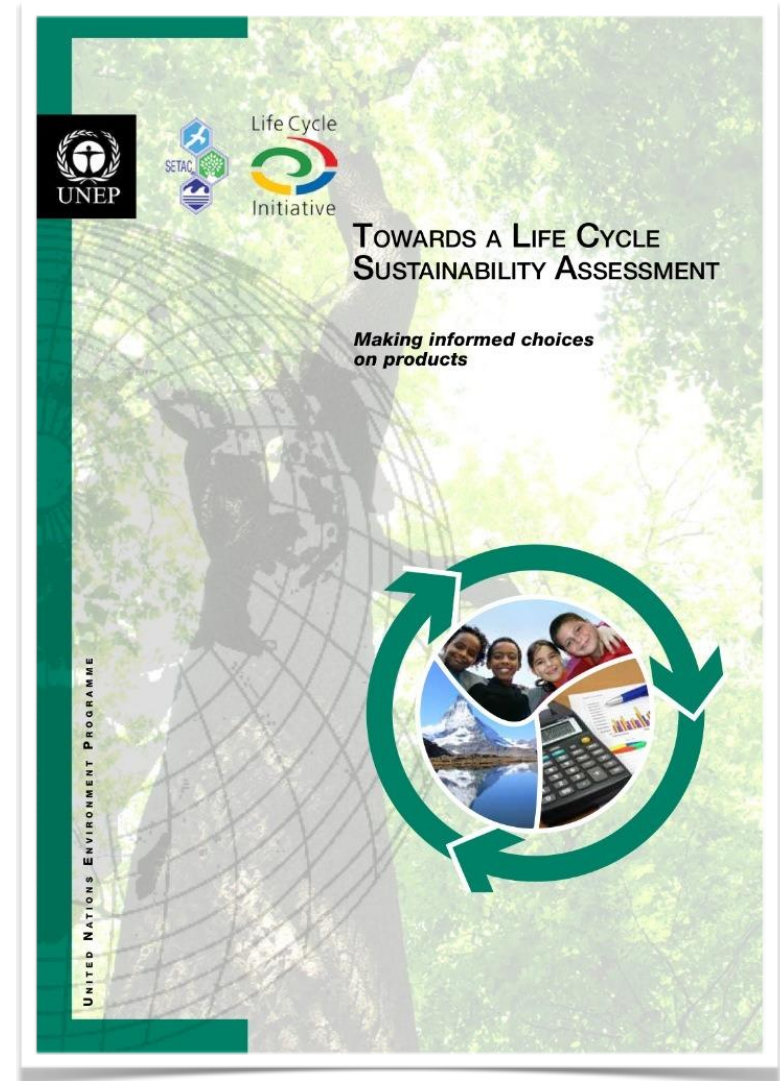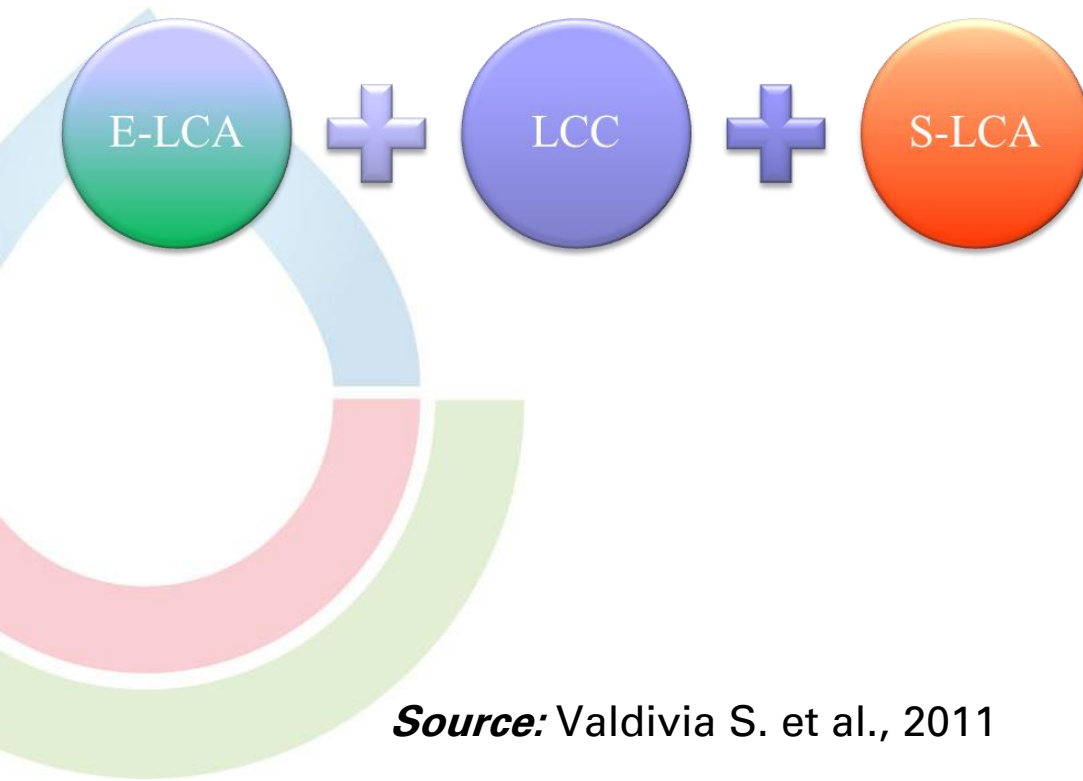the environmental, social and economic aspects of products

and their potential positive and negative impacts

along their life cycle,

encompassing extraction and processing of raw materials,

manufacturing, use, re-use, maintenance, recycling and final

disposal.

Bron: adapted from Benoit C. en Mazijn B. (Eds.), 2009

LCSA: integration of 3 techniques

Source: Valdivia S. et al., 2011

Education in LCSA: experiences.

From education experience (Belgium, Brazil, Germany and Peru), incl. the interaction with students/participants,
the following points can be made:

- participants in training sessions and students at universities are interested to learn, preferably in an inter- and multidisciplinary setting, about all dimensions of sustainable development through e.g. a tool for evaluating the sustainability of products and their global value chains;

- students are learning to deal with other types of problems;

- there is a difference of learning with regard to the maturity of participants/students and the duration of the training/teaching: educational material should be adapted accordingly.

Third input for the panel discussion:

- There are possibilities for curricula (e.g. LCSA) to cope with the challenges expressed inter alia in the Barcelona Declaration

- Students looking for an answer on the question 'What is a sustainable product?' by using LCSA are learning to deal with *complexity* and *uncertainty*; differences in *system boundaries*, *quantitative versus qualitative indicators*, *stakeholder involvement*, etc.

Sources

- Benoît C. and Mazijn B. (Eds.), *Guidelines for social life cycle assessment of products - A social and socio-economic LCA code of practice complementing environmental LCA and Life Cycle Costing, contributing to the full assessment of goods and services within the context of sustainable development*. UNEP-DTIE, Paris, 2009, 104 pp.

- Ciroth A. and Franze J., *LCA of an Ecolabeled Notebook - Consideration of Social and Environmental Impacts Along the Entire Life Cycle*. Berlin, 2011, 409 pp.

- Koppelman J.. (2013). *Are we really educating about sustainability?* The Journal of Sustainability Education, online http://www.jsedimensions.org/wordpress/content/are-we-really-educating-about-sustainability_2013_06/.

- Mazijn B., Ciroth A., Ugaya C. and Valdivia S., (2013), *Education in 'life cycle sustainability assessment': caring for all 3 P's in one.* Paper, Proceedings 6th Conference on 'Engineering Education for Sustainable Development', Cambridge.

- Tilbury, D. (2011), *Education for Sustainable Development: An Expert Review of Processes and Learning.* UNESCO, Paris.

- Van Dam-Mieras R., *L'education au service du développement durable*, pp. 147-164; en Mazijn B. et Gouzée N., La société en movement. La Belgique sur la voie de développement durable? ASP Editions, Bruxelles, 2012.

- Valdivia S. et al. (Eds.), *Towards a Life Cycle Sustainability Assessment - Making informed choices on products.* UNEP-DTIE, Paris, 2011, 64 pp.

Key Questions

Circular Economy: how is design for scarcity or recycling for scarcity introduced into the curriculum? what about the inter- and intrasectoral competition for resources?

Technological <u>and</u> societal innovation: how does it influence the curriculum of engineers? what about stakeholder involvement? …

Multi-, inter- and transdisciplinarity: how are courses set up for developing these capabilities? how far does this multi-, inter- and transdisciplinarity work in practice?

Innovative teaching technology/organisation: are there good examples in engineering education of 'massive open online courses', 'small private online courses', 'open educational resources', virtual communities of practise, etc.?

Lifelong learning: are the examples of on the job training?

www.eesd2016.org

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