From System Thinking to System Doing

Reestablishing value(s) in a sustainable economy
Agenda for today

- Introduction to systems thinking
- It’s the (circular)ECONOMY, stupid!
- Value value
- Practice makes perfect
There is one slide I ALWAYS show in all my talks
This is it...
The image illustrates our current system collapse
As we are optimizing and altering our organizational patterns...
With the ground fast approaching...
The System must change!
An introduction to systems thinking
Which termites design and manage the Mound?
Which termites design and manage the Mound?

The answer is: None of them!
Which termites design and manage the Mound?

Then, Who or What does?
Like any System, the mound is governed by laws
Which termites design and manage the Mound?

In this Case, Natural Selection
Which termites design and manage the Mound?

Which identifies Deciding Factors
Like these two
What decides for us?

In our Money Driven Economy, the Level of Profitability decides on Success and Survival of a Business or Service, not whether something is morally or ethically defendable.
Businesses are therefore the current Instruments of System Change
There is, however, one problem, remember?
A system’s behaviour can not be derived from its constituent parts.
A system's behaviour is subject to historical unicity.
Constituent parts are thus subject to both Laws and Historical Unicity.
Is System Complexity too much?
Let us become practical
Transformation relies on Implementation
City regions implement at the “right” level
Cities are therefore our most likely Platforms for System Change
Circularity is an unquestioned necessity for Sustainability

Let me say it one more time: Exponential Growth is Impossible within a finite system
Critical Raw Materials set System Boundaries
Circularity is an unquestioned necessity for Sustainability

The natural ecosystem is regenerative and restorative, our economy must mimic its principles.

Circularity allows us to apply increasingly better design to the same underlying set of available building blocks (materials).

Increased quality is increased value; qualitative growth remains as a result of qualitative development.
A circular economy is NOT a recycling economy, it is based on value creation and retention.

Recycling is therefore a means, not an end.

We may chose a path towards the future, which is sustainable.
A Circular Economy

The key to Circularity lies in CIRCULAR DESIGN

The key to a Circular Economy lies in CIRCULAR FINANCE
<table>
<thead>
<tr>
<th>Circular Product Design</th>
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</thead>
<tbody>
<tr>
<td>Design for Disassembly (dry joints, no composites)</td>
</tr>
<tr>
<td>Design for future adaptability (modularity, &quot;legofication&quot;)</td>
</tr>
<tr>
<td>Design for functional value retention</td>
</tr>
<tr>
<td>Use sustainable energy sources, only</td>
</tr>
<tr>
<td>Create closed loops for water</td>
</tr>
<tr>
<td>Nutrient retrieval is essential, but secondary to functionality retrieval (CE is value based)</td>
</tr>
<tr>
<td>No toxins may be used or cycled</td>
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<tr>
<td>Design for social fairness</td>
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Circular Design applies to products AND their financing

“Sustainability thinking” leads to the optimization of a failing system

• You pay for mitigating measures.
• Waste valorisation relies on waste to remain present
• TCO goes up, unless you account for True Cost and True Value
• Accountancy isn’t “that far” yet…

“Circularity” unlocks profitability potential by designing residual value into it

• TCU goes down, even in the current system
Circular Design applies to products AND their financing

Circular financing is TCU based

It ideally expresses CE’s higher earn out potential at lower costs

It requires acceptance/validation in accountancy, however!
Circular Finance is hindered by split incentives

Between Financier and Investor (High Risk vs Low Risk)

In time (Construction vs Deconstruction)
The Classic Dilemma

- Higher cost for developer
- Higher cost for tenant
- Lower cost for investor
- Lower cost for developer

Time (20 year write-off)
Circular

Finance is hindered by split incentives

It takes courage to let go of “purchase and write-off” accounting

Publically owned companies are forced to think in quarters, not decades

We need the Big Four; improved accounting standards are required
### Circular Finance is hindered by split incentives

Moving to a Product Service System is GREAT, but not always possible (initial investment must come from somewhere)

How about a transitional or deferred ownership model? Share the risks?

Everything ultimately hinges on reliability of numbers (value retention over time!)

High reliability = low risk perception
Circular Finance is hindered by split incentives

Reliability of numbers relies on integrated data management

Each product must be coupled with a Material Passport; this provides the Value Context (i.e. buildings; BIM plus Passport)

This passport MUST interface with Supply Chain Management and Post Use Market Places (virtual and physical)

Build a "Madaster"!

Asset Management = Value Management
Circular Finance is hindered by split incentives

<table>
<thead>
<tr>
<th>M-Mobility as an example (Mitsubishi, KPMG, Delta)</th>
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</thead>
<tbody>
<tr>
<td>Define KPI’s</td>
</tr>
<tr>
<td>Benchmark purchasing price</td>
</tr>
<tr>
<td>Defer ownership to Producer, Product Service System only</td>
</tr>
<tr>
<td>Initial CE Lease fee = Benchmarked purchasing price</td>
</tr>
<tr>
<td>Extend write off by internal write-off (20 to 30 years)</td>
</tr>
<tr>
<td>Tender for lowest Service Fee</td>
</tr>
<tr>
<td>Most sustainable option is now least expensive</td>
</tr>
</tbody>
</table>
Producer retains ownership; Asset value written off over 30 in stead of 20 years;

Same cost for developer; KPI's benchmarked

Lower cost for investor
Producer retains ownership:
Asset value written off over 30 in stead of 20 years

Same cost for developer; KPI's benchmarked

Lower cost for investor

Total Value Proposition for Producer A

Elevator A

Elevator B

Time (20 year Circular Lease)
Circular Finance is hindered by split incentives

The Key factor in this, is that you make Residual Value count on Day One!
Circular Finance is hindered by split incentives

Less OpEx AND less CapEx

- Lower founding costs
- Less reservations
- Less materials and logistics
- Less unnecessary labour
- Less down time
- Less failure costs
Circular Finance is hindered by split incentives

Oh yeah, almost forgot: You also save our technologically advanced society from catastrophic system collapse
Enter: “Reevaluation”

Reassess the value of currently written off/undervalued assets

Transfer this value to financing new assets
Enter: Block Chain (or comparable)

Unalienable content

Open access to a required extent

Allows for distributed storage, safe for “eternity”!
Enter: Track and Trace.

<table>
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<th>Know which value is represented</th>
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<tbody>
<tr>
<td>Know where it is within the system</td>
</tr>
<tr>
<td>Know when it becomes available for reuse</td>
</tr>
<tr>
<td>Know who owns it</td>
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Practice makes perfect

The case of Park 20|20
Park 20 | 20
Park 20 | 20 C2C & CE

Collaborative Design for Disassembly

Building Information Modelling

Product of Service and Circular Procurement

Buildings as Material Banks

Park 20|20 C2C & CE
Circular tendering and Purchasing

• Collaborative bidding outperforms competitive bidding
• Prefer Product Service Systems
• Ask for the highest quality for a fixed budget (Benchmark), not for the lowest price for stated specifications
A comparison was set up to compare two equally sized buildings of 8,500 m² Gross Floor Area, both located in Hoofddorp, The Netherlands, constructed in 2014 (traditional) and 2015 (C2C inspired).

The numbers supplied in the comparison are based on Delta Development Group internal reporting for the C2C inspired building or provided by contractor Boele van Eesteren / VolkerWessels for the reference building.
<table>
<thead>
<tr>
<th></th>
<th>Traditional Building</th>
<th>C2C Inspired Building</th>
<th>Advantage of C2C (CE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rental Value</td>
<td>1,470,875</td>
<td>1,807,075</td>
<td>336,200</td>
</tr>
<tr>
<td>Annual Cost to Investor</td>
<td>-271,293</td>
<td>-226,488</td>
<td>44,805</td>
</tr>
<tr>
<td>Residual Value Core &amp; Shell</td>
<td>-686,582</td>
<td>1,301,646</td>
<td>1,988,228</td>
</tr>
<tr>
<td>Construction Costs</td>
<td>-18,844,500</td>
<td>-21,955,500</td>
<td>-3,111,000</td>
</tr>
<tr>
<td>NPV Exploitation</td>
<td>27,310,886</td>
<td>33,501,615</td>
<td>6,190,729</td>
</tr>
<tr>
<td>ROI</td>
<td>109.75%</td>
<td>136.61%</td>
<td>26.86%</td>
</tr>
<tr>
<td>IRR (unleveraged)</td>
<td>5.25%</td>
<td>6.08%</td>
<td>0.84%</td>
</tr>
</tbody>
</table>

(NPV = Net Present Value, ROI = Return on Investment, IRR = Internal Rate of Return)
Sustainability measures cost you money

Circularity measures make you money
Now, let us go out and build our future!