

3rd Pan European Days of Environmental Education Toward Sustainability

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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			

Source: adapted from Valdivia S. et al. (2011)



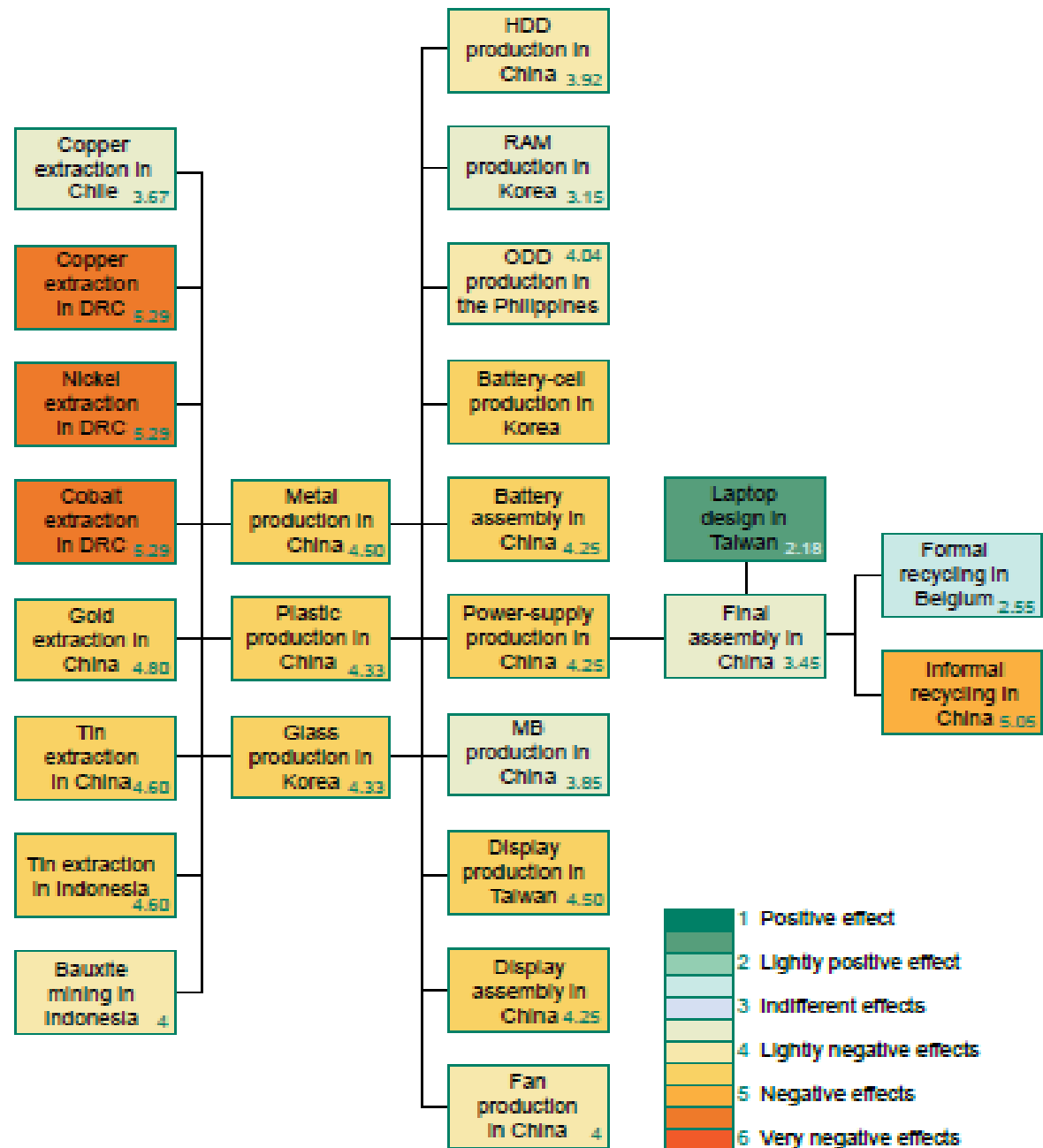
➤ L'Ecolabel européen

➤ Les produits

➤ Les critères

➤ Les nouvelles

➤ Les témoignages



Source: Ciroth A. et Franze J. (2011)

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 react 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 peers 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 an 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

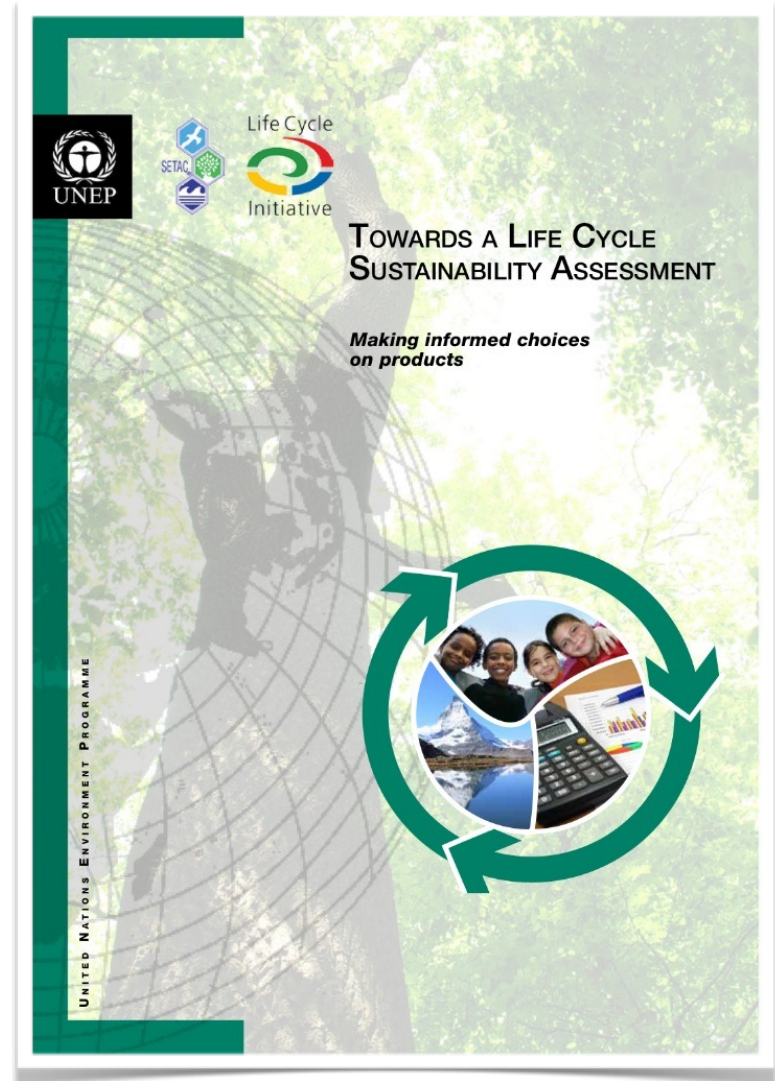
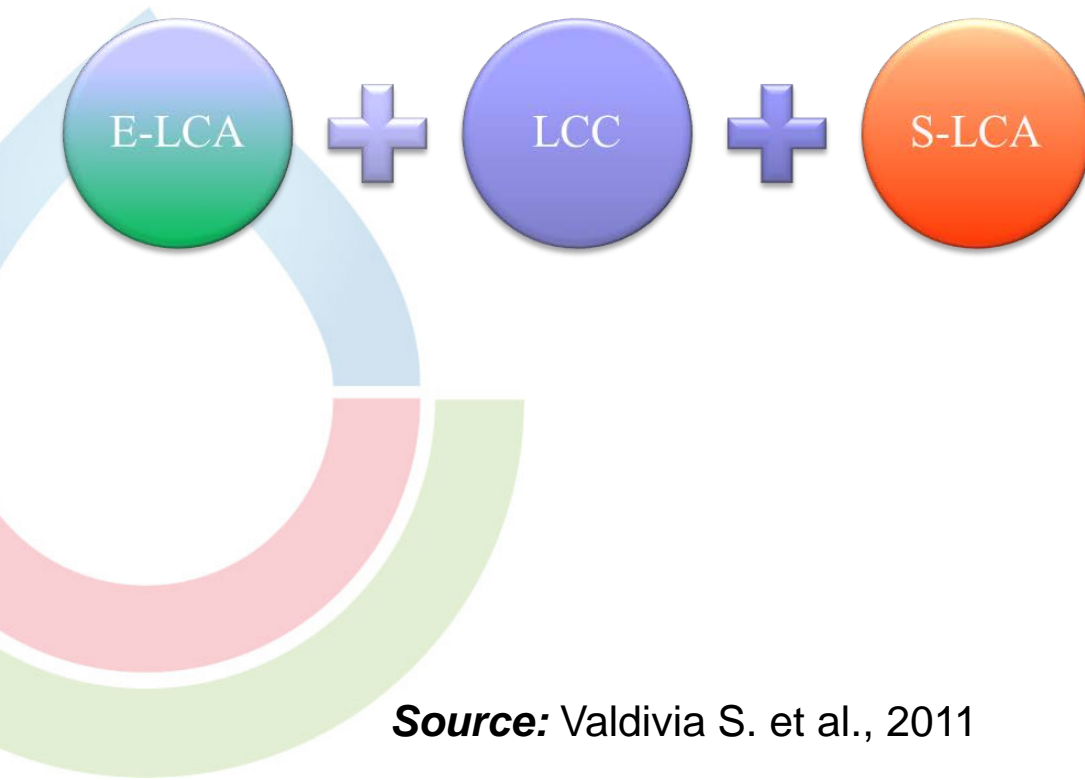
and their potential **positive and negative impacts**

along their life cycle,

encompassing extraction and processing of raw materials,

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

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;
- a difference of learning can be observed with regard to the maturity of participants/students and the duration of the training/teaching.

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

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EESD2016

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Building a circular economy together

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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 and 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 there examples of on the job training?

www.eesd2016.org



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