

LCA as input to LCC

Bengt Steen

Environmental Systems Analysis and CPM

Chalmers University of Technology

Gothenburg, Sweden

Introduction

- LCA and LCC both originates from the energy crisis in the mid 1970ies. LCC was developed by economists and LCA by engineers
- They normally have different system borders
- Lately, an increased interest in integrating LCA and LCC has emerged, (EU project DANTEs, www.dantes.info and SETAC LCC working group)

Driving forces for internalising externalities

- Polluter pays principle (PPP) or “get the prices right”
- Information society
- Institutionalisation
- Globalisation
- IPP

Identifying internalities

Item	Date of expense	Amount	Depreciation rate	Present value
Environmental permit				
Environmental monitoring				
Environmental Insurance				
Certification cost				
Labelling costs				
Environmental management				
Goodwill change, impact on sales volume				
Goodwill change, impact on recruiting				
Impact on mortgage rates				
Future taxes				

Use of LCA for value estimation

Item	Estimation of value
Environmental permit (EP)	LCA can identify production units that need permits. Upstream EP:s likely to be included in price. Correlated to LCA-results?
Environmental monitoring	As for EP
Environmental Insurance	LCA can identify and estimate risks but it has to be part of the goal and scope
Certification cost	As for EP.
Labelling costs	As for EP
Environmental management	As for EP
Goodwill change, impact on sales volume	Can be drastic when consumer oriented (BrentSpar). There are methods to determine small impacts. Correlated to LCA-results?
Goodwill change, impact on recruiting	Looking at the variation in salaries of people doing the same job and the search pressure may reveal some impact.
Impact on mortgage rates	There are methods in use. E.g. As used by Standard&Poor
Future taxes or abatement costs	Via damage cost and environmental goals

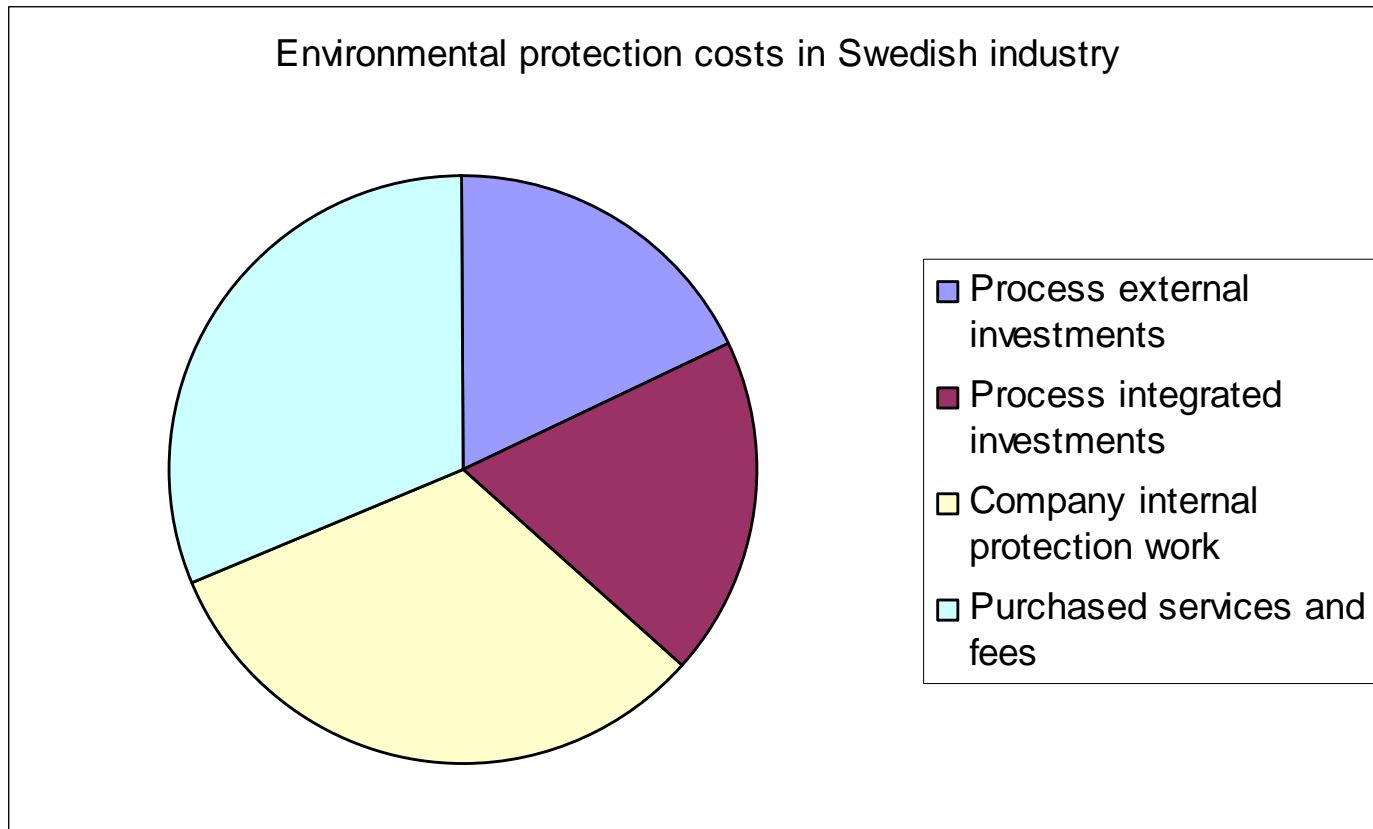
Environmental insurance

- Insurance companies have ceased to offer insurances for environmental risks
- This means that a company itself has to bare the costs. These may be either direct buffer funds to be used when the cost comes or oversized technology or administration to decrease the risks.

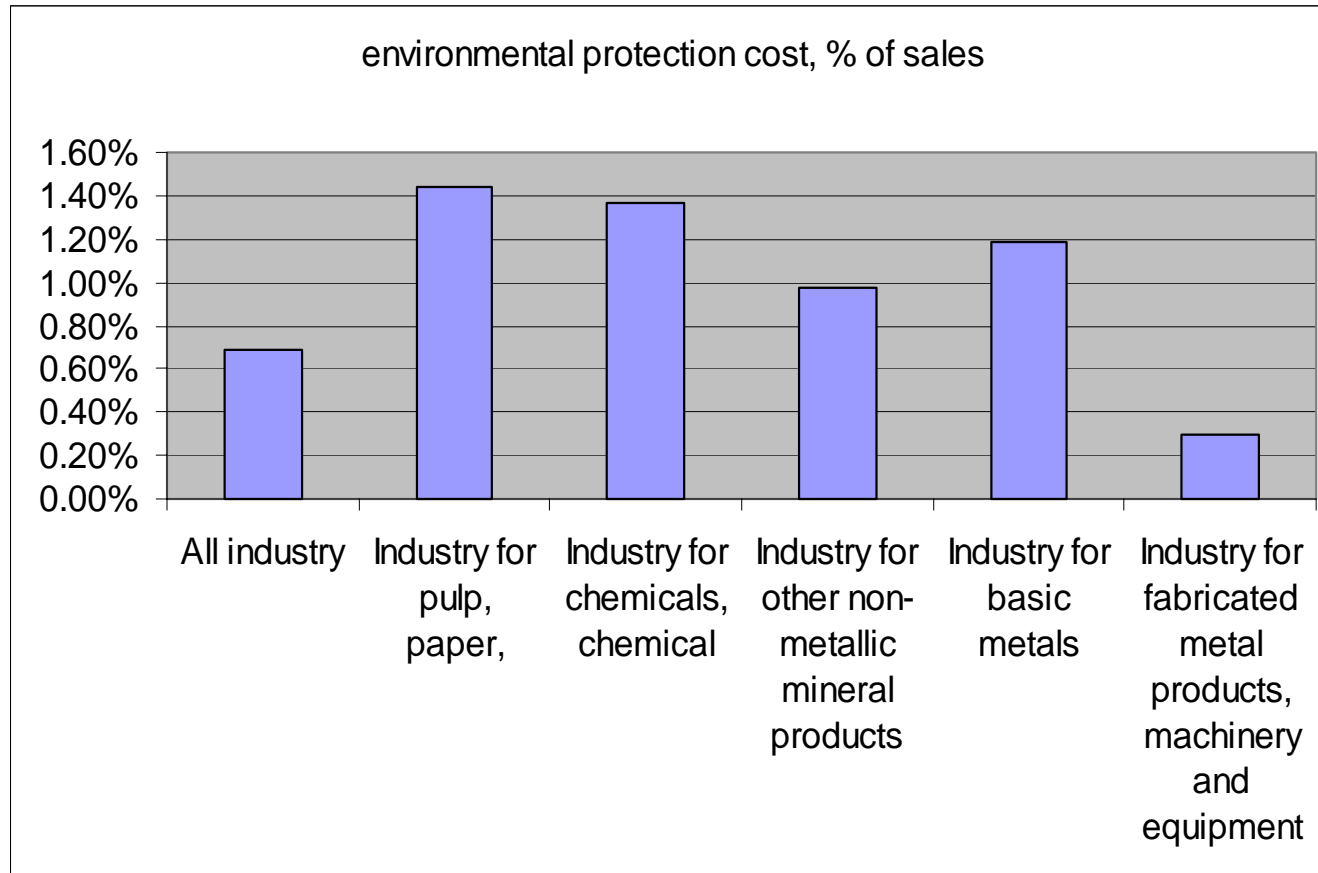
Use of LCI for LCC

- To some degree the processes in the value chain are the same in LCA and LCC.
General information gathered in LCA may therefore be helpful in LCC and vice versa.
- LCA software may be helpful in LCC

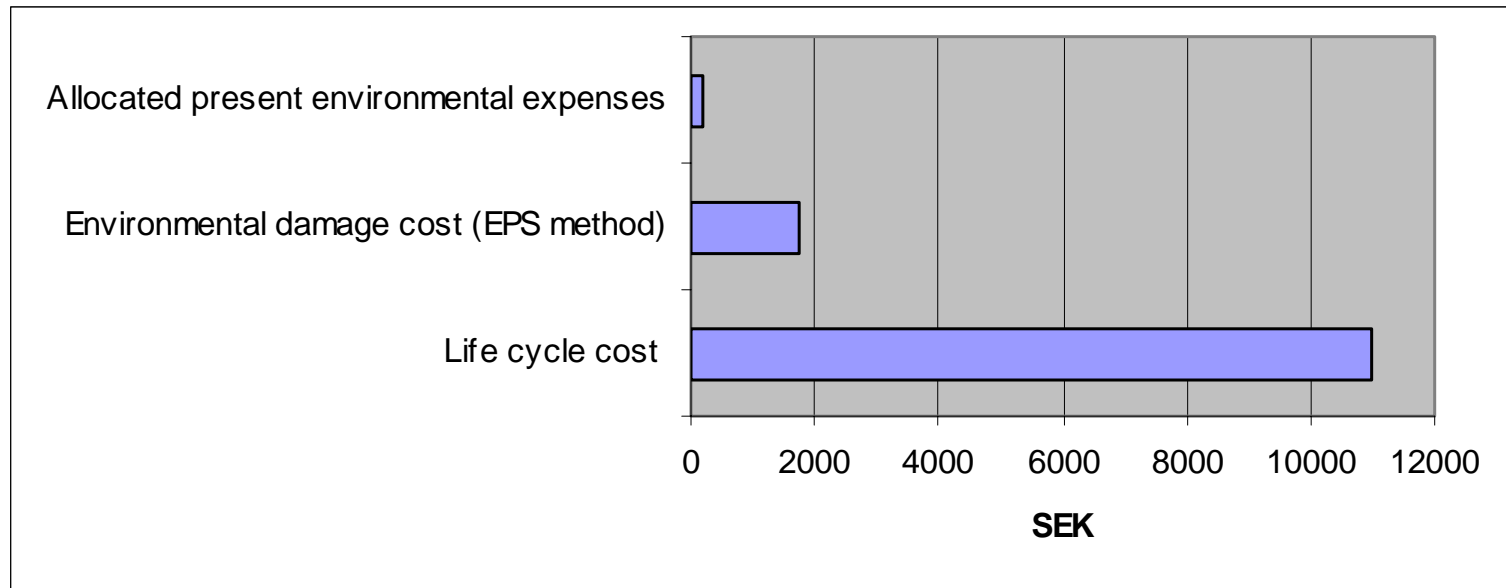
Process related environmental protection costs in Sweden



Process related environmental protection costs in Sweden



Potential future costs for a refrigerator



Comments

Present costs for environmental protection is around 1%

Damage costs are calculated with zero depreciation of future damages

Outline of a procedural methodology for estimation of environmentally related costs in an LCC

Item	Estimation of value
Process-related costs	Only include costs if production costs are not known. Use a statistical average.
Environmental Insurance	Carry out an damage oriented LCA that include work environment and risk assessment of flows identified.
Labelling costs	Use a statistical average for costs and added WTP
Goodwill change, impact on sales volume	Use LCA to identify positive and negative elements.
Goodwill change, impact on recruiting	Looking at the variation in salaries of people doing the same job and the search pressure may reveal some impact.
Impact on mortgage rates	There are methods in use. E.g. As used by Standard&Poor
Future taxes or abatement costs	Via damage cost and environmental goals

Conclusions

- LCA offer several inputs to LCC
- The time is right for an increased research in the area
- The LCA methodology may need modification to be useful for an LCC
- Some possibilities exists to estimate environmental costs, but present knowledge is immature