Comparing life cycle assessment modelling of linear vs. circular building components
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Environmental performance and material composition

Circular Economy

- Mining/materials manufacturing
- Building materials
- Construction
- Service
- Operations
- Collection
- Energy recovery
- Landfill
- Refurbish/remanufacture
- Reuse/redistribute
- Maintain
- Repair
- Leakage to be minimized

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Knowledge gap from research to practice

Knowledge gap

Life cycle assessment

Production

Construction

End of life

Use

Recycling

Reuse

Disposal

CO₂

EN 15978 standard

Ecoinvent 3.2 database

openLCA 1.4 software

CML baseline method
Examples from the industry

Concrete column  Window  Roof felt

A: linear
(worst case practice)

B: circular
(reuse/recycling)
Conclusion

The visualization approach shows:

- The material flows
- When and where impacts and benefits occur
- Size of impacts and origin
- Material losses and inputs
- Helps understand complex building components
- Subsequent life cycle thinking

Future work

Things to keep in mind:

- Future circumstances
- Allocation methods
- Resource scarcity