WHY INVEST IN A REVERSIBLE BUILDING DESIGN?

Ke WANG, Sofie DE REGEL, Wim DEBACKER (VITO)
Jona MICHIELS, Joëlle VANDERHEYDEN (Groep Van Roey NV)

BAMB-CIRCPATH, February 06, 2019
Circular economy starts with product design.

A reversibly designed building is easier to transform and disassemble.

This reduces demolition, and facilitates re-use / recycle.
This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 642384.

Very long life cycles

Ownership transfers

Uncertain residual value

No taxation benefits

But...

So why invest in a reversible building?
Quantitative financial analysis based on a real-life commercial office building in Belgium.

Why commercial buildings?
• Short service life
• Revenue based valuation
Is a reversible building more expensive to build?
YES, but not much.

Is a reversible building more expensive to build?

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 642384.
YES, but not much.

Is a reversible building more expensive to build?

Are there short term incentives to invest?

Yes, but not much.
YES, but not much.

Is a reversible building more expensive to build?

Are there short term incentives to invest?

YES, there can be.
Is a reversible building more expensive to build?

- Reversible roof
- Reversible interior walls
- Reversible floor
- Over-dimensioned foundation

In this case, initial investment (design & build) would be 5% higher than BAU.
Are there still short term incentives to invest?

Reversible design can deliver a higher Net Present Value (9% in this case)! → higher market price?
Sequence of events

Year 0
Design & build

Year 1
Put in use

Year X:
Drastic change

Transformation

Decommission

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 642384.
Probability of need for change

Average service life of commercial office buildings in Flanders is 33 years.
Decision flow – how to react?

Year X: Drastic change

Is there suitable market need?

Is it technically feasible?

Will it pay back in time?

Transformation

Decommission
Estimate cash flow

Use discounted cash flow to calculate NPV for a given scenario.
Net Present Value risk profile

Reversible design narrows the spread of NPV and reduces chance of capital loss. Aggregated NPV higher than BAU.
Why invest in a reversible building?

- Reversible Design
- Less chance of early demolition
- Lower investment risk
- Higher NPV
- Higher market price

It lowers investment risk, increases building market price, and is also good for the environment!
How to make it work (better)?

- Introduce the risk reduction aspect in building valuation methods.
- Reduce initial investment (e.g. technical innovation; new business models; economy of scale).
- Create 1st-life use phase benefits (e.g. maintenance cost saving; benefits for tenants).
Contact
Ke WANG
ke.wang@vito.be
+32 491 920740