

# GreenDelta<sup>TC</sup>

sustainability consulting + software

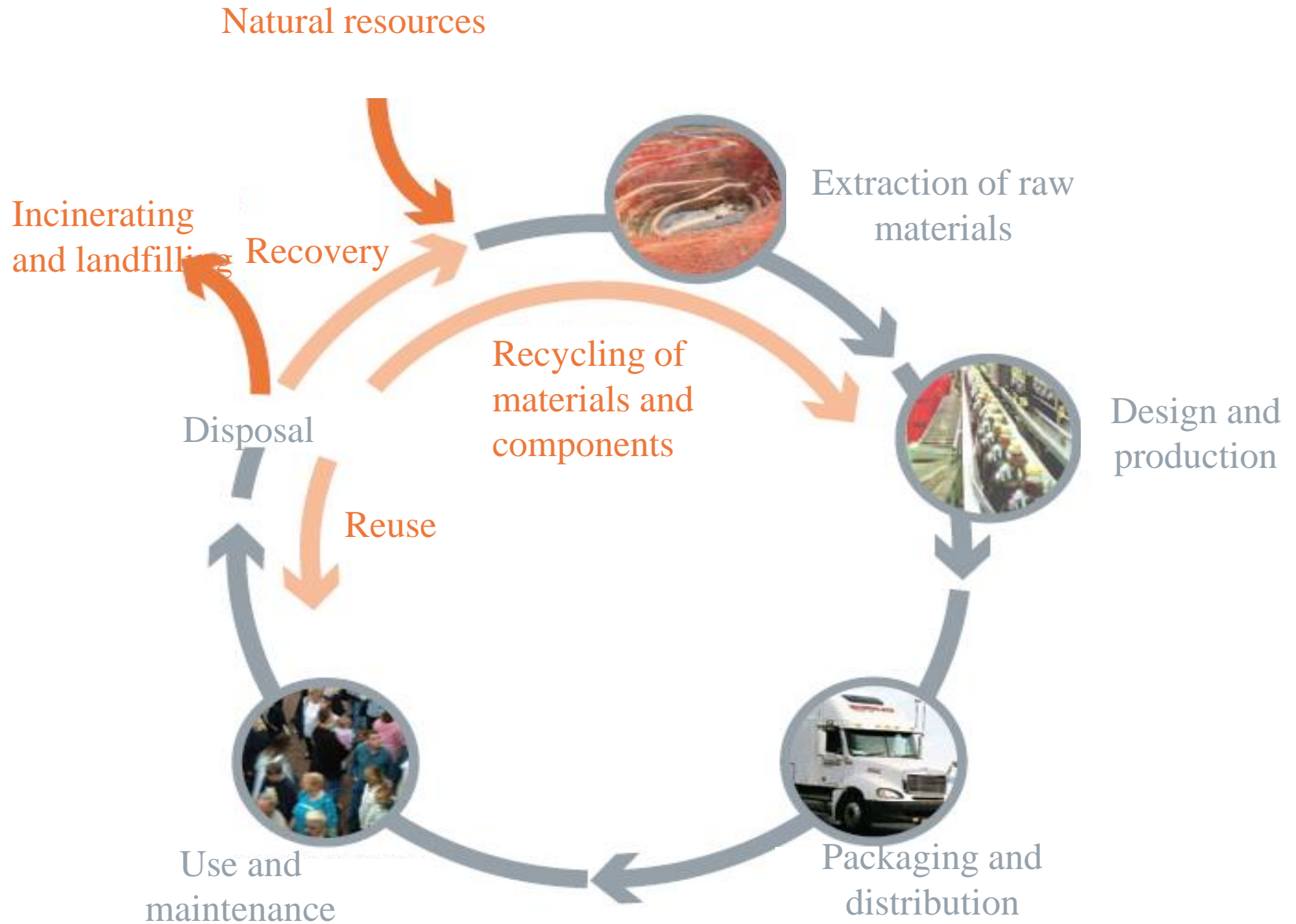
## Social And Environmental Life Cycle Assessment of a Laptop: Methodology, Key Policy Issues/Implications, and Lessons Learnt

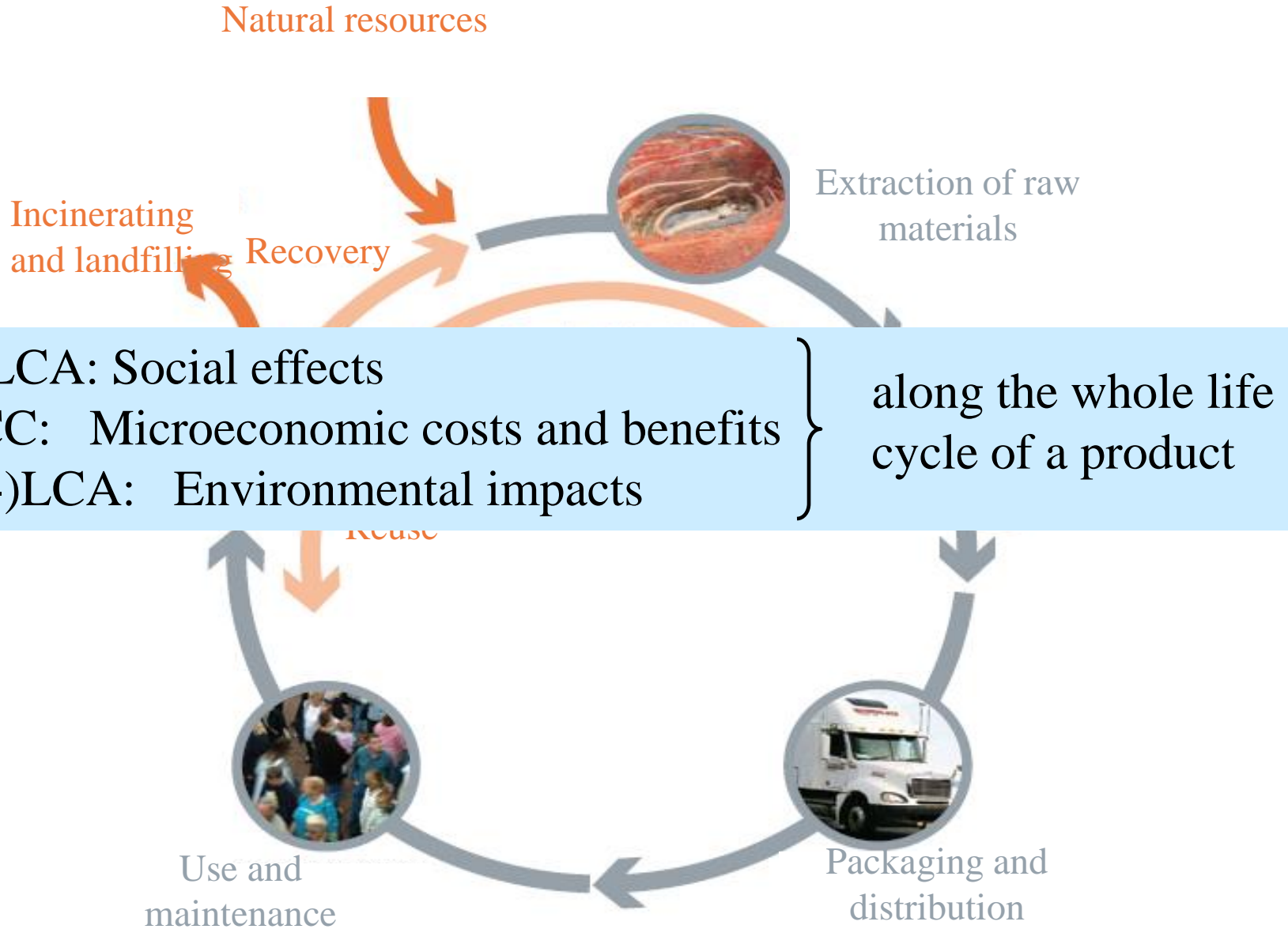
Dr. Andreas Ciroth, Juliane Franze, GreenDeltaTC Berlin  
Paris, October 18, 2010

# Agenda

1. Background
2. A case study:  
Social and Environmental LCA for a notebook
  - a. Goal
  - b. Approach
  - c. Results
  - d. Discussion
3. Conclusions

# 1. Background: LCA+





## (Environmental) LCA

- Holistic picture of the environmental impacts of a product, over its entire life cycle
- More than 20 years of experience
- Meanwhile growing support from policy and industry
- Software available
- Databases available for many products
- „LCA light“: Footprinting approaches (carbon, water)

## Social LCA

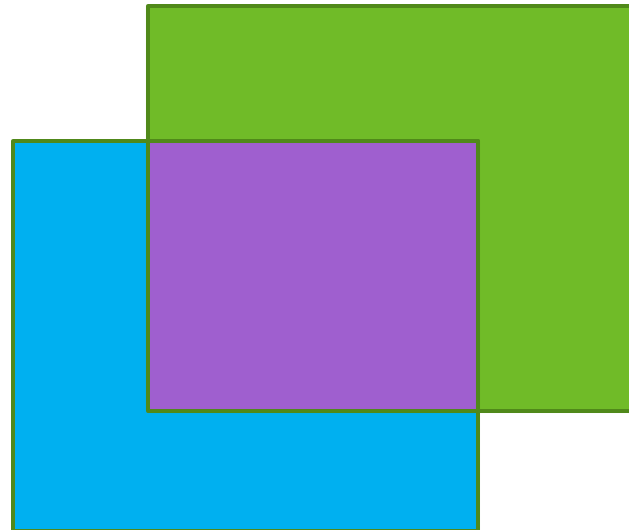
- Holistic picture of the **social** impacts of a product, over its entire life cycle
- **Recently developed in an international UNEP/SETAC Working Group**
- **High interest** from policy and industry
- **No** software available
- **No specific** databases available

## Social LCA

- Holistic picture of the **social** impacts of a product, over its entire life cycle
- **Recently developed in an international UNEP/SETAC Working Group**
- **High interest** from policy and industry
- **No** software available
- **No specific** databases available
- **Often qualitative**
- **Social impacts can be positive or negative**
- **Inherently subjective**

## Social LCA & (Environmental) LCA

- Identical object of study, “functional unit“
- Equivalent system boundaries
- A large amount of shared data (product structure, life cycle information)



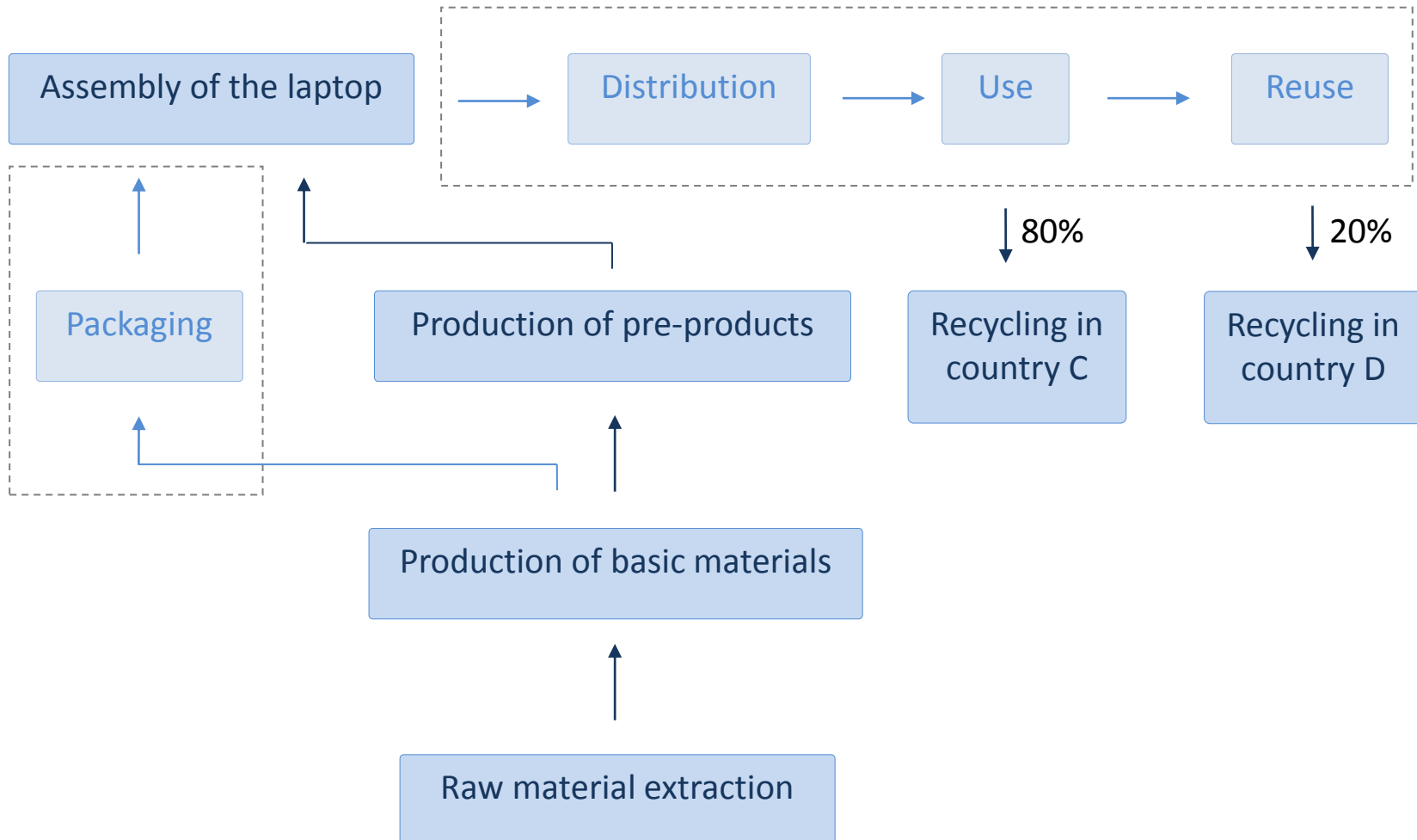
2. A case study:

Social and Environmental LCA  
for a notebook

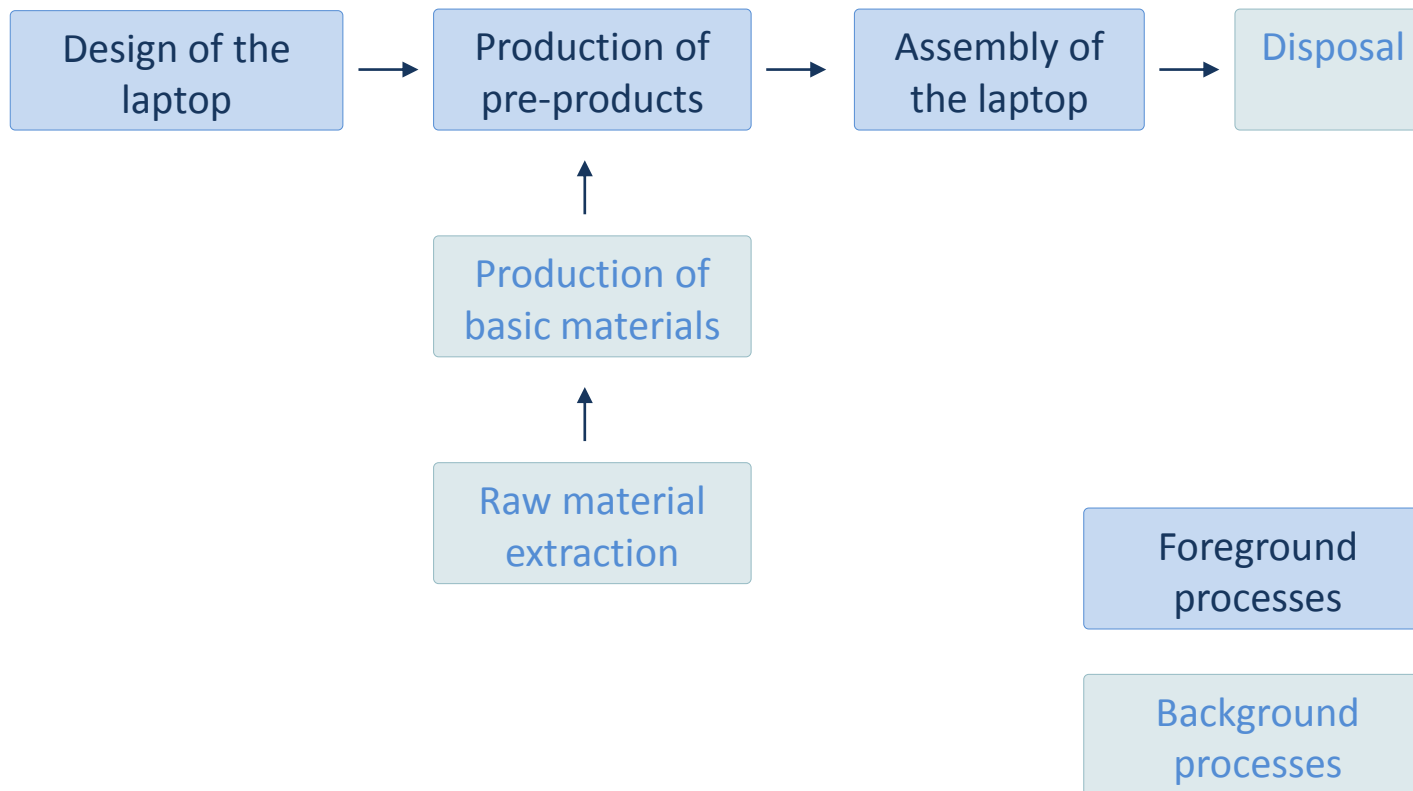
# Goal

- Application of the UNEP/SETAC guidelines on a complex product
- Identification of social and environmental hot spots in the life cycle in order to improve the sustainable performance
- Derivation of conclusions, suggestions, recommendations

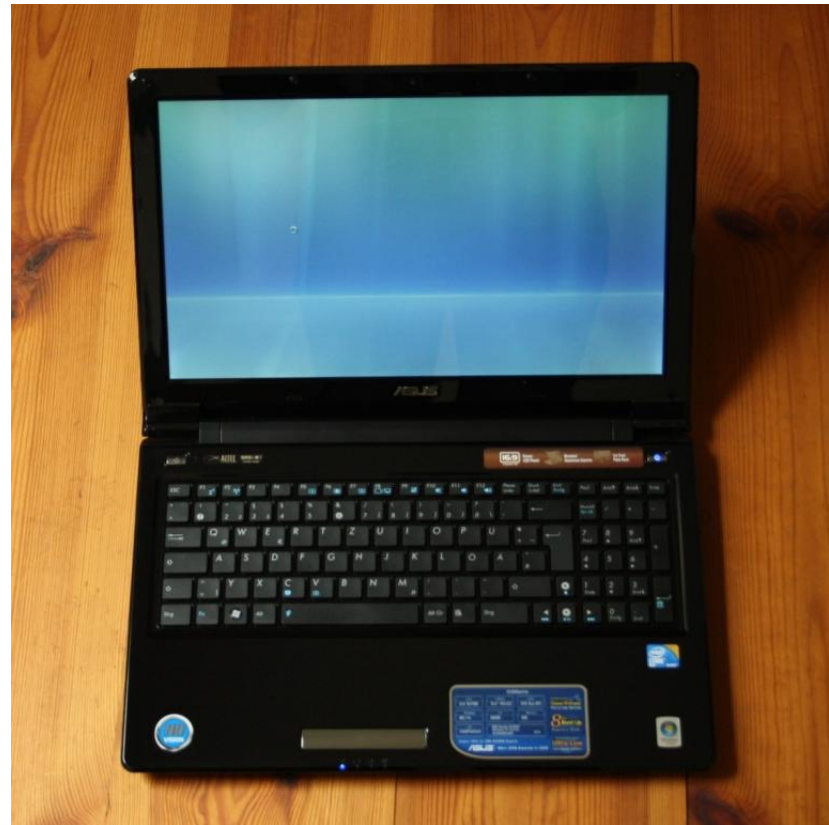
# Scope: System boundary



# Scope: Foreground and background processes




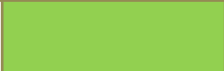
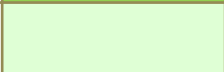



# Scope: Functional unit



# Method

- UNEP/SETAC guidelines as basis
- Determination of stakeholders, subcategories, and indicators
- Data sources for generic data:
  - governmental and non-governmental organisations
  - Internet research and literature review
- Data sources for company-specific data:
  - Corporate reports and websites
  - Reports from NGOs
  - Questionnaires
  - Interviews with workers
  - Internet research
- Application of own  
Social Life Cycle Impact Assessment method

# The rating scale used in the social Impact Assessment (S-LCIA)

Performance assessment	Colour	Impact assessment
Very good performance		Positive effect
Good performance		Lightly positive effect
Satisfactory performance		Indifferent effect
Inadequate performance		Lightly negative effect
Poor performance		Negative effect
Very poor performance		Very negative effect



# Raw material extraction – Copper from Country B

- Formal and informal mining sector
- Severe restrictions of union rights
- Unfair salary
- Occurrence of child and forced labour
- Hardly any safety measures
- Environmental pollution
- Mining sector is involved in war
- Migrant workers
- Use of outdated technologies
- Widespread corruption

Stakeholder group	Subcategory	Performance assessment							Impact assessment
			Wo	Hei	Hui	Soc I	Ind	Gove	
Worker	Freedom of association and collective bargaining	Red	✓	✓	✓	✓	✓	✓	Red
	Child labour	Yellow	✓	✓	✓	✓	✓	✓	Red
	Forced labour	Yellow	✓	✓	✓	✓	✓	✓	Red
	Fair salary	Yellow	✓	✓	✓	✓	✓	✓	Yellow
	Working time	Yellow	✓	✓	✓	✓	✓	✓	Red
	Discrimination	Yellow	✓	✓	✓	✓	✓	✓	Red
	Health and safety	Red	✓	✓	✓	✓	(✓)	✓	Red
	Social benefits/social security	Yellow	✓	✓	✓	✓	(✓)	✓	Red
Local community	Access to material resources	Yellow	(✓)	✓	✓	✓	(✓)	✓	Yellow
	Access to immaterial resources	Yellow	✓	✓	✓	✓	✓	✓	Yellow
	Delocalisation and migration	Yellow	(✓)	(✓)	✓	(✓)	✓	✓	Yellow
	Cultural heritage	no information							
	Respect of indigenous rights	Yellow	-	-	✓	✓	✓	✓	Yellow
	Safe and healthy living conditions	Red	✓	✓	✓	(✓)	(✓)	✓	Red
	Secure living conditions	Yellow	✓	✓	✓	(✓)	-	✓	Green
	Local employment	Yellow	✓	✓	✓	✓	✓	✓	Yellow
	Community engagement	Yellow	-	✓	✓	(✓)	(✓)	✓	Green
Society	Public commitments to sustainable issues	Yellow	(✓)	(✓)	(✓)	-	(✓)	✓	Green
	Contribution to economic development	Green	✓	✓	✓	✓	✓	✓	Green
	Prevention and mitigation of conflicts	Red	✓	✓	✓	✓	✓	✓	Red
	Technology development	Red	✓	✓	✓	-	-	✓	Yellow
	Corruption	Red	✓	✓	✓	✓	✓	✓	Red

# Production of pre-products – RAM by Company X

- Presence of a trade union at company and a regional union, but there are restrictions
- Fair salary
- Moderate working time
- No case of discrimination, share of women is 49.6%
- Environmental pollution, but presence of an EMS

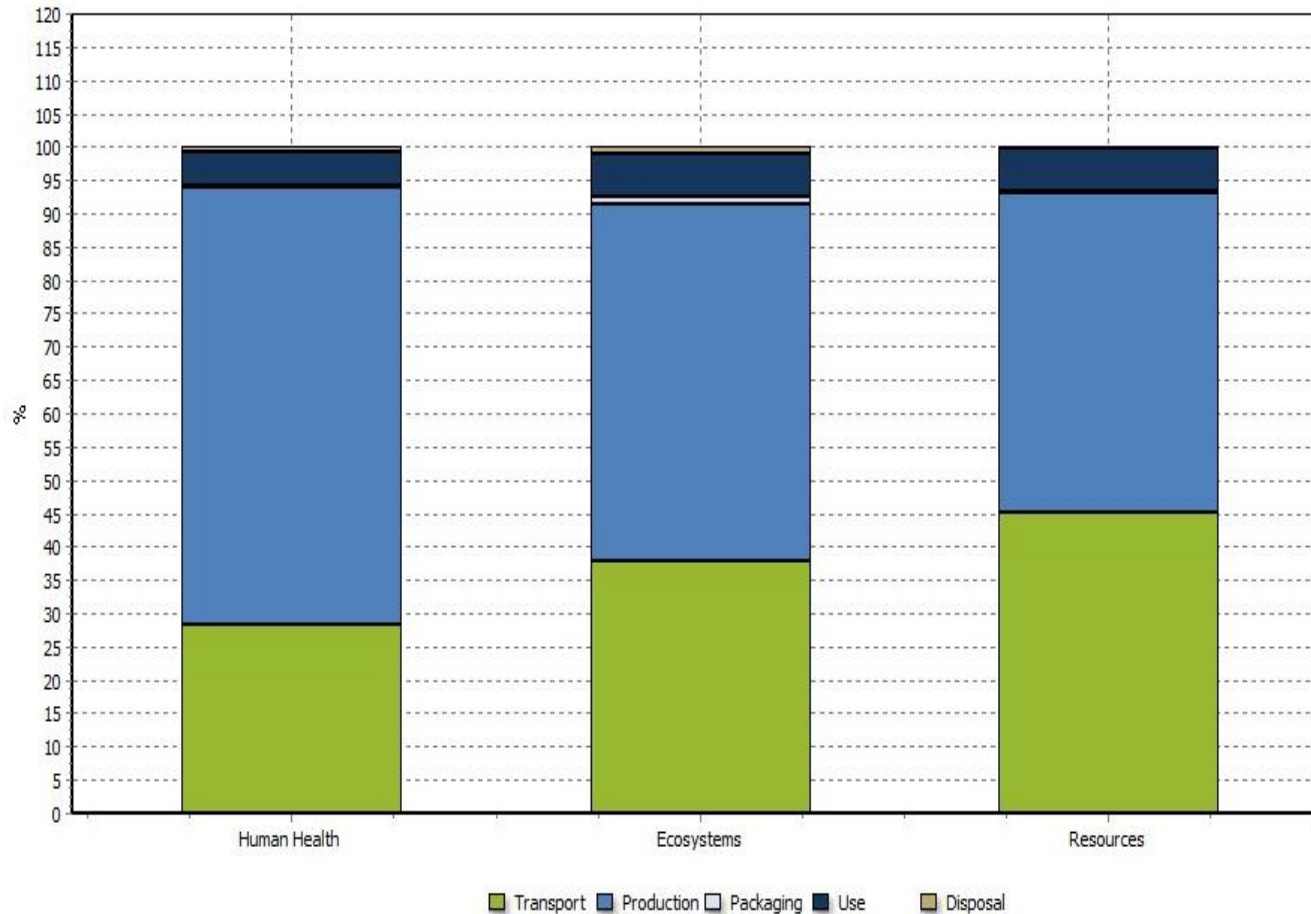
Stakeholder group	Subcategory	Performance assessment								Impact assessment
			Wor	Heal	Hurr	ec. r Soci	Indiç	Goverr		
Worker	Freedom of association and collective bargaining		(✓)	(✓)	(✓)	(✓)	(✓)	(✓)		
	Child labour		✓	✓	✓	✓	✓	✓		
	Forced labour		✓	✓	✓	✓	✓	✓		
	Fair salary		✓	✓	✓	✓	✓	✓		
	Working time		✓	✓	✓	✓	✓	✓		
	Discrimination		✓	(✓)	✓	✓	(✓)	(✓)		
	Health and safety		✓	✓	✓	✓	(✓)	✓		
	Social benefits/social security		✓	✓	✓	✓	✓	✓		
Local community	Access to material resources		(✓)	✓	✓	(✓)	(✓)	✓		
	Access to immaterial resources		✓	(✓)	(✓)	(✓)	(✓)	✓		
	Delocalisation and migration		-	(✓)	✓	(✓)	✓	(✓)		
	Cultural heritage	deficient information								
	Respect of indigenous rights	not relevant								
	Safe and healthy living conditions		✓	✓	✓	(✓)	-	✓		
	Secure living conditions		✓	✓	✓	(✓)	-	✓		
	Local employment		✓	(✓)	-	✓	✓	✓		
Community engagement		(✓)	(✓)	(✓)	(✓)	(✓)	(✓)			
Society	Public commitments to sustainable issues		✓	✓	✓	-	(✓)	✓		
	Contribution to economic development		✓	✓	✓	✓	✓	✓		
	Prevention and mitigation of conflicts	not relevant								
	Technology development		✓	✓	(✓)	-	-	✓		
	Corruption		(✓)	(✓)	(✓)	(✓)	(✓)	(✓)		
Value chain actors	Fair competition		(✓)	(✓)	(✓)	-	-	✓		
	Promoting social responsibility		✓	✓	✓	(✓)	(✓)	✓		
	Supplier relationships	deficient information								
	Respect of intellectual property rights		-	-	(✓)	-	-	(✓)		

# Production of pre-products – ODD by Company Z

- No unions
- Low wages and long working hours
- Discrimination?
- Weak CSR engagement
- Company is a member of a cartel

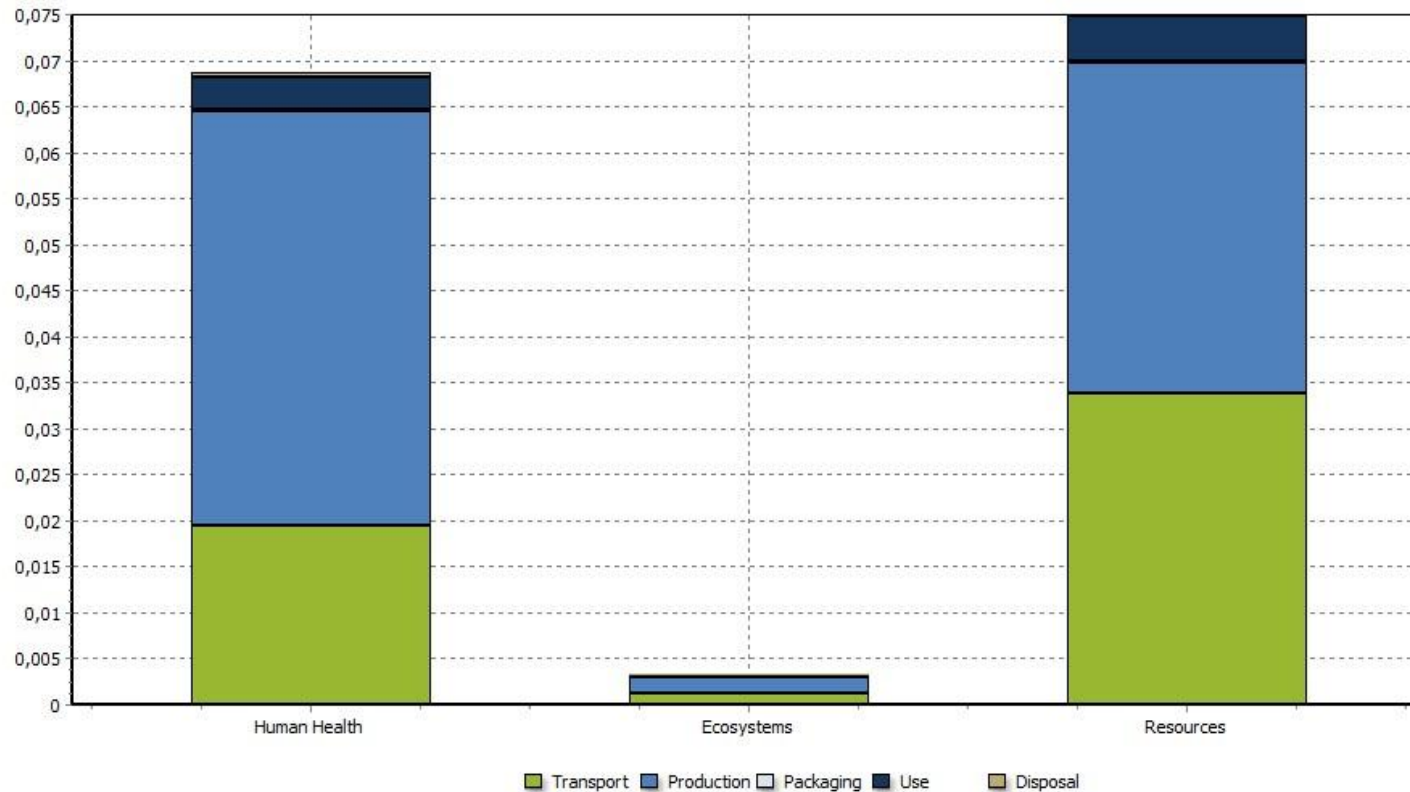
Stakeholder group	Subcategory	Performance assessment	Work	Heal	Hum	ec. re	Indig	Goven	Impact assessment
						Socic			
Worker	Freedom of association and collective bargaining	Red	✓	✓	✓	✓	✓	✓	Red
	Child labour	Green	✓	✓	✓	✓	✓	✓	Green
	Forced labour	Green	✓	✓	✓	✓	✓	✓	Green
	Fair salary	Yellow	✓	✓	✓	✓	✓	✓	Red
	Working time	Red	✓	✓	✓	✓	✓	✓	Red
	Discrimination	Yellow	✓	✓	✓	✓	✓	✓	Red
	Health and safety	Yellow	✓	✓	✓	✓	(✓)	✓	Yellow
Social benefits/social security	no information								
Local community	Access to material resources	Yellow	(✓)	✓	✓	(✓)	(✓)	✓	Yellow
	Access to immaterial resources	Red	✓	✓	✓	✓	✓	✓	Yellow
	Delocalisation and migration	Green	-	(✓)	✓	(✓)	✓	(✓)	Green
	Cultural heritage	deficient information							
	Respect of indigenous rights	deficient information							
	Safe and healthy living conditions	Yellow	✓	✓	✓	(✓)	-	✓	Yellow
	Secure living conditions	deficient information							
	Local employment	Yellow	(✓)	(✓)	-	(✓)	(✓)	(✓)	Yellow
	Community engagement	Yellow	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	Yellow
Society	Public commitments to sustainable issues	Yellow	✓	✓	✓	-	(✓)	✓	Light Green
	Contribution to economic development	Light Green	✓	✓	✓	✓	✓	✓	Green
	Prevention and mitigation of conflicts	not relevant							
	Technology development	Light Green	✓	✓	(✓)	-	-	✓	Green
	Corruption	Red	(✓)	(✓)	(✓)	(✓)	(✓)	(✓)	Yellow
Value chain actors	Fair competition	Yellow	(✓)	(✓)	(✓)	-	-	✓	Yellow
	Promoting social responsibility	Yellow	(✓)	(✓)	(✓)	(✓)	(✓)	✓	Green
	Supplier relationships	no information							
	Respect of intellectual property rights	Light Green	-	-	(✓)	-	-	(✓)	Light Green

# (Environmental) LCA results, 1



ReCiPe method, hierarchist version: distribution of impacts for the three endpoint categories human health, ecosystems, and resources

## (Environmental) LCA results, 2



ReCiPe method, hierarchist version: : "normalised" results, results for the laptop divided by world reference impacts

### 3. Conclusions, discussion

## Conclusions, case study

- Presence of social hot spots in the raw material extraction, production, and recycling phase, especially informal sectors have negative social impacts
  - Social hot spots are mainly found in the stakeholder group worker
  - The presence of codes of conduct could not avoid worker right violations
  - Environmental LCA: Resources and Human Health most important
- (for the investigated case:) identified hot spots for environment and social issues are partly congruent

## Conclusions, case study, ctd.

- General impression: A Social and Environmental LCA is possible even for a complex product...
- ...but involved for the notebook some new methodological developments.

## Conclusions, policy level

- Life cycle approach as a possible fruitful method to support decisions in the context of Policy Coherence for Development (PCD) and Development Cooperation
  - Addressing the hot spots
  - Analyse decisions and measures for possible counter effects and burden-shifting
- There is now a method available to investigate the social and socio-economic impacts related to a product, across the whole value chain

# Thank you.

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