ライフサイクルアセスメント
生命週期評估
전 과정 평가
வாழ்க்கை வட்டப் பகுப்பாய்வு
ارزیابی چرخه عمر
Evaluarea Ciclului de Viață
Posuzování Životního Cyklu
Bizi zikloaren analisi
Olelusringi hindamine
Lífsferilsgreining
Levenscyclusanalyse
Livscyklusvurdering

Lessons learned from assessing life cycle impacts for an environmental product declaration:
Examples for run-of-river power plant

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SBE 2019
Graz, 12.09.2019

Lessons learned from assessing life cycle impacts for an environmental product declaration (EPD): Examples for run-of-river power plant

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SBE 2019

Graz, 12.09.2019

Who are we?

Dr Niels Jungbluth

Christoph Meili

Over 20 years of experience in life cycle assessment

Clients from industry, NGOs, administration, universities

Founded 1998 as an ETHZ spin-off

Own LCA database with more than 6'000 datasets

EPD-related projects in 2018

- **EPD of our own consulting services**

- EPD on run-of-river power plants

- Revision of a PCR for electricity

- Review of an EPD on concrete products

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EPD of our own consulting services 2018
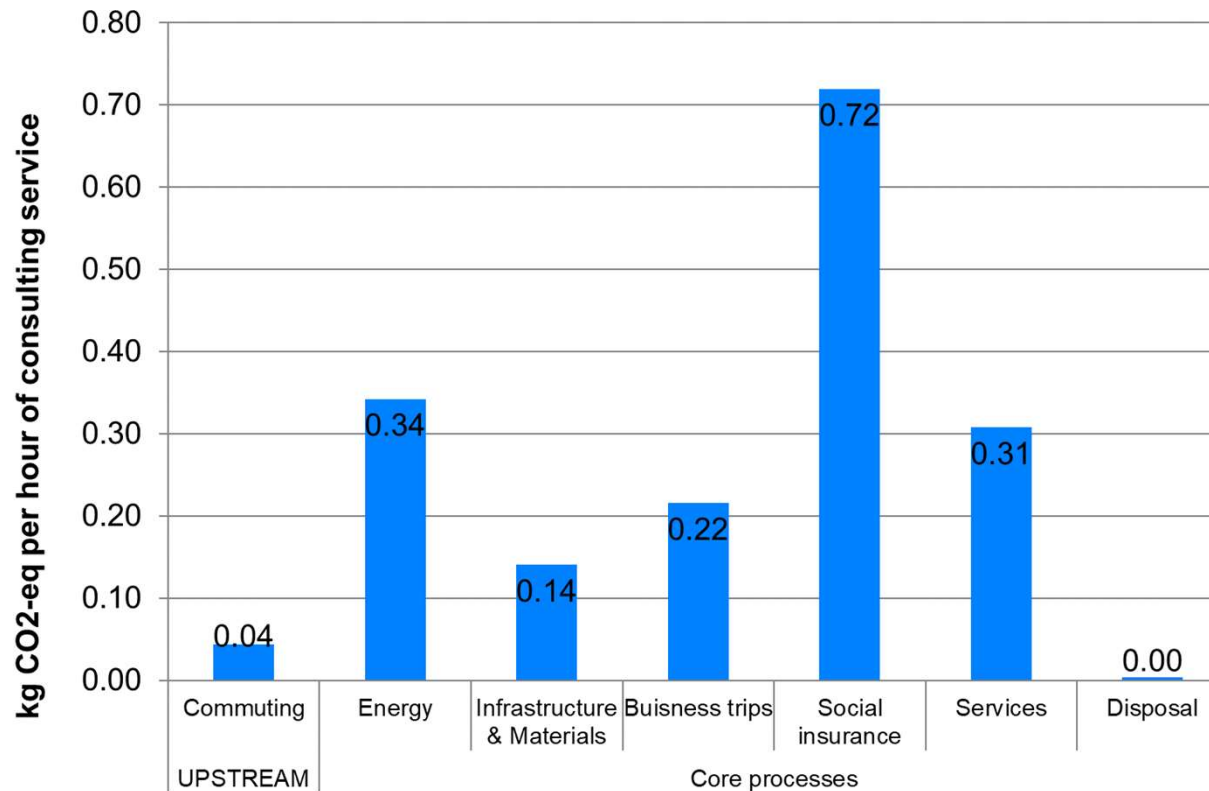
> ➢ ~1.5kg CO2eq per hour is low. This value would already have doubled if one person would have taken a business class trip by plane to e.g. New York and back!

EPD-related projects in 2018

- EPD of our own consulting services

- **EPD on run-of-river power plants**

- Revision of a PCR for electricity

- Review of an EPD on concrete products

➢ What were the main challenges faced?

➢ How could EPD and PCR be improved to simplify consulting and interpretation by customers?

Example: Run-of-river power plant

Goals:

- Show improvement options to operator

- Give rough estimate for comparison with other electricity sources in the portfolio of the operator

Parameter model


➢ **Allows managers to gain their own insights**

Selected challenges

- Which standard (ISO, EN) and Product Category Rules (PCR) to apply?

  - How to draw system boundaries accordingly?

  - Which life cycle impact assessment methods match the standard?

  - How to obtain requested information from LCI data which are not included in LCIA-methods?

- How to build an appropriate model in the LCA-software of choice?

- How to set findings in perspective and foster encouragement/improvement?
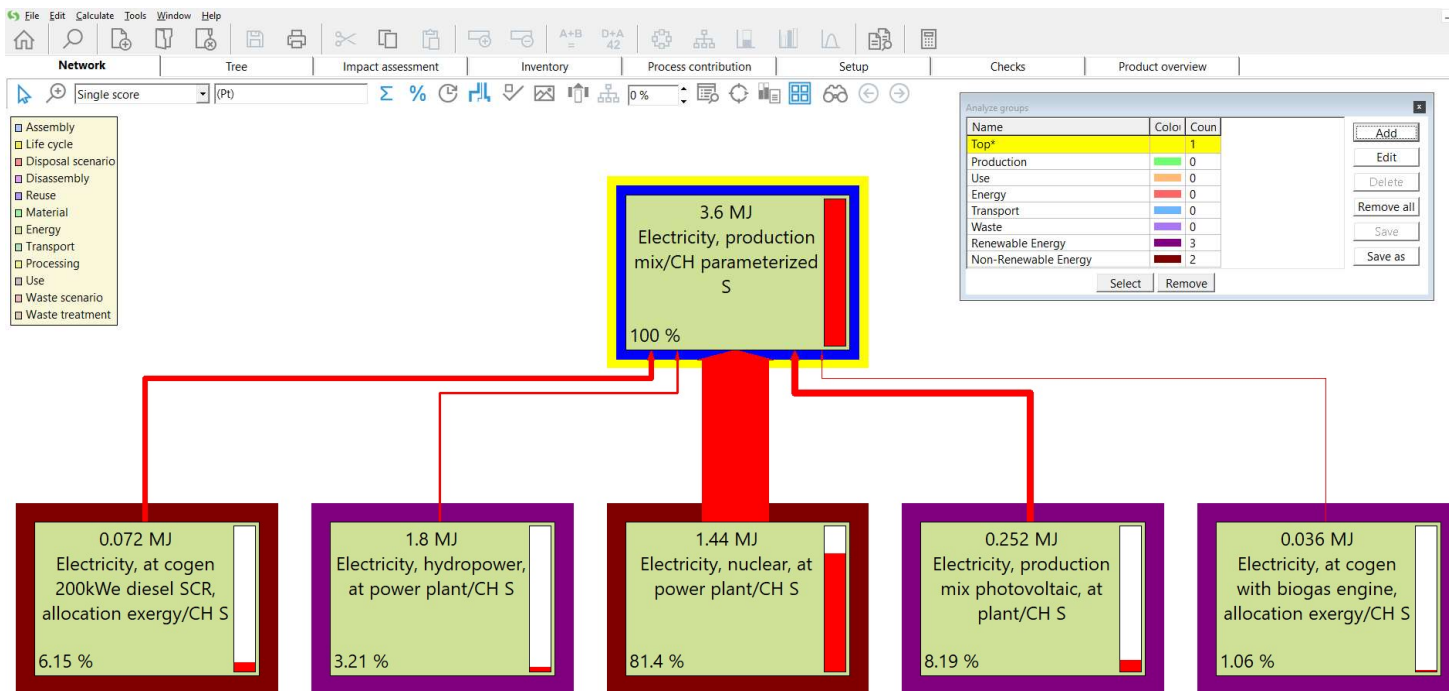
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Issue: LCI system boundaries

System boundaries have to be drawn following a predefined pattern, depending on the product under investigation:
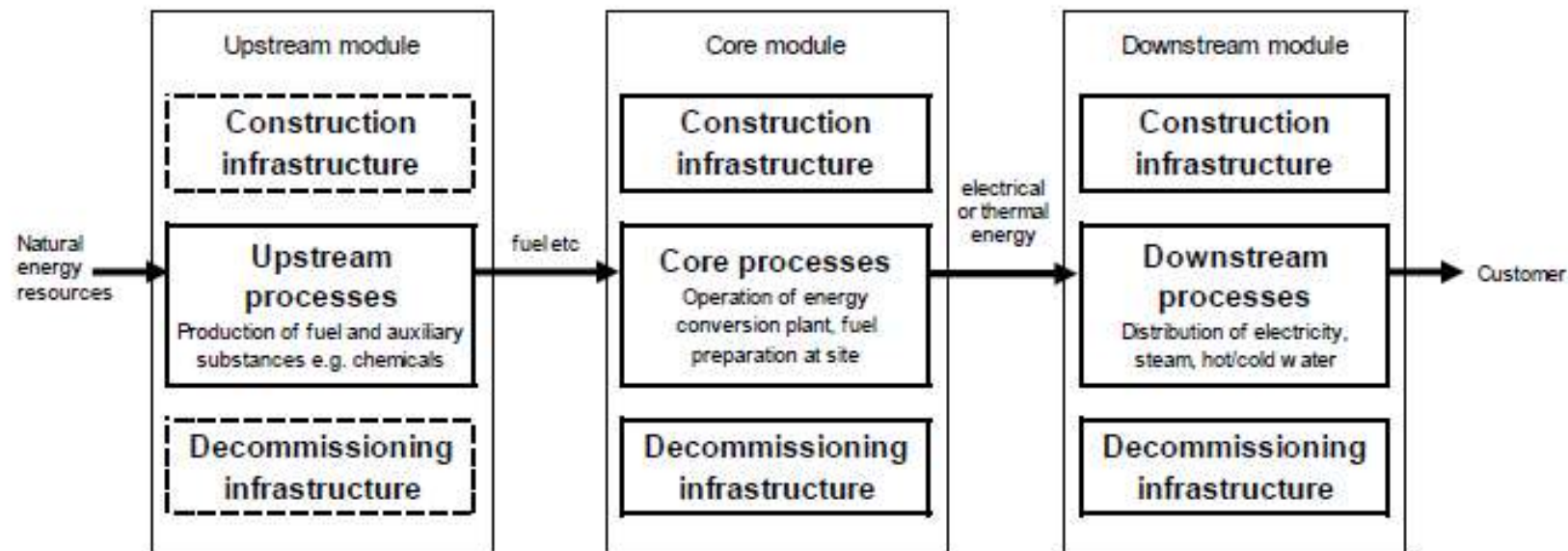
Solution: LCI system boundaries

System boundaries can be distinguished in SimaPro using the analysis-group function in network-view:

Issue: environmental impact categories

- EPD (2018) in SimaPro 9.0

- 8 LCIA indicators

- Based on environdec

www.environdec.com/Creating-EPDs/Steps-to-create-an-EPD/Perform-LCA-study/Characterisation-factors-for-default-impact-assessment-categories/

Environmental impacts				SimaPro
PARAMETER			UNIT	**Use EPD (2018) method**
	Fossil		kg CO2 eq.	/Inventory/GWP/fossil or ow n LCIA method
Global w arming potential	Biogenic		kg CO2 eq.	/Inventory/GWP/biogenic or ow n LCIA method
	Land use and land transformation		kg CO2 eq.	/Inventory/GWP/land transformation or ow n LCIA method
	TOTAL	GWP	kg CO2 eq.	EPD (2018)
Acidification potential		AP	kg SO2 eq.	EPD (2018)
Eutrophication potential		EP	kg PO43-eq.	EPD (2018)
Formation potential of tropospheric ozone		POCP	kg C2H4 eq.	EPD (2018)
Abiotic depletion potential – Elements		ADP	kg Sb eq.	EPD (2018)
Abiotic depletion potential – Fossil fuels		ADP	MJ, net calorific value	EPD (2018)
Water scarcity potential		WSP	m³ eq.	EPD (2018)

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Additional indicators

- Use of resources (PERE, PERMSM, NRSF, ...)

- Waste production (HWD, NHWD, RWD)

- Output flows for further use (CRU, MFR, MER, EEE, EET)

- Important are further instructions in the general description
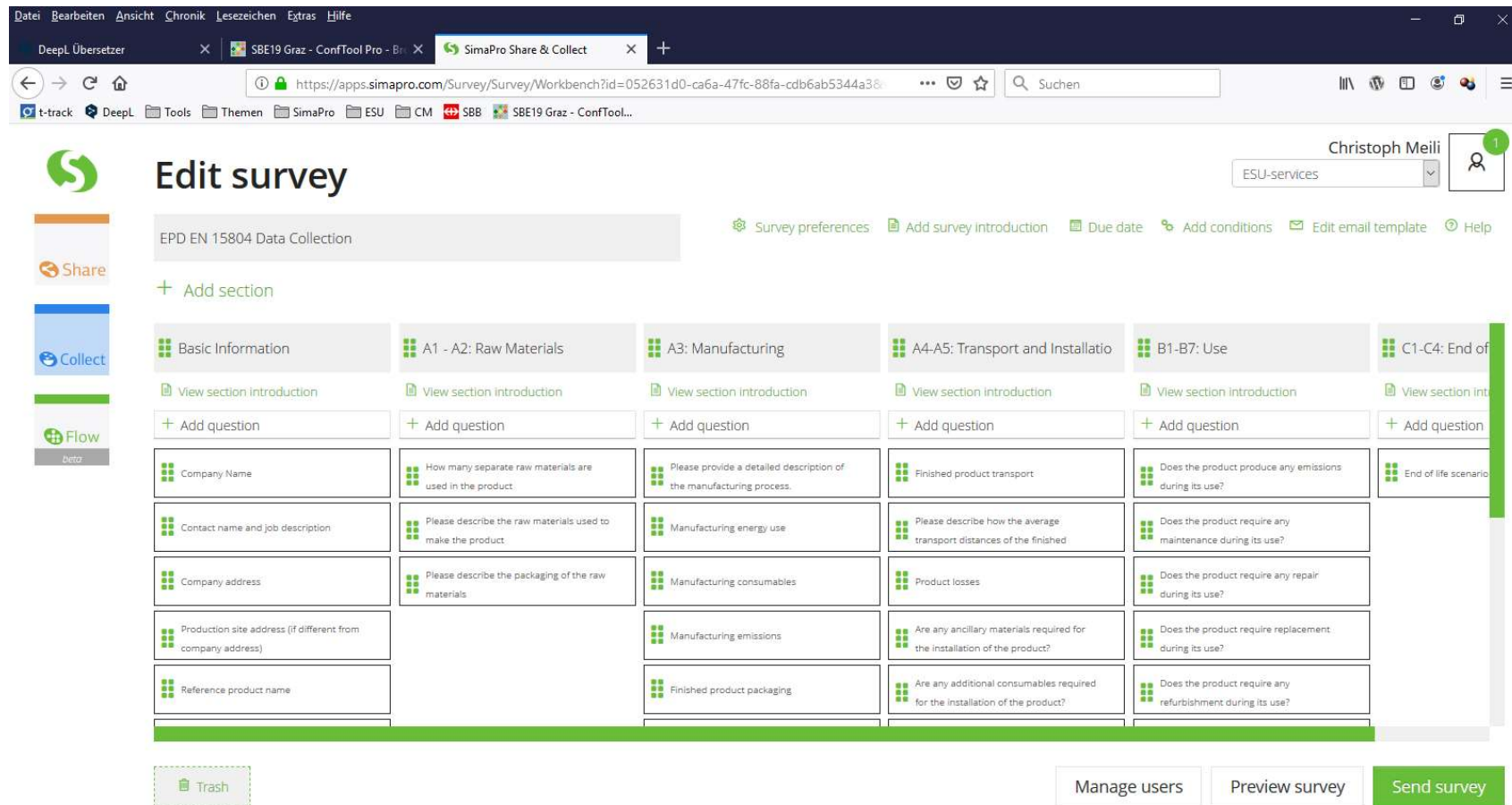 www.environdec.com/contentassets/95ee9211a9614f1faa7461ff32cecc91/general-programme-instructions-v3.0.pdf

Recommendations for PCR

- Concentrate on main LCIA indicators

- Skip non-LCA indicators (internal waste flows, material/energy differentiation of resources), or

- Give clear guidance how to measure and report these flows

- Report less, but more comparable information

- Request unit process raw data as an annexe

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Recently available supporting tools for EPDs in common LCA software-packages:

- Include an LCIA methodology with which one can easily access the available indicator information requested by the EPD-framework.

- Include an EPD-related questionnaire which might be directly linked to the LCA-project-model

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Survey: Might be done with SimaPro Collect

Automate data collection and analysis with tools like SimaPro Share&Collect

Collect allows to link a model prepared with Flow

The connection between the collection form and the model is:

- Tailored: User can only pick from datasets with simple names as listed by the Expert

- Dynamic: Data entered are visible in the model in real-time

- Collaborative: Support feature is available in-app

- Traceable: Data entered by the user are saved even if modified by the expert afterwards

→ http://esu-services.ch/simapro/sharecollect/

Use a Report Maker Tool

- Link Word or Excel to parameterized model from LCA-software

- Automatize reporting for several similar products

- Update the whole report with one click

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Conclusions

- There are many tools available for assistance

- Still, there is a need for clearer, harmonized guidance

- Reports, PCR, EPD and practitioner should have a clearer focus and should keep the goal for improvement in mind.

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