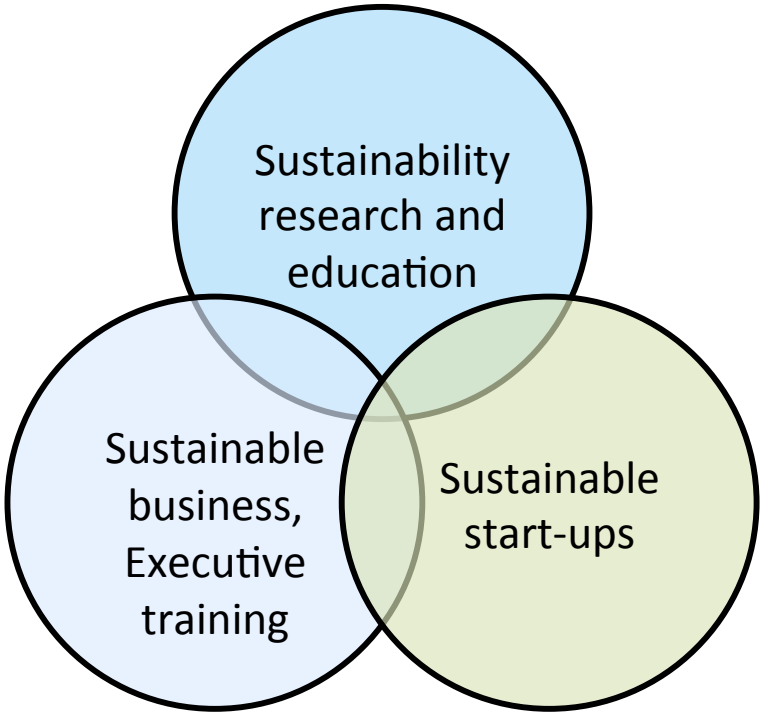
Sustainable Business Models
Experimentation and Collaboration

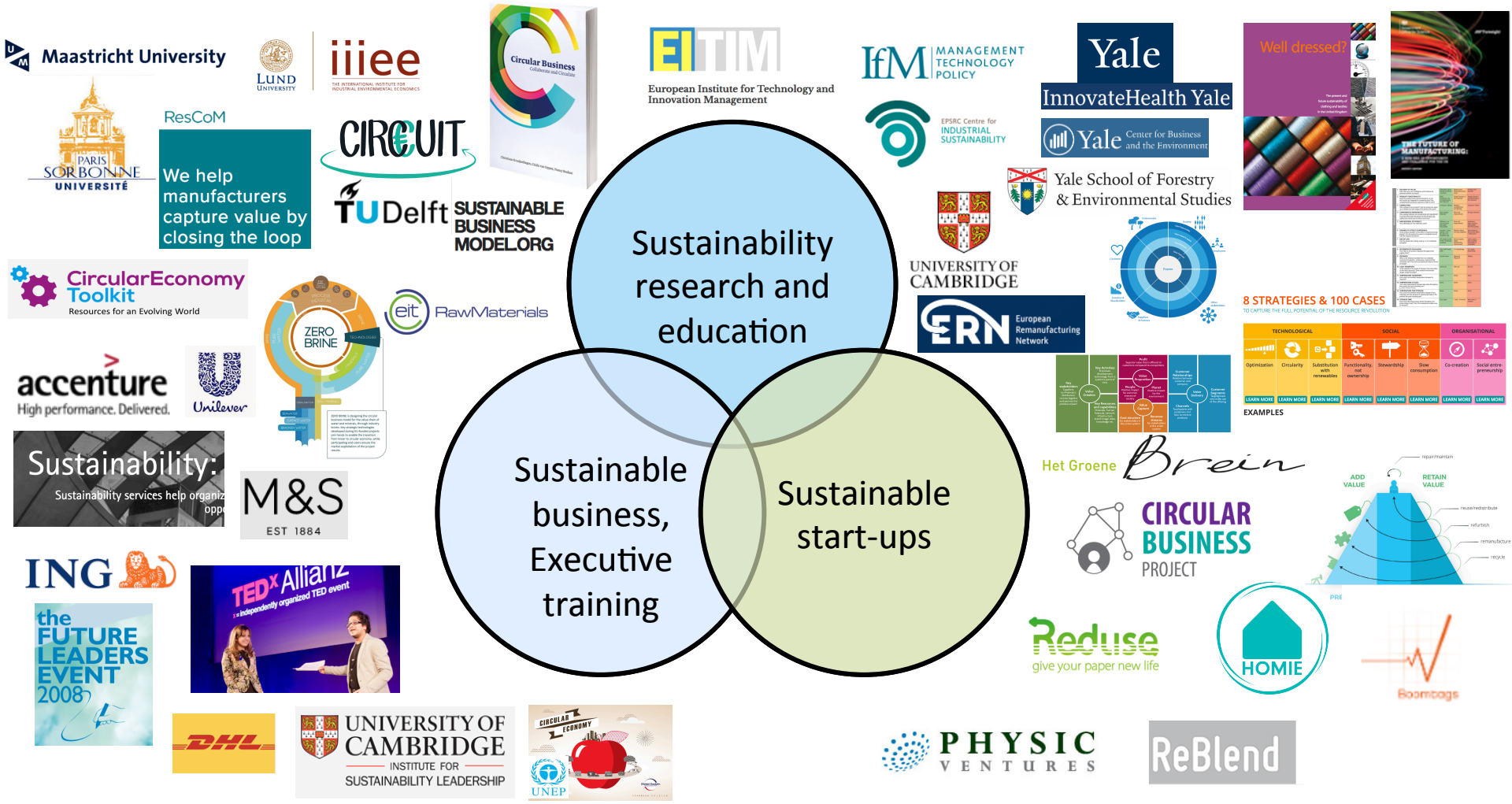
Tampere, Finland, 23 November 2017

Nancy Bocken

Professor in sustainable business management and practice - for a transition to low-carbon and resource efficient economies

Personal background

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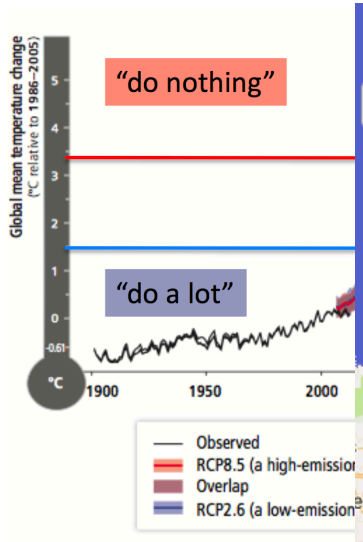
Agenda

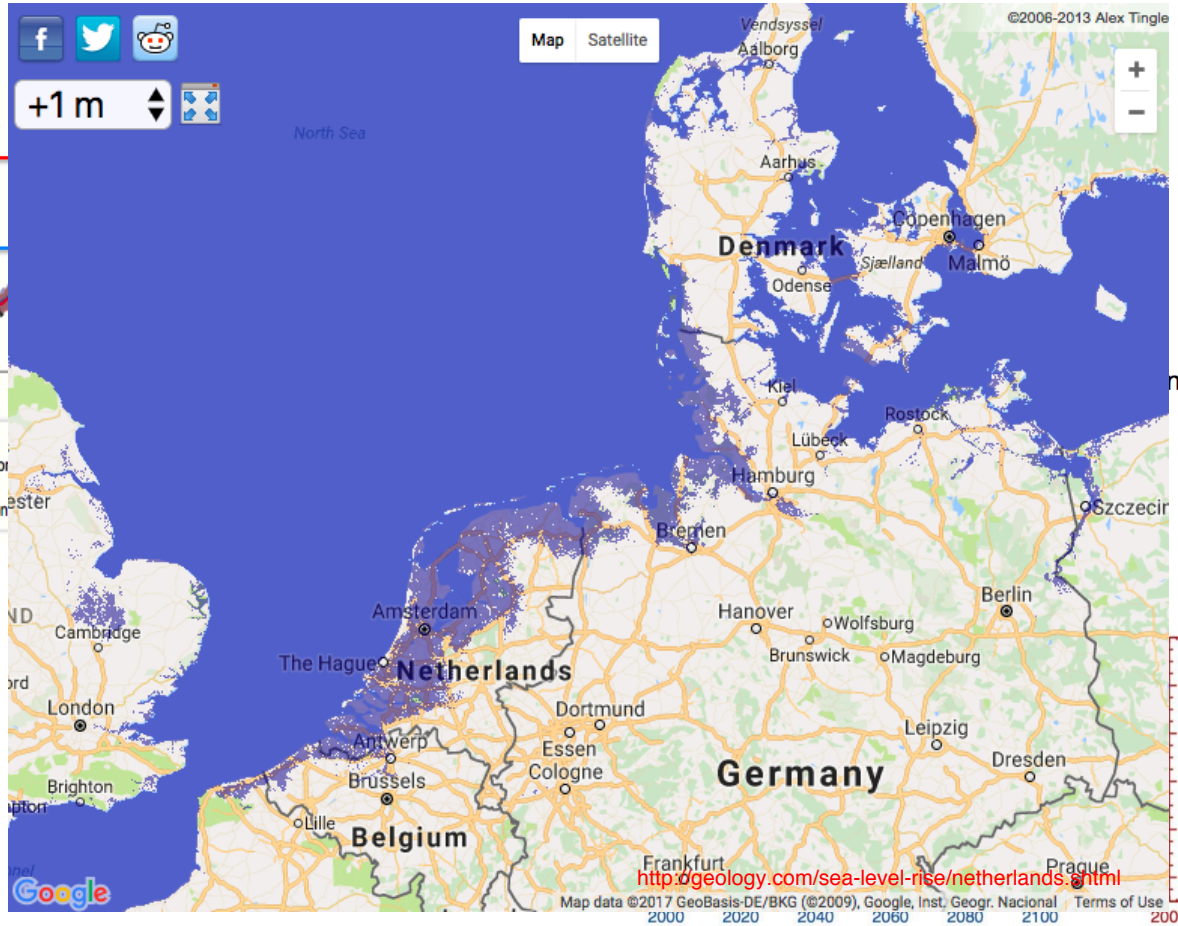
- The big issue
- What are sustainable and circular business models?
- What are some of the implementation challenges and opportunities?
- What are examples of sustainable business experiments? What are some tools and methods to be used?

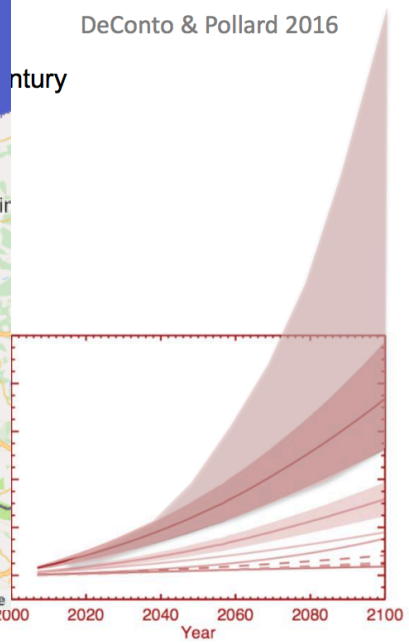
The big issue

Societal challenges

Risks of future climate change





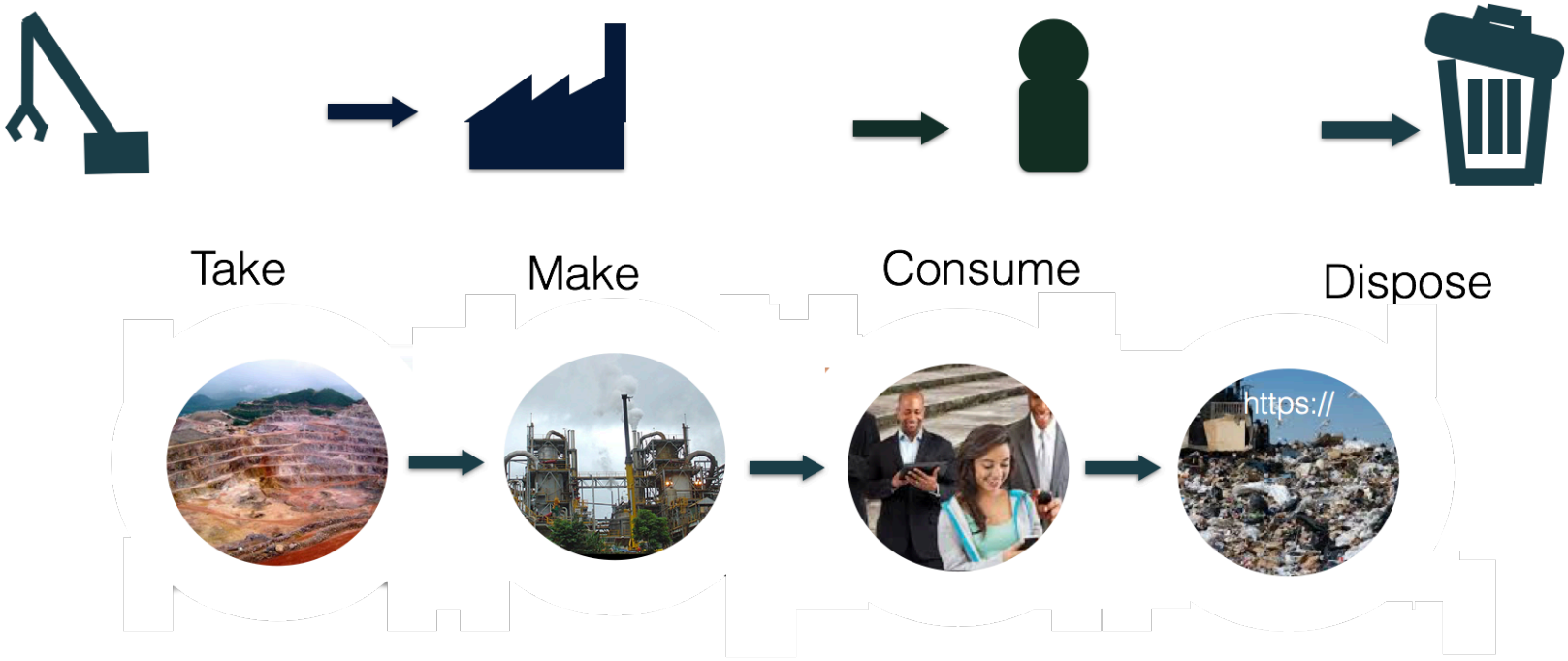


Source climate graphs: Emily Shuckburgh (2017) Presentation at CISL, Cambridge UK

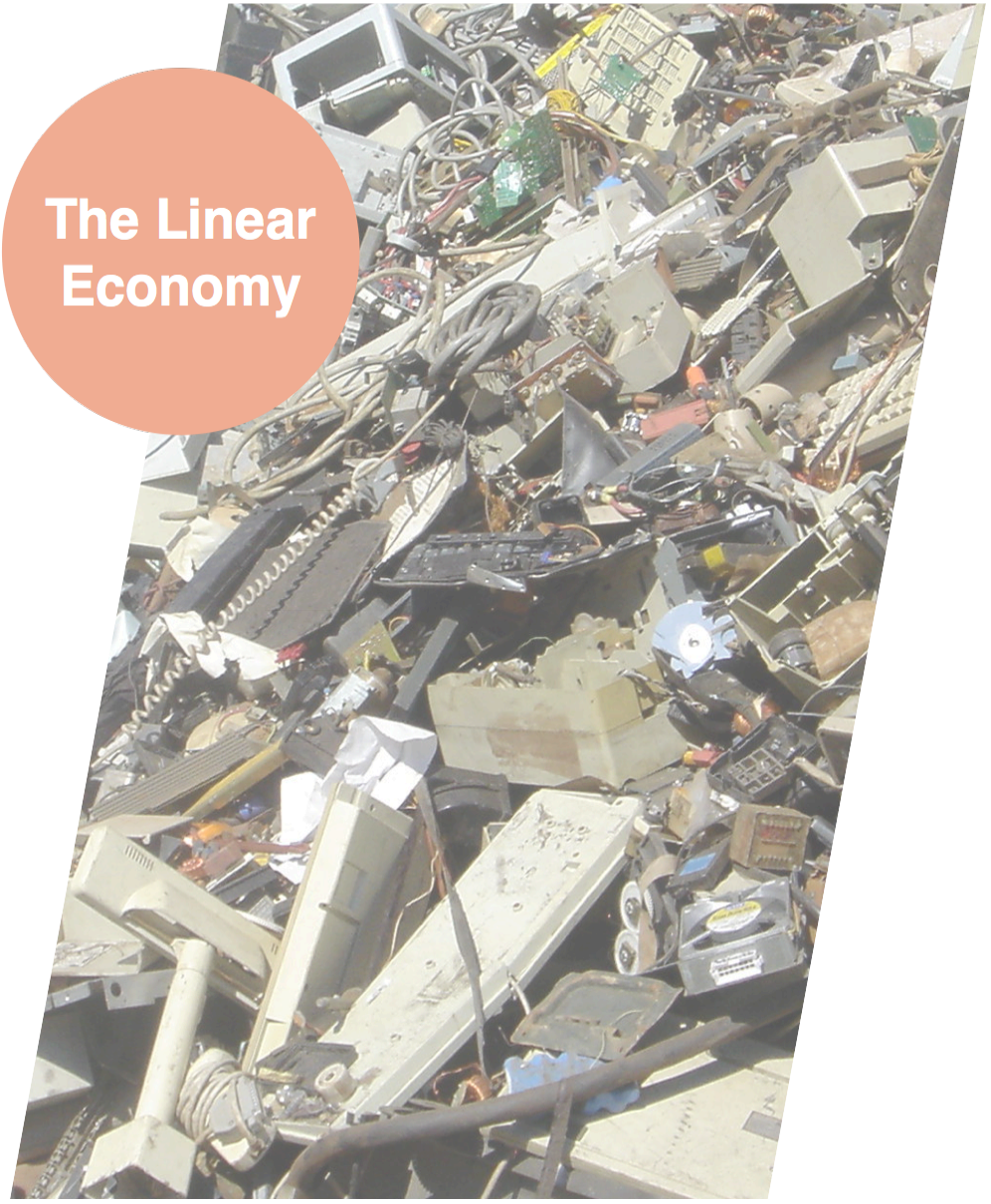
Up to 70 cm

Up to 2 m

The linear economy



The Linear Economy



Inefficient system to manage resources

1. Dependent on high turn-over of products and fast-pace consumption

2. Decreasing product lifetimes and high waste creation

3. Loss of value embedded in product (economic, environmental, user value), e.g. in unused functioning products, repairable products, reusable components, recyclable materials

Sustainable and Circular Business Models

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Sustainable business models

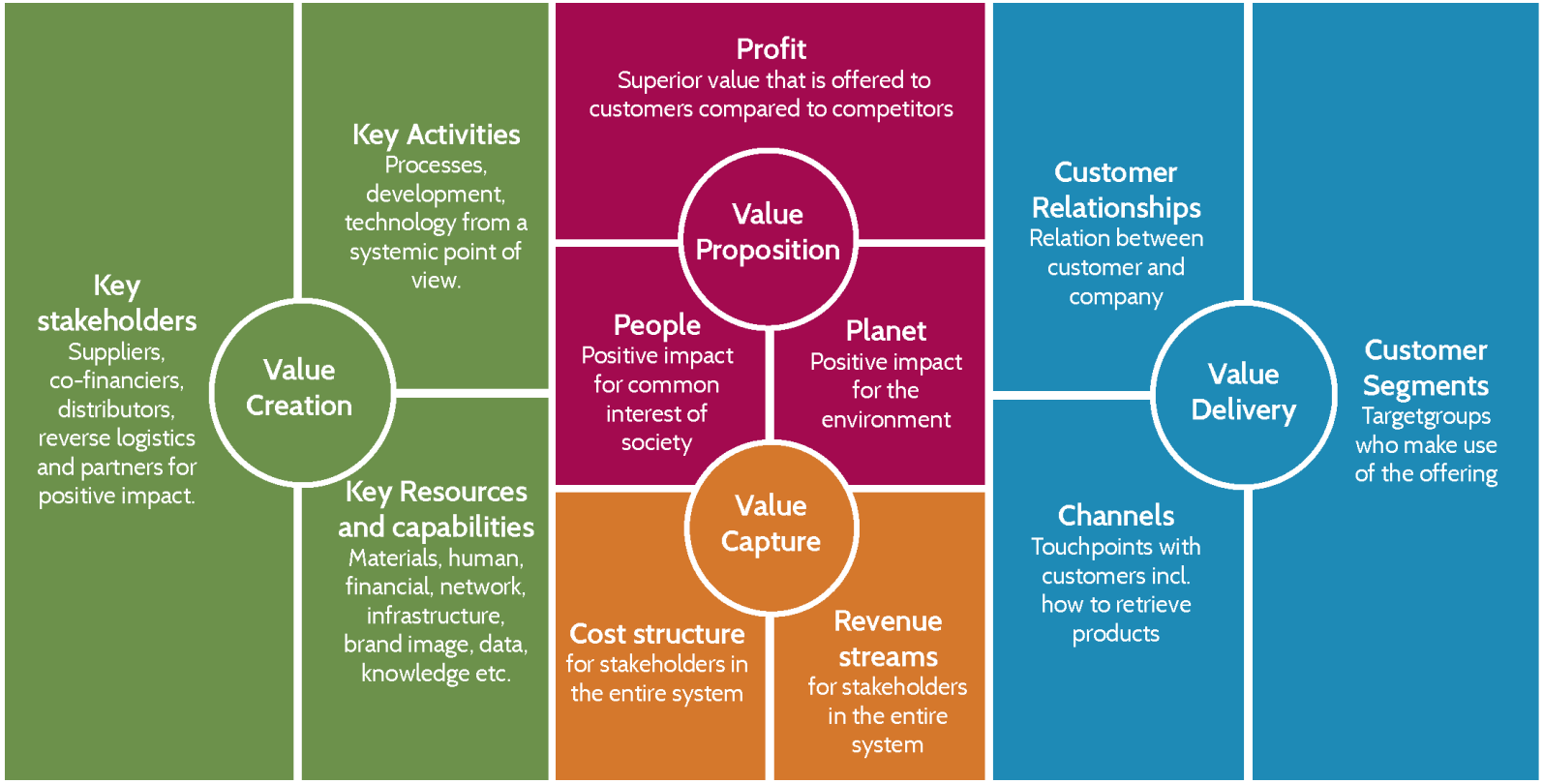

Figure: Sustainable Business Model Canvas. Source: Bocken, N.M.P. 2015. Conceptual framework for shared value creation based on value mapping, Global Cleaner Production Conference, Sitges, Barcelona, 1-4 November 2015 based on Osterwalder & Pigneur - businessmodelgeneration.com.

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Value logic – Rethinking business models

Value destroyed - negative outcomes of the business (traditionally referred to as 'negative externalities'); damaging social and environmental impacts of business

Value missed – cases where stakeholders fail to capitalise on existing assets, capabilities and resources, are operating below best practice, or fail to receive benefits they seek from the network

Value opportunities - new forms of value for existing and new stakeholders

Source: Value mapping tool. Source: Bocken, N., Short, S., Rana, P. and Evans, S. (2013). A value mapping tool for sustainable business modelling. Corporate Governance 13(5), 482-497.

Sustainable business models

Value mapping tool

Form a vision with external stakeholders by discussing concrete solutions

How to use it?

1. Unit of analysis
What is the unit of analysis that is to be explored – product and/or service offering, business unit, firm, industry sector?

2. Stakeholder Groups
Which organisations or individuals have influence or involvement in your business operations, or are influenced/ affected in any way by your business operations?

3. Purpose
What is the primary reason(s) for the existence of your business and its network of stakeholders including the value chain? The purpose is more than just making money, although that may certainly be viewed as a primary reason.

4. Value Captured
What positive tangible and intangible value is currently created for each of your stakeholders? For example, why does your customer buy the products and services offered? Does the business network mitigate or offset some negative outcomes e.g. carbon emissions?

5. Value destroyed
What are the negative outcomes of the business for any of your stakeholders? e.g. pollution, or loss of local employment caused by offshoring or global outsourcing etc.

6. Value is missed or wasted
How might the business be missing an opportunity to capture value, or wasting or squandering value in its existing operations? e.g. risk of reputational damage, loss of customers, profitability and market share, risk of regulatory change. Are resources, assets, capacity and capabilities under-utilised?

7. New Value Opportunities
What new positive value might the network create for its stakeholders through introduction of new capabilities, activities and relationships? Review the output of the previous steps (value created, destroyed and missed) and consider: how could more value be created?

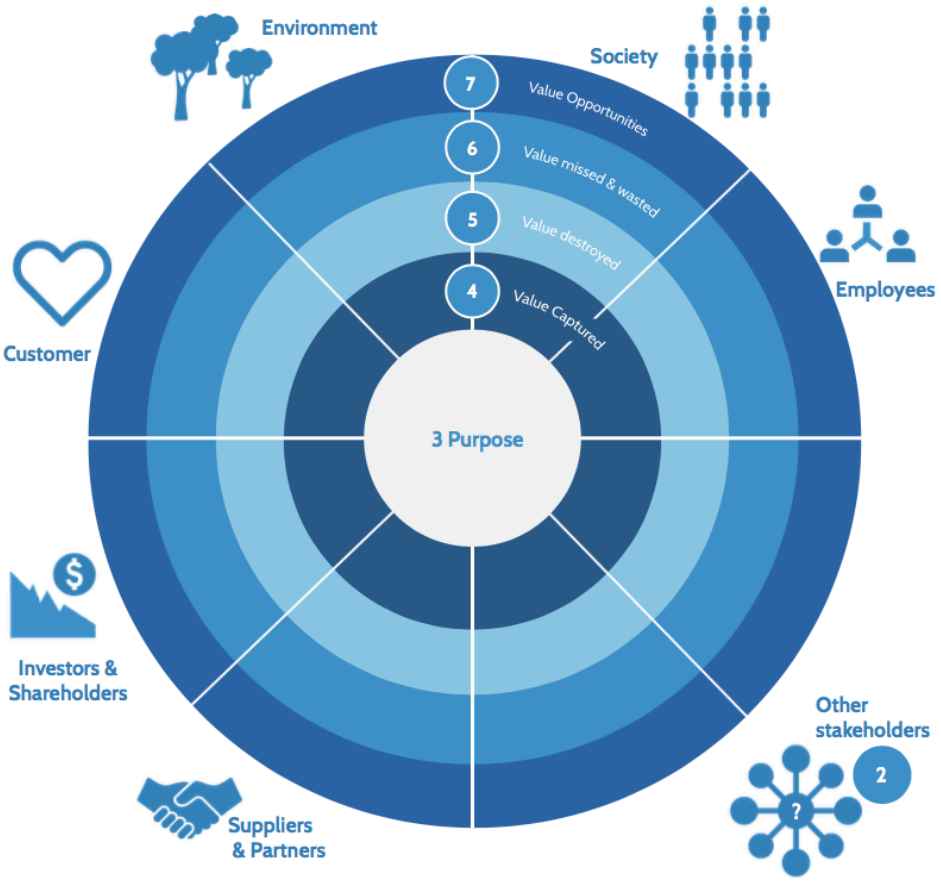

Figure: Value mapping tool. Source: Bocken, N., Short, S., Rana, P. and Evans, S. (2013). A value mapping tool for sustainable business modelling. Corporate Governance 13(5), 482-497.

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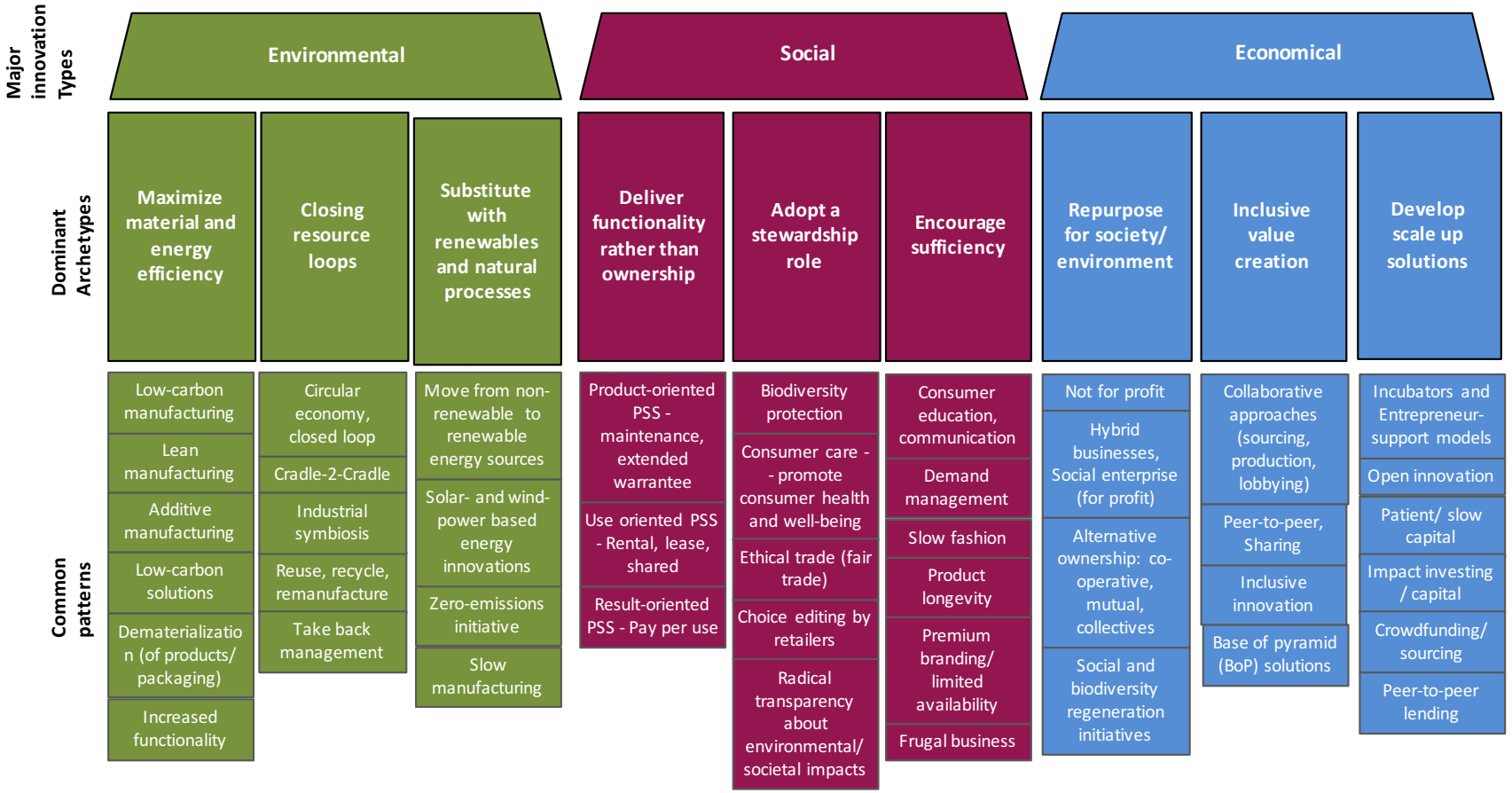
Sustainable business cases & archetypes



Source: Bocken, N., Short, S., Rana, P., Evans, S. 2014. A literature and practice review to develop Sustainable Business Model Archetypes. Journal of Cleaner Production, 65, 42–56
&
Ritala, P., Huotari, P., Bocken, N., Albareda, L., Puumalainen, K. Sustainable business model adoption among S&P 500 firms: A longitudinal content analysis study. Journal of Cleaner Production

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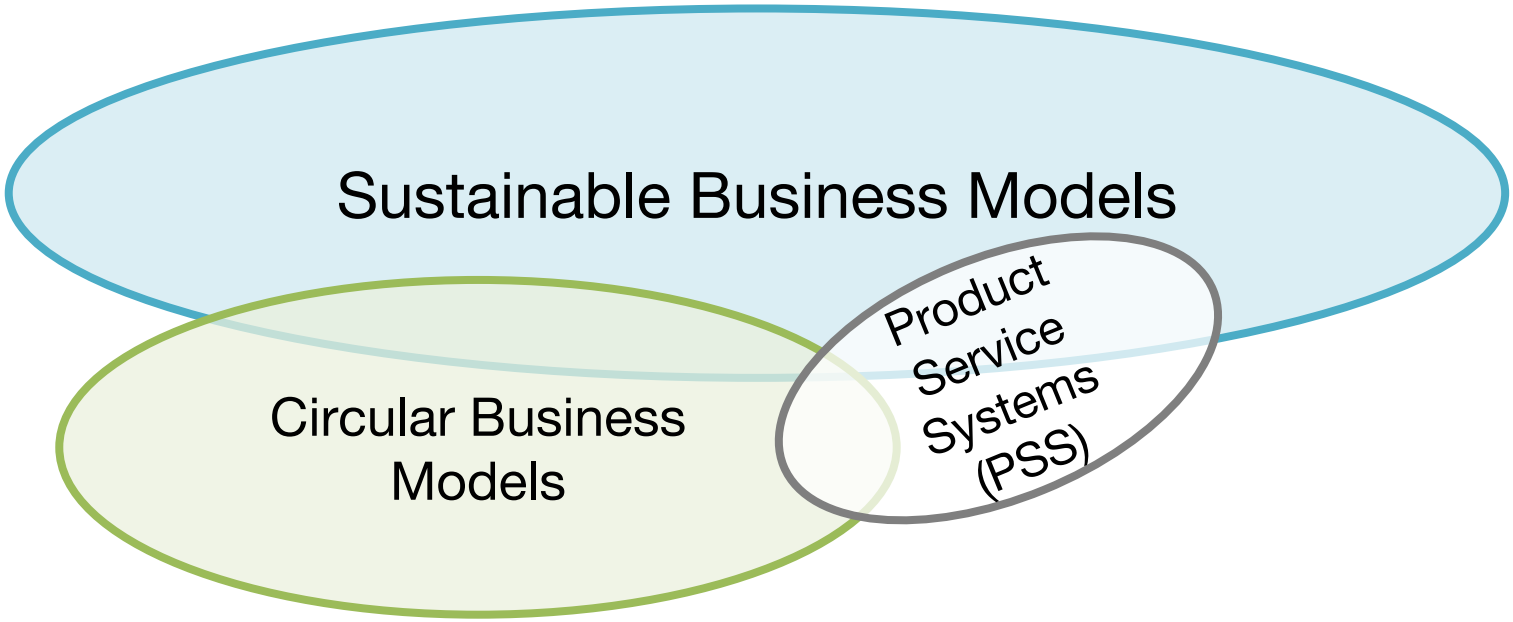
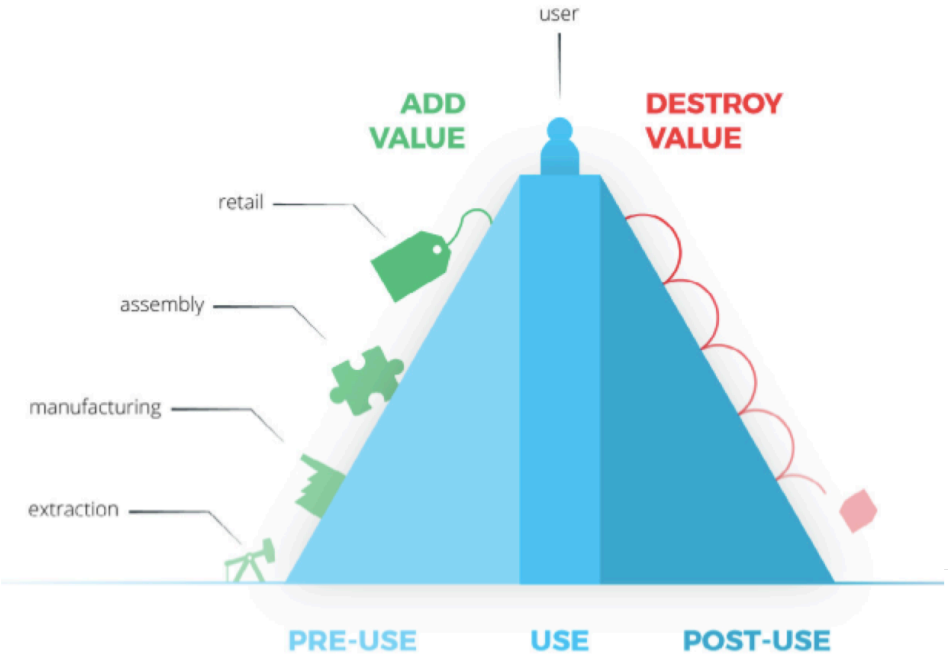
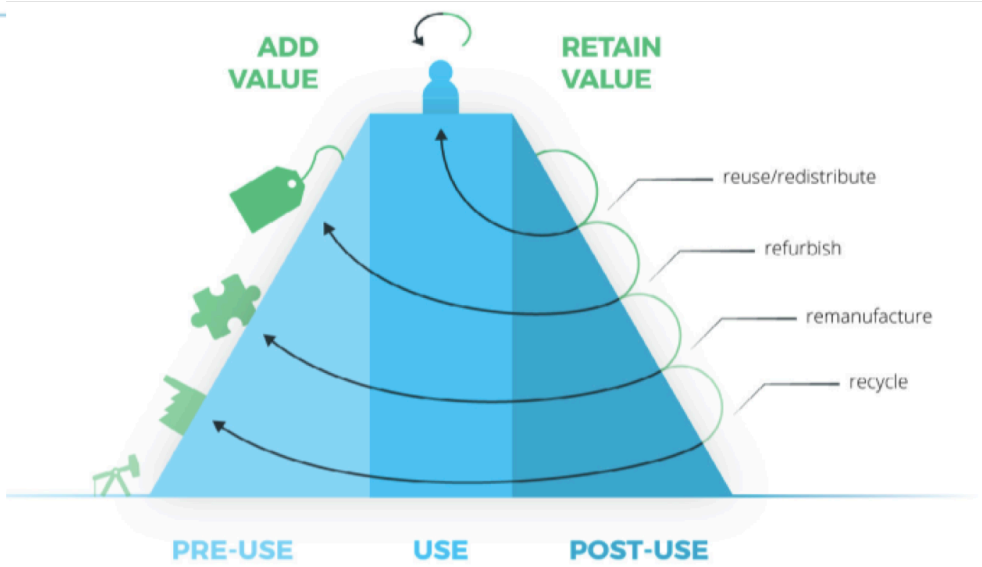
Circular Business Models



The Value Hill



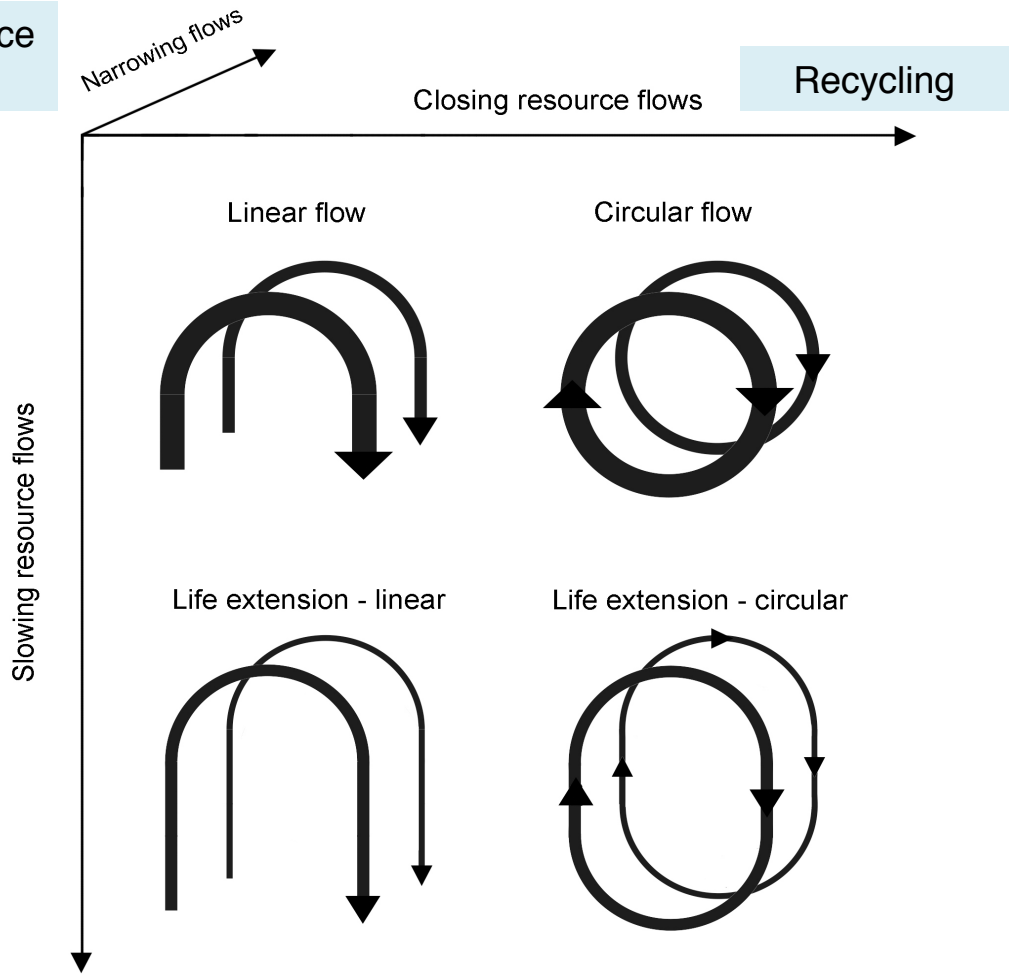


Value Hill source. Achterberg, E., Hinfelaar, J., Bocken, N.M.P. 2016. Master circular business models with the Value Hill. White paper, September 2016

Resource flows & loops

Minimising resource use per product

Extending the useful life of products



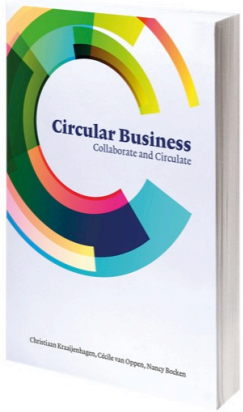


Figure: Circular Economy framework. Source: Bocken, N.M.P., de Pauw, I., van der Grinten, B., Bakker, C. 2016. Product design and business model strategies for a circular economy. J. Industrial & Production Engineering, 32 (1), 67-81.
+ Kraaijenhagen et al. 2016. Circular Business. Available at: www.circularcollaboration.com

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Implementation

Consumer: Circular offers

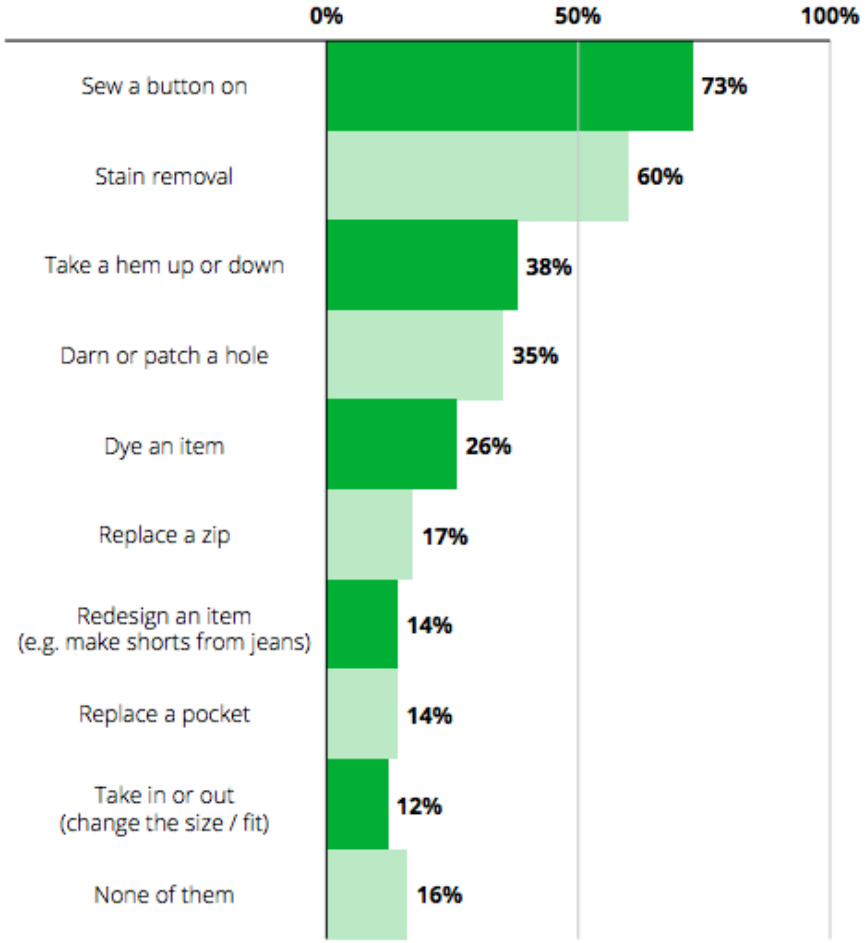

Figure 13: Shows the % of people that felt confident to perform repairs and alterations'

Base: Graph an

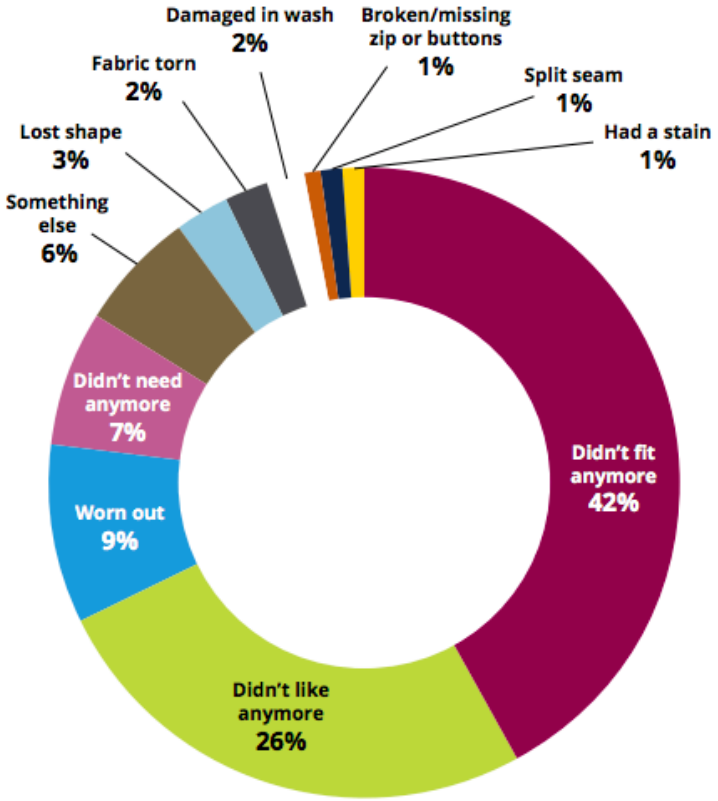

Figure 16: Reasons for choice of disposal routes for garments, on average, reported in a survey[xxi]

Charts. Source: WRAP. Valuing our clothes report. http://www.wrap.org.uk/sites/files/wrap/valuing-our-clothes-the-cost-of-uk-fashion_WRAP.pdf

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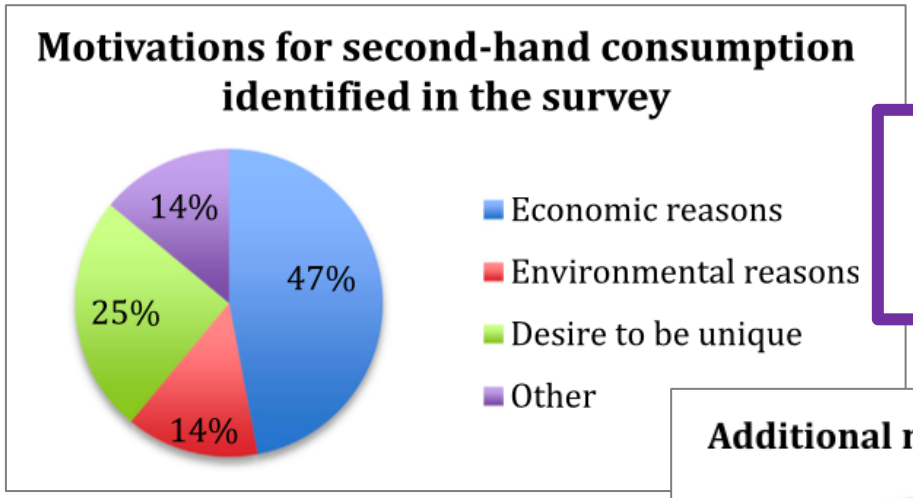
Circular offers and second hand



VINTAGE & SECOND HAND SHOPPING

Shop timeless interior design, furniture and fashion.

Study in collaboration with:

IKEA®

Pie charts: Exploring attitudes towards 2nd hand. Source: E. Gullstrand Edbring et al. 2016. Exploring consumer attitudes to alternative models of consumption: motivations and barriers. Journal of Cleaner Production 123 (2016) 5-15

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Environment: Efficiency improvements and reuse

Product	Time period	Efficiency improvement (%)	Reference
Car	Theoretical annual improvement	+3.2	Skelton and Allwood (2013)
Refrigerator	1947–1974	–530	Gutowski and colleagues (2011)
Refrigerator	1974–2008	+76	
Dishwasher	1981–2008	+45	Boustani and colleagues (2010a)
Clothes washer	1981–2008	+70	
Refrigerator	1981–2008	+62	
Clothes washer	1981–2003	+88	AHAM (2005) cited in Bole (2006)
Cell phone, LCD monitor, CD player	Theoretical 1991–2001	Variable but nominal +20	Rose and Stevels (2001)

Note. LCD = liquid crystal display; CD = compact disc.

Source: Cooper, D.R., Gutowski, T.G. The Environmental Impacts of Reuse: A Review. Journal of Industrial Ecology (in press).

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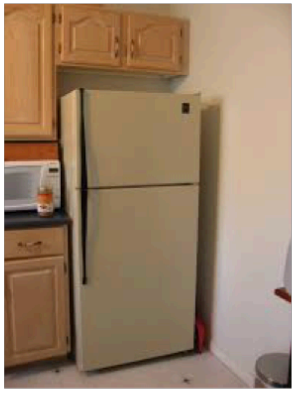
Environmental assessment

Old fridges
Is reuse a good option?

Used fridge



Extending life saves materials

vs.

New energy efficient fridge

Saves energy during use

Source: Bakker, C.A., den Hollander, M.C., van Hinte, E., Zljlstra, Y., 2014. Products that Last - Product Design for Circular Business Models. TU Delft Library, Delft.

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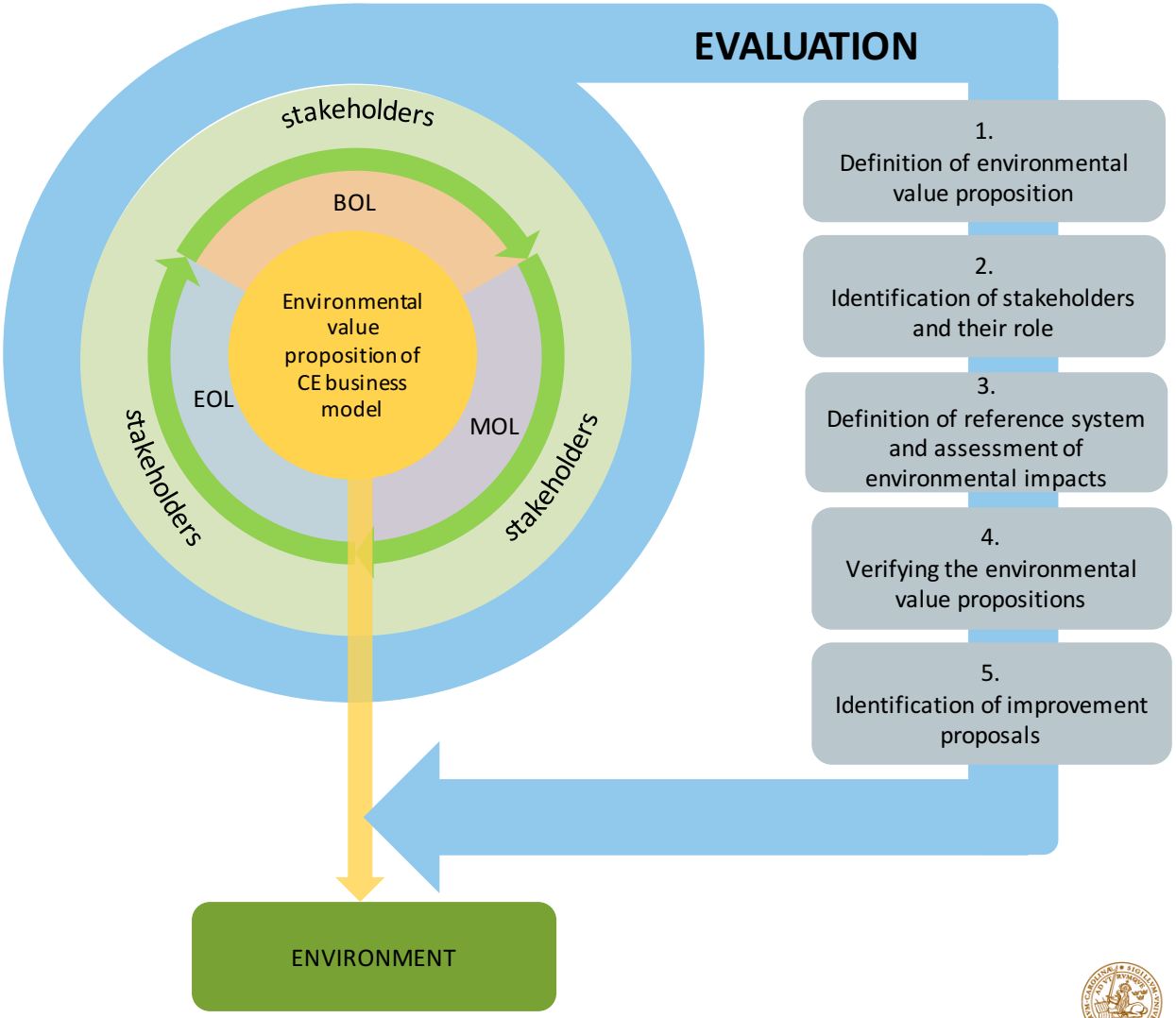
Environmental value proposition



Source: Manninen, K., Koskela, S., Antikainen, R., Bocken, N., Dahlbo, H., & Aminoff, A. (2018). Do circular economy business models capture intended environmental value propositions?. Journal of Cleaner Production.

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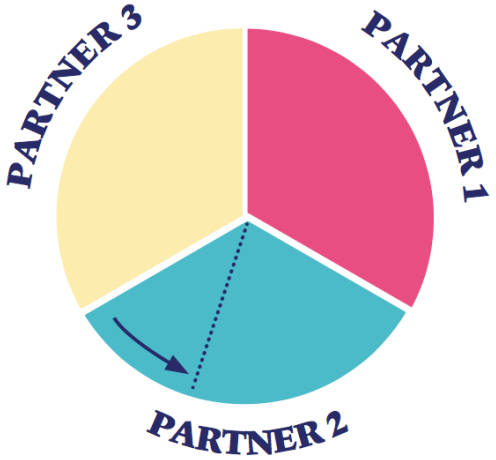
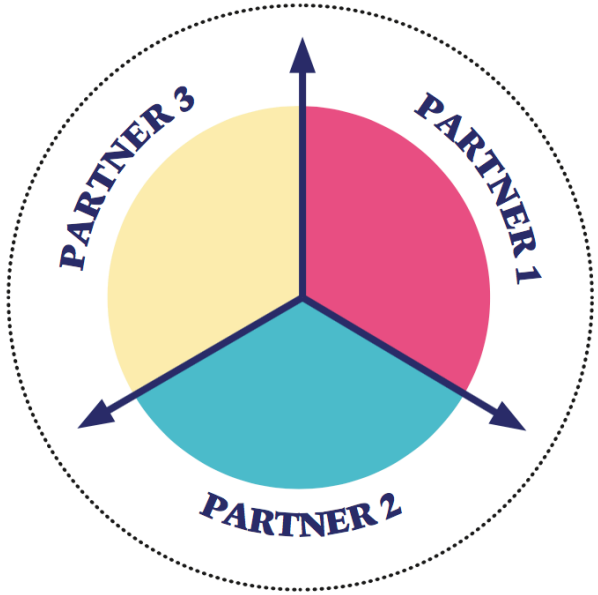
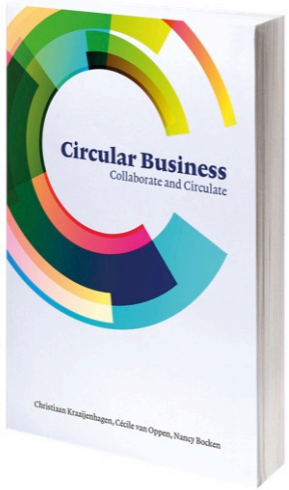
Collaboration: increasing the pie







EXAMPLE

Shared visioning: Marks & Spencer

UK-based retailer Marks & Spencer (M&S) first launched its Plan A in 2007, in which the company made 100 commitments for the next five years to help protect the planet. These commitments included responsible sourcing, waste reduction and helping communities. Plan A 2020, which was recently launched, has added 100 new, revised and existing commitments in the company's pursuit of becoming 'the world's most sustainable major retailer'.[57]

EXAMPLE

Innovation through collaboration: the Net-Works initiative (Interface, Aquafil, ZSL)

In the Net-Works[3] initiative, waste (nylon fishing nets) is transformed into new value as the raw material for carpet tiles. This collaborative initiative between carpet manufacturer Interface, yarn producer Aquafil, the Zoological Society of London (ZSL) and local communities dependent on fishery generates new streams of income while simultaneously cleaning up the oceans.

Kraaijenhagen, C., Van Oppen, C., Bocken. N., 2016. Circular business. Collaborate & Circulate. Circular Collaboration, Amersfoort, The Netherlands. Available at circularcollaboration.com

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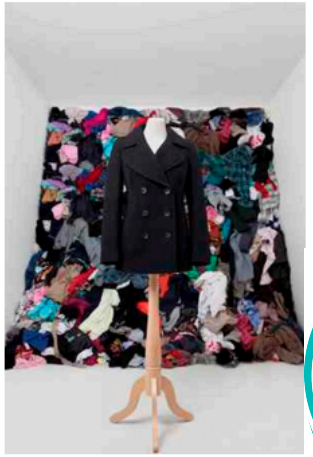
Experimentation

Business experimentation for Circular Economy

LAUNCH OF REDRESS PROJECT WITH M&S

REDRESS is a collaborative project between M&S and Cambridge and funded by the TSB competition 'Supply Chain Innovation Towards A Circular Economy'. This is a 2-year project to drive garment recovery and retained value through business model and supply chain innovation. This project seeks to accelerate M&S Plan A commitments around reducing waste. The focus for this project will be to reduce the environmental impact of raw materials in M&S' clothing supply chain. The team will apply circular economy thinking to drive greater garment recovery and retained value. The outcomes of the project can be applied to textile and other industries.

The first REDRESS workshop took place on 2-3 October and was attended by a group of enthusiastic forward-looking thinkers from academia, business and other organisations. The group generated a wide range sustainable business model ideas for the project. The next challenge is to pick out the best ideas for the business pilots. To find out more about this project, contact lead researchers Dr Curie Park (cp538@cam.ac.uk) or Dr Nancy Bocken (nmpb2@cam.ac.uk).



Sustainable Design and Manufacturing 2016 pp 297-306

Business Model Experimentation for Sustainability

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Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro

Developing sustainable business experimentation capability – A case study

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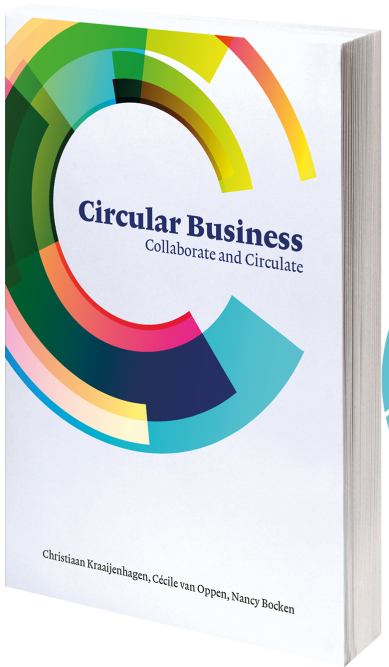
[c] Design for Sustainability & Product Innovation Management, The Netherlands

ABSTRACT

This research paper shows how a firm pursues innovation activities for economic, social and environmental value creation in the context of time sensitivity. We make a conceptual link between lean startup thinking, triple bottom line value creation, and organizational capabilities. The case study firm uses a novel experimentation approach to pursue the goal of diverting all of its sold clothing from landfill through a two-year project. This requires substantial changes to the current business practice because in 2012, the clothing retailer recovered 1% of all garments sold. The fibre input value for all garments sold in 2012 exceeded $7m. We found that despite a stated need for fast learning through project experiments, the experiments were not executed quickly. (1) The desire to plan project activities and the lack of lean startup approach expertise across the whole project team hampered fast action. This led to the extension of the project timeline. However, project team confidence about learning by doing increased through privately executed experiments. (2) Some project experiments were not fit to meet the triple bottom value creation project goal and were dropped from the project. Overall, the corporate mindset of economic value creation still dominated.



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CIRCULAR BUSINESS PROJECT

What is sustainable business experimentation?

- Business experimentation: to learn and improve business model innovation activities *with limited risks and resources* through *continuous and collective learning* with stakeholders
  - Sustainable business experiments consider Profit, People, Planet
  - Experiments cannot typically be controlled in a business environment
  - Businesses deal with real customers and immediate business pressures

- Business experimentation is a core organisational capability to stay in business (Chesbrough, 2010; Weissbrod & Bocken, 2017)

- Test the environmental and societal value proposition
- Think big, start small
- But start: Just do it!

- Chesbrough, H. 2010. Business model innovation: opportunities and barriers. Long Range Planning, 43 (2), 354-363.
- Weissbrod, I., & Bocken, N. M. P. (2017). Developing sustainable business experimentation capability–A case study. Journal of Cleaner Production. 142, Part 4, 2663–2676

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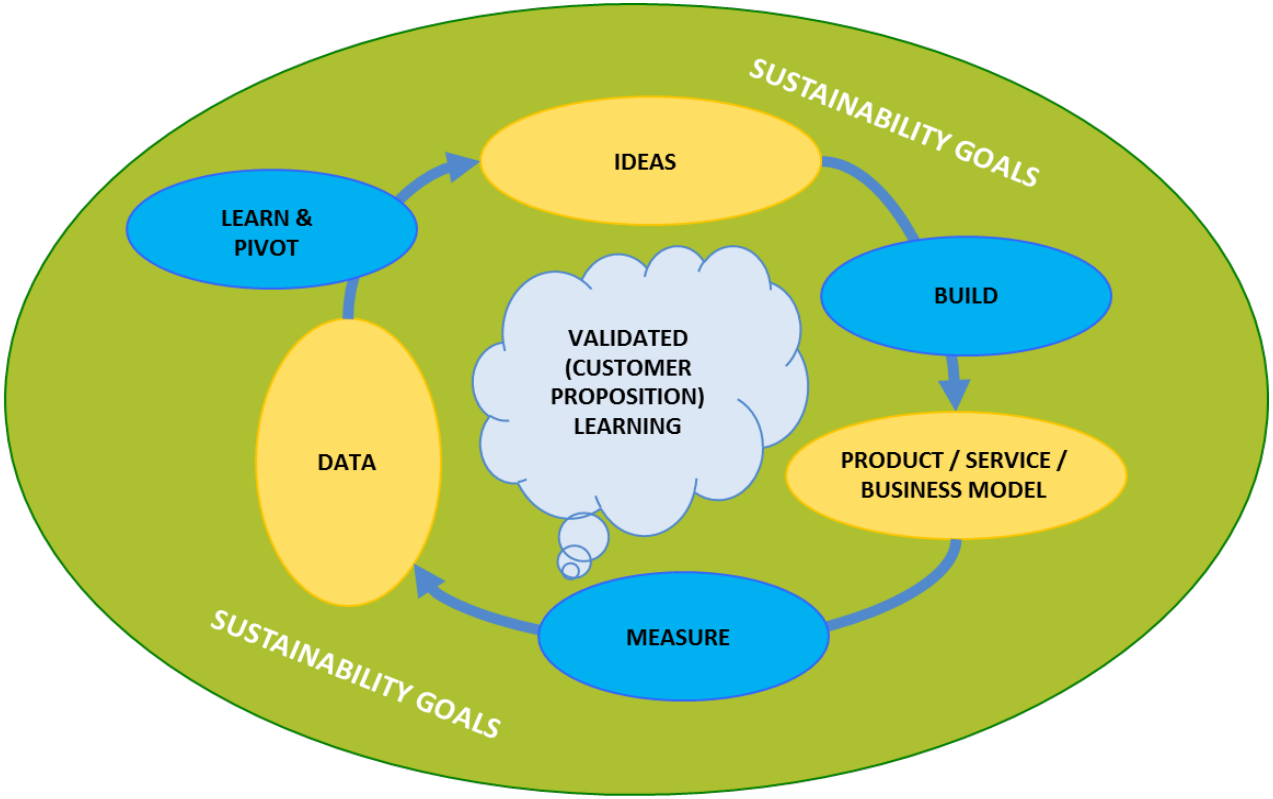
Business model experimentation for Sustainability



Source: Weissbrod & Bocken (2015) adapted from the lean startup principles (Ries, 2011) and customer development (Blank, 2013)

The Circular Business Experiment cycle

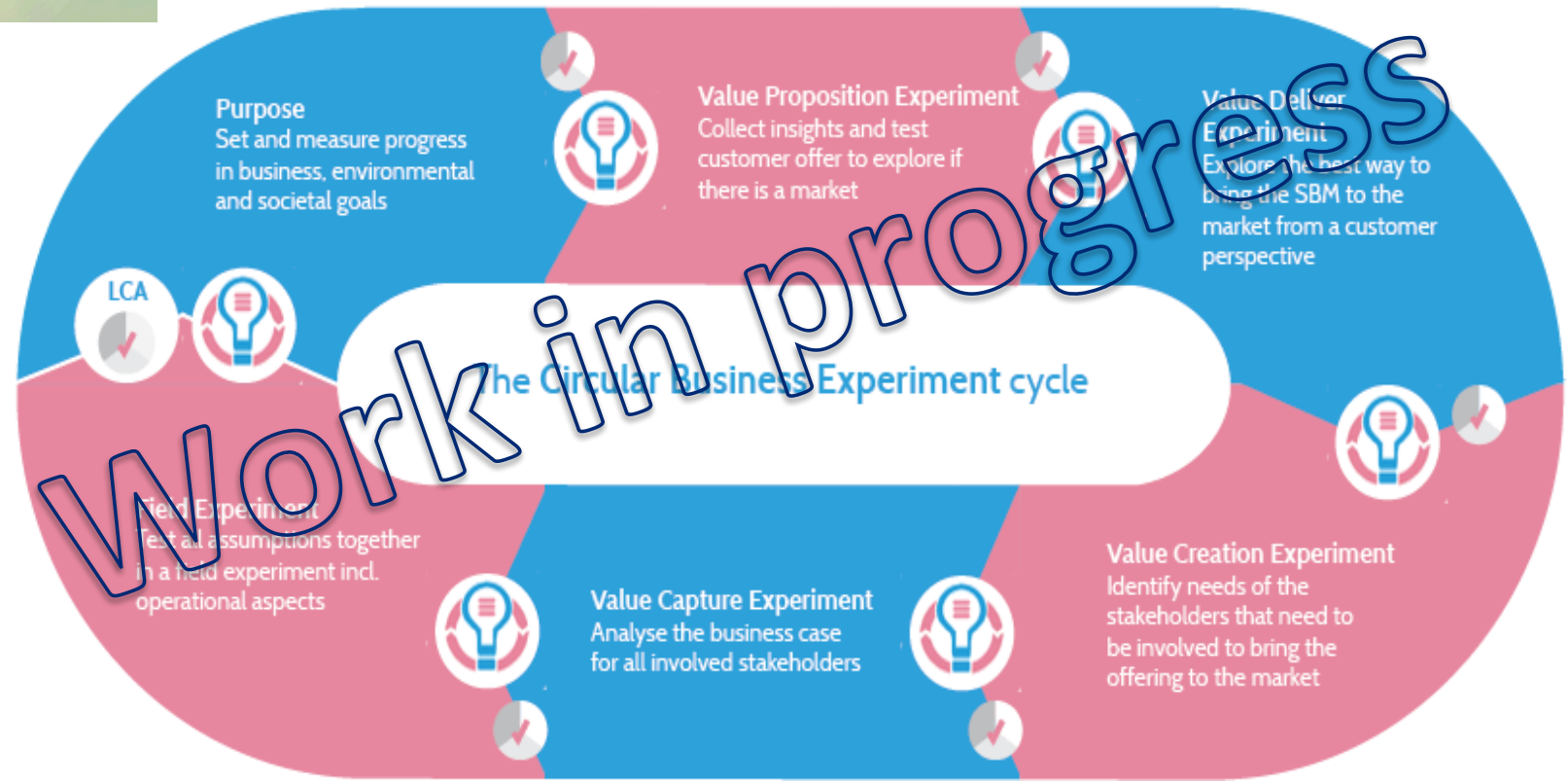


Figure: Experiments in the business innovation process. Bocken, N., Schuit, C., Kraaijenhagen, K. (under review). Circular business model experimentation: exploration through eight cases. Environmental innovation and societal transitions (building on Osterwalder et al. 2014)

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Start-ups influencing sustainable consumption

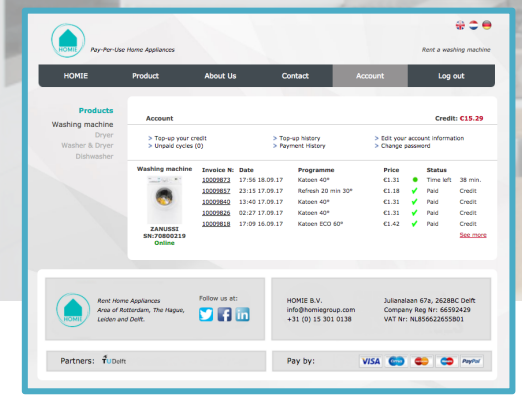
- **Zipcar** estimates that every Zipcar takes six personally-owned vehicles off the road and that after joining Zipcar, 60% of its members drove less than 1,000 miles per year, saving 829 litres of petrol each
- **Airbnb** estimates that its guests use almost 80% less energy than average hotel guests

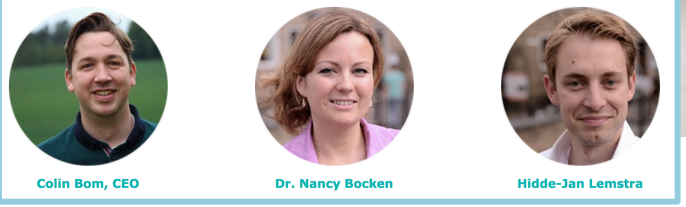
- *"Social norms and peer education, goal setting and feedback, incentives, engaging people in the solution and choice editing and defaults"* could stimulate pro-environmental behaviour (Bocken and Allwood, 2012, p. 121)

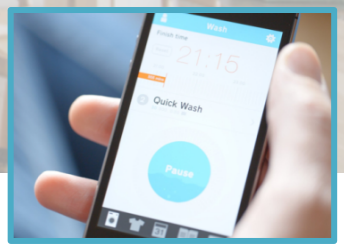
- However… impact of new business models remains highly underexplored despite the hype

- Bocken, N., Allwood, J. 2012. Strategies to reduce the carbon footprint of consumer goods by influencing stakeholders. Journal of Cleaner Production, 35, 118-129.
- Bocken, N.M.P., Bom, C.A.,, Lemstra, H. 2017. Business experiments as an approach to drive sustainable consumption: the case of HOMIE. Product Lifetimes and the Environment (PLATE), Delft, The Netherlands, 8-10 November 2017.

About HOMIE







- **TU Delft spin-off HOMIE** aims to significantly reduce the environmental impact associated with domestic appliances, by offering appliances on a “pay per use” basis.
- **Circular & Sustainable consumption**: through paying per use, high quality appliances can be offered affordably, and sustainable behaviour can be stimulated
- **Starting with washing machines**, HOMIE offers free installation and maintenance of quality appliances
- **Customers pay per wash** and there is differential pricing to encourage the use of lower temperature settings; e.g. a cold wash is €1,13 and a 90°C wash is €1.69

Pay-Per-Use **Reliability** **Sustainability**

HOMIE
www.homiepayperuse.com

Source: www.homiepayperuse.com

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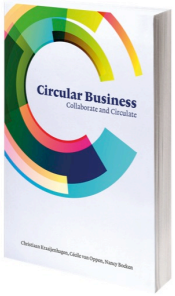
Circular strategies



RE strategy	✓	?
Closing resource cycles	Easy product take back and recycling	Product redesign Partnering Strategy Financial model Product life cycle impacts Other product categories Long-term impacts
Slowing resource cycles	Easy maintenance, repair, reuse	
Narrowing resource cycles	Efficiency in use phase; sustainable consumption	

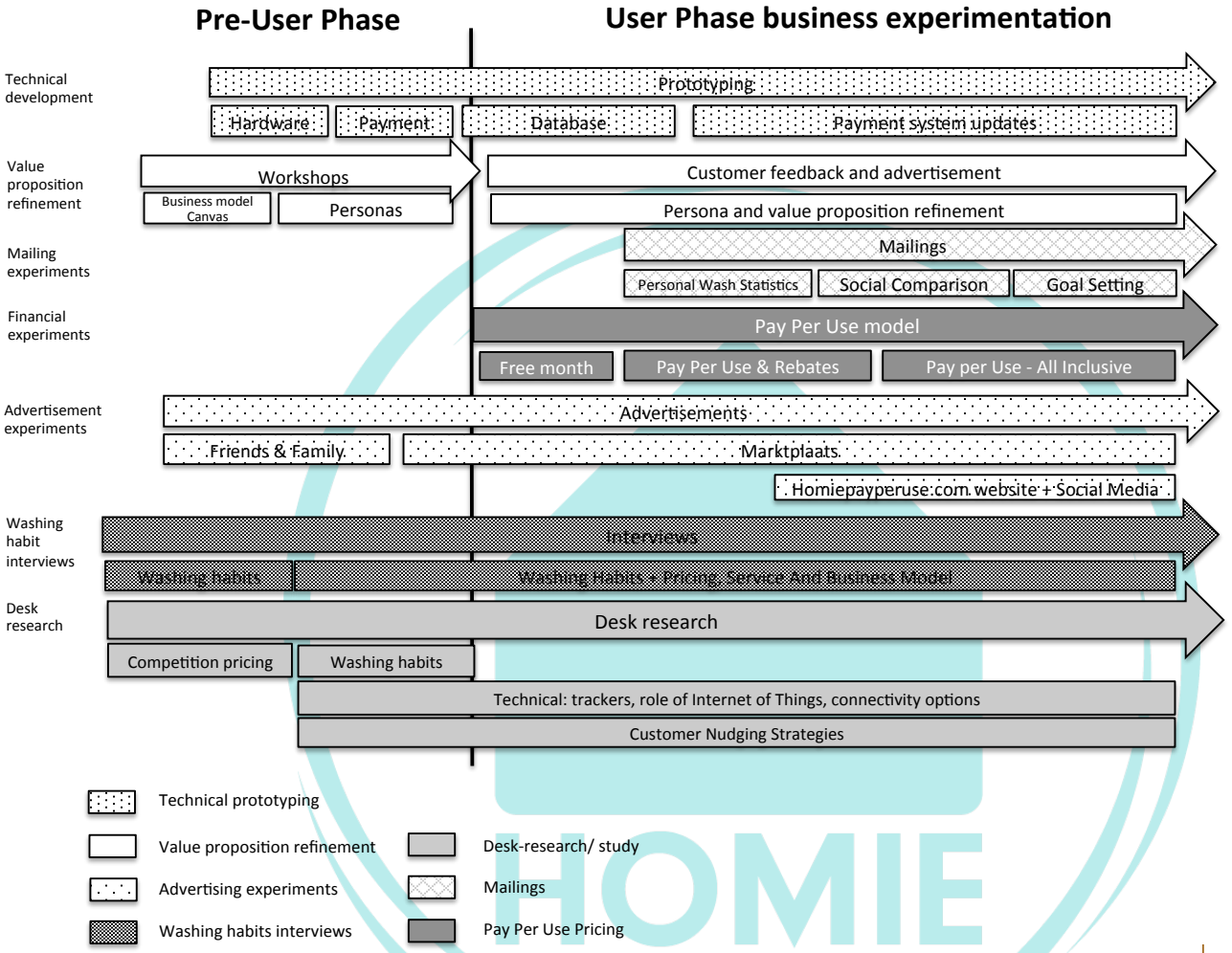
Kraaijenhagen et al. 2016. Circular Business. Available at: circularcollaboration.com + Bocken et al. 2016. Product design and business model strategies for a circular economy. J. Industrial & Production Engineering, 32 (1), 67-81.

Business experimentation at HOMIE

- *How can companies contribute to sustainable consumption through experimentation with new business models, and specifically 'pay per use' business models*?
- Experiments
  - Interviews
  - Free month
  - Paying per use
  - Providing information
  - Social comparison

Sources: Bocken, Bom, Lemstra (2017a, b)

Experimentation roadmap HOMIE



Overall findings

- Paying per use pays off for the environment
  - Consciousness about number of washes
  - Consciousness about types of wash (differential pricing)
- Impacts of mailings (information, social) are mixed
- Experimentation is a useful approach but long-term impacts need to be understood
- Start-ups are one big experiment (Blank, 2013; Ries, 2011)
- Sustainability adds another experimental dimension (Weissbrod and Bocken, 2017)

- Blank, S. 2013. (1st Edition 2005) The Four Steps to the Epiphany: Successful Strategies for Products That Win. K&S Ranch Publishing, San Francisco, USA.
- Ries, E. 2011. The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses. Penguin Books, London, UK
- Weissbrod, I., & Bocken, N. M. P. (2017). Developing sustainable business experimentation capability–A case study. Journal of Cleaner Production. 142, Part 4, 2663–2676

Circular Business project

Available via: circularcollaboration.com/

CIRCULAR BUSINESS PROJECT

The Circular Business Project explores how we can make it more attractive for customers and businesses to choose service models above ownership models. In a period of six months, nine companies participate in a track of eight weeks to create a circular value proposition and business rationale.

Shifting from ownership to service models

Welcome to the circular business project! Together with nine companies we will explore how we can make it more attractive for customers and businesses to choose service models above ownership models. On this website you find more information about the project, updates and reflection on the methodology. Feel free to join the discussion!

Circular Business project

- Can we speed up the transition towards circular business?
- Together with eight companies, Innoboost and TU Delft explored how small scale experiments speed up the shift from selling products, to delivering services – and ultimately customer experiences

Conclusions

- Our global sustainability challenges are pressing and rapid action is needed
- *Sustainable business experimentation is a way to kickstart transitions in business*
- Business experimentation: to learn and improve business model innovation activities *with limited risks and resources* through *continuous and collective learning* with stakeholders
  - Sustainable business experiments consider Profit, People, Planet
  - Experiments cannot typically be controlled in a business environment
  - Businesses deal with real customers and immediate business pressures
- Test the environmental and societal value proposition
- Think big, start small
- But start: Just do it!

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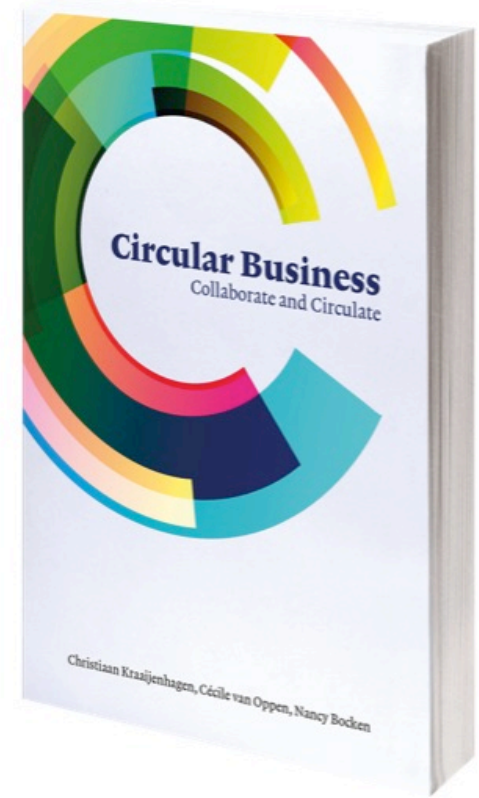
Questions?



"The best way to predict the future is to invent it" (Alan Kay)

Book: www.circularcollaboration.com

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